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# THE ILLUSTRATED POULTRY RECORD

NEW YEAR'S NUMBER.



JAN.  
1914

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Edited by E. J. Brown.



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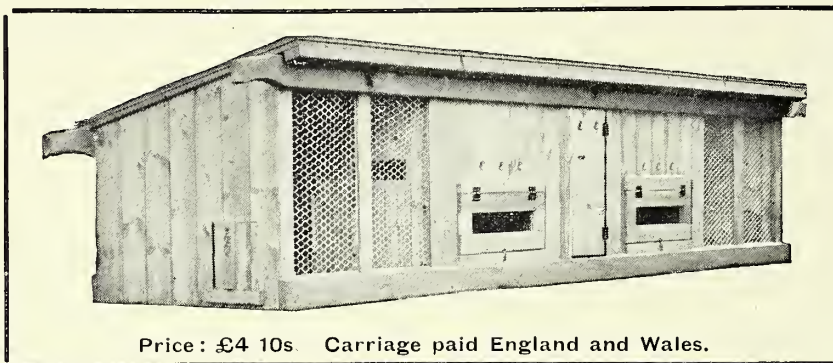
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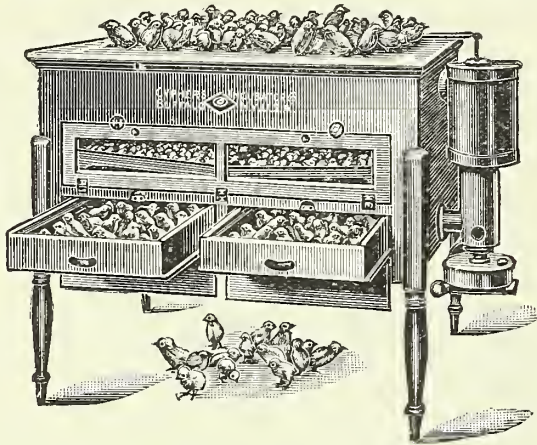
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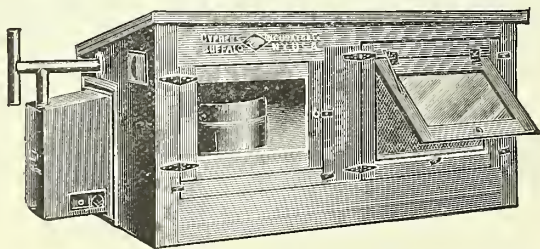
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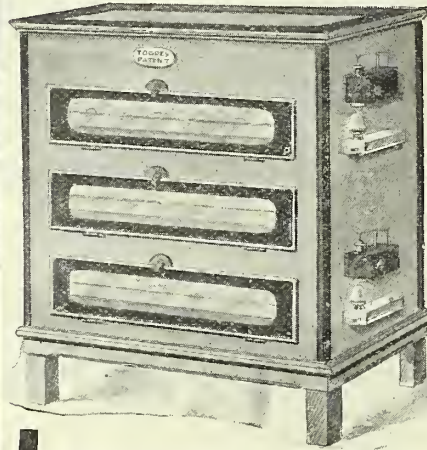
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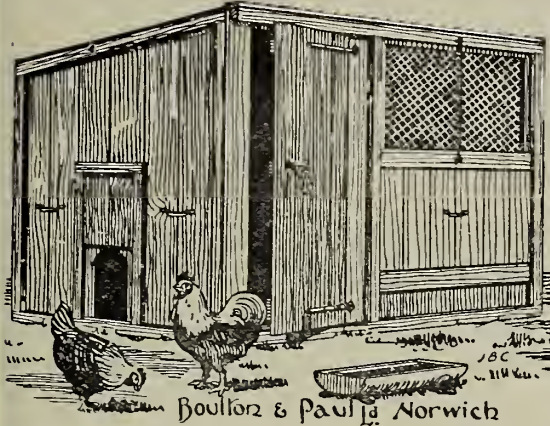
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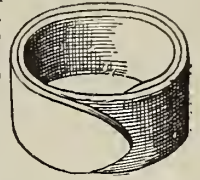
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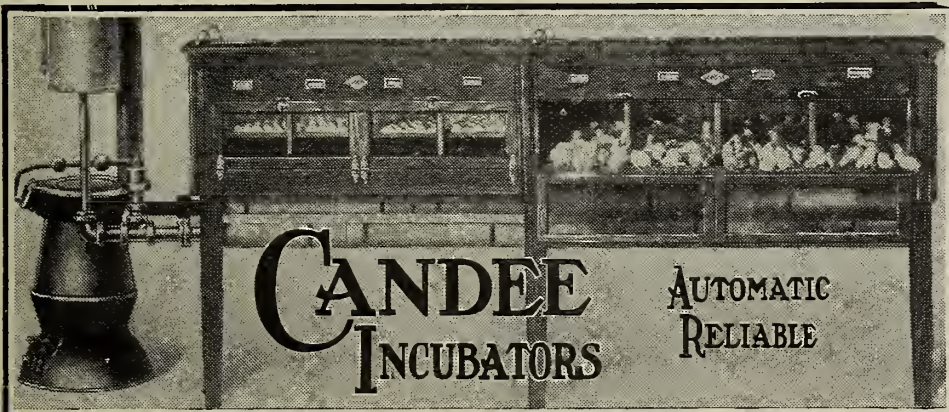
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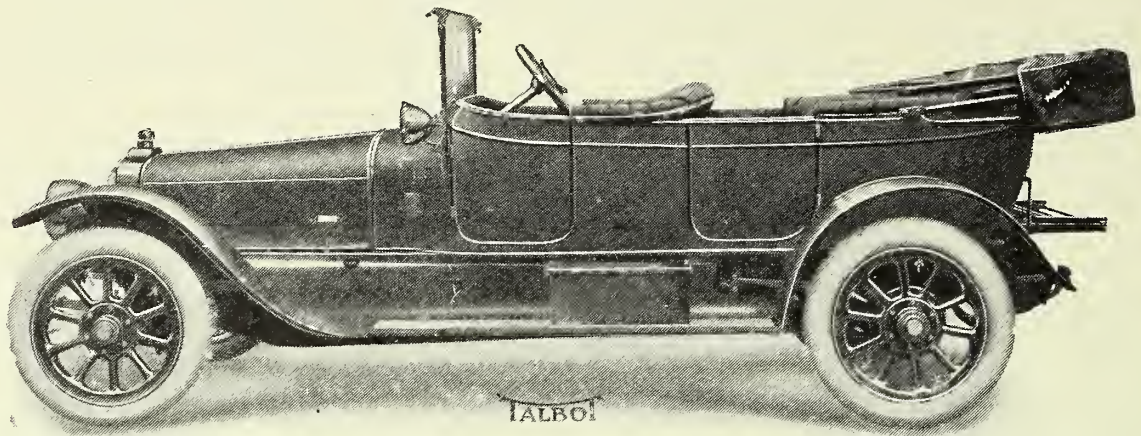
**F. JEWELERS, LORD'S MILL,  
CHESHAM, Bucks.**



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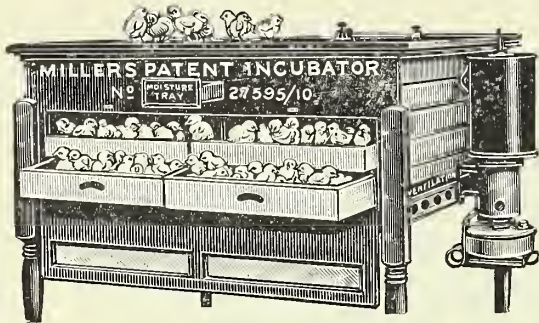
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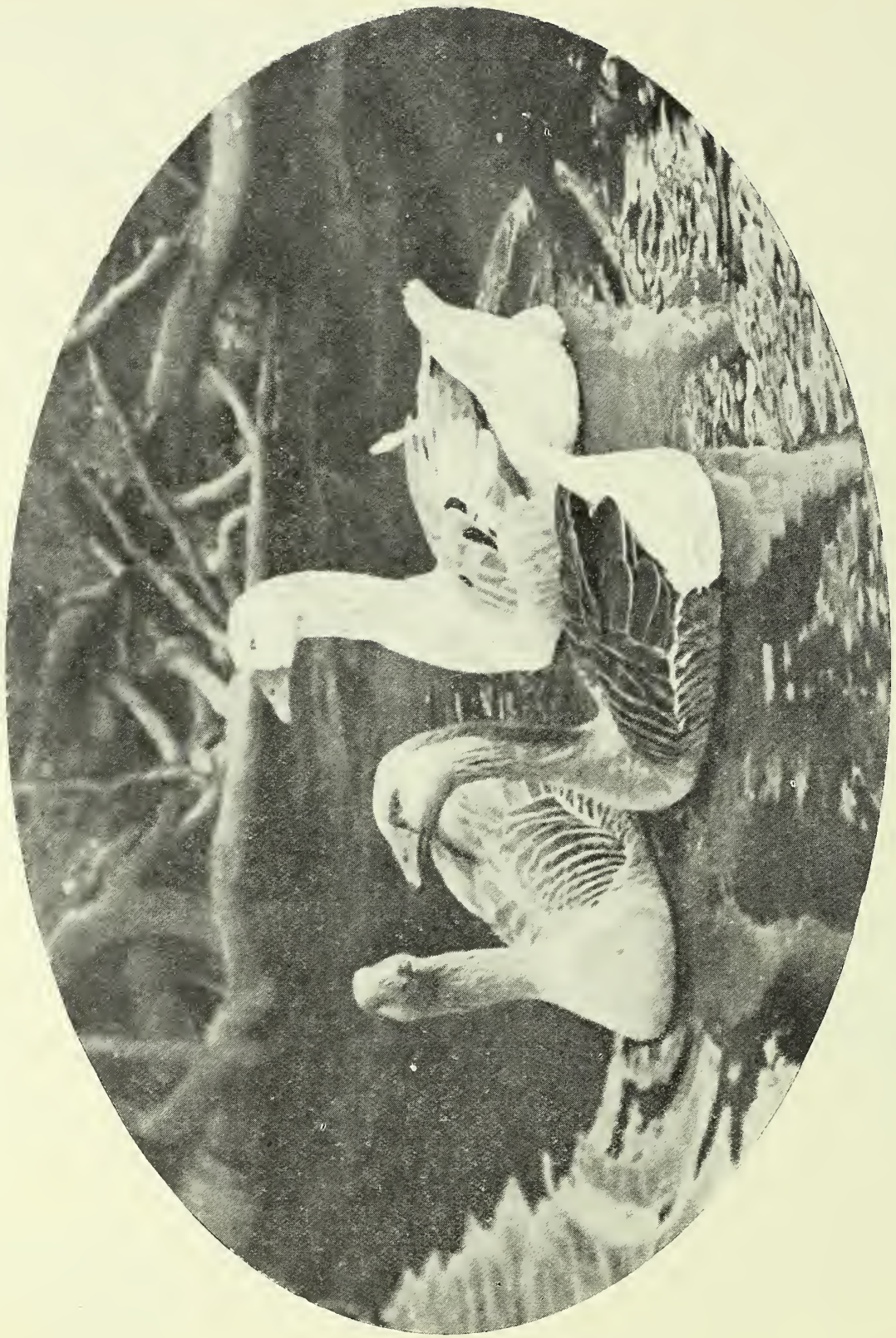
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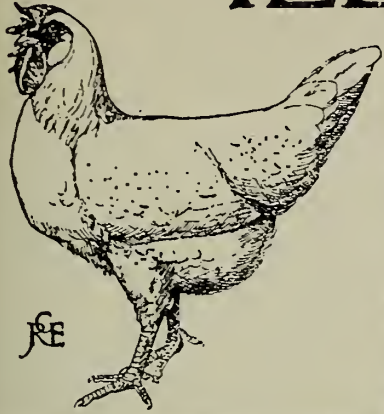
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# THE ILLUSTRATED

# POULTRY

# RECORD



Vol. VI.—No. 4.

January 1, 1914.

Monthly, Price Sixpence.

## DIARY OF THE MONTH.

### EDITORIAL NOTICES.

ATLANTIC HOUSE, HOLBORN VIADUCT, LONDON, E.C.

Telegrams : " VIVACIDAD, CENT., LONDON."

Telephone : 2697 HOLBORN.

*The Editor will be glad to consider any MSS., photographs, or sketches submitted to him, but they should be accompanied by stamped addressed envelopes for return if unsuitable. In case of loss or injury he cannot hold himself responsible for MSS., photographs or sketches, and publication in the ILLUSTRATED POULTRY RECORD can alone be taken as evidence of acceptance. The name and address of the owner should be placed on the back of all pictures and MSS. All rights of reproduction and translation are reserved.*

*The Editor would like to hear from readers on any Poultry Topics, and all Queries addressed to the paper will be answered by experts in the several departments. The desire is to help those who are in difficulty regarding the management of their poultry, and accordingly no charge for answering such queries is made.*

*The Annual subscription to the ILLUSTRATED POULTRY RECORD at home and abroad is 8s., including postage, except to Canada, in which case it is 7s. Cheques and P.O.O.'s should be made payable to the ILLUSTRATED POULTRY RECORD.*

**The ILLUSTRATED POULTRY RECORD is published on the first of every month. Should readers experience any difficulty in securing their copies promptly they are requested to communicate immediately with the Editor.**

**The latest date for receiving advertisements is the 20th of the month preceding date of issue.**

**The utmost care is exercised to exclude all advertisements of a doubtful character. If any reader has substantial grounds for complaint against an advertiser he is requested to communicate at once with the Editor.**

### The Proposed National Poultry Institute.

We regret to hear that the proposal for the establishment of a National Poultry Institute, at which training in the higher branches of experimental work could be undertaken, will be abandoned by the Provisional Committee, which for the past three years has endeavoured to bring the project to a final issue. The reason for this step will be financial. To realise the conditions under which the Development Commission was prepared to recommend Treasury Grants of £8,500 for establishment and equipment, and of £2,000 per annum for maintenance, the Provisional Committee was charged with the responsibility of raising equal amounts. This it has been unable to accomplish. Before abandoning the scheme the Committee made application to the Development Commission for revision of the terms, and in view of a very generous offer made as to land, etc., by a warm supporter of the scheme, had such application been acceded to, the Institute might have been carried through. The Development Commissioners, however, have declined to modify the conditions, and the Provisional Committee will have no alternative course to that announced above. The hopes, therefore, of all those interested in the extension and advancement of the Poultry Industry in this country are thus grievously disappointed, and of seeing the many problems awaiting solution dealt with as can alone be performed at a great public institution.

### New Laid Eggs.

Some time ago we called attention to a case in the Potteries of a prosecution for selling eggs under a wrong designation. Another case has



just been tried at Burslem, as a result of which a tradesman in that town has been fined three guineas and costs amounting to £25 for selling Russian eggs as new-laid. As it is possible an appeal will be made we make no comments but merely state that a claim was made, that the terms "new-laid" and "fresh" eggs are synonymous in the trade. That, however, cannot be sustained. "Fresh" is a designation to note not preserved, whereas "new-laid" clearly means recent production. No self respecting trader would confound the two, and we are glad, therefore, that efforts are being put forth to compel adherence to what is evident to all. It is entirely a question of age, not the place of origin. The stipendary magistrate in giving his decision wisely said that "the ordinary person who asked for 'new-laid' eggs would hesitate if told they were from Russia or a more remote part still." In any case, he thought the purchaser ought to have an opportunity of exercising his judgment and choice.

#### Hatching Eggs and Equatorial influences.

We have received from Mr. I. Gundelfinger particulars of a shipment of eggs for hatching recently sent out to Durban, Natal, which is of special interest. One lot was placed in a Hearnson's incubator to be worked by electricity, but the heat not to be applied until the ship was a week out from the Thames, so that the three weeks will be completed a day or two after arrival at the port of debarkation. In this case arrangements have been made for proper control of the incubator en route. A further batch of eggs have been sent in a specially made insulated case, with a central pivot, so that it may easily be turned daily, and thus give the eggs every possible chance. These arrangements are designed to avoid the risks inseparable from passing through the tropics, which is where the danger arises. The results cannot fail to be of great interest, though neither one nor the other is new as similar tests were made some years ago. That with an incubator was for the passage of the Red Sea, and succeeded. The other did not turn out satisfactorily. It may be pointed out that November eggs are less likely to give the same results as those laid in the spring months.

#### The War on Foxes.

Until the Fox tyranny is ended, either by Hunt Committees taking steps to minimise the operations of these destructive animals, and by paying promptly and adequately for fowls, lambs, &c., killed by them, or a systematic and determined extirpation of the vermin, it is necessary to keep the matter forward prominently. As is well known, we have always advocated the former solution, and do not desire to interfere

with legitimate sport. The time has arrived when the word "legitimate" can be no longer applied to fox hunting, and is approaching when, in the interests of poultrymen individually and the nation generally, there will be no alternative to taking the second course, and undertake a war of extermination. Hunt Committees appear, in the main, to be unwilling or unable to see the rights of the case, and we fear that little may be expected from the government. The tide of indignation is, however, rising rapidly, as evidenced by the daily press. In our last issue was mentioned that a Cheshire landowner was taking matters into his own hands. Among other accounts published is that of a Hertfordshire farmer, whose claims are ignored by the local Hunt, so much so that the *Daily News*, in recording this case says: "Can any 'sportsman' wonder that a bullet sometimes finds its billet in the body of Reynard Turpin, licensed highwayman?" And a correspondent of the *Times*, under the cognomen of "A Non-hunting Farmer," says: "We breed foxes; we do all we can to keep the old sport alive. All we ask is fair play. And we ask—how is it that you can find funds to hunt five days a week (a day extra), yet you cannot find money for a few extra poultry claims?"

#### Professor F. V. Theobald, M.A.

A well deserved tribute was paid recently to our valued occasional—too much so—contributor, whose name is given above, upon which we congratulate him most heartily, when the Mary Kingsley Medal of the Liverpool School of Tropical Medicine was conferred upon him for his researches into Mosquitos and their influence in spread of disease. At a luncheon given in his honour Mr F. C. Danson, Chairman of the school, after paying a personal tribute to Mr. Theobald's book, read a letter from Sir Donald Ross, in which he stated that few people had played such an important part as Mr Theobald in the modern developments of tropical medicine and sanitation. He had made a masterly study of Mosquitos, on which he had written a five volume work which was a masterpiece and on it he had been engaged for ten years. It was also recorded that Mr Theobald had presented most valuable material to the school, and recently given all his type specimens of those insects. We have often wished that this skilled scientist had been in a position to have continued his researches into the parasites of poultry, in which he has rendered notable service, and wherein is a field of operations as yet very little explored. Perhaps the opportunity may yet come for this to be done, which would be welcomed by all.



### Antagonistic Views.

In an Australian paper is given extract from the letter of a correspondent, evidently a poultry man, to the effect that the way in which poultry have been boomed during the last few years by egg-laying competitions, pamphlets and lectures have so increased the supply that prices of eggs have dropped by something like 20 per cent. in the Colony during what are there the spring months. This is explained by our contemporary as due to the insufficiency of cold storage accommodation to provide for the surplusage and thus relieve the market. In spite of all we can do there is always a period of increased supplies, though during the last two or three years in this country the demand has grown to such an extent that the margin unobtainable at profitable prices has practically disappeared. In a country where the consuming population is comparatively small to producers this arises to a much greater extent than in Western Europe and the United States of America. Therefore, unless methods of preservation are adequate to deal with the surplus, not restriction of the output, such must recur. On the other hand, complaints in the more remote areas of the United Kingdom and European countries are very rife that effect of better organisation is to greatly enhance to local householders the price of eggs in these respective districts. It is evident that prices were inadequate so far as producers are concerned, and the increase referred to is merely bringing the values up to a reasonable point. Such being the case there is nothing for housewives to do but accept as philosophically as possible what is irresistible.

### Careless Producers.

In spite of all that has been and is being done to improve the methods adopted in marketing home produce, the complaints of inferior quality and of bad packing are apparently almost as rife as ever, probably even to a greater extent by reason of the fact that the market standard has been considerably raised during the last few years, and consumers demand better quality than was formerly the case. That is due to some extent to co-operation, though not wholly so. It will, however, be in vain, unless producers and local traders rise to their opportunities. As an example, a firm of wholesale English egg merchants, writing in one of our weekly contemporaries, say:

"We are spending a lot of time and money in an endeavour to popularise English eggs, but are often disheartened. English eggs come in mixed sizes, and too often mixed in quality, there being a deplorable tendency to keep eggs for a rising market, and then, when the prices are right, selling them as new laid."

The practice here referred to is by no means peculiar to England, for it is known everywhere. Nothing, however, could be more fatuous than to do this with some of the best markets in the world at hand. Such is calculated to speedily destroy confidence, which is the essence of all successful trading. Possibly it may be the fact of a huge demand that leads many people to do what they would not otherwise attempt.

### Individuality in Laying.

The observations of Professor James Dryden, of Oregon, which we quote in the present issue, are certain to cause all egg producers "furiously to think," as they run athwart a good many notions. Some of the statements made are startling in the extreme. For instance, hen No. C 543 in feeding "had to take pot luck with the rest" of the flock. There was no coddling or special treatment, also "the standard of perfection is worthless when it comes to breeding for eggs." Again, "this hen was a little offish." She had some greater object in life than to be petted. Further, "high laying is an individual, not a breed or race characteristic." Evidently Mr. Dryden has not much faith in strain. And, finally, "the quickest and surest way to get vigour is to cross," for this hen was not pure. We do not propose at this stage to consider the questions thus raised. That they are of great importance is admitted. Considering the source from whence they emanate, they command respect. Perhaps Mr. Dryden may be regarded as old-fashioned in many of his ideas, but that he is eminently practical, all who know him will freely admit. He is out for permanent, not transitory results.

### Growth of Chickens.

That there is much to be learnt in respect to the growing of chickens everyone will admit. Absence of reliable data as to rate of growth and cost of production has led to very erroneous ideas on the questions involved. It may be hoped, therefore, that the Table Poultry Club will be able to help materially in this direction by exhaustive and reliable growing tests, and thus accomplish for that side of the poultry industry what has been done by the Utility Poultry Club in respect to egg production. Fortunately, in growing tests for table chickens (we hope in process of time ducklings, goslings, and turkeys may be treated in the same manner) there is not the same danger of injuring the race as is undoubtedly present with laying competitions. Birds entered in the latter are used for breeding, often whilst undergoing the forcing process and whilst they are immature. That should never be the case with the former,



as one important point is the sale value, which can only be tested by killing the birds, so that transmission of weakened constitution is entirely obviated. This should always be insisted upon in all such tests. We are led to these observations as a result of letters recently published giving the results of private tests. Even though these have been issued as indicative of the value of well-known proprietary poultry foods, that does not in any way detract from their interest. In one of these twelve Rhode Island Red chicks, incubator hatched but hen reared, attained an average weight of 3lb. 4½ozs. in twelve weeks at

methods are employed. For instance, in the experiments conducted at Theale a few years ago there was no attempt to force growth. The birds were fed more with the idea of normal development. Therefore, the weights attained were not equal to those secured by Mr. E. G. Paynter, and in the cases referred to above. We suggest that in all such experiments it should be clearly stated whether the birds are fed with the view to produce laying or breeding stock, or for early killing, as otherwise the results will be very misleading. Assuming that, in the first place, the object is production of table chickens,



At the close of day.

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a cost of 4½d. per bird; in the second, twelve white Orpingtons reached 3lb. 5ozs. each at a cost for food of 8¾d. each; and in the third thirteen un-named chicks at twelve weeks averaged 2lb. 10ozs. at a cost of 9d. each. In the two latter cases the methods of hatching and rearing are not stated. The discrepancy between the first and the two others requires further information.

#### Methods of Growing Tests.

In the above cases it may be assumed that the object and mode of feeding was attainment of rapid development. Here we have raised an important question, which should not be forgotten. We all know that under such conditions increase of weight may be secured to a greater degree during a given time, than where ordinary

the primary effort made should be to determine the growing values of different breeds hatched and reared under identical conditions, and fed upon the same food. That, together with the relative cost of food, will afford information of the highest importance. Even there, however, are contributory influences which must receive consideration, namely, constitutional vigour in the parent stock, for this must have great influence. Following that there should be equally careful experiments as to the results achieved with different foods, which should be on a more extensive scale, first, several lots of one breed supplied with such varied foods, and second, comparisons between breeds. In this direction there is abundant scope for the Table Poultry Club for some years to come.



## RANGE *versus* RESTRICTION FOR POULTRY.

Their Influence upon Physical Vigour.

BY EDWARD BROWN, F.L.S.



PART from all questions of economics, with which it is not my purpose to deal, one of the most important questions that poultry breeders have to consider, is the influence upon future generations of the methods generally adopted. It is not enough to regard the immediate. The essence of all operations is jointly provision for the present and reservation of a surplus for the future. The farmer who consumed all his grain, and had none left for seed or no money to buy any, would speedily come to grief. He wisely places on one side a reserve upon which he can draw when the season arrives. As the object of all natural laws is evidently perpetuation and continuation of the race it is only in so far as the poultry breeder keeps the same policy always in mind, acting in accordance therewith, that he can hope to make for permanent success. Too often are the facts here stated forgotten. I have seen many instances of failure owing to that being the case, perhaps misled by the results of one or two years experience. As I have pointed out previously, what we have to guard against is not the rapid and large, therefore patent, results accruing from any system, but the accumulation of less apparent influences along the same lines for a series of years. It is there that the danger lies.

That the future will see an increase of intensification in respect to egg and poultry production is evident. In fact such must be true if the needs of a rapidly growing earth population are to be provided for. My own view is that this is possible if, and only if, the balance of nature is maintained as between animal and plant life. Observations in Belgium and other countries as recently demonstrated have shown such to be the case. No more striking evidence has been forth coming in support than the valuable work written by the late Professor F. H. King, entitled "Farmers of Forty Centuries," from which some quotations were made in the May issue of the ILLUSTRATED POULTRY RECORD, showing what is being done in China. Our methods are much less intensive than there. We might copy the Chinese with advantage. It will not, however, be accomplished on present lines, which in many cases are tending to disaster, by reason of the fact that limitations are disregarded.

The other day I was discussing poultry questions with a visitor, when he surprised me by

stating that I am regarded as antagonistic to intensified methods. It may be true that when it is heralded that the future of the poultry industry is to be by "bird-cage" methods, when extravagant claims are put forth as to production under abnormal conditions, when it is suggested that even the 1000 hen unit is the line of profit, when, as I saw the other day it was said that a thousand birds may be kept to the acre. When I see men and women misled into risking their little capital in what, to say the least, are doubtful enterprises, and which, in the majority of cases, must fail, then, in the light of considerable experience, I am compelled to tell the truth as I know it. Were half the statements made by those who have birds or appliances to sale practically true, the other half might be forgiven. The disproportion between fact and fiction is, however, vastly greater. My firm opinion is that the larger success will be achieved by extensive methods, that is by farmers and others, and that any other is doubtful in the extreme as a financial proposition, although it may be excellent as a supplemental pursuit. The farmer can intensify more than he has ever done, because he is a farmer. The "bird-cage" man lacks the essential element, namely, cultivated land.

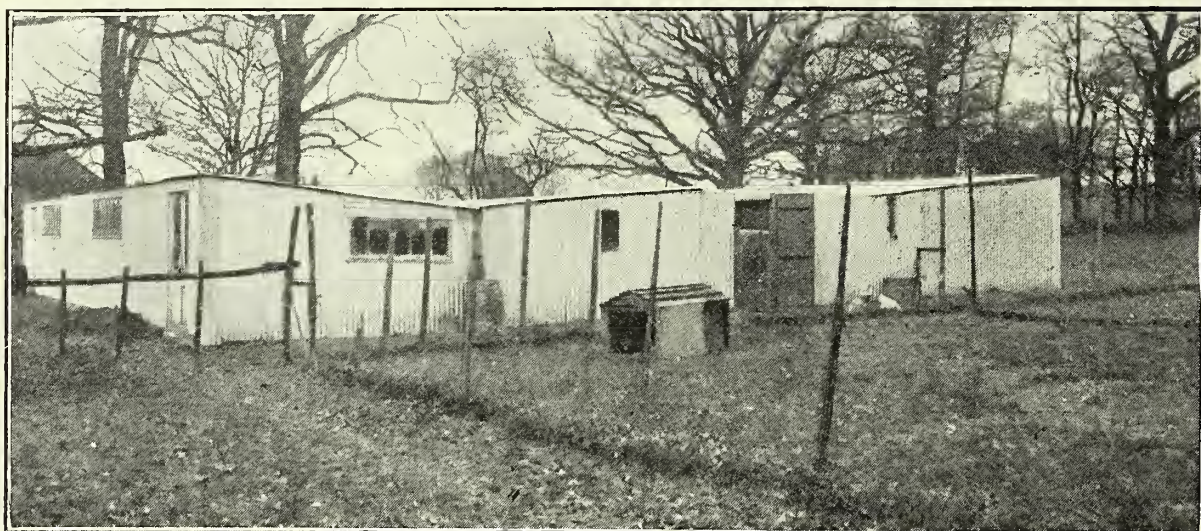
In this connection we are faced by a very serious condition of affairs, namely, the effect of continued breeding, under highly intensive conditions, upon the vigour of the stock. As previously mentioned (ILLUSTRATED POULTRY RECORD, 1911, page 102) the claim has been put forth that to succeed intensively it is necessary to buy stock from birds which for generations have been bred in that manner. That is not only sheer nonsense, but it is criminal folly, even though those who make the statement believe it themselves, in that it deceives others, who are led to risk their all in what is a hopeless enterprise. We are now obtaining evidence confirming our opposition. Information has been available for sometime as to the high average of mortality among chickens bred and raised on the intensive poultry plants both in Europe and America, for many of the much advertised poultry farms may thus be described, but more is coming to hand. A man who has worked for some time upon one of the much-boomed intensive poultry farms in the States, which lives mainly upon the sale of stock and of appliances, told the writer that their busiest time in the day was gathering



up the dead and dying chickens in the morning. Could we have a complete record of fertility in eggs and percentage of chickens raised in these places it would be a revelation. The cemetery or crematorium is often the place of greatest labour.

What seems evident is that it will get worse, not better. If the better follows the worse it would not be ultimately all a loss. As the vigour of the stock is reduced the losses will increase, until there is a drastic change of method. The fact needs no amplification. Past experiences afford the amplest justification for that statement. In certain directions we can intensify methods up to a given point. For instance, laying hens can be so kept and

down, voluntary or involuntarily, to any of them. What is most helpful is that he is not afraid to scrap a part of his plant the moment that he is convinced it is on wrong lines. In that respect he is exceptional. It would commend to all who are bitten with *intensifitis* a careful study of his writings in various publications before they plunge too deeply. From what he has recorded, apart altogether from questions of profit, it is evident that whilst during the infantile stages chickens may be reared on fairly intensive lines, that such may be continued if they are destined to an early death, and that laying hens may be kept thickly together, it is all important that breeding stock shall have sufficient range, affording them the



**Up-to-date Fattening Sheds at Clayton Priory Poultry Farm.**

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profitably. They frequently are more productive than if at liberty. So long as they are killed off and not used as breeders, no harm is done. Chickens and ducklings may also be forced for early maturity and advantageously. In both cases, however, there is no question of future generations. The death of one or the other ends the business. To breed from the former is folly. As I have previously pointed out, the mating up of pullets in laying competitions, and using for hatching the eggs from these young birds, has probably caused as much harm as the contests have done good. It is unfortunately true that those who intensify most in their methods go to an equal extreme in using immature birds for breeding.

All who are interested in this question owe a debt of gratitude to Mr. T. W. Toovey, of King's Langley, for the records of his experiences and observations, so freely and fully given, which have contributed greatly to our knowledge of the problem here presented. He has not been afraid to test many new theories and on a fairly large scale, without being tied

privilege of abundant exercise and natural food, so as to make for vigour of constitution transmittable to their progeny. And, further, that it is essential, also, for chickens in the adolescent period of development to have plenty of space, if they are destined to be breeders or layers. Under domestication, especially where natural elimination of weaklings is checked, there is always a tendency to degeneracy, which must be emphasised if in either the stock or the growing chickens, the conditions are such as to make for increase of physical weakness. The danger of eugenistic teaching at the present time is that conditional influences are insufficiently regarded.

All our experience goes to show that bad environment makes for the development of disease, and that disease tends to destruction of the physical resources both in the parents and their progeny. Where such influences are continuous one generation after another, it is not to be wondered at if in a few years there is disaster. I regard with a considerable degree of trepidation the effect upon the poultry stock of the



country at large unless the facts of the case are realised, more especially if such intensively bred stock are disseminated on a large scale. Happily the greater part of our fowls are kept under extensive conditions.

It may be thought that what has been stated imposes a restriction upon what is known as poultry farming. No harm will result if that be recognised. Much injury has been and is being done by attempts made to maintain and produce large numbers of fowls on totally inadequate areas of land. That such can be accomplished where the birds are intended for early killing is well known. As already indicated, however, that is a totally different matter to breeding from closely yarded birds, and rearing the chickens to adulthood where the ground space is extremely limited. I look upon what are known as breeding plants as supremely essential for further development of the poultry industry in this and every country. Without these, to supply farmers and other poultry-keepers with carefully selected stock, progress would be extremely slow. That fact makes it all the more important for such establishments to be conducted upon proper lines, which means not alone keeping the right class of stock, and scientific feeding, but, also, conserving the natural vigour of constitution which cannot be unless the breeders have all the time abundance of exercise and of fresh air, with clean ground, and the chickens be raised in such a manner as to make for hardihood. How much of the common idea that pure breeds are less vigorous than crosses is due to the unsatisfactory results of buying from small-yard vendors, it is impossible to say. My advice is, purchase from such as are able to give abundance of space, even though the laying records are lower. A high egg-production may mean exhaustion.

Could many of those, who, misled by statements so glibly put forward as to poultry-keeping, or base their calculations upon what they have been able to accomplish with a few birds, go into the accounts of intensive plants, and there have been abundance of examples within the last half century, they would be better able to discern the difficulties which have to be overcome. In not a few of the best managed of these the direct cause of failure was the reductions of vitality and of productiveness as a result of continued breeding under such conditions. In this connection is a question which has never, so far as I know, been investigated or received adequate attention, namely, the effect of breeding the same race or strain for several generations upon the same soil, even where every precaution is taken to avoid earth taint. It is not at all improbable that the introduction of what is called fresh blood from a distance has the effect

of preventing degeneracy as much by change of environment as by avoidance of inter-breeding. Such a subject is worthy of careful and prolonged research, but can be no more than mentioned at the present time.

What would appear necessary, therefore, is that those who adopt intensive methods for rearing table chickens or keeping laying hens, in which directions there are limitations as yet undetermined, whether their operations be large or small, can only hope to succeed if the breeding stock are on range, and those chickens that are to be reared to adulthood are given abundance of space during the post-infantile period of growth. Such imposes restrictions on the smaller poultry-keepers, those who are compelled to keep their birds thickly on the ground if they are to secure anything like adequate returns. One of the most striking examples of what is here meant is in the case of the majority of "duckers" in Buckinghamshire. They find it more profitable to buy eggs from those who are able to give the stock birds liberty, restricting themselves to the work of hatching and rearing. It is not too much to say that they would fail if they attempted both, and that the maximum of returns are obtained by the present methods. We want the same principle adopted all round, no matter what branch of the industry is carried out. In this way the risks to which reference has been made can be avoided. The cost of purchasing fresh birds need not be great, and will be amply compensated by the greater results attained.


So far as farmers and those with greater opportunities are concerned, there is no real hindrance to adoption of a system such as has already been indicated. I have frequently suggested that the way of successful poultry-keeping as of dairying and cattle breeding, is having four times as much land as is actually required by the stock in any one year. That seems to many an extravagant rotation. The larger and longer our experience the more evident is it that such is the line of safety and of profit. Once these facts are recognised we shall have gone far to put the industry on a firm and sure basis. Such is within the power of this class. It may be necessary to modify the houses in use. I cannot see why portable houses should not be employed as at present for breeding stock and growing chickens, according them the advantages of extensive range, and also using larger houses for market egg producers, more especially in the winter, with small houses and yards for chickens whose duration of life is to be short. That would systematise farm poultry-keeping in a manner which has been attempted as yet to a very limited extent.



## INSTRUCTION IN POULTRY KEEPING.

## Plain Speaking to Educational Authorities.

By "OBSERVER."

O pay good salaries is the only way to fight corruption—some business concerns that I could mention here in England are seething with corruption. It exists among the highest as well as the lowest officials."

In these pregnant words James Sutherland Warner—one of the keenest business men in the world—summed up the underpayment of those in responsible positions.

Whilst reading the interview with this gentleman my thoughts turned to the payment of those who are responsible for the development of the poultry industry in the United Kingdom, for if there is one branch of agricultural instruction more than another where false economy is practised it is in the subject under review. What some Education Authorities expect for the miserable pittance they offer passes human comprehension.

Only the other day I heard of a Committee offering the enormous salary of 50/- per week, the lecturer to *pay his own hotel expenses* and find a bicycle to do his lectures and visits. I asked if they also paid for an insurance policy against accidents when riding the bicycle over strange country roads late at night, or if they provided a purse to carry home at the end of the month what remained of his salary. No doubt in that sudden outburst of economy they thought the lecturer would carry back his salary tied up in one corner of his trussing cloth.

Look closely into what this "salary" means. Staying at the cheapest rate hotel, expenses would come to 30/- per week—5/- per day—and even more if he had to stay away from home over the week-end. Allowing again 2/- for liquor refreshment and tobacco we get a net result of a lecturer being paid at the rate of 18/- per week. A sum which a Billingsgate fish porter would throw at the head of the cashier who offered it to him. What would be expected for this 18/-. First there would be 1 hour's lecture in the schoolroom or lecture hall, to say 50 people. If he deals fairly with his audience he will give his practical experience—practical experience oftentimes is dearly bought—he would point out how to avoid the mistakes he has made—and this experience is placed at the service of his audience. Next to the lecture is question time when he stands the chance of getting his "leg pulled" by any facetious member of his audience. An apparently simple question will take perhaps a quarter-of-an-hour to answer, and the answer must be given without resource to a book of reference—the lecturer who did this would find his audience missing the next time he appeared. At last it is over and for the night his work is finished. The

next day there are visits to make which will take up the best part of his day. In hundreds of cases I have not seen the doors of the hotel from the time I left it in the morning till I got back again at 10 o'clock at night. Then there is the trussing class, with a dozen or so, and if he is worth his salt he will show them how to put 3d. or 6d. per head on each bird by trussing it to the best advantage. (The little knowledge possessed by the writer in this department alone cost over £50 in time and money to acquire). That is, the students get more profit on *each bird* improved by proper trussing than the teacher does for the whole class. Anyone with any knowledge of the work knows there are dozens of other details, such as the mating of pens (some days more than a dozen different breeds will have to be mated) and the treatment of diseased birds. Again the evening lecture and he goes back to bed buoyed up with the thought of "something attempted something done"—or in the case of the cheap man "somebody" done—for which he has been paid at the rate of 4d. per hour, about the same pay as they give a girl in a collar factory. Chatting with an agricultural organizer on this point he said, "I should not like to offer such a fee, but I can get several who would do it for that sum."

Of course he could, but here we get to the root of the whole trouble. The best way to explain what I mean is by two actual incidents, for which I can personally vouch.

A very old friend of mine who has for several years been in charge of the poultry instruction in a county which does not begrudge the labourer his hire, was a few years since paying a visit of inspection and happened to see a very fine cockerel of a particular breed. The owner of the bird knew very little of the points. "Why dont you show that bird," said my friend, "entries do not close till to-morrow at —— Show." The man replied he did not know how to wash a bird. The instructor, although this was quite outside his duties, gave the man a lesson in washing and preparing the birds for show. The bird duly appeared at the show and when the delighted owner came he found the cards for First Prize, two Special Prizes—and best bird in the Show—on his pen. To-day the name of the owner of the bird is known far and wide with this particularly variety—and he is making three times more per year out of his poultry than he is out of his business. To his credit be it said he does not mind telling anyone who started him on his successful career.

One picture—here is a different one. In another county there was a man—I will not call him an instructor—who saw a bird owned by a working man who delighted in his birds. The so-called



instructor "crabbed" it, pointed out every defect which did exist, and some which did not, but eventually *bought* the bird for half-a-sovereign, and soon after sold it to a big exhibitor for the same number of sovereigns as he gave shillings.

In the first case the lecturer was paid a fair salary: in the other the "expert lecturer" at £2 per week.

The Board of Agriculture are doing their best to foster the industry, but when it comes to the administration side by many of the County Councils the work is hampered in every shape and form. Not in all cases, as there are several committees who are doing a good work, and it is in these counties where poultry-keepers are reaping the benefit.

The work of the poultry instructor is, under any circumstances, like that of Gilbert's policeman, not a happy one. It is no easy matter to hold the attention of an audience for an hour-and-a-half, and my experience is it is the smaller branches which are most difficult to teach. Hundreds of times one hears the remark "I know as much as he does about it." To break down that barrier is the first step to success. The man who can increase his numbers, that is, get more people each time he attends the place, is the successful lecturer. I would like to point out to the various authorities the danger of this cheap labour by asking them a

simple question. Is it likely that the man who has the necessary practical experience, and who has the heaven sent gift of imparting that knowledge so that his listeners may benefit will be likely to give that experience for a beggarly £1 a week. If it is done you may be sure there are other ways by which the amount is augmented, either by direct sales, accepting commissions, or by some other means. No one can be blamed but the authorities themselves. They are daily putting temptation in the way of these men—I have had many opportunities of watching the growth of the system. It is not confined to one department. To-day it is more prevalent than ever, and while developments are in progress I would, through the columns of the ILLUSTRATED POULTRY RECORD, say to the President of the Board of Agriculture—himself a keen business man—to watch carefully this so-called economy. He will know the evil wrought in ordinary business life by the secret commission—and what is true in business life is ten times more so in regard to education. If this canker is not speedily eradicated the expert staffs will become advertising agents, commission agents and dealers, all done under the disguise of education. Once the agricultural class gets to know this, agricultural education will have a set back from which it will not recover in a generation.

Let me repeat once more the dictum "To pay good salaries is the only way to fight corruption."



Outside fattening cages on a Buckinghamshire farm.

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# THE HANDLING OF DRESSED POULTRY A THOUSAND MILES FROM THE MARKET.

By M. E. PENNINGTON.

*Food Research Laboratory, Bureau of Chemistry.*

## HISTORICAL INTRODUCTION.



OUR grandmothers tell us of the time when the chore boy, wielding the farm ax, decapitated the chickens that had been hatched on the home farm and fed and cared for by the women of the family to be utilized for the feeding of the farm people. Our mothers tell us of the days when the family supply of fresh produce was purchased from the farmer, who brought butter, eggs, poultry, and fresh vegetables into the city from his near-by farm. But now we see the chickens that we are to eat on either the Atlantic or Pacific coast roaming the cornfields of Kansas and Iowa or the wheat fields of Minnesota or the Dakotas, or clustering around the mountain cottages in Tennessee and Kentucky; and instead of the rumble of the farm wagon bringing them to the family, we hear the patient, continuous chug-chug of the long freight train as it winds over the prairie and climbs the mountains on its way to the hungry millions who live far from the great producing section of that almost ubiquitous bird—the common barnyard fowl.

Formerly chickens were killed to-day and eaten to-morrow, because decay could not be checked for

heads and feet, and the gradual dissolving out of the soluble parts of the flesh caused a loss in eating quality and induced decay.

The people increased in the cities faster, however, than the chickens multiplied on the near-by farms. The hauls soon became too long for farm wagons, and then the railway was called into service. Each year for 20 years or more the railroads have been carrying to eastern and western cities dressed poultry from a wider and wider radius. Texas turkeys and Oklahoma chickens are sent to New York and San Francisco, and such are the wonders of the modern methods of handling perishable foodstuffs, they usually reach these distant centres in better condition than did the ice-packed chickens years ago after travelling only a hundred miles or so. In these days of food shortage and enforced conservation of foodstuffs it is well to know something of the means by which distant sources of production are made available to the nation, and such delicate commodities as dressed poultry delivered in good order to a consumer living a thousand miles or more from the place where the chickens were raised and killed.

## PREPARATION FOR KILLING.

Good handling of dressed poultry necessitates facilities which can not be maintained by the individual farmer. Dressed poultry is now a business by itself, and a great industry has grown up to attend to this work. Therefore, when the farmer's flocks has reached a marketable stage he sells it to the poultry packer, or to his agent, and the birds reach the packing house located in the producing section in great wagon-loads, as shown in Fig. 1, or by the carload, Fig. 2. The latter illustration shows the type of "live poultry car" which is now being used when the birds must be carried alive for more than a day. Both wagon and car are being unloaded at establishments of poultry dressers.

The fowls are generally hungry and thirsty and are always nervous and tired; hence they are not in condition to be killed. Many of them are thin, because comparatively few farmers feed their poultry enough to fatten them. The poultry packers have established feeding stations where from 10,000 to 30,000 birds, housed in specially constructed feeding batteries, are given clean grain mixed with buttermilk for from 7 to 14 days. The 7-day feeding causes a great improvement in the flavour and tenderness of the flesh; feeding for two weeks causes young birds to double in weight if they are vigorous and are of a desirable breed for food purposes.



**Fig. 1. Wagon loads arriving.**

any length of time. Then, as the farms were pushed away from the edges of the growing cities, crushed ice was used to preserve the dressed birds until they could reach the consumer, a matter of a week, perhaps. An early method of packing poultry was in a barrel by placing chickens and ice layer by layer, and a big lump of ice on top. The soaking of the birds in the melted ice, the dirty



A photograph of a feeding station and the batteries in which the birds are kept are shown in Fig. 3. Note how light and airy are the stations. They are also clean, because dirt prevents the birds from gaining weight. What progress this wholesale feeding represents is better understood when the juicy, milk-fed bird is tasted and compared with the "ranger" chicken that forages far and near for a living and eats from the dunghill a large part of the time. The new system of crate fattening is an out growth of an old custom on many farms of feeding milk and clean grain for several days before killing.

After the feeding period is over the birds should be starved for 24 hours, having a plentiful supply of clean water only. This practice results in almost completely emptying the intestinal tract of foods in progress of digestion and of waste products to be thrown off, and has been found to be far better than the practice of eviscerating when the bird is killed.

It may be said in passing that the viscera should not be removed until the bird is about to be cooked. A habit has developed, especially in cities, of permitting the butcher to draw the birds before sending them to the consumer. If the housewife had the drawing done in her own kitchen the bird would be in a more sanitary condition and she would frequently find evidences of unfitness for food that disappear with the removal of the entrails.

#### PROCESSES OF KILLING AND PICKING.

When farmers prepared the poultry for market the process of killing and picking was an individual matter. Some simply chopped off the head, dipped the carcass in water heated to the steaming point to loosen the feathers, rubbed these off, and, if the weather was cool, kept the bird out of doors or in a well-ventilated room until it was taken to market. Poultry so prepared has a greatly short-end keeping time, and the eating quality is lowered even before decay has begun, because the desirable "ripening" that does so much to improve flesh does not occur.

The undesirable methods used heretofore are many and various, but they are being so rapidly replaced by better methods that it is scarcely worth while to give space to their description. Rather let us pass at once to what are now the best procedures known for the dressing of poultry to preserve quality and prevent decay, for these methods only can be used if the bird is to travel long distances and be kept fresh for from two to three weeks before it reaches the table of the consumer.

Fig. 4 shows the dressing of poultry in a house west of the Mississippi River. The output is marketed in New York City. In this house men kill the birds by cutting the jugular vein with a slender, straight-edged knife, especially constructed for the purpose. Then that portion of the brain tissue which controls the muscles holding the

feathers in place is destroyed by a thrust of the same knife, and the feathers are so loosened that they are easily pulled out. The cutting of the blood vessels in the proper way permits the blood to drain out of the carcass until it is practically blood free. This is essential, if the bird is to keep



Fig. 2. Carloads arriving.

well, and is a part of the process of dressing that is too often faulty. In order to accomplish this bleeding the vessels must not only be cut properly, but the bird must be held head down while removing the feathers. The scheme used in the killing room shown in Plate XIII permits this, prevents the feathers from being contaminated with blood, and enables the killer to handle the bird very quickly, less than two minutes being required for killing and the removal of all except the fine down and pin feathers. When the feathers have been removed, the bird, still hung by the feet, is taken by women and "pinned" or "tipped," as the western phrase goes; that is, the fine down and the close-growing feathers are picked off one by one.

The system of killing shown in Fig. 4 is known as the "frame method" and has resulted from a selection and combination of the best features of the "string" and "bench" systems. String killing has been most commonly used. The bird is hung by twisting a cord around the feet, "bled" and "brained," and the feathers removed while it hangs head down. A vessel fastened to the head of the bird catches the blood. In bench killing the head of the chicken is held by means of a hook, the legs by the hand of the operator. After killing, the feathers are removed.

"Frame killing" keeps the bird upright, prevents its coming in contact with rough or soiled surfaces as with the string method, and holds the bird even more firmly than does the bench method, because the feet, as well as the head, are supported.

Cleanliness of handling is further emphasized by the system of pinning while the birds are hung on



shackles. This scheme permits of quick, good work and is vastly superior to the old "lap" method. Pinning by the lap method means that the skin of the bird is constantly being rubbed over dirty, bloody surfaces and that it is frequently held by the neck, which prevents the draining out of the last portions of the blood.

Cleanliness being one of the watchwords of modern poultry dressing, the heads must be freed from blood and neatly wrapped in paper, and the feet must be scrubbed if they are dirty. This is generally done just before the birds are sent to the chill room.

#### CHILLING.

The up-to-date packer no longer uses ice to remove the animal heat. He uses mechanical refrigeration and provides clean, insulated rooms in which a temperature of about 32° F. is constantly maintained. The chickens are hung by the feet on racks<sup>1</sup> made entirely of metal, such as are shown in Fig. 5. This illustration shows, also, how a number of these racks stand in the chill room while the poultry is cooling, and the arrangement on the walls of the pipes carrying the cold brine on which the refrigeration depends. The four top-most pipes are doing the work, as is shown by the heavy covering of frost from the condensation of the moisture in the air.

Low temperature, as we know from household practices, is used to inhibit decay, which it does by slowing bacterial growth and enzym action. When chickens are alive their temperature is 103° F. This must be reduced to 32° F. or less before the birds can be packed for long hauls in refrigerator cars.

The time required to chill the fowl is usually about 24 hours, and the packer must be sure that the viscera, as well as the skin and flesh, are free from heat before the birds leave the chill room. It is the failure to observe this requirement that is responsible for much of the bad-conditioned poultry in our markets. The range of temperature permitted, too, is small. Below 30° F. the flesh is frosted; above 35° F. decay proceeds too rapidly to permit of long hauls to distant markets and a routine of marketing such as our urban life now requires. Of course, the birds can be frozen hard after they are chilled, and so shipped, and this is a very excellent plan, especially if the haul is across a hot country.

#### GRADING AND PACKING.

Having removed the natural heat from the dressed fowls, the next step in their preparation is to grade and pack in suitable containers for shipment. This operation should be performed in a room having a temperature of 30° F. and in this room the packed boxes may remain for several days while awaiting shipment.

No longer does the packer thrust old cocks, broiling chickens, and fowls indiscriminately into the big sugar barrel, pressing down the birds in his

endeavour to pack tightly and so bruising flesh and tearing skins. Such a procedure prevents good keeping; therefore the shipper, far from his market, must not only avoid it but he must use a package that allows the birds to stay in good condition the maximum length of time. With this end in view, as well as to enable his customers to see at a glance the quality of his product, he has adopted wooden boxes, holding only 12 birds each. He also takes care that each bird of the twelve is an exact match for the other 11, both in weight and quality, and when he has a brand on the box and a

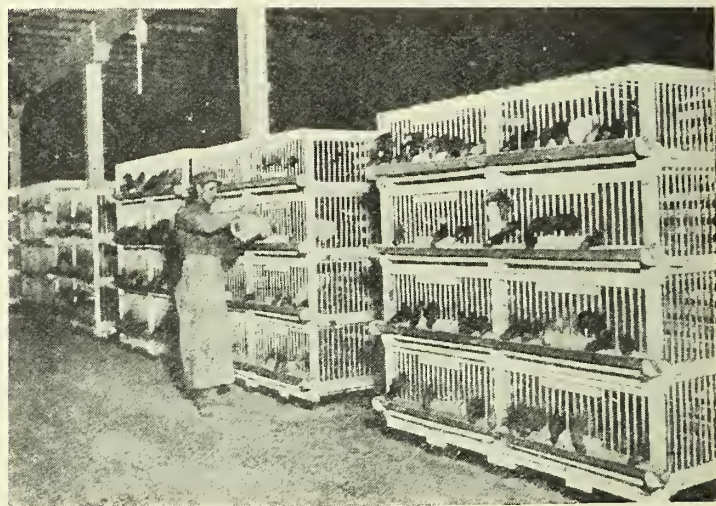


Fig. 3. The feeding cages.

reputation in the market, he even matches the color of the skins, that the package may present an attractive appearance. Such exactness involves experience and knowledge in grading the birds, and is by no means a simple operation. It will be of interest briefly to describe the interior of an up-to-date packing room with graders and packers at work. Natural light falls on the rack from which the birds are being removed; each dozen as selected are weighed on the track scale and the weight stamped on the box into which the packer puts them. The boxes are lined with parchment paper to protect the skins and to prevent evaporation, and sometimes, especially if long storage is contemplated, each bird is separately wrapped.

Fig. 6 shows the appearance of these boxes of chickens. Broilers are breast up, and there is but one layer in the box; roasters and fowls are packed on their sides, and two layers are used. The boxes of broilers weigh from 15 to 24 pounds; roasters and fowls may run 60 pounds to the box. The ordinary barrel of poultry weighs 250 pounds or more. When one considers the delicate character of the skin and flesh of a chicken and the pressure that the poultry in a heavy package exerts upon itself, it is easy to see what advantages in the way of good carrying apply to the small box.

For very high-grade poultry the carton holding one roasting or two broiling chickens is being used



to a limited degree. Like all individual wrappers put on at the source of production, it tends to keep the bird clean and sound skinned. It also insures to the housewife a package that has not been mauled by prospective customers nor soaked in water by the retailer to freshen up a dried-out bird, or perhaps to remove the odors of beginning decay. When high-grade poultry is to be kept from the season of production to the season of scarcity, as is necessary to feed this great country, the carton pack is highly desirable. The drying out of the flesh in the low temperatures of the cold store is very largely prevented and, what is even more desirable, the unbroken package can be sent hard frozen to the consumer. As the consumer becomes better informed on the subject of food supplies and their handling the packers will mark the cartons with the date of killing, as well as the brand of goods. Thus the purchaser will see that the bird has been killed during the season when the quality is highest—broilers before December and roasters between September and January—and that they have not been held in storage more than 12 months. The packer of high-class goods is now more than willing to put such information on his labels; the warehouseman desires it; the wholesaler wants such information; but the retailer can not risk giving the true story to the consumer because the prevailing ignorance would translate the truth into undesirability, and the purchaser



Fig. 4. Dressing Poultry.

would go elsewhere to purchase the same grade of goods, but accompanied by the verbal statement of "strictly fresh and nearby." The consumer does not realize when he clamors for true labels on food-stuffs that his own ignorance and prejudice are the greatest bars to the obtaining of his wishes.

#### SHIPPING METHODS.

But to return to the boxed poultry that we left in the refrigerated packing room waiting for its long journey to the consumer. How must that journey be made to insure good order on arrival?

The answer used to be "speed," because the time that the produce would keep was so short under even the best of prevailing conditions that the whole course of marketing must needs be rushed. Now the reply is, good handling and refrigeration, from from start to finish; refrigeration evenly and constantly maintained, because cold is a great discourager of those all-pervading and ever wide-awake forms of plant life, bacteria and molds, without which we do not have decay.

To maintain refrigeration between the far-distant source of supply and the consuming center, we have developed a system of refrigerated carriers in connection with our railroads, and we are as dependant upon them for our food supplies as is England upon her ships. The travelling public everywhere is familiar with the appearance of the outside of the freight car which bears the word "refrigerator," as well as the initials of its line, but few of the many thousands who depend on those cars for their daily supply of foodstuffs know how they are constructed and made efficient for the work which they are to do.

Ice is used to produce low temperatures, and when below 40° F. is required salt is mixed with the crushed ice. A compartment is built across each end of the car to hold the ice, and openings above and below, into the body of the car, permit circulation and consequent cooling of the air of the car. Rock salt is contained in the barrel which lies on the roof of the car. The hatches through which the ice and salt are put into the bunkers are also shown. In some places ice crushers are used instead of man power, which greatly hastens the icing process.

In order to keep the heat of the atmosphere from penetrating the car and so disseminating the cold produced by the refrigerant, insulation must be used in its construction. The modern refrigerator car is rapidly becoming a chill room on wheels, and it must be that it is to serve the public to its satisfaction and to the financial profit of railroads as well. During the long hauls in the United States the same car, with its unbroken load, must traverse the heat of deserts and the cold of high mountains, or go from the warm southland to Alaskan snows. It may that the load carried must not vary in temperature more than 5° F., in which case ice is used in some parts of the journey and stoves in others.

Our chickens, however, seldom become too cold. It is heat that we must guard against when they are shipped; therefore the careful packer will ask the railroad to set the refrigerator car on his siding at least 24 hours before he expects to load, for no packer who works to prevent decay ever loads his poultry in a car having a high temperature or hauls chilled goods in waggons. Then he will examine the car to see that when the doors are closed not a ray of light enters, because that would mean inefficiency of insulation. He looks



also to see that drain pipes are working and the general repair good, and finally, after the car has been iced and salted for at least 24 hours, he takes the temperature about 4 feet from the floor midway between the doors. If it is below 40° F., he may load his chilled birds with safety. The packages bearing tags are to be examined by the United States Department of Agriculture when the



Fig. 5. Cooling the birds before packing.

reach their destination and their condition noted. The small iron-bound chest contains a thermograph which registers the temperature of the car during transit. One tagged barrel contains dry-packed, the other ice-packed poultry. The latter is the barrel having a big lump of ice under the burlap covering. This experimental shipment was made to determine the relative keeping time of wet and dry birds and also to study the question of the height of the load in the car. A great many experimental shipments of poultry have been made by the Food Research Laboratory to learn the best available way to conduct every phase of the handling, and it is on the basis of this experimental work that statements in the present article are founded.

The loading of the car containing 20,000 pounds of poultry—that is, the car lot of the West—can be accomplished in 30 minutes if the work is well planned. It should be done as expeditiously as possible to prevent a rise in the temperature of the car. Even with prompt loading it is well to have a heavy canvas curtain hung in the door of the car to keep the outside air from entering. A better plan still is to have a door in the packing room which opens on the loading platform, and then connect the car and the packing room by means of a canvas corridor.

Having loaded the car and again observed the temperature, that the packer may know under just what conditions his goods start on their long journey, the doors are closed and sealed. The railroad agent knows the perishable character of the freight, and he issues instructions to add ice and

salt while en route that low temperatures may be maintained. Or the packer himself may designate when and how he wants his car iced. When the doors are closed they should remain closed until the market is reached. If the packer has dressed and chilled the birds properly, if the refrigerator car is well insulated and built, if ice and salt are added as needed during the haul, the load is just as sure to reach the market a thousand miles away—that is, about five or six days as reckoned by time—in good condition as is a carload of cast iron. After the chickens reach the market they have still to go through the hands of the commission man, the retailer, and, perhaps the storage warehouse. But that is another story.

#### Gases in Eggs.

A correspondent of the *Aberdeen Daily Journal* says: "A little knowledge is a dangerous thing, and so it is with eggs that are kept for months for the dear market. There are those who know how to "fake" them for winter use, but they don't know that they are doubly sealing up gases that contain rank poison. In the case of ducks' eggs it is still more deadly to human health. It is the old and the invalid and the little children who suffer." What does chemical analysis say to this?



Fig. 6. Packed ready for shipment.

#### A Nova Scotian Hen.

A clergyman in Nova Scotia, the Rev. W. B. Crowell of Arcadia, Yarmouth County, claims to have a pullet of the Barred Plymouth Rock breed, which has beaten the world's record in laying the largest number of eggs in the year, her product during the time specified being given as 292. This same gentleman has a flock of 16 pullets of the same variety each of which he states has produced 205 eggs on an average of 283 laying days this year.

#### New Zealand Competitors at Missouri.

Recent exchanges record that seven pens of White Leghorns have been dispatched by seven owners from New Zealand for the Mountain Grove, Missouri, Laying Competition. It will be of special interest to watch results, for these came from across the equator where the seasons are exactly opposite to those of the Northern Hemisphere.



# DR. RAYMOND PEARL'S INVESTIGATIONS INTO THE FECUNDITY OF FOWLS.

## SUMMARY AND DISCUSSION OF RESULTS.

(continued from page 120, December, 1913.)

Another matter which needs careful consideration is as to the possibility of unconscious bias having influenced the results themselves. In other words, to what extent does the personal equation factor enter into this fecundity work? It can be fairly said, I think, that there is less opportunity for unconscious bias to affect the results here than in genetic work on most other characters. The reason is because of the impersonal and objective character of the original records in the case of fecundity. The original trap-nest records on which this whole study is based were made by Mr. F. Walter Anderson. He had neither knowledge of, nor interest in, the use of which any particular record or set of records were to be put. He was solely concerned to make as accurate record as possible of the laying of each individual hen. The system of record taking used is such that it was impossible for him to have any notion of what the total production of any given bird up to a particular date had been. The chance for bias or personal equation influencing results is excluded when, as in the present case, one person makes the basic records, and has nothing whatever to do with their analysis, while another person analyses the data but has nothing directly to do with their collection.

Another safeguard on the results in this same direction, and also in another, is found in the fact that birds belonging to the same family (full sisters) were not given identifying numbers which would make it possible to be certain or even to surmise that they were sisters, without consultation of the pedigree records. The numbering of the birds for identification each year was purely at random and without any regard whatsoever to relationship. Furthermore members of the same family were distributed at random through the different pens and houses. No attempt is ever made, from the day the chicks hatch, to keep the birds from one family together. Indeed it is important that they be scattered at random through the flock in order to insure uniformity of *average* environmental conditions.

The writer has no desire to generalize more widely from the facts set forth in this paper than the actual material experimentally studied warrants. It must be recognized as possible, if not indeed probable, that other races or breeds of poultry than those used in the present

experiments may show a somewhat different scheme of inheritance of fecundity. The directions in which deviations from the plan here found to obtain may, at least *a priori*, most probably be expected are two. These are: (a) differences in different breeds in respect to the absolute fecundity value or worth of the factors which determine the expression of this character, and (b) gametic schemes which differ from those here found either in the direction of more or fewer distinct factors being concerned in the determination of fecundity, or in following a totally different type of germinal reactions.

Regarding the first point it will be recalled that in several places in the body of the paper it has been suggested that the absolute fecundity value (i.e., the degree of actual fecundity determined by the presence of the gametic factor) may differ for the factor  $L_1$  in the case of the Barred Rock as compared with the Cornish Indian Game breed. It is hoped later to take up a detailed study of this point, on the basis of the material here presented, and additional data now in process of collection. Wherever there is a difference in the absolute fecundity value of the  $L_1$  factor, it means that the division point for the classification of winter productions should be taken at a point to correspond with the physiological facts. In this first study the division at 30 eggs has been found to accord sufficiently well for practical purposes with the actual facts. Similarly the absolute fecundity value of the excess production factor  $L_2$  may be different in different breeds. In applying the results of this paper to the production statistics of other breeds of poultry the possibility of differences of the kind here suggested must always be kept in mind.

The second point (the possibility of gametic schemes for fecundity differing qualitatively from that found in the present study) is one on which it is idle to speculate in advance of definite investigations. I wish only to emphasize that nothing is further from my desire or intention than to assert before such investigations have been made that the results of the present study apply unmodified to all races of domestic poultry.

It cannot justly be urged against the conclusions of this study that the Mendelian hypothesis advanced to account for the results is so complicated, and involves the assumption

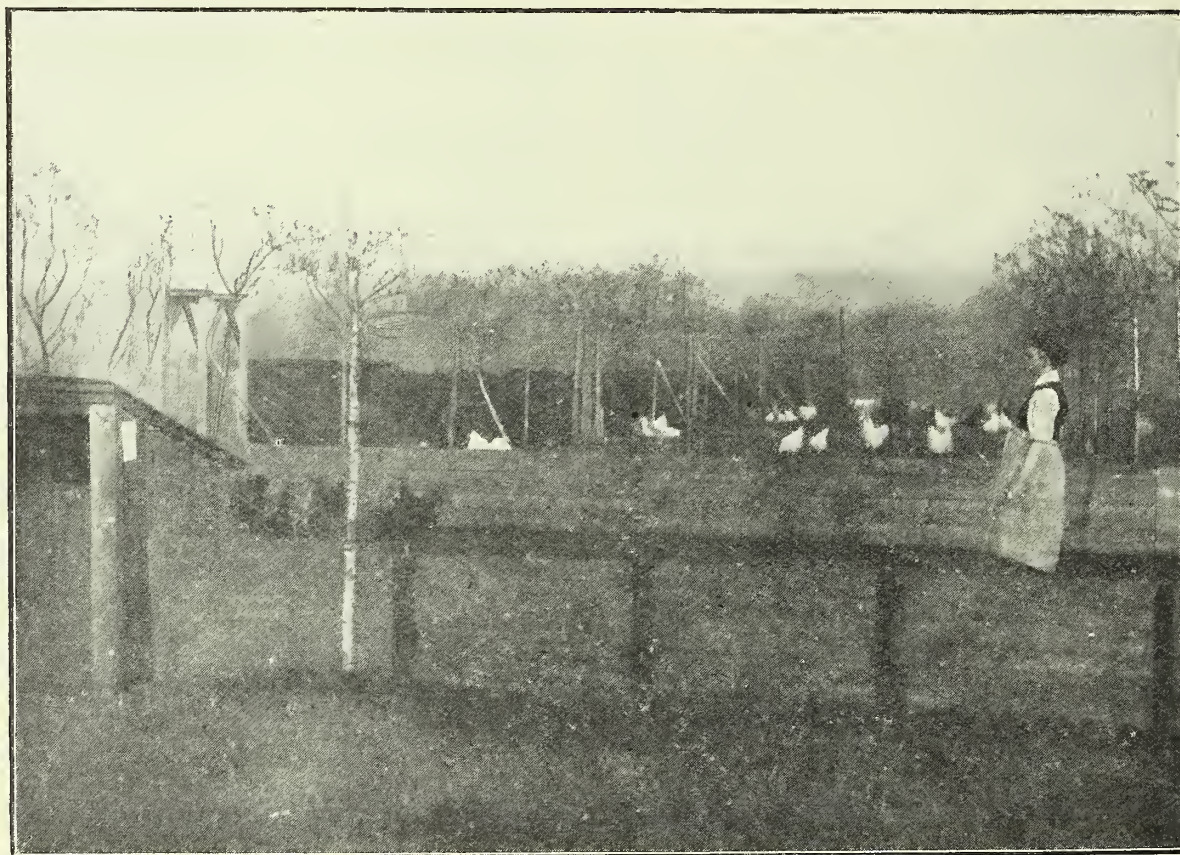


of so many factors or such complex interactions and limitations of factors, as to lose all significance. As a matter of fact the whole Mendelian interpretation here set forth is an extremely simple one, involving essentially but two factors. This surely does not indicate excessive complication. To speak in mathematical terms, by way of illustration merely, it may fairly be said that the formula here used to 'fit' the data, has essentially the character of a true graduation formula, rather than that of an interpolation formula. The number of constants (here factors) in the formula is certainly much less than the number of ordinates to be graduated.

and thorough experiments of a number of independent investigators. Finally it is to be noted that Bateson and Punnett (4) have recently shown that the inheritance of the peculiar pigmentation characteristic of the silky fowl follows a scheme which in its essentials is very similar to that here worked out for fecundity.

*The selection problem.*

The results of the present investigation have an interesting and significant bearing on the earlier selection experiments on fecundity at this Station. It is now quite plain that continued



**Some well-arranged Breeding Pens.**

[Copyright.]

There is no assumption made in the present Mendelian interpretation which has not been fully demonstrated by experimental work to hold in other cases. That the expression of a character may be caused by the coincident presence of two (or more) separate factors, either of which alone is unable to bring it about, has been shown for both plants and animals by a whole series of studies in this field of biology during the last decade. To find examples one has only to turn to the standard hand-books summarizing Mendelian work, as for example those of Bateson and Baur. Again sex-linkage or correlation of characters in inheritance has been conclusively demonstrated for several characters in fowls by the careful

selection of highly fecund females alone could not even be expected to produce a definite and steady increase in average flock production. The gametic constitution of the male (in respect especially to the  $L_2$  factor) plays so important a part in the determining the fecundity of the daughters that any scheme of selection which left this out of account was really not 'systematic' at all but rather almost altogether haphazard. It has been repeatedly shown in the body of the paper that the same proportion of daughters of high fecundity may be obtained from certain mothers of low fecundity as can from those of

<sup>18</sup> Particularly important here are the brilliant researches of Nilsson-Ehle (24, 25) on cereals, and of Baur (2) on *Antirrhinum*.



high fecundity, provided both set of mothers are mated to males of the same gametic constitution. What gain is to be expected to accrue from selecting high laying mothers under such circumstances, at least so far as concerns the daughters?

'Selection' to the breeder means really a system of breeding. 'Like produces like,' and 'breed the best to get the best': these epitomize the selection doctrine of breeding. It is the simplest system conceivable. But its success as a system depends upon the existence of an equal simplicity of the phenomena of inheritance. If the mating of two animals somatically a little larger than the average always got offspring somatically a little larger than the average, breeding would certainly offer the royal road to riches. But if, as a matter of fact, as in the present case, a character is not inherited in accordance with this beautiful and childish simple scheme, but instead is inherited in accordance with an absolutely different plan, which is of such a nature that the application of the simple selection system of breeding could not possibly have any direct effect, it would seem idle to continue to insist that the prolonged application of that system is bound to result in improvement.

It seems to me that it must be recognised frankly that whether or not continued selection of somatic variations can be expected to produce an effect on the race depends entirely on the mode of inheritance of the character selected. In other words, any systematic plan for the improvement of a race by breeding must be based and operated on a knowledge of the gametic condition and behavior of the character in which improvement is sought rather than the somatic. Continued mass selection of somatic variations as a system of breeding, in contrast to an intelligent plan based on a knowledge of the gametic basis of a character and how it is inherited, seems to me to be very much in the same case as a man who, finding himself imprisoned in a dungeon with a securely locked and very heavy and strong door with the key on the inside, proceeded to attempt to get out by beating and kicking against the door in blind fury, rather than take the trouble to find the location of the key and unlock the door. There is just a possibility that he could finally get out in a very few instances by the first method, but even in those cases he would be regarded by sensible men as rather a fool for his pains.

Of course what has been said is not meant to imply that selection on the basis of somatic conditions may not have a part in a well considered system of breeding for a particular

end. In many cases it certainly will have. Thus in the case of fecundity in the fowls, selection of mothers on the basis of fecundity records is essential in getting male birds homozygous with respect to  $L_1$  and  $L_2$ . But the point which seems particularly clear in the light of the present results is that blind mass selection, on the basis of somatic characters only is essentially a haphazard system of breeding which may or may not be successful in changing the type in a particular case. There is nothing in the method *per se* which insures such success, though that there is inherent potency in the method *per se* is precisely the burden of a very great proportion of the teaching of breeding (in whatever form that teaching is done) at the present time.

It seems to me that it has never been demonstrated, up to the present time, that continued selection can do anything more than:

1. Isolate pure biotypes from a mixed population, which contains individuals of different hereditary constitution in respect to the character or characters considered.

2. Bring about, as a part of a logical system of breeding for a particular end, certain combinations of hereditary factors which would never (or very rarely) have occurred in the absence of such systematic selection; which combinations give rise to somatic types which may be quite different from the original types. In this way a real evolutionary change (i.e., the formation of a race of qualitatively different hereditary constitution from anything existing before) may be brought about. This can unquestionably be done for fecundity in the domestic fowl. But here 'selection' is simply one part of a system of breeding, which to be successful must be based on a definite knowledge of gametic as well as somatic conditions. It is very, very far removed from a blind 'breeding of the best to the best to get the best.' The latter plan alone may, as in the case of fecundity, fail absolutely to bring about any progressive change whatever.

It has never yet been demonstrated, so far as I know, that the absolute somatic value of a particular hereditary factor or determinant (i.e., its power to cause a quantitatively definite degree of somatic development of a character) can be changed by selection on a somatic basis however long continued. To determine, by critical experiments which shall exclude beyond doubt or question such effects of selection as those noted under 1 and 2 above, whether the absolute somatic value of factors may be changed by selection, or in any other way, is one of the fundamental problems of genetics.



*Prepotency.*

One of the least understood phenomena in genetics is that which the practical breeder calls 'prepotency.' When the scientific student of genetics deals with the matter at all he is rather apt either to throw it over entirely as a 'breeder's superstition,' or to take it as something 'given' to help him out of a difficulty in the interpretation of results which fail to conform to expectation. Some time a more searching investigation of this phenomenon must be made than is implied in either of these lines of procedure.

In a former paper it was suggested that the evidence indicated, for certain productive characters at least, that hereditary high performance tended to behave as a Mendelian dominant to hereditary low performance. The following statement was then made:

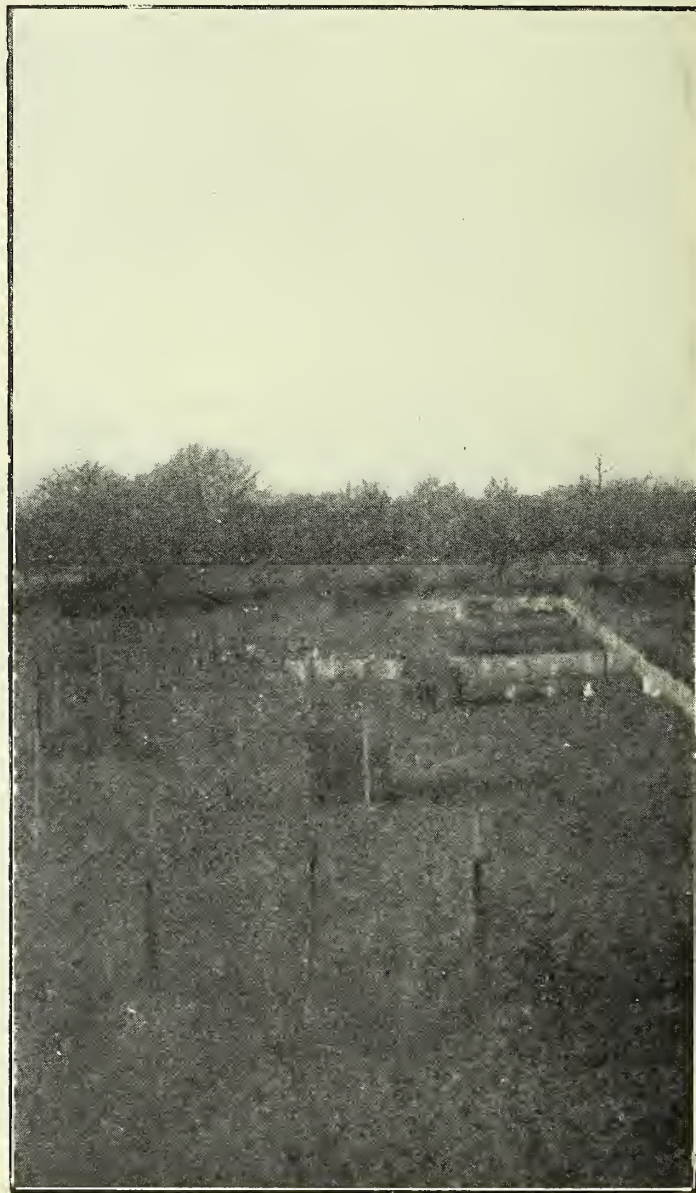
"If this suggestion is true it gives at once, I think, a possible clue to the explanation of a part at least of the known facts regarding what is called prepotency in the practical breeding of domestic animals for performance. It is customary in practice to regard an animal as prepotent in breeding for performance when the progeny of that individual uniformly tend to resemble it closely in respect to the character bred for, regardless of the other parent in each mating. Let it now only be considered that the great sire, say, of speed or of milk production belongs to a line having a high genotype with regard to those characters; then it is to be expected, on the hypothesis under consideration, that his progeny will tend on the average to be like himself in performance regardless of what he is mated with, because any female to which he is mated will be either of a high genotype like himself or of a lower one. But if genotypic high performance is dominant over genotypic lower performance, then all the offspring in the first generation must approximate to the high condition exemplified in the sire. But this is the very essence of what is called prepotency in actual breeding practice."

It seems to me that certain of the facts set forth in this paper give strong support to this view. A class 1 B.P.R. ♂ ( $= fL_1L_2 fL_1L_2$ ) will get all high producing daughters (barring physiological defects of development) regardless of the females to which he is mated. He will show all the objective phenomena of 'prepotency.' B.P.R. ♂ 550 is an example of this. A class 7 B.P.R. male would, in breeders' parlance, be regarded as less prepotent than a class 1 male, but even so, more prepotent than the general run of the flock.

The essential point here should not be misunderstood. It is not, of course, contended that simple Mendelian 'dominance' in general, and prepotency are the same thing. More than

that is demanded. It is only suggested that a homozygous dominant individual, when high performance is dominant over low, has all the objective characteristics of a prepotent individual in the breeder's sense.

That this suggestion explains all the facts regarding prepotency is by no means asserted. It seems to me, however, that it does furnish



A distant View of Breeding Pens on an Essex Smallholding. [Copyright.]

the explanation for a part of the phenomena at least, and by so much helps towards a final solution, since, it brings us nearer to the kernel of the problem.

*The practical bearing of these results.*

To the practical poultryman the data and conclusions of this paper would appear to have some significance. They make it possible to outline a scheme of breeding for increased egg production which shall be intelligently directed towards the attainment of that end. This, however, is not the place to discuss such a scheme. That will be undertaken later in another place.



## THE STORY OF HEN NO. C543.

## 291 Eggs in Twelve Months.

BY PROFESSOR JAMES DRYDEN.

[We quote the following extract from an article in the *New York American*, by Professor James Dryden, of the Oregon Agricultural Experiment Station, probably one of the sanest poultry experimentors of the day, who with his shrewd common sense looks at the ultimate as well as the immediate. EDITOR I.P.R.]



EN C543 was hatched on April 29th, 1912. She began laying at the early age of five and a half months; and in twelve months, or 365 days, thereafter she laid 291 eggs. From the date she was hatched to the end of her laying year there were 532 days. She, therefore, laid an average of more than half an egg a day, counting from the date she was hatched, and more than three-fourths of an egg a day during the laying year. The eggs were of white colour and good marketable size, averaging about two ounces. She, therefore, laid some thirty six pounds of eggs, nearly nine times her own weight. At 30 cents a dozen, her eggs were worth 7 dollars 25 cents. She ate heartily, of course, because the eggs came from the food. There is no way of telling exactly how much she did eat, because she was fed with a flock of fifty, and she had to take pot luck with the rest of them. The average food cost for the flock of fifty was less than 1 dollar 50 cents per fowl, but it is reasonable to suppose that this hen ate more than the poorest layers of the flock. The number of eggs laid, however, does not bear an exact relation to the food eaten, because one hen with better digestion makes better use of her food than another. I noted that she was a frequent visitor to the beef scrap hopper and also to the protein for the egg contents and for lime for the shell. She took her daily rest after her feed of mash; and she would go back to the mash a second or third time. She was also a frequent visitor to the water dish; take her off the trap nest after laying an egg, and she goes straight to the water, some of which is later put into the egg. She would nibble at the green food which was always accessible, then walk to the scratching shed and scratch for a stray kernel of wheat or oats. In disposition she was not the most friendly or amiable; she kept her distance; she wouldn't be a pet; she was usually on the outskirts of the flock when you entered the yard. But because this hen was a little offish, and kept herself to the outer circle, the poultry enthusiast should not make the discovery that "offishness" indicates the good layer, and then proceed to kill off all those hens of the inner circle. The next best layer in the flock was the most amiable of the fifty, and kept herself usually inside the inner circle, or around your feet. It has never been a profitable business to pick out the good layer by some external characteristic or some peculiarity of disposition.

We can theorise till doomsday about egg type and get nowhere. Up to date there is only one way of picking out the good layer and the poor

layer, and that is the performance test as indicated by the trap nest record. But I forget that the reader is anxious to learn what breed of hen this is that has laid within nine eggs of 300 in a year. I overlook the fact that the breed heresy is deep-rooted. I wish that the name breed as applied to chickens had some meaning when we come to discuss egg laying ability, but a mass of trap nest records of hundreds of hens of various so-called breeds show clearly that high egg laying is not a characteristic of any one breed. I have had high egg layers in various breeds, and poor layers in the same breeds. I have had good layers of no breed, and this hen, this world's record hen, belongs to the no-breed class. She was a cross-bred. I don't want to tread on anybody's toes, but the "Standard of Perfection" is worthless when it comes to breeding for eggs. The egg standard of perfection is the trap nest. High laying is an individual, not a breed or race characteristic as we have breeds. A great many breeds of chickens, or rather a great many strains of a great many varieties, have been injured by too close breeding for show points that have no correlation with utility or egg-laying points. We have no less an authority than Darwin that crossing restores vigour that has been lost through close breed or in-breeding. The effect of crossing is a much debated, and, I am inclined to think, a much misunderstood subject among poultry breeders, but I will report some data on that point later. Sufficient now to say that the Oregon champion layer was the result of crossing. At the same time this method of improvement may be abused as well as used. The immediate parents of this hen were both cross-bred. It matters not that crossing crosses together maybe a mongrelising process. If we are to believe a certain class of breeders this hen is a mongrel—neither of her parents were pure-bred.

But wait a minute; her parents were good layers and they transmitted that trait to her. Is she not, therefore, a pure-bred egg layer, a mongrel as a show bird, just as the bird in the show room may be a pure-bred show bird, though a mongrel egg layer. If we cross the latter with the former would we not be mongrelising egg-laying qualities? I don't pretend to say that we must necessarily cross to get high egg records. The Missouri hen and the Canada world's record hen were pure-bred in the meaning of the Standard of Perfection, though not show birds, but none of the records that I have quoted were made by hens that had an ancestry of good layers, so far as known. To get high egg records by selective breeding we must



breed for constitutional vigour, and the quickest and surest way to get vigour is to cross. Another point about the ancestry of this hen is that her dam and sire were related, the sire being a son of the dam. Here we have two opposing factors, crossing and inbreeding, the one adding, and the other taking away vigour.

I will not anticipate my report on our experiments on breeding, but in this case the hen had great constitutional vigour and it undoubtedly came from her cross-bred blood. The hen, of course, was fed and well fed. She was born with the ability to lay; she had the inherited tendency to lay; her ancestors did their part. The great predisposing factor in high egg prices and small profits for the egg farmers, in other words the low egg yield in the United States, which is about seventy eggs per hen in a year, is the ancestry or breeding of the hens. They won't lay by any kind of feeding unless the ability to lay has come to them from their ancestors. On the other hand the hen may be born with the seed of several thousand eggs, or oocytes, as scientists would call them, but

she won't lay them unless the feeder does his part. A Maine experiment station biologist has found by actual count over 3,000 oocytes in a hen. The feed must be of certain kinds and the feeding must be done in a certain way or egg records will go glimmering. There was no secret in the feeding of this hen. The main purpose of our experiment was not to get the highest possible egg yield, but to show the effect of selective breeding and crossing on egg yield. The conditions of feeding and housing were such that they could be followed by the practical breeder and farmer. There were no impossible conditions. To test the effect of breeding on the transmission of egg-laying qualities or fecundity the conditions of feeding and management must be the same year after year.

Hen C543 is not an isolated case. There is a strong probability that another hen, a flock or mate, of similar breeding, may pass her in the race before the end of the year, and I expect others to exceed the Missouri and Canada records. The note of encouragement is that they are all bred from an ancestry of heavy producers.

## A MEAT FAMINE IMMINENT IN CANADA.

### A Call to Skilled Poultry-keepers to Supply the Demand.

By WALTER JAMES BROWN, Aylmer (West,) Ontario, Canada.



FOR many years some of the leading thinkers in Canada have been warning the people that more attention should be given to the production of meat of all kinds, but very little attention has been paid to the rather startling conditions revealed by those who were in a position to speak with authority. The truth is that in Canada there exists to-day an opportunity unparalleled in history for the producers of meat and similar food products.

Representatives of the big packing houses in Great Britain during the last two years have been in Canada studying the country and trying to ascertain if it would be wise to depend on this Dominion as a source of supply for beef, pork, mutton etc. As a rule they have returned to the Motherland with the report that Canada has at present little or no surplus. The future no doubt has great things in store for the producing classes of all of the Canadian provinces and possibly in a few years there may be enough people on the land raising live stock to warrant the investment of capital in stock yards, packing houses and meat canning factories, but at present local demands practically absorb local supplies.

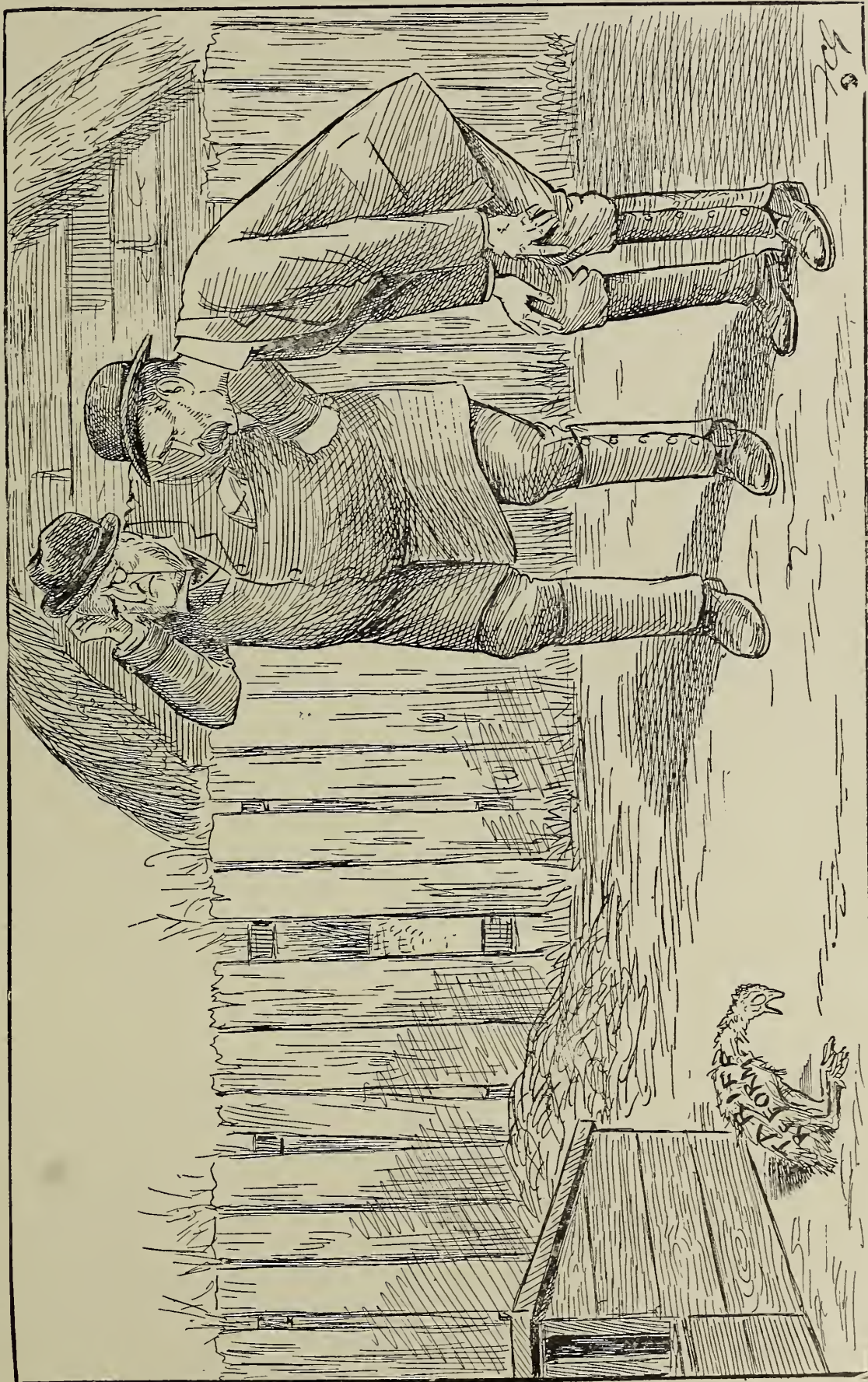
The United States have been importing beef in large quantities from Argentina and have also looked with longing eyes across the Canadian border for a possible source of meat supply. The people of the great Republic have healthy appetites

especially for meat. Notwithstanding their tendencies to fads in matters of eating they are as a people among the greatest meat consumers in the world. Between 150 and 160 pounds of meat per capita are consumed annually. The United States packing houses have pushed their business into Canada. They have already established factories at many points and scattered their buyers over the country. In numerous instances the animals are slaughtered at the Canadian factories and the by-products of the packing industry are shipped to Chicago for manufacture. When the big meat packers of the United States became interested in Canada as a source of supply for the raw materials of their business the Washington Government decided to lower the tariff and to-day prices for meat animals of all kinds are climbing upwards at an unprecedented rate. This is rather hard on the Canadian consumer. The farmers of this country are not really producing enough meat for their home markets, but owing to the prices offered they are to-day sending across the border to Uncle Sam what Canadians themselves need. During the last three years there has been a sharp decline in the number of cattle, sheep and swine maintained on the farms of the leading agricultural province of the Dominion—Ontario. The number sold and slaughtered during the period has uniformly decreased. It is only in poultry that there has been an increase of nearly two



**WANTED—A STIMULUS.**

[The following drawing by the famous cartoonist, Sir F. G. Gould, appeared recently in the *Westminster Gazette*, and to the courtesy of our contemporary we are indebted for permission to re-produce it. With the political allusion we have no concern, expressing neither approval nor disapproval. We feel, however, our readers will appreciate this recognition of the Poultry Industry, and the skill of the artist in his clever picture. Editor I.P.R.]



FIRST POULTRY FARMER: *I wonder whether it would be any good trying this here new Electricity treatment. They do say it brisks a chicken up most wonderful—you can see the sparks coming from its beak!*

SECOND POULTRY FARMER: *I wish we could do something—there ain't much in the way of sparks about this one!*

[In a Paper read before the Royal Society of Arts on Wednesday night it was stated that electric currents are of great value in chicken rearing.]

December 14th, 1913.



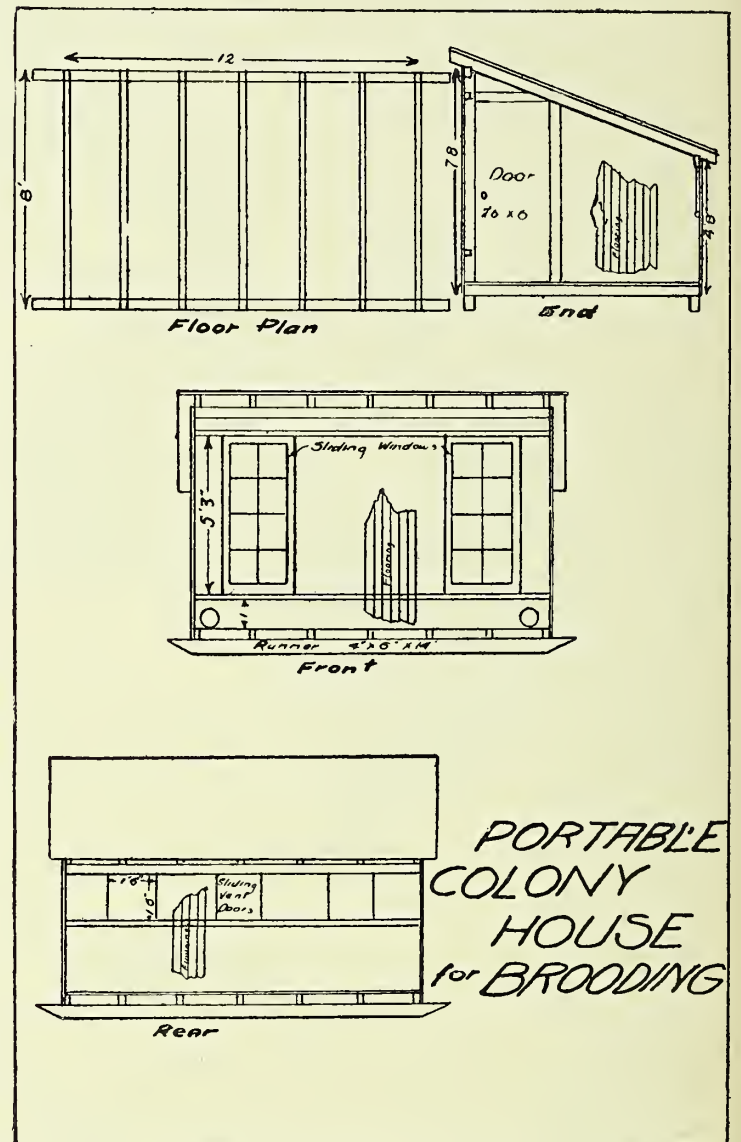
million head. The outlook for cheaper meat is not, therefore, reassuring. It would seem opportune for all those who have the knowledge and skill to join in effort to meet the demand for these high priced food products. Canada needs just now the presence and activity of men and women who by extensive methods can increase our supplies not only of beef, pork and mutton, but of poultry and eggs also.

It is the tendency in Canada, especially among the better educated people, to look upon the United States as an example of "how not to do." The lessons that Canadians may learn from the mistakes of the United States are so many that they cannot be counted; but, perhaps, the greatest lesson of all is the evil results that follow quickly when the people of the rural districts crowd into the into towns and cities leaving the fields to grow up with grass and weeds and the plough to rust to in the furrow. The fact that Uncle Sam has only 53.7 per cent of his people on the land and 46.3 per cent living in the towns and cities explains not only acuteness of his social problems, but also the rapid increase in food prices. The United States have been filling up their waste places for a century or more while Canada with its vaster spaces is just beginning. Yet in Canada—admittedly the wealthiest country in agricultural resources in the world—in 1911 only 54.4 per cent of the population was on the land, while 45.6 per cent was urban. Notwithstanding immigration is increasing Canada's population by nearly half a million a year and farming inducements are the magnets held out to new comers there has been an increase of food prices in Canada of 27 per cent and the people here seem as far away as ever from producing a surplus of food. During the same period foodstuffs in England increased only 2 per cent. Canada imports as much food in the form of meat, eggs, dairy products, fruit, etc., as she exports in the form of grain and cattle. The country has too large a proportion of its population engaged otherwise than in producing food to be classed very long as an agricultural country. The evils of concentrating population in the cities in Canada are no less marked than they are in the United States.

It is a true saying "wherever there is a need there is a fortune." Certainly there is a very great and very pressing need in Canada for more food products. It is a need that can be met by the coming of more men and women of the right type to this country. For many years Canadian writers and speakers discouraged British men and women from going into poultry farming on an extensive scale in this country. We hastened to point out the risks and the pitfalls, instead of enlarging on the opportunities the business presents. We said that the poultry industry of this country must be built up by the farmers and their families. It is true that poultry raising has made some progress among the people engaged in general agriculture, but in the meantime the poultry breeding farms when managed

by skilled operators have yielded fortunes to their owners.

Just now all Canada, but more especially southern Ontario, where land is cheap and fertile and the climate equable, is calling loudly to British men and women to come out and help us to build up a great industry, to grow and fatten more poultry and produce more eggs that the increasing thousands of our population may be fed. The meat famine in Canada and the United States constitutes



**Plan of a Portable Poultry House.**

a call to skilled poultry-keepers to come over to Canada and possess the land. To many British people think that Canada is all west of Winnipeg. They know that the new west is rough and only partly settled and for that reason they are reluctant about embracing it opportunities. If they only knew Canada better they would not fix their eyes so intently on the vast prairie country west of the Great Lakes, but would come to southern Ontario where markets are plentiful, where schools are only two or three miles apart, where all modern rural conveniences are established and where the peach, grape and cherry thrive.



## PROTOPLASM AND SEX.

(AN OLD SUBJECT IN A NEW LIGHT.)

By OSCAR SMART.

HAS it ever occurred to you as strange that, in spite of all the time, experiment, and theory that has been spent on trying to determine the sex of chickens by mating, or to foretell it by the appearance of the egg, we still remain as ignorant on this subject as we were at the beginning? If you have never thought of this, I now commend it to your consideration as being calculated to show how helpless we are when approaching a scientific question without the slightest scientific knowledge.

It is curious that poultry keepers generally know so little of what may be termed "natural science," when this, after all, would prove most useful to them. Is it because it appears to them a particularly dry subject, or because for the most part being unacquainted with scientific terms they find it difficult to apply scientific truths generally?

In either case, the blame must rest with those writers who cater for their wants—much they have done to be sure, and all credit is due to them—but the fundamental laws of breeding they have woefully neglected.

Now we are going to break through this rule, and, in entering the realms of biology, see what it can teach us. We are only going to touch the merest fringe of the subject, and shall feel our way as we go along. We are going to discuss protoplasm, and we shall ask of biology three questions.

First: What is protoplasm?

Second: How does it develop?

Third: Is it possible to determine or foretell sex?

Starting, then, at the very beginning—What is protoplasm? It is at once the most simple and most complex thing in the world: it is the germ\* from which all life springs. In appearance it is almost exactly like the white of an egg, and even under the strongest microscope it displays hardly any appreciable difference. There is absolutely nothing, so far as human knowledge goes, in its simple construction to warrant the wonderful organism which, under favourable conditions, will develop out of it. Science has analysed it, and all it can tell you is that it is composed of carbon, hydrogen, oxygen, and nitrogen. It can tell you no more—this is absolutely everything that is known about it. To illustrate the extreme ignorance on this subject, let science adopt all

her most modern methods of examination, and she cannot distinguish between the protoplasm of a tree, a horse, a bird, a fish, or a man; yet you know, and I know (or at any rate we think we know) that there must be the widest possible difference between them. Now one remarkable thing about these various protoplasms, which are all so much alike, is that they always conform to type; that is to say that the protoplasm of a tree will produce a tree, that of a horse will produce a horse, and so on through the whole kingdom of living things. So it will be seen that simple as they are, and indistinguishable one from the other, there must be a certain complexity about them, as well as a certain distinctness, which is beyond our present power to understand.

Any conclusions we may come to about this "life-germ" are, therefore, bound to be more or less speculative on account of our ignorance concerning it. We are, however, bound to assume that it is the medium by which alone inheritance is possible. I say that we are bound to assume this; therefore, although we cannot see them or distinguish them, a single protoplasm must contain numberless units which are capable of developing into an almost facsimile of the parent-stock. There is an almost awful thought embodied in this simple and logical conclusion—that of predestination. The protoplasm must be predestined to develop the various units contained in it before even it shows any signs of change or life. When, then, even if he understood it which admittedly he does not, could man change it to his will? It is true that he can alter the units contained in it by the science of breeding; but (and this is what I want to emphasize) does he know at what period the sex of the embryo is determined, or how it is determined, and if he does not, what does he imagine he is going to do by his petty experiments or theories, when they are made so much in the dark?

We next ask of biology, How does this protoplasm develop? It cannot, we know, develop of itself. It is true that it is the "germ of life," but it is not life itself. It is a dead thing; it awaits some other force before it can be truly said to live. Nevertheless, when this force is brought into action the development begins almost immediately, and the protoplasm rapidly shapes itself into the complex organism to which it is kindred.

We may describe this wonderful change—this evolution of the organic from the inorganic—

\* Protoplasm must not be mistaken for the sexual germs (spermatozoa and ova), although it is the material in these from which the embryo is developed. Protoplasm pervades every living organism, and may be described as the germ of life.



best by quoting a passage from Prof. Huxley's "Lay Sermons." The observation was made through a strong microscope, and is on a speck of protoplasm of one of the commonest animals. It is thus he writes:

"Strange possibilities lie dormant in that semi-fluid globule. Let a moderate supply of warmth reach its watery cradle, and the plastic matter undergoes changes so rapid, and yet so steady and purposelike in their succession, that one can only compare them to those operated by a skilled modeller upon a formless lump of clay. As with an invisible trowel, the mass is divided and subdivided into smaller and smaller portions until it is reduced to an aggregation of granules not too large to build withal the finest fabrics of the nascent organism. And, then, it is as if a delicate finger traced out the lines to be occupied by the spinal column and moulded the contour of the body, pinching up the head at one end, the tail at the other, and fashioning flank and limb into due proportions in so artistic a way that, after watching the process hour by hour, one is almost involuntary possessed by the notion that some more subtle aid to vision than an achromatic would show the hidden artist, with his plan before him, trying with skilled manipulations to perfect his work."

Thus we see that even to so highly scientific a mind as Huxley's this changing of matter into organism is an unsolved mystery. He sees the force at work, systematic and objective in its end, but he is powerless to tell you what it is or how it operates; and the whole processes of biology are equally difficult to demonstrate.

We find it impossible to explain the exact period at which sex is determined, whether it is at the unity of the spermatozoon (male germ) and ovum (female germ), or whether it is at some stage of embryological development. Any experiments, therefore, having for their object the governing of sex are necessarily carried out in total ignorance of what we may term, for sake of a better word, "sexual principles." We shall find when we come to consider experiments made by the best and cleverest of biologists that their very ignorance on this subject has rendered their work fruitless or indefinite.

A series of photographs showing the various stages of development in the embryo chicken might be interesting, but, as poultry-keepers generally have noticed this by the aid of a strong light, it is hardly necessary. He will have observed how the yolk has first become interlaced with innumerable veins and arteries (although this is not actually the first sign of development), how the heart, lungs, and intestines have been evolved, how the brain and blood have come into existence; how the bones, head, limbs, and skin

have been formed; how the embryo has been clothed with down; and how the whole has been endowed, even in its early stages, with life. But however closely he has observed these changes, he cannot say—if he is wise, he will not attempt to say—what there is in this simple fertilised ovum which only needs a certain amount of heat to change it into a complex organism. So ignorant will he be of the whole process which he witnesses that it is doubtful whether he could, however carefully he observed, detect the very earliest indication of sex, and so again he will be astonished at his own ignorance.

The answer to our third question—Is it possible to determine or foretell sex?—must be answered, as will already be anticipated, in the negative. But we do not purpose dismissing it with a brief "No." We will see what has been attempted in this direction; we will even go so far as to say that with greater knowledge than is now at the disposal of science, even this, the crowning glory of biology, may be accomplished, although with the material we now have at our disposal, any effort to influence sex must be futile.

Science has divided itself into two schools over sex, or at least over the possibility of determining sex, and it will be interesting to note the position that each has taken up. The one maintains that the sex of the offspring is fixed *ad initio*, which means that the organisation of the ova is from the first predestined either to produce a male or female offspring; so that it is impossible for any exterior conditions to affect it. The other school holds that the sex of the ova is not predetermined by organisation, but that it is determined at a later date by certain conditions.

It is obvious that, while few experiments have resulted from the former view, a large number have been the result of the latter. The more intelligent of these have concerned themselves with nutrition, and it is only fair to say that their efforts, in some instances, have met with a certain measure of success; but so slight is the evidence that the whole favour of opinion is with those who believe in the predetermination of the ova.

Thus, in regard to Yung's experiments on tadpoles, though not conclusive, are very interesting. A sufficient and liberal diet is supposed to give a large percentage of females, and in carefully nourishing the larvæ he found a decided tendency in this direction. Was he, then, justified in formulating this theory as affecting sex? Let us see.

The same experiment has been carried out in regard to mice, and, although it was continued for several generations, it absolutely failed to



alter the proportion of male to female in a single instance. One result, therefore, flatly contradicts the other; the proposition cannot be applied generally, and it is consequently unsafe to accept it.

Another experiment denotes a certain belief in the predetermination of ova, for it maintains that it is determined by the age of the respective parents. It is again a question of nutrition, but in a slightly different form; it attempts to prove that the older the mother, the more nutriment will go to nurturing the ova, and a larger percentage of female offspring will be the result. In some instances this rule has seemed to prevail; in others it has been doomed to complete failure. I have two pens of two-year-old hens mated this year, both pens being headed by one-year cockerels. From one pen I had a large majority of males, from the other a large majority of females; as one pen was White Orpingtons and the other Buff Orpingtons, there was no mistake about the young, so this theory also appears a false one.

Various experiments in Germany have been along totally different lines; but, as I do not know on what deductions these experiments are based, I dare not presume to criticise them. It is maintained that if the male fowl be kept separate from the hens, and only allowed to pair with them in the evening, the majority of the resulting young will be females; while if he is only allowed to pair with them in the early morning, the majority of the young will be males. One cannot say anything about this without further particulars and more authentic instances; it sounds extremely improbable, but some of our fanciers might care to enquire into it.

Whatever may be the actual factor in the desideratum of sex, one thing stands out clearly, and is disputed by none. This is the fact of it being hereditary, and it is this that poultry-keepers should realise and utilise for their own ends. In order that they may the more successfully do this, we will take some pains to explain it.

Although as far as our present knowledge goes, man is powerless to affect the sex of any living animal, the determination of sex does not appear to be a matter of chance. It is usually—one might almost say invariably so generally does the rule apply—dependent on the female; and so firmly is this factor, whatever its nature, fixed in her that it is impossible to alter or influence it. Thus some females breed nearly all young of their own sex, some nearly all males, others the proportion more or less equally balanced. Whatever males these females are put to, the proportion of the sexes in the resulting young remains exactly the same; so that we may safely assume that the determining factor in sex lies with the mother, not with the father.

When the significance of this is thoroughly grasped, we may consider the next point. This deciding factor in sex, whatever its nature, is inherited by the female progeny. That means this: that if a poultry-breeder has a hen that throws 75 per cent. pullets, no matter what male she is mated to, these resulting pullets will inherit the same tendency as their mother—namely, they will always produce a majority of females. The converse is also true. The females from hens producing a preponderance of males will, in their turn, also breed a majority of males.



**White barbus d'Uccle, a favourite Belg. variety.** [Copyright.]

These facts relate to all living organisms, they are disputed by none, and their application to poultry-breeding ought to be obvious. If a man wants nearly all pullets in the offspring, let him adopt means by which he may ascertain which hens produce the most pullets, and line breed with the pullets from this hen (the cockerel used is immaterial), and if he wants cockerels, let him line breed with pullets that are bred from a hen breeding a majority of cockerels. (Again, the cockerel mated to these pullets is immaterial.)

This course may entail extra trouble, but as the result is a mathematical certainty, I think that it is worth it.



## POULTRY KEEPING IN CALIFORNIA.

A short while ago we gave some particulars in this subject from the pen of Mr. J. S. Nutman of Mayfield, California. Since then we have received a few more details from him as to his method of working a large egg ranch, and we believe these will prove of interest to our readers.

The capacity of the ranch is 50,000 laying hens, 25,000 chick brooder, and 25,000 incubator capacity, therefore one may say it is run on a fairly extensive scale. The climate is evidently first class, there being plenty of sunshine, very little frost and warm rains from November to February.

with no drop curtain is used. Each house accommodates 1,500 birds. On the first of August a beginning is made in the disposal of the hens, for in this case it is found more profitable only to keep the birds during their pullet-hood. Breeding is carried out with yearling hens, mated either with early or fall hatched cockerels.

Dry feed alone is given. A dry mash is eaten from hoppers and all grain is fed in the litter, which is at least a foot deep. In wet weather the grain is given inside, and outside in straw during fine weather. The grain is given twice a day—morning and evening. Green food such as kale, mangolds, sugar beet, cabbage, etc. is fed at noon. The average yield last year was 153 eggs per hen.



**A Birds' Eye View of Mr. Nutman's Farm in California.**

[Copyright.]

Even with the thermometer at 100°F. there is no feeling of excessive heat owing to the fact that the air is bracing.

The breeding stock is mated early in December and hatching begins in January and is continued until the first of May. A certain amount of autumn hatching is carried out in the district for the production of broilers for the Christmas market. This is profitable but Mr. Nutman confines his efforts to egg production alone. All eggs are carefully graded before they are despatched to San Francisco and the neighbouring Bay cities, and this ranch realises a higher price than the market quotation for extras. All eggs are shipped the same day as laid and a guarantee is given that they are under 24 hours old when despatched.

The houses are 150ft. by 30ft., 7ft. high in front and 5ft. high at the back. An entire open front

Mr. Nutman points out that even in California poultry keeping is not all profit, "as it requires hard work and much attention to make it successful, and of course we have our drawbacks occasionally."

We hope at a later date to give further particulars as to incubation, the plans for the laying and colony houses.

### POULTRY RAISING IN CALIFORNIA.

*To the Editor of The Illustrated Poultry Record.*

Sir,—The letter under the above heading in your issue for December is not unfamiliar as a type of many with which the press of this country is being circularised. To put it in another way it is, briefly and vulgarly, piffle.



But, while I am not going to insult the intelligences of your readers by attempting to disprove the existence of the New Jerusalem which Mr. Nutman says he has discovered after thirty-years' globe-trotting, I would like to know why it is that he is so anxious for others to go over and share the clutch-you-by-the-throat profits which he says he can "guarantee." Most people, when they have got such a good thing on as Mr. Nutman says he has got, generally prefer to keep it to themselves. But here, behold a philanthropist, giving away the tip as to how to make a clear profit of £200 or £250 per annum out of a capital of £500 by keeping poultry—and "without doing physical hard work either!"

When I was staying in the Santa Clara Valley about two years ago I met a large number of Mr. Nutman's sort. They "laid it on so thick" about their land, their fruit, eggs and so forth that—well, one might have wondered why all this boasting, for the average settler in California does not as a rule give his trump cards to a possible rival. But I had been in California long enough to see a hole through a dough-nut, therefore I did not wonder. Instead of doing so I would say something like this:—

"Yes I know all about that, but I am not out to take up land. Tell me what you think of Santa Clara Valley."

"Ain't got no use for it. If it wasn't for the suckers who came out West to buy rotten orchards guess we'd all be dog-gone broke long ago. Half the bloomin' orchards is eaten up with thrips, phylloxera ruins the vines every now and again, and what the late frosts leave for us the fruit combines get."

That was the sort of tale at ranch after ranch in the "world-famed valley." Every other man I met was anxious to sell, and until he discovered I was not going to invest in land he would talk "hot air" after the manner of your correspondent Mr. Nutman. The price of land at the time of my visit was 300 to 1000 dollars per acre (the latter would be planted) and it is "rapidly rising"!

As to the "ideal" climate everyone who has been there knows that of San Francisco to be one of the vilest in the world. The city is blanketed by fog all morning and raked by bitter trade winds and dust for the rest of the day. And the Mayfield end of the Santa Clara Valley gets its share of these blessings of the El Dorado State.

Mr. Nutman would like to establish an English colony at Mayfield. Of course he would, and so would about a thousand or so other people in California. Settlers with £500 or so apiece are nice sort of people to have about. They farm them out in the Far West. And I am surprised at Mr. Nutman's modest returns when trap-nested "suckers" can be induced to yield, say, three or four hundred per cent. the first year and that without the expenditure of any more physical energy than sitting on an office stool.

I may add that I have nothing to gain nor to lose by making these statements public. But I would beg any readers who may have been led away by the voice of the charmer, who hath such an honied tongue, not to forget to take a large pinch of salt before going any further

A. T. JOHNSON,  
Author of "California," etc.

Llys Llewelyn,  
Conway.

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## A SMALLHOLDER'S FIRST YEAR,

### CHAPTER I.

#### THE SELECTION OF LAND.



NUMBERLESS people have the desire to return to the land; to leave the hustling ways of the city behind them, and thus escape from many of the disadvantages of modern civilisation. The desire is easy of acquirement, but to fulfill the desire is a different proposition altogether. How many have been seeking for months to find just exactly what they require, and how few have succeeded in locating a spot that possesses those factors which are essential for the profitable working of a farm on a small scale?

One reason undoubtedly for this is the fact that a number of would-be small-holders have only a hazy idea as to what they really require, and hence are unable to determine on the scene of their future labours. It is folly to go to work in this way, and therefore, we propose to give a brief note as to

those factors which are considered essential for the success of such a venture. Once have them firmly fixed in one's mind, and the work of selection is rendered easier for the reason that so many districts can be eliminated at the outset, leaving only a comparative few for visitation.

There are four principal requirements, all of which are necessary, and, failing any one, the place can be classed as unsuitable right away. These are:—A. Nature of soil and subsoil and climatic conditions; B. Drainage; C. Water supply, and D. Accessibility to a town and nearness to a good market for the produce of the farm.

Extremes in soil should be avoided, for land that is clayey or too sandy will handicap the small-holder from the beginning. A good medium soil of average depth, with a porous subsoil is the best that can be secured. The porous subsoil will ensure



good natural drainage. If the land is likely to become water-logged, drainage by pipes must be resorted to. This is a costly proceeding, and therefore, if the land when taken over is complete in this respect, it will save a considerable outlay on the part of the purchaser or tenant as the case may be. If possible a site with a southern slope should be selected, as the formation of the ground tends towards a natural drainage, and moreover, during the winter months ensures a maximum of sunshine. The quality of the land, however, is not everything. The surroundings must be suitable, in that shelter from prevailing winds and extreme sunshine must be present. We have visited certain districts where the soil was all that could be desired, but standing high, without hedgerow, or belts of woodland, the bleakness of the situation rendered the place quite out of the question as regards the profitable working of a small-holding. The presence of a

that of the first quality, will in all probability have to be sent away by train. This produce must first of all be delivered at the station, and then forwarded by rail. The freight charges on all railroads is on the weight and zone system, the charges being increased as the mileage becomes greater. For instance the price for poultry produce on the G. W. Railway is as follows:—

lbs.	miles	miles	miles	miles	above
	1.30	31.50	51.100	101.200	200 miles
2	4d.	4d.	4d.	4d.	4d.
24	6d.	6d.	9d.	1s.	1s. 3d.
96	1s. 3d.	2s.	3s.	4s.	5s.

This point is of very great importance for the difference in cost for carriage between 25, 55, 105, and 205 miles on 10 dozen eggs three times per week for 12 months, packed in the lightest boxes on the market would be considerable. The



good water supply is necessary. In some cases this may be by service from the main, but under some conditions it will have to be obtained from wells. To have the water supply laid on in various parts of the holding is a labour-saving device.

The last point is with reference to the position of the nearest town. The distance must not be great, seeing that a large proportion of the feeding stuffs for the poultry must be purchased, and carted to the farm. The extra cost of delivery per mile is an item to be considered, even in this age of motor traction. Then, again there is the question of the mileage to the best market for the disposal of the produce. A certain proportion of this produce may be disposed of locally, but the greater part, and

respective charges would be £3 18s., £5 17s., £7 16s., and £9 15s. On 96 lbs. sent three times weekly, the charges would be £9 15s., £23 8s., £31 4s., and £39 respectively. The difference between these sums is not to be dispised.

One other point must be taken into consideration when dealing with the question of accessibility. This has to do with the nearness and condition of the roads. It is essential that the holding should be near a good road, otherwise the labour involved in carting will be excessive.

It is our purpose in these articles not merely to indicate in a general way what is to be denied, but to examine actual estates and to give our opinion



in accordance with what we believe to be the true state of affairs. This applies equally to appliances and stock. In this way our readers will be in a position to stock and work a small holding successfully, without the necessity of first bearing in mind what we advise and then having to find from other sources what will meet their requirements.

We have personally viewed a number of sites and have pleasure in giving a brief description of those available in one well-known district.

A district that offers great promise from the point of view of the smallholder is Fawkham in Kent. Within the past three years a large estate has been cut up into medium and small-sized plots and a regular smallholder's colony has been established.

The estate is owned by Smallowners Ltd. and can be recommended to those who desire to begin work on the land.

The soil in this district is a good medium loam with a chalk subsoil, while the land is well drained. It stands about 400ft. above sea-level, but although standing high, owing to its being well interspersed with woodland, there is adequate shelter from the north winds. A great advantage is that water is laid all over the estate from the company's mains. This is a great boon to the occupier.

The estate is within a mile of Fawkham station on the S.E. & C. Rly., and is only 23 miles from London. Two good shopping centres are Gravesend and Dartford, both reached from Lingfield Halt Station, and within five miles of the holdings.

At present there are about 600 acres available on the Hartley Manor estate for purchase at prices ranging from £35 to £120 per acre. The latter price is for the finest fruit land on the farm. Even the poorest land is very good indeed and can be depended upon to produce heavy crops. Any sized plot can be bought from one acre upwards.

An interesting point connected with the Small Owners Ltd. is the central depot which now comprises departments to deal with every requirement of the smallholder. Whether he wishes to buy implements, seeds, fruit trees, appliances, manures, or to sell fruit, poultry, or market garden crops, he will find every facility for doing so cheaply and profitably.

In addition he can obtain expert advice on any subject connected with his work. If he requires a loan there is the credit bank to meet his wants. The jam factory will purchase his fruit in the case of a glut on the market, and should he be in need of horses, implements, labour, packing materials, he is given the assistance necessary. The farm store supplies practically everything, and as this is run on a profit sharing basis the prices are very low.

In the club room he finds books, diagrams, and instruments, of which he is given full use.

On purchasing the land the buyer can either have his house erected by the company or he may have the work carried out by an outside firm. The company is, however, open to do all the building,

cultivating, planting trees and erecting poultry pens, etc., before the purchaser takes possession, if he so desires.

Another feature of the scheme is that the purchaser can pay out right for his land and buildings, or he can pay by instalments—in the latter case he pays 5 per cent. interest on the balance actually outstanding from time to time.

There are three repayment plans as follows:

A. Under this plan the company have arranged with a well known Building Society to advance on approved property on the Hartley Manor Estate on the following terms:—

Repayment can be made over any period from 5 to 20 years monthly or quarterly payments. Assuming the period of 20 years, a deposit, say of £80, would be paid down and the balance of £400 would be repaid in monthly instalments of £2 13s. 8d., including repayment of capital and interest—equal to an annual rental of £32 4s.

B. Under this arrangement a well-known Life Insurance Company are prepared to advance on approved property on the Hartley Manor Estate on the following lines:—

Again assuming a property of the value of £80 would be required to be paid down, leaving a balance of £400. It could be arranged for this amount to be repaid over 20 years by quarterly or half-yearly instalments inclusive of capital repayment, interest, and life insurance, equivalent to an annual rental of £34 10s. 8d. This figure is for a purchaser aged 30, and would be subject to a slight increase for older ages. Under this repayment plan, in the event of the death of the smallholder, all the property is handed over free of all charge to his wife or next-of-kin.

C. Under this scheme the Company are prepared in the event of a smallholder deciding not to take advantage of the two preceding repayment plans to advance 75 per cent. of the purchase price of house or land on their estates.

Assuming again the value of £480, £120 would be paid down and the balance would be repaid in quarterly instalments, equivalent to an annual rental of £40 12s. 4d.

In any of the above cases shorter terms of repayment can be arranged if desired. In the case of repayment plan (a) longer terms of payment up to 25 years can also be provided for. In every case larger deposits or instalments can be paid if desired, and any portion of the debt can be paid off at any time. Provided that the repayments are punctually made advances under any of the above three schemes can never be called in until maturity.

Up-to-date, there are 60 smallholders on the Estate and it speaks well for the success of the enterprise that there is not a penny of arrears owing.

From time to time as we hear of other suitable land for small holdings, we will give a description of the various properties.





**A Group of late-hatched Pullets and Cockerels.**

*Copyright*



## THE FARMER AS A FANCIER.

By WILFRED H. G. EWART.

**W**HY are there not more fancier farmers? There are some, we know—and very successful ones. There is one in Kent whose name as an Orpington breeder is known far and wide. There is another in Gloucestershire known to everybody, and several others, both in North and South, all highly successful with their various breeds. But these are a very few compared to the enormous number of general farmers throughout the country; the proportion of them who make a success of the business is even smaller. Yet in some respects it would appear that the conditions of agriculture are peculiarly suited to the establishment of a large poultry farm. There is a great variety of fresh land, plenty of shade, food is cheap, and altogether things can be done in a much more economical way than where fowls are the one and only consideration. Again, an infinitely larger head of stock can be reared than in the case of a cramped specialist establishment, to which every little addition makes a difference on the debit side of the account. Force of numbers counts as much as anything in fancy poultry farming. Another great advantage enjoyed by the farmer-fancier is the outbuildings and houses which he finds ready to hand. This is no small item. I don't suggest that a farm building can easily be turned into a suitable exhibition house—not believing in experiments of that kind—but there are all kinds of uses to which such can be put.

The poultry farm can be established in either of two ways. It may be as far as possible an integral part of the farm machinery or it may be an altogether distinct department. On the one hand we may have the ordinary farmyard flock, the colony system, and so forth; on the other, a deliberately planned and laid-out poultry farm, a thing of stakes and wire netting, self-contained as it were. Under ordinary circumstances the first-named plan is the most convenient and economical to adopt. The immediate neighbourhood of the farm will be allocated to purely fancy stock, the orchard, garden, and shrubbery used as a rearing ground, while the lesser grades can be farmed out on the land. These at least are the main lines on which the poultry department should be run.

### FEW BREEDS.

It is essential in this connection that a number of different breeds or varieties should not be kept. I will tell you why. On a farm arranged in the manner described, there are practically no barriers of free range. The essential feature of modern arm poultry keeping is the small flock system.

Cockerels must be separated from pullets at an early age and the various grades and sizes must also be kept apart. Then there are the breeding flocks from December on until May. Think of what it means if you have half-a-dozen breeds at that time, each to be kept strictly separate! Think of the complications likely to ensue if you are selling eggs from them and your customer who has ordered a sitting of Rhode Island Reds gets instead a variety of first-crosses. That is the chief danger you have to guard against in connection with the colony system, and I have it in mind that were I to start keeping fancy stock on a farm again, I might build a range of breeding pens. It saves trouble in the end, and at least it makes for shelter. Still, so long as your birds are kept in semi-confinement you will never get the same percentage of fertile



**Mr. Nutman with some of his famous layers.** (See page 170).

[Copyright.]

eggs as you would if they were enjoying absolutely free range. That, believe me, is more than anything the secret of strong germs.

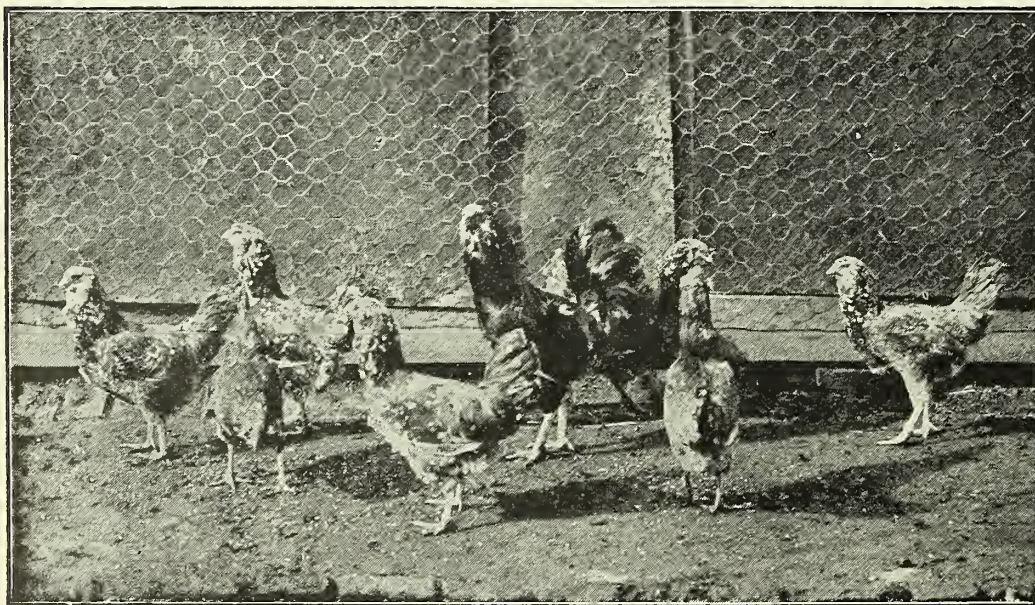
What sort of breeds are best adapted to conditions of farming? Generally speaking, I don't think white breeds are well adapted. You see, it does mean such a vast deal of extra trouble if you are going in for elaborate shading arrangements. It means in all probability, unless there is a quite unusual amount of natural shade, American scratching sheds, covered runs, and cockerel boxes, apart from a lot more washing to be done during the show season than would otherwise be necessary. Choose a breed that stands a certain amount of weathering—the Barred Plymouth Rock, for instance, the Rhode Island Red, or the Black



Minorca or Leghorn. When a man has nothing to do but tend the wants of his feathered stock—that is to say, keep them in show trim—it is all very well; farmers are busy men, however, and it might happen that washing day would clash with other business. Preparation for show is not like ordinary routine work which can be left to the odd man or the boy. The “boss” must do it himself. There was an Essex farmer, a white Wyandotte exhibitor, I once knew, whose hobby in life was the washing of his fowls. He just revelled in it and would take on thirty birds a day with pleasure. Well, that is not the experience most of us enjoy!

#### THE BREEDING FLOCKS.

After all, it is only at one time of year and in regard to a small proportion of the stock reared that particular care is necessary. When December comes round, birds which have done their duty in the show-pen can be mated and drafted out in flocks to the pasture. Three cocks to twenty-five or thirty hens is a good proportion, a sound roomy



**A Pen of Faverolles.**

*[Copyright.]*

kind of colony house being in use. Even where there is a very wide range, it may be found difficult to keep the various flocks apart. There must be two, and if possible three fields between; other, perhaps, more formidable difficulties are also likely to be encountered. In a hunting country, for instance, the fox danger will be ever present to the fancier farmer's mind even if he is scrupulously careful to close all the houses at night. It is no good to have half-a-dozen valuable breeders killed by some hedgerow miscreant. This is why I have found it really best to pitch the house in the middle of the field for that prevents reynard lying in wait when the birds go to roost—a favorite habit of his. Most of the danger is done at dusk when the fox lies low in cover should there happen to be any near. From March to June is a particularly

dangerous time, otherwise, only a stray bird here and there is likely to be missed. Near towns, fowl-stealers represent an ever growing danger. You cannot, so far as I know, prevent their intrusions and insurance is the only effective safeguard. Then the stolen nest is another difficulty. It is bad enough when only the marketable product is at stake; how much worse when eggs are being sold at a guinea or half-a-guinea a dozen. The best pens should of course be kept near the house and if necessary wired in.

#### THE COMMON MISTAKE.

Too many farmers who only exhibit occasionally are quite content with a mediocre class of stock. They keep a number of different breeds with ducks, geese, and turkeys thrown in, and they are satisfied to win the Two Guinea Cup at the local show. They make no special effort to dispose remuneratively of birds or eggs but advertise them somewhat feebly “at moderate prices” in the local paper. This is not the kind of poultry-keeping that pays. It is neither utility nor fancy and whichever way you look at it, such methods are bad. At the same time, the average general farmer is not likely to prove a good poultry fancier. He is not sufficiently enterprising, adaptable, or “receptive,” if the word may be used, to take up with new-fangled projects. It is to the superior class of man, the class of man who keeps a pedigree herd and sends his fat stock to Smithfield that we must rather look for development on the lines indicated.

I do not say that fancy poultry-farming is for the struggling tenant-farmer or for the yeoman with a well-equipped holding and nothing much more behind him. It's a bit risky for them. But for the larger and successful farmer with his balance at the bank, there are great possibilities in this line. From the expert poultryman's standpoint, the opportunities of agriculture are simply wasted. Hundreds of acres of fresh land carry never a bird, shady copses lie empty, orchards are unoccupied—only the yard and its environs are tenanted by a miscellaneous crowd. I am not taking too sanguine a view of the business when I say that an enterprising farmer with capital behind him could add two hundred a year to his income by developing the higher branches of poultry culture as opportunity offers. Nor need this interfere with the purely economic aspects of the industry.



## FANCIERS AND FANCY MATTERS.

BY WILLIAM W. BROOMHEAD.

## THE COMBE BANK POULTRY YARDS.

**R**EADERS of last month's "ILLUSTRATED POULTRY RECORD" could not fail to notice the remarkable record made by Mr. Robert L. Mond's Orpingtons at the late Crystal Palace Show. The prizes won with Buffs from the Combe Bank Poultry Yards were first in the class for breeding pens (nine entries), first and challenge cup in the hen class (fourteen entries), International Challenge Trophy and two medals for the champion Buff Orpington in the show, and with six entries in the pullet class of thirty-two, challenge cup, first, second, third, fourth, fifth, and commended; while in a class of thirty White pullets Mr. Mond's exhibit secured first prize, challenge cup for the best White Orpington in the show, and the Poultry Club's gold medal for the best bird in the Variety Orpington Club Show. The wins with the Buff pullets are, of course, those which made the record, since although many charming birds have been exhibited at the Palace and the Club Shows, on no previous occasion has any one exhibitor staged such a winning team of pullets of this popular variety. Considering the keen competition there always is at the Club Show, and the fact that more than one of the thirty-two birds entered in the class had already been successful this year at big events, the wins are the more remarkable; and it says much for the excellent manner in which the birds were prepared by Mr. M. Dalton Cowap, who has entire charge of the poultry at Combe Bank.

Since the Crystal Palace Show I have been through these renowned yards at Sundridge, Kent, and after inspecting the stock I am not surprised at the high quality of the progeny. In all my travels and inspections of fanciers' yards I have never come across a better lot of stock birds; and I was very glad to find that both Mr. Mond and Mr. Cowap are particularly keen on one point, viz., true Orpington type. This is the keynote throughout; and no matter whether the variety be Buff, White, Black, or Blue—and all are kept at Combe Bank—type comes first. The Blue is the latest variety of Orpington that Mr. Mond has taken up, and he is likely to breed some first rate birds from the stock he possesses. In addition to the Orpington there are other kinds of poultry in this Kentish yard, and among them Speckled Sussex, Duckwing and Black Red Yokohamas, also Faverolles, while for utility there are several pens put up for general purpose first crosses, and in the laying line a large flock of American White Leghorns—the smart little birds that enjoyed such a vogue in this country prior to the infusion into exhibition strains of Malay and other blood.

Beyond these large fowls there are the charming bantams kept and exhibited by the Misses Mond,

and including Millefleur d'Uccle, Light Brahma, Pile, Birchen, and Black Red Modern Game, while an attempt is being made to breed White Leghorn bantams. There are, too, some big pens of Buff Orpington Ducks at Combe Bank, and among the birds winners at two or three shows; while on the five-acre lake there are wild geese and ducks of various kinds, and in the Warren one of the finest collections of fancy pheasants I have ever seen, including Golden, Silver, Mongolian, Old English, Chinese, Amhurst, and Reeves. This does not embrace the whole of the live stock kept on this great estate since there are British and Foreign cage birds, Fantail pigeons, Angora and other breeds of rabbits, Black and Chestnut guinea pigs (now known as Cavies), Shire horses and hunters, St. Hilda (Highland) and other sheep, Jersey, Shorthorn, and other cattle, and a few dogs. Mr. Robert L. Mond is a fancier in the true sense of the word; and nothing gives him greater pleasure when he can find time—he is a particularly busy man—than to go the round of inspection among his live stock. Certainly the poultry yards alone are well worth a visit, not only to see the birds but to see the excellent manner in which the place is laid out.

## MORE ERRORS.

To those of us who know the breeds of poultry it may appear strange that the different names are evidently difficult to grasp by those who are responsible for the printing of catalogues. Admittedly there are those among poultry fanciers—just as there are, of course, in other walks of life—whose "fist" is such that one might suggest the use of a typewriter. And it is may be on account of this that compositors and readers are often puzzled to find out just what is meant, and consequently get as near to it as they can. Glancing through the catalogue of a recent show held not many miles from Charing Cross I found two or three little errors that are worth noting. An exhibitor had entered some Silver Spangled Hamburgs, but in the prize list they appeared as "Silver spong hambury" in one case and "Silver Span Hum" in the other. Rhode Island Reds were catalogued as "R. J. reds" and Black Rosecombed bantams as "b. r. comb," while one entry of Silver Laced Wyandottes had to be content with the term "Silver-faced." Well, well, there is an excuse, since, after all, our printers in last month's issue made me refer to entry as "enty"—my bad writing, of course!

## THE LADIES POULTRY CLUB.

I am glad to see that the Ladies Poultry Club is still in existence, since little indeed has been heard of it of late. Time was when the club ran a successful show or two at the Corn Exchange,



Reading; but both last year and this season the club show appears to have been abandoned, the members' birds competing for the cups in the different classes at the Crystal Palace, and the entries not being particularly strong. I must admit that I am opposed to such a body as this holding a club show, just as, in my opinion, the mission of the Poultry Club should not be to such an end, but rather to see that shows are run in a correct manner. However, the Ladies Poultry Club went in for shows on its own account shortly after it came into existence, and fanciers looked for a continuance of them. The club should be a strong one, since nowadays there are many women who go in for poultry, and fancy stock particularly. The hon. secretary and treasurer of the Ladies Poultry Club is Mrs. Frank Bateman, whose address is 9, Sackville Street, Piccadilly, London, W.

#### A NEW ROCK CLUB.

Now that the Plymouth Rock Club has changed its name to the Barred Plymouth Rock Club, fanciers of other varieties of this old and popular breed will have to shift for themselves. The Buff Rock Club is fairly old now and there is already well on its legs the White Rock Club. A few weeks since a club for Black and Blue Rocks was formed. Through the efforts of Mr. Marsden Chandler, who acted as secretary, *pro tem.*, and a few other fanciers, a meeting took place at Manchester "to form a club to further the interests of the Black and Blue Plymouth Rocks." A few prominent fanciers put in an appearance, and Mr. Harry Hall was elected president for the ensuing year. The standards were formed and are now in circulation, so something should be seen of Blue and Black Rocks during next season. The hon. secretary of the new club is Mr. T. W. Gibson, 33 New Road, Kirkby Lonsdale.

#### HAMBURGS.

In a letter to a contemporary a correspondent asks "Hamburgs—Where are they?" In the words of the song, "Echo answers—Where!" Well may the question be asked, since little enough has been seen of this beautiful and graceful breed during the past season. Perhaps it has been put aside these days on account of its failing to come up to a certain standard for utility purposes. And yet, after all, the utility qualities of the Hamburg, and especially of the Black variety, are not to be despised. Granted the eggs are white-shelled, and by no stretch of the imagination can they be termed large. Nevertheless they are very plentiful, and for home use or for disposal among those who appreciate quality they are very serviceable indeed. It is some years now since I kept Hamburgs, but when I did so I found the birds were remunerative, even for utility purposes. I had some of the Golden Spangled variety, and they gave an excellent account of themselves even when kept in London in an ordinary suburban back garden. On one occasion I bred some with rather large Black Red Malay bantams, and from the progeny were secured some remarkably good table fowls, as plump as

partridges and with the short flavour of a game fowl. Some fanciers are under the impression that the Hamburg will again become popular; but if so, the classes will have to be better supported at the general run of shows than has been the case of late.

#### THE SHOW SEASON.

Those of us who have much to do with poultry shows are always pleased when Christmas is over and the New Year ushered in. It means that the backbone of the show season has been broken once more and that there is a chance of a three or four month's rest. The exhibitions these times are much more numerous than they were even twenty years ago, in fact there can be little doubt that they are altogether too numerous; and much as I like attending the shows, not only to judge there or to report, but to meet fanciers and talk things over, it will be a blessing all round when some scheme can be devised considerably to curtail their numbers. The vast majority of poultry exhibitions do not pay, and at several of them the entries are so poor as to force the committees to withhold or curtail the prizes. There was some talk at one time of the Poultry Club running a gigantic show; but it would be better for the Fancy as a whole if the energetic members of the Poultry Club council set their wits to work on a scheme for the proper distribution and government of the 700 or more shows held annually in the British Isles. It is a tough task to tackle, I will admit, but the club should be powerful enough to take it in hand, and by doing so it would be better employed than it has been on some recent schemes.

#### THE WELSH FEDERATION.

I have before remarked on the good work that is being done by the South Wales and Monmouthshire Federation of Fur and Feather Societies, and I am glad to see such an excellent report of its first annual meeting held at Swansea. There is scope for such a body as this, and it would be a grand thing for the Shows of the British Isles if others could be formed. Of course, the first to come into being was the Lancashire and Cheshire federation, which continues to do good work. There used to be one for Durham and Northumberland, but not much has been heard of it of late. The Welsh Federation, however, does not intend to rest on its laurels. It started its second year with thirty societies affiliated, an increase of seven compared with last season; but it means to get all of them in. Mr. S. W. Thomas, the veteran Swansea breeder and fancier, was re-elected president of the federation, Mr. D. A. S. Longden (Swansea) chairman, Mr. W. J. Davies (Treharris) vice-chairman, and Mr. A. A. Gordon McLucas (48, Rosse Street, Maesycod, Pontypridd) secretary and treasurer. The accounts for the year showed a balance in hand of £4 12s. 6d. The executive council (12) consists of representatives from Pontardawe, Mumbles, Treharris, Neath, Abertillery, Swansea, Resolven, Pentrebach, Pontypridd, Llanelly, Treorchy, and Cardiff.



## THE IMPORTANCE OF FOUNDATIONS.

BY REGINALD WILLS.

SOMEONE once wrote "build your house on a foundation of solidity and it will last for years and years." The same maxim may be applied to the poultry house for there can be no doubt that a good foundation will most surely prolong its life. Yet there are very few poultry-keepers who erect their appliances on something that will withstand the wet and the damp. It is a pity, and a waste of money. The contrast between a house that is erected on a foundation and one that is not is very great indeed, and a test of six months in the height of winter will clearly demonstrate this fact.

The cost of "Sleepers" underneath a house of, say, 6ft. long by 4ft. wide would be, roughly,  $\frac{3}{6}$ , while the cost of repairing a house of the same dimensions which has been allowed to rot away through being placed direct to the damp earth would be at least double that amount. But let it be understood that the difference does not by any means rest here, for while the  $\frac{3}{6}$  expended on the "Sleepers" was an initial and final outlay, the other sum was but a periodical one and, in reality, a pure waste of money. It does not matter which kind of foundation is used so long as it is of some solid nature and is well pitched and tarred. One may use 3 by 3 material, cut and joined so as to be the same size as the bottom of the structure, or bricks, properly laid and cemented on the same principle would prove to be serviceable and lasting. Some people recommend a poultry house with a floor, and mounted on a foundation of bricks along the back and two sides to a height of 18in. or 2ft. so as to form a shelter underneath, but it has been the experience of many who have tried this method that the comparatively small piece of ground underneath quickly gets fouled and, moreover, is difficult to clean out properly on account of its lowness.

I certainly think that it is the better way to mount the house on bricks or wood as previously explained, and to use the natural earth, and so long as this latter is made higher inside than outside, the dampness will be prevented to a very great extent.

It is false economy, however, to place the framing of the house direct to the ground just to save a few shillings at the outset, for, as I have said, the money which has to be spent to keep the house in repair after, eclipses such a small outlay many times over.

### Farm Poultry.

Mr. John H. Robinson, is now sole proprietor of this well-known Monthly, as well as filling the Editorial Chair which he has occupied for several years with great ability. His virile personality makes its pages always very interesting reading, and we hope it will prosper still more under the new regime.

## HATCHING PREPARATIONS.

FAILURES in many directions may be traced to the habit, which is very common among many poultry keepers—procrastination. The results of this evil are seen in so many different phases, but probably in no other way is the effect more disastrous than when hatching operations are unduly delayed. We do not mean to imply that the actual hatching of the chickens should be hastened, since this might be quite as bad as hatching too late. It is the preparation that should be made well in advance of the time when incubation is to commence. The first point to observe in this direction is to see that the pullets intended for breeding purposes are selected sufficiently in time so that they are not partly played out before fertile eggs are required. They should be selected in the Autumn, kept under the best conditions, receiving the treatment that is essential to prepare them for



A White Holland Turkey. [Copyright.]

spring breeding. Unless this receives attention the best results are rarely secured. Very frequently the pullets are allowed to run out in the open in a cold bleak situation during the winter months, or maybe they are closely hugged together in some close, stuffy, unsanitary place. Separation of the sexes is frequently delayed beyond the proper age, and the general laying flock, related cockerels, and the prospective breeders are all allowed to commingle right up to the time when mating is to take place. They should be selected and kept apart from the main flock in warm and comfortable quarters.

Purchasing the male bird is also very often delayed longer than it ought to be. As a matter of fact most poultry keepers wait until his services are actually required before obtaining him, with



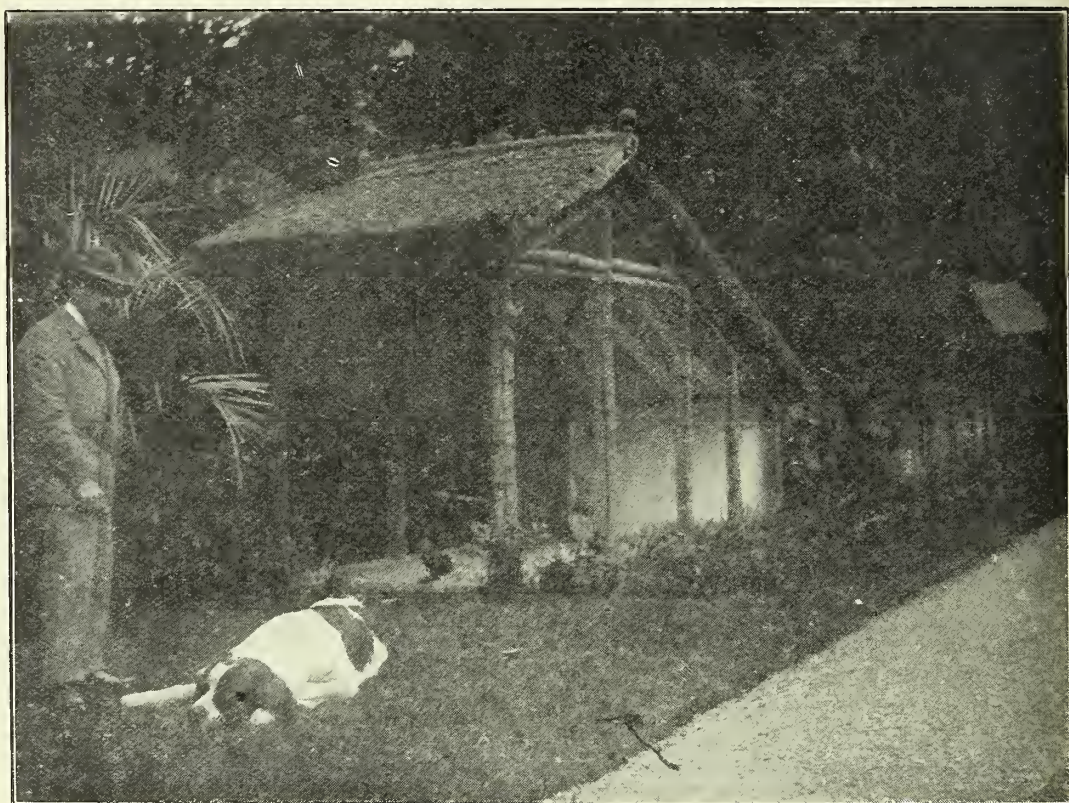
the result that he has to be placed straight into the breeding pen, consequently there is no time for him to become accustomed to the changed conditions, and he has to face the danger of weakness in attempting to become acclimatised coupled with the strain of breeding. It is not at all uncommon to find the male bird go completely wrong after a week or so in the breeding pen, and if he is so bad that a substitute has to be found, much valuable time is lost at the most important period of the poultry keeper's year. In addition to this there is no certainty that the new bird may not also succumb under this method of management. A whole seasons' work may thus be spoilt for the want of decision and strength of purpose in not giving way to this habit of delaying matters, to which many are prone.

All this danger may be avoided by getting the male in advance of the time when he is needed, so that he may grow accustomed to his altered environments before he is used for breeding purposes. Having chosen the breeding stock, and mated say, by the first of January, that is when it is intended to breed chickens for ordinary farm purposes, the next thing is to prepare for hatching the chickens. If artificial methods are adopted, the incubators should be thoroughly examined to see that everything is in a perfect state. If this is not done until the eggs are ready to be placed therein, considerable delay may be caused by finding that the capsule is not in working order, a lamp glass may be broken, the lamp itself may need repairing, and many other things may happen that militate success. Before spare parts can be obtained, or any breakages rectified, the season may be so far advanced that the chickens are late, and time has been wasted that cannot be regained. Brooders should also have the same attention, so that all may be in readiness when the chickens make their appearance. The principle of supervision should be extended to appliance when chickens are to be naturally hatched. Sitting boxes and coops should be thoroughly cleared and disinfected, as they are not in an ideal condition for occupancy when they have been stored for the matter of eight or nine months.

## FARMERS AND THE HIGGLER.

By E. C. DAVIS.

Many farmers who do not care for the work of fattening and preparing table birds for the market, alleging (and with a good deal of truth) that the specialized operations concerned with fattening take up more time than can be well spared from the general farm work, can yet make a good profit from rearing chickens for the higgler. As we have often pointed out the farmer has many advantages for chicken rearing which are peculiarly his own. There are plenty of sheltered corners in the stack-yard and among the outbuildings where broods of



**Mr. Van Gelder, President of the Club Avicole du Barbu Nain, Belgium.**

[Copyright.]

winter chickens can be most successfully reared even in most inclement weather, there is plenty of skim milk available (than which nothing will push table chickens on better) and when the chickens have passed the baby stage of their existence there is plenty of fresh clean land enabling them to be reared to a splendid size at a trifling cost. It is often most noticeable how big and sturdy farm-reared chickens grow even though they may have had comparatively little care and attention, while chickens which have been reared on a limited grass run may not have reached half their size even after the expenditure of much good food and endless care. The difference is simply that the farmers'



birds have had free range, and so built up a good sturdy frame on which a skilled fatterer can readily put the requisite amount of flesh to fit the birds for good class markets.

Every farmer should mate up two or three pens of some such breed as the Faverolles or Sussex this season for early hatching or perhaps it would be found even better to secure a couple of good utility Faverolles cockerels and mate them to Orpington or Sussex hens. The resulting progeny would be as healthy and sturdy as possible, making the matter of rearing a simple one, and the youngsters would be of the best stamp, plump, good flavoured, and meaty in the right place. Furthermore since all the above mentioned breeds are quick growing they would be ready for the higgler when 12 or 14 weeks old and those birds hatched the beginning of December would be ready for the March and April markets where as much as 3/6 or even 4/- may be obtained for the fattened specimen weighing from 2½ to 3lb. Naturally the fatterer would want his profit, but so great is the demand at that season for really well grown birds that the higgler is quite ready to pay good prices to farmers who can supply them with lean chickens of good size and of the right stamp.

Unless rearing is to be carried out on a large scale—and we consider that the farmer would do better as a rule to be content with the hatchings from a couple of large pens—artificial incubation will not be necessary, unless of course there is a great scarcity of broody hens. Feeding should be liberal from the shell and of foods calculated to build up a good framework rather than too much flesh, since the putting on of the final weight will be performed better in the hands of the fatterer than of the rearer. The first few weeks will necessitate a good deal of care being given to the little birds, feeding every two hours and since the days are so short giving a couple of meals by lamp light. Biscuit meal, fine sharps, oatmeal, and ground oats should figure in the menu, while as much milk as possible should be given both for mixing the food and for drinking purposes. Grit and green food must not be forgotten and while liberal feeding must be the order of the day, the birds must be kept active and busy. Table chicken must be kept growing and never allowed to look back. It will be found that scrupulous cleanliness has much to do with pushing them on. As soon as the chickens can leave the hen, or the brooder in which they may have been reared, they should be turned on to the fields using a Sussex "Ark" to house them in at night, of which there is no better growing house for chickens. By moving it about each day the manure is made useful to the ground and the birds are kept in perfect health by reason of the fact that they are not sleeping in a contaminated atmosphere.

**Mr. Alfred L. Sewell.**

Poultrymen everywhere will sympathise deeply with Mr. Franklane L. Sewell, the well-known American artist, on the death of his father, who recently passed away in his eighty-second year.

## "RASSEGEFLUEGEL."

(PURE BREEDS OF POULTRY).

*Illustrated by Kurt Zander.*

The above is the title of a most up-to-date German work on poultry which has been published by the well-known and enterprising firm of F. Pfennigstooft, Berlin, whose Proprietor, by the way, is President of the "German Poultry Breeders' Club," a society founded for the purpose of combining the useful with the ornamental side of poultrydom. The 120 colored plates forming the work have appeared in 10 monthly parts *unbound* are thus ready for insertion into a handsomely finished album, arranged after the manner of similar receptacles for pictorial postcards, a happy idea, facilitating the substitution of new types for old (an emergency soon to be anticipated in these fast changing times of storm and stress!). Supplementary to the colored plates, the descriptive text—incorporating the club standards—by Dr. Blancke, a well-known authority on poultry matters, will be published in pamphlet form, the price for the complete work being 10 marks (10 shillings) with an additional charge of 2 marks for the album (or 5 marks for an "edition de luxe"). The work has been received with acclamation not merely in German fancier circles—where the name of Kurt Zander has become almost a household word—but also in other German speaking countries, as testified by laudatory extracts from the Swiss and Austrian fancy press.

To reproduce by the art of the delineator (aided by the skill of the color printer) types of poultry that *live and breathe*, whilst satisfying at the same time the requirements of the stickler for standard perfection, in short: the blending of the real with the ideal, has at all times proved a task difficult to accomplish. After perusing these illustrations we come however to the conclusion that the artist has solved the ticklish problem—frequently with the assistance of a well chosen background—in a thoroughly praiseworthy manner and that but in a very few instances could the reproof of an approach to "Museum type" (a common fault with this class of production) be levelled against him.

Amongst the happiest of the artists inspirations we number: the Phoenix and Yokohamas, the Lakenfelder (male), the Indian Game cock and hen, the Millefleurs Bantams, the Silver Brackel, the Pommeranian gander, Houdan cock, bronze and white turkey hens, light Brahmas, golden Wyandotte hen, Aylesbury drake, black Wyandotte cock and many others, whilst the color printer certainly deserves more than a V.H.C. for his excellent reproduction of the blue laced Wyandottes, the speckled Sussex and brown Leghorn hen, and in fact for his general attention to detail in the application of the complicated "four colour process." A slightly blueish tinge in the case of the barred and some of the pencilled varieties and an excess of green sheen—probably a well-meant



exaggeration of the idea?—in several of the black varieties must be excused, for where can perfection be found?

Amongst the many types of poultry here portrayed it is interesting to find besides a number of old friends (some certainly in a new guise, owing to international standard differences! quite a large collection of fresh faces, hitherto strangers to these shores, to wit: the Ramelsloher, Rhineland, East Frisians, Thuringians, Bergish Crows, and German Imperials (or Reichshuchner), to which must be added the Austrian Sulmtaler and Altsteirer. Since writing we hear that a further supplement of 48 plates will shortly be issued at the price of 4 marks, and is eagerly looked forward to by the German fancier world. Summing up we consider the work deserving of every commendation and have not the least doubt that it will meet with the success it so well deserves.

## FOX-HUNTING—A PROTEST.

By A WELL-KNOWN ESSEX FARMER.



One may judge from recent reports in the daily press, the knell of fox-hunting is being sounded. In Warwickshire a reward of £1 is offered for dead foxes; in Cheshire armed resistance has been offered to the trespass of hunters and dogs: in Sussex a golf club has warned the local Hunt off its grounds; and from Essex comes an account of a farmer entirely driven out of poultry rearing by the depredations of foxes, and this without a penny compensation.

The English are truly a long-suffering race, but it is time that, in the interests of the rural districts, some firm stand should be made with a view of putting an end to such an anachronism. From the business point of view it has nothing to recommend it—the damage it causes is both direct and indirect. The destruction of poultry by the vermin, the straying of cattle through gates being left open, the breaking-down of hedges and fences, can all be seen and lamented, but the indirect injury to the farming interest—the damage to crops—can only be roughly estimated, nevertheless it is considerable.

The truth of the matter is that the sport has outlived its day—the followers of the Hunt are now mainly comprised of men from the towns who are engaged in commerce and who have neither sympathy for, nor knowledge of country economy—men who will gallop over young wheat as heedlessly as they will over grass land. The niggardly spirit displayed in the few cases in which some compensation is given for damage done is partially due to poverty—the Hunt is supported less and less by men of wealth and influence, and more and more by those who desire, in accord with the spirit of the age, to get as much as possible in the way of amusement for as little cash outlay as possible—sport on the cheap.

In olden days Hunts were maintained by local residents, and the field was composed of friends and neighbours—now the countryside is invaded by a horde of strangers, in many cases on hired hacks, who, judging from their conduct, evidently look upon the farming industry as run to minister to their pleasure, and every field as a galloping ground. Let any reader whose neighbourhood is favoured by these gentry consider what benefits they confer in return for the devastation they bring in their train. How many tons of hay, or how many quarters of oats do they buy from the local farmer—how many hunters are pastured in the summer—how much poultry do they buy from the thrifty housewife for distribution at Xmas? In the vast majority of parishes the only answer to each and all of these questions would be “none.” In former days these points were carefully taken into account by the various Hunt Committees and some attempt was made to ease the burden of those who had contributed to their amusement. Now the case is entirely altered, and it is time that the final alteration is made and the poor man no longer compelled to provide sport for men and women who are too niggardly to pay but not too proud to trespass. The remedy is simple but needs some courage—a formal warning to keep off, and, if this be disregarded, an application for an injunction restraining trespass which would be effectual—trespass in foxhunting, as many decided cases show, cannot be justified.

## FOXES AND POULTRY KEEPING.

By W. U. THOMAS.

The subject of fox-hunting is capable of discussion from many points of view, and probably the most important, and to my mind absolutely unchallengeable argument against this form of Sport, is that of the unwarrantably cruelty inflicted on the victim throughout the chase.

But another important aspect of the case—important for the reason that it affects the very livelihood of hundreds of people on the countryside—is the damage done to poultry breeders by the nocturnal depredations of foxes. Let us for a moment consider the ordinary everyday risks run by farmers and poultry keepers, and I can speak with experience extending over a lifetime. There is, first of all, the danger that in spite of careful selection, the whole or at any rate the best part of a sitting of eggs may prove abortive. Even if in this respect, the owner is fairly fortunate and his sitting turns out well, are his troubles at end? Not at all. There is untold risk in rearing poultry, and in recent years this has been aggravated by the great increase in traffic.

Added to all this, is the prospect of that sly night poacher, the fox who is not amenable to the jurisdiction of the magistrates, destroying the birds just at a time when they are likely to be financially productive to the owner. On this latter account alone, a farmer of my acquaintance has



given up poultry keeping, he having lost 4 turkeys one night, and 18 fowls another. It was for this reason as much as for any other, that I, along with my men, somewhat dramatically held at bay the members of the Cheshire Hunt when they attempted to carry on their cruel sport on my tenants land. I am convinced that if farmers would only unite in resisting this wanton interference with their holdings and stock poultry, breeding could be carried on much more profitably.

## TABLE POULTRY AT THE SMITHFIELD.

TWO hundred and sixteen exhibits in the table poultry section of the Smithfield Club Cattle Show! We go back in memory to fifteen or sixteen years ago when this section was run by a separate committee. For seven or eight years this arrangement held good and each December a magnificent display was on view. We have seen as many as 500-600 birds staged in those years, and every succeeding show was better in every way than the preceding. Two hundred and sixteen birds staged! For the sake of the poultry industry we wish we could go back to the old days. Not that we have any remarks to make as regards quality, for that is excellent this year, but it appears to us that the commercial element is not being catered for at the present time. Where are the "grouped classes" of the past, in which half a dozen birds were shown as one exhibit? Where are the numerous foreign birds that were so highly placed when specialists ran this section of the greatest fat stock show in the world?

We do not want to mention names, but we cannot help recalling the members of the special committee as it was in those days. They were men who knew something, at any rate, of the requirements necessary to make the work successful. To-day, the show is almost useless for the commercial man. He is the man to remember if the poultry industry is ever to reach that position which it has a right to claim.—The most important minor branch of agriculture.

One criticism we must make, not only as a journal but as part of the general visiting public. The birds are staged in the most extraordinary manner. We find class 117, with exhibits Nos. 792-796 on shelves above class No. 136 with exhibits Nos. 976-978, and in every class it was the same. From everybody's point of view, this is most

objectional. One does not really want to keep turning over the pages of the catalogues as if one was looking up the unknown in a reference library. We wasted three-quarters of an hour ourselves—others the same—and taken altogether the time wasted amounts to money and loss of pleasure. Committees please note this for future fixtures.

The feature of the show was the success of the Marchioness of Londonderry. Our readers will remember that for two years Her Grace has won numerous prizes at the Dairy Show, but on this occasion she has beaten all previous records. In all, thirteen exhibits were staged, twelve of these bringing prize money, she being awarded 6 firsts, 4 seconds, 2 thirds, and in addition 2 gold medals, 2 silver medals, 1 bronze medal and 3 £3 cups. In class 129 for a couple of Indian Game and Dorking pullets the two pairs shown were undoubtedly the best in the class, as far as we could judge, but only



**A White Spanish Hen.**

[Copyright.]

one was awarded a prize and that was a third. The record as it stands, however, is a wonderful one. Great credit is due to Mr. Mothersell for the splendid condition in which the birds were shown. Amongst other notable winners were Mrs. Paynter, Lord Rothschild, Mr. H. J. Tennant, M.P., and Mr. Frank H. Wheeler.

### Record Brood of Turkeys.

Twenty-six turkeys hatched at the same time by a turkey hen early in the spring on a farm near Llanelly (Carmarthen) have all survived and now weigh in the aggregate 400 lbs. The farmer claims this as a record single hatch in number and weight.



## SCARCITY OF EGGS.

By F. W. PARTON, (*The University, Leeds.*)

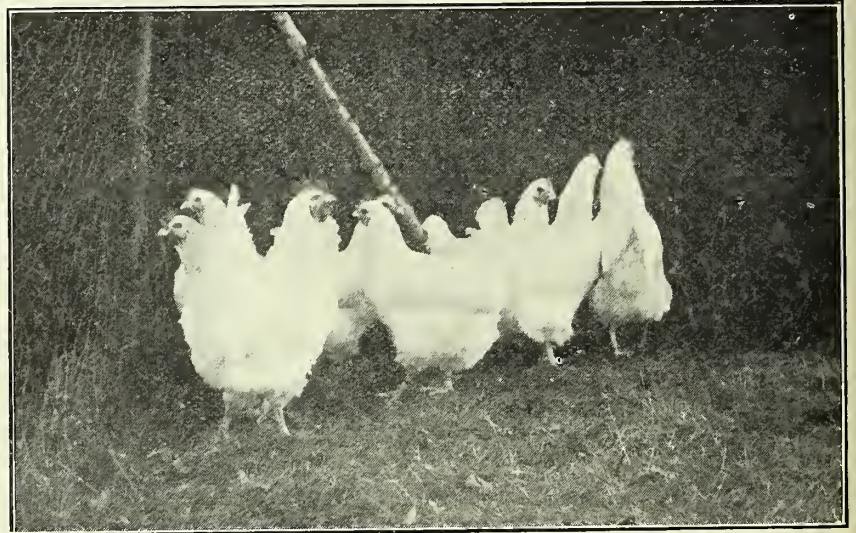


CAREFUL observation during the last few years shows, without a doubt, that eggs are getting more scarce. Probably this fact has never been more apparent than during the last three months. Winter prices started earlier and every indication is that they will last longer than has ever been known before. The weather is usually given as the reason for the shortage. If the rain fall has been heavy during the spring and summer, or if there has been a period of drought, one hears the same complaint, "bad weather for growing stock"! There must, however, be other and more serious reasons, since it will be found that the rain fall taking the year throughout varies very little, and the inexorable law of averages is maintained. It is the distribution over the twelve months that differs. A cold or wet autumn and winter militate very considerably against egg production at these periods, but however much one may wish to blame the weather it must be admitted that the end of 1913 was remarkable for its mildness, and was a fitting close of twelve good months for the poultry keeper, so that the scarcity of eggs cannot by any stretch of imagination be put down to bad weather.

Every year finds more and more people taking up poultry keeping, the majority of whom make egg production their chief aim. In many cases, farmers have very considerably increased the number of fowls on their farms, not only have they done this but they have also improved their methods both as to the breeds they keep and system of management, so that it can reasonably be said that they are producing more eggs than formerly. Laying competitions, the advent, or supposed advent, of the 250-egg hen, the semi-intensive system, and all the valuable information spread throughout the country by means of the press, should certainly bear fruit to the extent of, at least, a noticeable increase in the out-put of eggs. There is not the slightest doubt that the demand for eggs is very considerably in excess of the supply. There are to-day thousands of householders who are in a position to, and were quite willing to pay threepence for an egg in November and December, but genuine new-laid eggs, in many districts could not be possibly obtained.

It is a very good thing commercially when the demand for any commodity is greater than the supply, and it should act as an extra incentive to every poultry keeper to endeavour as far as possible, by individual effort, to meet this demand. We say individual effort because the task of getting the bulk of poultry keepers to realise the advantages accruing from organisation in certain districts,

is very great. This phase of the question is, however, at present more one of individual than combined effort. There is no doubt that the egg yield could be enormously increased where more attention devoted to the general management of farm poultry. It is very doubtful if the growing demand for eggs can be entirely met by those that are produced at home, but more could be done than is at present accomplished, and it is to the farmer to whom we must look, and were they—even a few of them—to give the same attention to their fowls, and manage them with the same intelligence as do the small class of poultry keeper, a great advance would be achieved in the poultry industry. Of course, the farmer could not be expected to give the same amount of individual attention to his fowls as can the man who has only a very limited number, which are probably so penned that he can have ready access to them at any time; but, improved methods are necessary among farm fowls generally. Laying competitions are intensely



Line-bred White Orpingtons.

[Copyright.]

interesting, and do a great amount of good because they stimulate the industry, but as run at present they do not in one direction or another benefit the farmer. The method of conducting matters, does not coincide with that of the farmers.

It is bad management in many instances that is responsible for the paucity of eggs in winter. There are several items that should be carefully observed by every farmer, items that go far to secure a large proportion of eggs in winter, and a more even distribution throughout the year. The first thing to be observed is that of hatching at the right time of year if the chickens are to be in laying condition when eggs command the highest prices. Chickens of the heavy type should be hatched in March and April while the non-sitters need not be hatched so early by five or six weeks. They are much more precocious, so much so that by the autumn they will be as forward in condition as the more slowly growing breeds. It is also very



important that two types should be kept, say one of the non-sitters, and one of the general purpose breeds, the non-sitters will be largely responsible for the supply of eggs in summer and when the general purpose breeds are sitting; while the latter will have finished their brooding and be ready to contribute their share of eggs during the winter months. It is by a combination of these apparently minor details that the desired end may be secured. A further and most necessary precaution is that of disposing of all hens as they approach their second moult, birds in their first and second years as layers must be depended upon absolutely.

## POULTRY COOKERY.

### GARNISHES FOR FOWLS, ETC.

In the dishing up and serving of a meal it is always wise to please the eye as well as the palate, therefore, the time bestowed on the art of garnishing should never be begrudged. Even the most costly and elaborate dish will, in all probability, fail to give satisfaction if sent to table in a careless slovenly fashion; while on the other hand, with due care and the exercise of a little patience and good taste, the most simple and inexpensive fare can be rendered exceedingly dainty and appetising. The following are a few examples which I hope may prove useful to those who, very wisely, aim at making the very best of everything.

**POTATO GARNISH. No. 1:** Peel the requisite number of medium sized sound potatoes and cut them in quarters; rinse these well in cold salted water, dry them thoroughly, drop gently into boiling fat, sufficient in quantity to quite cover them, and fry until soft enough and coloured a rich golden brown. Drain carefully from the fat, and sprinkle the potatoes lightly with salt, pepper, and finely-minced dry parsley which has been made quite hot, and use as required.

**No. 2:** Choose rather small potatoes and in peeling them make them to resemble olives as nearly as possible in size and shape. Boil them in the usual way until sufficiently cooked but not at all broken, then drain off every drop of water and add to the potatoes a light sprinkling of salt and pepper, a small quantity of strained lemon juice, some finely minced parsley and two or three ounces of fresh butter, and toss gently over a moderate heat until the latter is entirely dissolved and the potatoes nicely coated, when they are ready for use.

**No. 3:** Boil or steam some good mealy potatoes and, when done enough, mash them smoothly, adding while doing so, a seasoning of salt and pepper, and sufficient slightly melted butter, or cream, to moisten and enrich the potatoes. When ready, make up into small neat shapes—balls, cones, cork shapes, or cakes—and, after covering these with a firm covering of beaten egg and fine bread-crumbs, fry them in clarified fat until just delicately browned, then drain thoroughly and use.

**CAULIFLOWER A LA MAITRE D' HOTEL:** Prepare and boil in the usual way one or two freshly-cut

cauliflowers, and when done enough, and well drained, divide the vegetables into tiny sprigs, as even in size as possible; return these to the saucepan with a pat of fresh butter, a seasoning of salt and pepper, and a sprinkling of fresh lemon juice and finely minced parsley, and re-heat very carefully. If liked, a small quantity of grated cheese can also be added, and is sometimes considered a decided improvement, but this, of course, is entirely a matter of individual taste.

**A MIXED GARNISH:** Take the requisite quantity of French beans cut in neat lozenge shapes, green peas, turnips and carrots stamped out in small fancy shapes, tiny cauliflower sprigs, asparagus tips, etc., etc., all of which have been carefully cooked and well drained, and put them into a stewpan with just sufficient good bechamel sauce to moisten them; add an ounce or two of fresh butter and some strained lemon juice, toss gently over a moderate fire, and when thoroughly hot, use as required.

**MUSHROOMS AU GRATIN:** Prepare, very carefully, some freshly-gathered flap mushrooms and cut off the stems, then fill the hollows with a dainty mixture composed of the following ingredients: Put into a small stewpan two or three ounces of grated ham or prime bacon, a teaspoonful of mixed herb powder, a dessertspoonful of chopped parsley, a little grated nutmeg, or mace, a light seasoning of salt and pepper, and an ounce of fresh butter, and when thoroughly blended and quite hot, stir in the yolks of two or three fresh eggs. When the mushrooms have been filled, sprinkle them well with fine brown raspings, arrange them in a single layer in a flat baking tin which has been liberally greased, place a tiny bit of butter on the top of each and bake in a moderate oven from fifteen to twenty minutes.

**STUFFED TOMATOES:** Choose ripe red tomatoes of equal size, cut off the stalks and the green part that adheres to them, and carefully scoop out the insides. Press the pulp thus obtained through a sieve and mix with it a pleasant seasoning of salt and pepper, a small quantity of fresh butter broken up into tiny bits and some fine bread crumbs, allowing about a tablespoonful of the latter for each tomatoe, then, when well mixed, press the preparation into the tomatoes. Bake as already directed for "Mushrooms au Gratin" and when done sufficiently insert a tiny sprig of parsley in the top of each, and use as required.

**STEWED CELERY:** Thoroughly cleanse two or three heads of fresh young celery and cut the stalks into pieces about three inches long; tie these up in small bundles and boil in the usual way until quite tender, then take up the celery, untie it and return it to the empty stewpan; add sufficient maitre d'hotel sauce to thoroughly moisten, make the whole quite bubbling hot, and use. **NOTE:**—The above garnishes are equally suitable for serving with any kind of poultry, no matter how the birds are cooked, and are always very highly appreciated as they form a great "set off" to the dish.



## BIGGEST HATCHERY ON EARTH.



LAST season the Pittsfield Poultry Farm, Pittsfield, Maine, sold over 100,000 day old chicks. The development of this trade indicated very early in the season, that if the company wanted to take the business that would probably come to them in 1914 it was necessary to begin at once to provide for greatly increased hatching facilities, and—of course—for everything necessary to use them to advantage and to dispose of the product. At the same time the problem of location—whether to enlarge the plant at Pittsfield or build another large plant somewhere else had to be considered.

still in the early prime of life, who had built up a highly successful manufacturing business, which he had recently sold to a large corporation, became interested in what was doing at Pittsfield Farm, and in the possibilities of the day old chick trade, and gradually the plan of enlargement here described was worked out.

At Holliston, Mass., a farm of 150 acres, one of the finest in the state was purchased, this farm to be used for the breeding of White Plymouth Rocks and as the headquarters for the day old chick business and to be under the personal management of Mr. Gilmore whose previous business experience



Laying Stock on an American Farm.

[Copyright.]

About this time something quite unusual in the history of large poultry plants happened. The Pittsfield Farm has a history of beginnings a little out of the ordinary anyway and this was something in line with that but "more so." Mr. F. W. Briggs who established the Pittsfield Poultry Farm is engaged in a large manufacturing business, and the management of the farm has been a side issue that quite monopolized what leisure his other business allowed him. Just as the question of enlarging the business was becoming acute, it happened that Mr. Howard Gilmore, an old friend of Mr. Briggs,

especially qualifies him not only to deal with the administrative problems of an undertaking of this kind, but with matters relating to incubation and brooding. Immediately upon the purchase of the farm, preparations for the buildings, equipment and stock required began. It was decided to make the farm at Holliston the principal hatching plant, continuing at Pittsfield only such hatching capacity as is needed to supply the stock grown on the Maine farm and the trade in day old chicks that could be handled to better advantage from that point. The incubator capacity there has been



reduced to 12,000, and at Holliston has been erected what is, I believe, the largest hatchery in the world, consisting of two incubator cellars, each 34 feet by 127 feet, inside measurement, and each containing three Hall Mammoth Incubators, giving a total capacity of over 100,000 eggs. The nominal capacity of each machine is 16,500 eggs, but some recent slight changes in the construction of the egg trays have given each tray a capacity of 5 eggs more than its rating, and the actual capacity of the six machines used here is 102,300 eggs at one time. It is planned to run each incubator nine times in succession. On this basis, the total incubator capacity of the two plants is over 1,000,000 eggs a year. It is estimated that from a million eggs incubated about 600,000 chicks will be produced.

As the reader understands, it is not the purpose of the company to undertake to start off at full capacity. That indeed is practically impossible, for it takes longer to get the breeding stock increased than to put in incubators. But the business done last year and the outlook for the coming year, indicate that sales of day old chicks may easily go well over to 300,000 in 1914. Add to this chicks to be grown on the several farms of the company to sell at 8 weeks of age or at maturity or to be reserved for stock purposes and it is easy to see how though the full capacity of the two large incubator cellars may not be reached this season or next, it is all likely to be needed at the height of the season.

To provide for the young chickens at Holliston, there were in course of construction when I visited the farm early in November, two brooder houses, each 215 feet long, x  $15\frac{1}{2}$  feet wide, each having 20 pens 10 x 12 feet with a passage 3 feet wide, in the rear and a grain room at one end. There are solid partitions between the pens, making each a separate room. Each compartment will have its separate heater of the type used for large flocks of small chicks, and the chicks will be started in lots of 500. The walks in these brooder houses are necessary only for visitors. Other brooder houses will be erected if needed, but it is anticipated that these two will meet requirements the first season. For the general laying and breeding stock there has been built and is now in use a house 240 feet long by 24 feet wide, divided into four 60-ft. sections. Each of these sections consists of three sub-sections each 20 feet wide, between which there are partitions extending from the rear a little farther than the roost platforms and between the nests in the front of the house. At present there are about 500 White Rock hens or pullets in each 60-ft. section. This house will have yards 60 feet wide and 200 feet long running both from the front and from the rear of each section. Next spring another similar house will be built.

For growing stock after leaving the brooders and for all the uses to which such houses may be put there are now on the place fifty colony houses. Fifty more will be built in the spring.

Attached to the long stock-house is a grain elevator 25 x 35 feet, with a capacity of 8,000 bushels, a shipping room 25 x 30 feet, and a sprouted oats cellar 15 x 25 feet. A work shop 22 x 35 feet, two stories high, will be equipped with a 20 horse power auto gas engine. There will be a 7 horse power engine at the grain elevator, and the farm will have its own electric light plant.

All the equipment described is new. The farm had on it a number of poultry buildings, some of which will be used as they were, others have been remodelled. Thus the two long old poultry houses have been arranged for twenty pens of fancy matings, another smaller house has pens for seven more such matings, and three houses of the Mapes type are used for surplus cockerels.

A farm of 150 acres in a high state of cultivation will keep quite a large stock of poultry and some other stock. The other stock in this case is cows. The herd of cows on the farm was purchased with it and the dairy business has been continued, but it is proposed to sell only cream, retaining the skim milk to feed to the poultry. All the green food and vegetable food required can be grown on the farm. Some grain will be grown, though of course this cannot be a very large part of what is required.

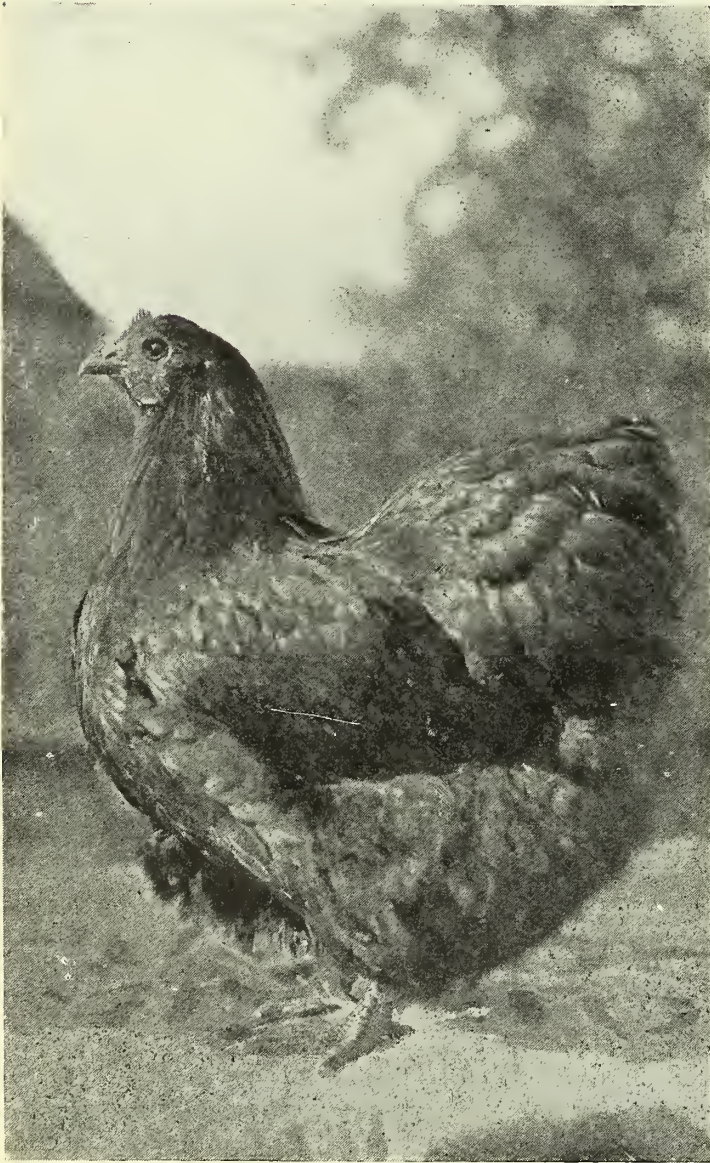
The most difficult part of this mammoth project is to get eggs for hatching of the kinds and quality required. The stock at Pittsfield, Me., and at several farms under lease in that state which provided the Barred Rock eggs hatched last year is for the present the largest and most reliable source of supply, but enough White Rock stock was grown at Holliston and on other farms the past season to produce a large supply of eggs of that variety, and within a year or two, no doubt, the breeding stock of this variety will equal that of Barred Rocks in numbers, and enough eggs of these two varieties be available to run the incubators to their fullest capacity.

The arrangement for such supplies of eggs must eventually take the form of a co-operative plan of breeding, even though there be no formal co-operation. A central breeding farm with subsidiary breeding farms is the only plan that admits of growing breeding stock on a scale commensurate with the requirements of so large a hatchery. No one has ever done a very large business in high-class poultry without farming out a great deal of stock.

When we analyse a proposition like this we see at once that the hatching and disposition of the day-old chicks are manufacturing and commercial problems of a kind with which men who have been successfully engaged in manufacturing are peculiarly qualified to deal. The breeding and the growing of fowls are agricultural problems and the success of the whole project depends upon each class of problems being worked out in its own terms. The manufacturing part of the problem is much easier to work out on a large scale than the other, because



it can be concentrated, brought together within a very small compass, and operations yielding a large product are completely and continuously under the eye of the manager. But a very small part of either of the Pittsfield farms would be required if the business was confined to day-old chicks and to such chicks as could be hatched from general collection of eggs. Factory methods and conditions apply well to the hatching of eggs and to the handling of chicks for the first few weeks, but not



**Black Orpington Pullet.**

[Copyright.]

to breeding and growing stock. With 110 acres in the original Pittsfield farm, and 150 acres at Holliston owned by the company and enough more in the leased farms to make the total 400 acres, good range conditions can be given to very large numbers of breeding and growing stock. There is quite a difference between the intensity of poultry culture on the Pittsfield farm of 110 acres with home capacity for 4,000 layers and brooder capacity for 20,000 chicks, and plants undertaking to handle

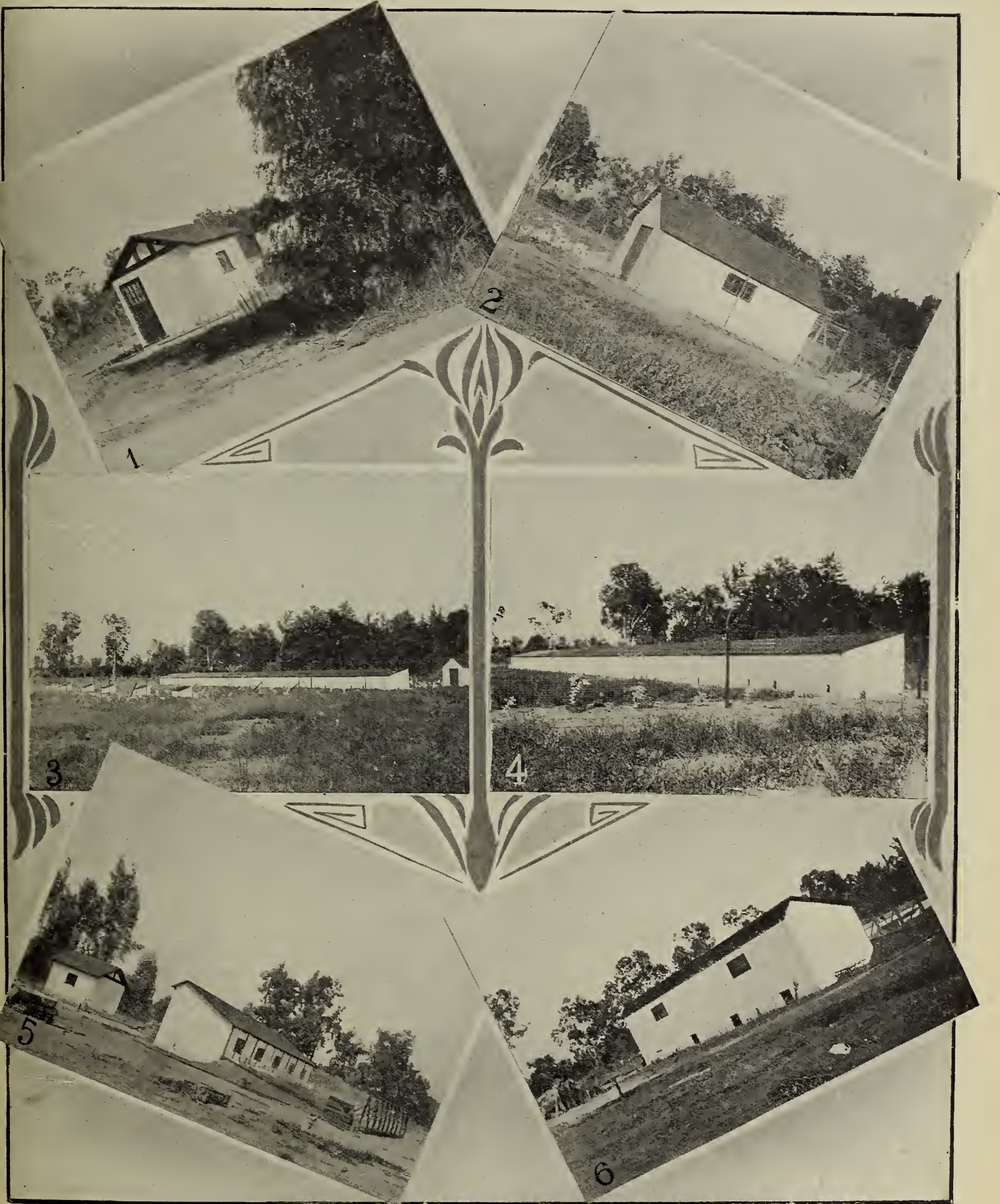
one-half or one-third as many birds on about one-tenth of the land.

A very great advantage to the proprietors in locating the hatchery and one farm at Holliston, is that the plant here is easily accessible to visitors and also to customers. Until somebody undertakes something that will eclipse it, or at least divide the interest of those looking for big things in poultry culture, this will be *the* poultry farm of this section of the country. Personally, I am delighted to have such an attraction so near to Boston, for of late years it has often been a puzzle what to do for those who came to this office asking directions to the poultry features near the city that are most worth seeing. The number of places that I feel free to send the merely curious visitor has been very small for more than a decade, but here is one poultry farm where all will be welcome and everyone who comes treated as a prospective customer; and where intensive and extensive features of poultry culture, utility and fancy can be observed on the same farm.

The attitude of the proprietors of the Pittsfield Poultry Farm towards the poultry business is somewhat different from that of the average poultryman. They are in the business to make money and their policy is to study all the conditions affecting the business and adapt their business to the conditions. People want day old chicks, therefore they sell day old chicks. People want chicks of various stages of growth, therefore they are advertising and selling chicks eight weeks old, and doubtless will gradually extend their offerings until customers can buy anything they want from eggs to breeding stock.

The great majority of those who go into poultry keeping as a business do it with the fixed purpose to do a certain kind of business in a certain way, to keep a certain variety for a certain purpose, and to stand or fall with the project as they first decided upon it. There are very few breeders, even breeders of the most ordinary grades of Standard varieties, who having hatched a chick and started it successfully, are willing to sell it before it has reached such a stage of development that they can make a good estimate of its probable value at maturity. Most breeders are so afraid that they may unintentionally give a customer what may develop into more than his money's worth that they will not sell a bird at all until it has developed to the stage where its probable quality as an adult is plainly indicated. This is all right if one is content to do business in a small way, and with the class of buyers who can appreciate values, but a big business in this line depends upon catering to the most numerous class of buyers and upon sharing the chances and the risks with your customer in chicks at any age as well as in eggs for hatching. A number of other breeders that I know have been giving more or less consideration to the question of selling stock at all ages, and it seems quite evident that trade along such lines will become more general. [*Farm Poultry U.S.A.*]





**Concrete Poultry Houses.**

*[Copyright.]*

Concrete is becoming more and more popular for building purposes. Above are some buildings recently erected on a large Californian Farm.



TABLE OF PRICES REALISED FOR HOME, COLONIAL, AND FOREIGN POULTRY, GAME, AND EGGS FOR THE FOUR WEEKS ENDING DECEMBER 20th, 1913.

ENGLISH POULTRY—LONDON MARKETS.					FOREIGN POULTRY—LONDON MARKETS.					
DESCRIPTION.	PRICES REALIZED DURING THE MONTH.				COUNTRIES OF ORIGIN.	CHICKENS. Each.	DUCKS. Each.	DUCKINGS. Each.	GEESE. Per lb.	TURKEYS. Per lb.
	1st Week. Each.	2nd Week. Each.	3rd Week. Each.	4th Week. Each.						
Surrey Chickens ...	2/9 to 3/9	2/9 to 3/9	3/0 to 3/9	3/0 to 3/9	Russia .....	—	—	—	—	—
Sussex .....	2/9 " 3/9	2/9 " 3/9	3/0 " 3/9	3/0 " 3/9	Belgium .....	—	—	—	—	—
Boston .....	2/0 " 3/3	2/0 " 3/3	2/3 " 3/3	2/3 " 3/3	France .....	—	—	—	—	—
Essex .....	2/0 " 3/6	2/0 " 3/6	2/3 " 3/6	2/3 " 3/6	United States of America .....	—	—	—	—	—
Capons .....	4/6 " 5/6	4/6 " 5/6	5/0 " 7/0	5/0 " 7/0	Austria .....	—	—	—	—	—
Irish Chickens .....	1/9 " 3/0	1/9 " 3/0	2/0 " 3/0	2/0 " 3/0	Canada .....	—	—	—	—	—
Live Hens .....	2/0 " 2/9	1/9 " 2/6	2/0 " 2/9	2/0 " 2/9	Australia .....	—	—	—	—	—
Aylesbury Ducklings .....	2/6 " 4/0	2/6 " 4/0	2/6 " 4/6	2/6 " 4/6						
Ducks .....	—	—	—	—						
Goslings .....	6/0 " 8/0	6/0 " 8/0	5/0 " 8/0	5/0 " 8/0						
Turkeys, .....	9 " 1/0	9 " 1/0	9 " 1/0	9 " 1/0						
Guinea Fowls .....	—	—	—	—						

ENGLISH GAME—LONDON MARKETS.					IMPORTS OF DEAD POULTRY & GAME. MONTH ENDING NOVEMBER 30TH, 1913.				
DESCRIPTION.	PRICES REALIZED DURING THE MONTH.				COUNTRIES OF ORIGIN.	Price Each During Month.	DECLARED VALUES.		
	1st Week. Each.	2nd Week. Each.	3rd Week. Each.	4th Week. Each.					
Grouse .....	2/6 " 3/0	2/6 " 3/0	2/6 " 3/0	2/6 " 3/0	Russia .....	—	Poultry. £7,170		
Partridges .....	2/0 " 2/6	1/9 " 2/0	2/0 " 2/3	2/0 " 2/3	France .....	1/2	£1,977		
Pheasants .....	2/0 " 2/6	2/3 " 2/9	2/0 " 2/3	1/9 " 2/3	Austria-Hungary .....	1/6	£6,072		
Black Game .....	—	—	—	—	United States of America .....	—	£5		
Hares .....	2/6 " 3/0	2/6 " 2/9	2/3 " 2/9	2/3 " 2/9	Other Countries .....	—	£130		
Rabbits, Tame .....	1/0 " 2/0	1/0 " 1/6	1/0 " 1/9	1/0 " 1/8	Totals .....	—	£3,994		
" Wild .....	8 " 1/0	9 " 1/0	9 " 1/1	9 " 1/1			£19,343		
Pigeons, Tame .....	—	—	—	—					
Wild Duck .....	1/6 " 1/9	1/9 " 2/0	1/6 " 1/9	1/6 " 1/9					
Hazel Hens .....	1/1	1/1	1/1	1/1					
Woodcock .....	1/6 " 2/6	1/6 " 2/0	2/0 " 2/6	2/0 " 2/6					
Snipe .....	6 " 1/0	—	9 " 1/3	9 " 1/3					
Plover .....	8 " 1/0	9 " 1/0	9 " 1/0	9 " 1/0					

ENGLISH EGGS (Guaranteed New-Laid).					IRISH EGGS.					FOREIGN EGGS.				
MARKETS.	PRICES REALIZED DURING THE MONTH.				DESCRIPTION.	PRICES REALIZED DURING THE MONTH.				DESCRIPTION.	PRICES REALIZED DURING THE MONTH.			
	Per 120.	Per 120.	Per 120.	Per 120.		1st Week. Per 120.	2nd Week. Per 120.	3rd Week. Per 120.	4th Week. Per 120.		1st Week. Per 120.	2nd Week. Per 120.	3rd Week. Per 120.	4th Week. Per 120.
LONDON	18/- to 23/0	18/- to 23/0	14/- to 19/0	14/- to 19/0	Irish Eggs	15/0 to 17/0	15/0 to 17/0	14/0 to 16/0	14/0 to 16/0	French ...	15/6 to 18/0	15/6 to 18/0	14/6 to 17/0	
Provinces.	Eggs per dozen.	Eggs per dozen.	Eggs per dozen.	Eggs per dozen.	Danish ...	15/9 " 18/0	15/9 " 18/0	15/0 " 17/0	15/0 " 17/0	Italian ...	14/3 " 16/6	14/3 " 16/6	13/0 " 15/0	
CARLISLE	2/2	2/2	2/3	2/4	Austrian ...	9/0 " 12/0	9/0 " 12/0	9/0 " 11/6	9/0 " 11/6	Russian ...	8/3 " 10/3	8/3 " 10/3	8/3 " 10/3	
NEWPORT	2/0	2/1	2/2	2/3										

IMPORTS OF EGGS. MONTH ENDING NOV. 30, 1913.					
COUNTRIES OF ORIGIN.	QUANTITIES IN Gt. HUND.				DECLARED VALUES.
	1st Week.	2nd Week.	3rd Week.	4th Week.	
Russia .....	1,249,005	1,249,005	1,249,005	1,249,005	£608,846
Denmark .....	356,218	356,218	356,218	356,218	£238,342
Germany .....	59,714	59,714	59,714	59,714	£25,489
Netherlands ...	40,727	40,727	40,727	40,727	£25,126
France .....	33,728	33,728	33,728	33,728	£16,551
Italy .....	68,454	68,454	68,454	68,454	£44,088
Aust.-Hungary	55,488	55,488	55,488	55,488	£26,246
Other countries	132,190	132,190	132,190	132,190	£56,687
Totals .....	1,995,504	1,995,504	1,995,504	1,995,504	£1,041,375





## HATCHING SEASON NOW HERE.

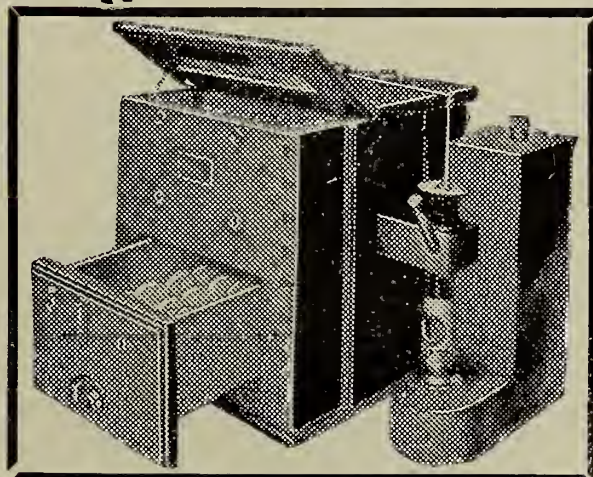
To end well must mean to begin well. A successful hatching season begins with procuring the right Incubator—one that gives the best results in the hands of the novice under any atmospheric conditions. If you contemplate purchasing an Incubator you will do well to consult the—

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*You should send for a copy of this book; it is the most beautiful Catalogue issued in the whole trade, with two hundred and fifty Illustrations of different Appliances for Poultry Keepers and Breeders, and its photographic reproductions of some of the largest Poultry Farms in different parts of the World where the TAMLINS are installed. It is most interesting reading, and is free, and post free.*



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 INDIA: Oakes & Co., Madras; Treacher & Co., Bombay.  
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## LIMITATIONS OF EGG PRODUCTION.

Paper read at the Fifth Annual Conference of Poultry Farmers at Hawkesbury Agriculture College, Richmond N.S.W.

BY J. B. MERRETT, (*Christchurch, N.Z.*)

IN the rapid advancement of the poultry industry and the development of the laying hen we are apt to overlook the future effects on our flocks; the ambition to extract the highest total from layers is fostered without regard to the penalties that Nature is sure to demand. The hen that is forced to produce 250 eggs per year must be fed in such a way that in order to provide egg material she impoverishes the other organs of her body. This procedure must carry its penalty, and there are evidences to-day that this is enforced. The desire for numbers can only be gratified at the sacrifice of those characteristics it is desirable for us to retain if our poultry are to become producers of healthy stock. It is being clearly manifested that there are limitations in egg-production, and the warnings are held up to us in various ways.

1. *A Deterioration in the Quality of Eggs.*—It is impossible for a hen to increase its egg supply to 250 and retain the quality of size. Small eggs, many of them being unmarketable, are strongly in evidence. A glance at the egg basket from any of our competitions reveals the fact. When weights are analysed it is seen that some hens laying 1,300 eggs in the year lay as great a weight as those laying 1,450 eggs. A small egg is undesirable for the market, and while we may increase the number Nature demands the penalty in small unmarketable eggs. Our best stock are raised from the best eggs, and it is obvious that much of the weak stock of to-day is due to the fact that small eggs are being used for reproduction.

2. *Ovarian Troubles.*—The number of cases reported, both from competitions and private yards is a significant sign that egg-laying may be overdone. Protrusion of the oviduct is so common now compared with a few years ago that it is evident Nature is showing its revolting spirit. The egg-producing functions of the hen are so sensitive that over-stimulating and force-feeding are bound to create ruptures. The egg-laying tests show these cases to be more numerous now than ever they have been, and poultry breeders everywhere complain of the frequency with which the complaint has to be treated. To continue in this way will result in heavy losses, and a greater number of cases of this kind may be looked for each year.

3. *Faulty Incubation.* Most breeders conceal the number of failures they have with their eggs. Thousands of eggs are put into the machine and found to be infertile, while thousands of others fail to hatch, even though chickens have been formed

in them. This serious loss should teach us to investigate and ask whether it is a better policy to have fewer eggs and more chickens. There may be one of many things to prevent good hatches, but the general cause is the weakness of the parent stock whence eggs have been obtained.

4. *Weakly Chickens.*—The losses of chickens that die before they are a month old are enormous. In many cases we find the cause sheeted home to the parent stock. To have healthy, strong chickens there must be a retention of strength to enable the eggs to be produced that will result in chickens of vitality and vigour. There is nothing so distressing as to hatch out apparently healthy chicks, and four weeks after hatching the obvious signs of weak constitutions are seen in drooping wings, loose feathers, inactive eye, and a tendency to go off food. The sad tale of many poultrymen today in the loss of their chickens is due to over-forced parentage. In addition to these symptoms the chicks are more susceptible to chills, and the poultryman has to be doubly careful in his attention to temperatures. Just as the pullets near maturity the trial of strength again takes place. Signs of weakness are evident, and there are many birds that fail to reach the laying stage without showing an impaired constitution. There are other penalties that have to be paid in an increased death roll, susceptibility to catarrh, and roup, so that while we may increase our egg supply temporarily the penalties do not warrant our doing so.

There is a safe procedure for all poultrymen to follow, and that is the gradual increase of the general average of the flock. This may be done with safety. Discrimination must be used to select the hens that lay a fair number—say, 180 to 200 eggs in their first year. The eggs should average 2 oz. There must be no sign of weakness in the egg-producing organs, or any sign of weakness in the constitution. Our egg-laying competitions have taught us their best lesson in the gradual increase of laying hens, but the chase for numbers has resulted in a disregard for the average layer, and breeders have been tempted to invest in the individual pens of high records, or the progeny from them, with the result that our flocks on the whole are deteriorating. A close study of egg-production assures me there is much in the system of feeding. The healthy hen must respond to the egg materials that are given her in the way of food. We can overdo the feeding, but the judicious poultryman, with an assurance of inevitable penalties, will keep his feed in check, and look more to the future than to the present production of his layers.



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Good Breeding Cockerels from 21s., 30s., and 42s. each.

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Good Breeding Trios, carefully mated for producing high-class stock, at £5 5s., £10 10s., and £21 the three birds.

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All the above are hardy stock and reliable Breeders, being raised and bred in open-fronted houses on large grass runs and fields, and are second to none for laying, whilst their respective strain is the most reliable in England, as severe tests have proved.

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### English Turkeys for America.

The *Yorkshire Observer* says:—It is stated that at the present time there is a very strong demand for English turkeys for the American market, and that Leadenhall Market dealers are receiving orders for as many as 5,000 birds at a time. Perhaps the thanksgiving dinners last month have exhausted the native American supply. Be that as it may, it seems curious that we should be sending consignments there, for America is the native land of the turkey. The first turkeys that were seen in England were brought by a Yorkshire gentleman, William Strickland, who served as lieutenant of the famous expedition of John and Sebastian Cabot, the first Europeans to set foot on the North American continent. In consideration of his services, King Henry granted to Strickland new armorial bearings with the style and title of Strickland of Boynton on the Wolds of Yorkshire, and the turkey surmounts the coat-of-arms of the Stricklands to this day.

### Poultry in Argentina.

The *Prensa* (Buenos Ayres) gives the following advice to its readers:—Let us pay more attention to our poultry, to pig-breeding, fruit-tree planting, all of which do not occupy much time nor demand much outlay, and thus we shall have taken a big step towards lessening the cost of living, freeing ourselves from our present reproach of being a country of dear and difficult living.

### Poultry in Unsuitable Places.

The Sanitary Inspector at Mansfield U.D.C. submitted a detailed report with respect to the keeping of poultry and pigeons in the Council's district and asked for the committee's instructions thereon. It was eventually decided that the Clerk be instructed to prepare and submit to this committee a series of bye-laws providing that in future no poultry or pigeons be allowed to run loose in any yard common to two or more houses, nor kept:—(a) In any part of a dwelling-house or coal-house; (b) in any backyard of an area of less than 200 square feet; (c) in any building, fowl-house, pen or shed of any description whatever situate within a distance of 10 feet from any portion of a dwelling-house.

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## TRADE ITEMS.

### A New Address.

We are interested to know that owing to the enormous increase of business Messrs. Lasco, Limited, late of Carruthers Street, Liverpool, have taken larger and more convenient premises at 47, Imperial Chambers, Dale Street, Liverpool.

### Mr. Tamlin's Exports.

The following is a list of W. Tamlin's exports for November, 1913: Fifteen 60, ten 100 and ten 200 incubators, thirty 100 and thirty 60 foster mothers; to

Gose & Martinez. Sole agents for the Argentine Republic. One 60 incubator and one 100 Sunbeam rearer; to C. W. Jones, Ceylon. One 60 incubator; to D. F. Kelly, Transvaal, S. Africa. One 100 incubator and one 100 Sunbeam foster mother; to S. Africa, per order of the African Merchants Ltd. One 60 and one 100 incubator, one 60 and 2 100 foster mothers; to S. America, order of Balfour, Williamson & Co. One 60 incubator; to Mombasa; order of Mr. W. Walther, Newcastle. One 30 incubator; to Algoa Bay, order of Sowden & Stodart, London. One 100 incubator; to E. S. Wilks, Jamaica. One pen Rhode Island Reds; to Mrs. Curle, Freemantle, W. Australia. One 30 incubator, and one 60 foster mother; to J. H. Owen, Sydney, N. S. Wales. One 60 incubator, and one 60 foster mother; to E. S. Maddison, Barbados. One pen White Orpingtons; to S. Birtwhistle, Austria. One 200 incubator, and one 100 foster mother; to W. T. Yeo, East Africa.

### Egg and Hatching Register for 1914.

Messrs. A. Thorpe & Sons, Rye, Sussex, the well known poultry food manufacturers have again issued their Egg and Hatching Register, calendar and cash account for next year. This is a very comprehensive booklet and it is issued free by the firm. Thousands have been sent out to their regular customers and from the number remaining fresh customers will receive a copy until the issue is exhausted. If our readers, who have not as yet secured a copy, will write to Messrs. Thorpe & Sons, for this booklet it will prove of very great use to all poultry keepers, and, therefore, no time should be lost in making application for a copy.

### Poultry Keeping in South Africa.

Messrs. Spratts Patent, Ltd., has published a very interesting booklet under the title of "Profitable Poultry Keeping in South Africa." The purpose of the work is to assist in the extension of poultry farming in that country, and the subject is treated from a purely South African stand point. It is hoped that it will be recognised as THE handbook for the country by those who wish to increase their knowledge of poultry and poultry farming. As far as we know this is the only book dealing specially with poultry keeping in South Africa, and as it is written by a practical man it should prove of very great use. It should assist materially in developing the poultry industry upon correct lines.

This book will also prove useful to home readers, and anyone writing mentioning *The Illustrated Poultry Record* will receive a copy by return of post.

### A Remarkable Poultry Spice.

Judging by the results that have accrued from the use of the Karswood Poultry Spice, we think that we are justified in giving the above title to this note. In a test from November to March, five months in all, the results were astonishing. The trial was with pullets and hens, some of each being fed with and others without spice. One hundred birds of each age were selected. During the five months the birds without spice laid 2,452 eggs, and those with the addition of this specialty laid 4,389, giving a difference of 1,937 in favour of this compound. The 1,937 eggs were sold for £15/10/0 and the cost of the spice was only £1/4/0, thus showing a clear profit of £14/6/0. The makers of this wonderful egg-producer are Messrs. E. Griffiths Hughes, Ltd., 712, Deangate Arcade, Manchester.

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### Canadian Imports of Eggs.

The New Zealand shipments to British Columbia appear to be growing. One vessel recently carried consignments equal to ten thousand dozens.



# 1,190 per cent. Profit

## Wonderful Egg-Producing Discovery

For Poultry, Ducks, Geese, Turkeys, and Pheasants.

### How 24s. made £15-10-0.

THE most extraordinary profitable discovery of special interest to everyone who breeds and rears fowls for pleasure or for profit has just been made. It is one whereby anyone may enormously increase the output of eggs from hens—and this not for one week only, at the most prolific season, but for every week in the year, and particularly in winter when egg fetch the highest price.

The announcement of this discovery is all the more valuable as the statements of the discoverers are supported by the most astounding series of proofs. These proofs are the result of remarkable and independent experiments conducted under particularly adverse conditions.

#### A Winter Test.

The published figures forming the results of these experiments are authentic and attested. Without fear of contradiction, we may say that the test of which these figures are a faithful record was the most severe to which any Poultry Spice was ever put. It is quite an easy matter for the makers of a Poultry Spice to select a lot of excellent layers, feed them on the very best food, with the addition of Spice, and show as a result an astounding record of eggs laid. But in this test carried out with "Karswood Poultry Spice" there was no selection whatever of the Poultry. The tests were carried out in the worst months of the year upon average pullets and old hens, and extended continuously over a period of 5 months from November, 1912, to March, 1913.

The accompanying table of figures tell a wonderful story how the egg-producing powers of pullets and old hens were enormously increased simply by adding to the morning meal once a day a small quantity of "Karswood Poultry Spice."

Just think of it. A small quantity of "Karswood Poultry Spice" added to the morning meal nearly trebled the egg output during November and December.

#### Here is the Story.

Here are the facts of the experiments:

On the 1st of November last 100 pullets of the same age and breed, and 100 old hens of the same age and breed, were picked out haphazard—good, bad and indifferent—and placed into 4 pens, 2 pens containing 50 pullets each and 2 pens containing 50 old hens each.

The birds in all four pens had precisely the same food, consisting of meals, barley, maize, sharps, bran, peameat, oats, &c., with the usual grit and shell—in short, just the ordinary food given to poultry. But to one lot of 50 pullets and one of 50 old hens, "Karswood Poultry Spice" was added to the morning meal once a day, as directed on the label.

#### A Five Months' Test.

The conditions were continued daily for five whole months and a complete daily record of the eggs from each pen was carefully kept. The record of the increase in the number of eggs laid by the two lots of poultry fed with the "Karswood Poultry Spice" was simply astounding.

The old hens and pullets, to whom "Karswood Poultry Spice" was given at the

morning meal, laid between them in five months 4,389 eggs. The same number of old hens and pullets, which were not assisted by "Karswood Poultry Spice," laid between them only 2,452 eggs in the same period.

The egg increase from using "Karswood Poultry Spice" was thus 1937 eggs, which sold at the prevailing average market price, gave a magnificent gross profit of £15 10s. 0d., as against 24s., the cost of the spice used.

This prolonged test gives overwhelming evidence of the splendid qualities of "Karswood Poultry Spice," taking place as it did in the bleak, cold and windy Peak District of Derbyshire, during the worst-weather months of the year.

The most extraordinary part of this test is the fact that, in spite of the marvellously prolific output of eggs, the pullets and old hens—aided by the Karswood Spice—were, in every other way, in superior condition.

stimulates the natural development of the egg cluster, and the eggs resulting from its use are larger, richer in flavour, and much more fertile.

One tablespoonful is sufficient for 20 hens per day. A shilling packet is ample for 20 hens for a whole month. The cost of the spice is thus but a trifle, and the value of the increased egg output is about 13 times the cost of the spice used. "Karswood Poultry Spice" is thus the finest aid a poultry-keeper can employ. In fact no one can afford to be without this wonderful egg-producing product. Very often "Karswood Poultry Spice" makes all the difference between keeping your fowls at a loss and their making you a profit.

#### A Wonderful Opportunity for Poultry-Keepers.

The discovery of "Karswood Poultry Spice" is destined to work a complete revolution in the sale of eggs in British markets.

During 1912, according to Board of Trade returns, eggs to the total value of £8,000,000 sterling were imported into the United Kingdom from abroad.

With such a wonderful egg-producing product as "Karswood Poultry Spice," what is to prevent British poultry-keepers from transferring every penny of that sum to their own pockets by introducing into the English markets, fine, large, rich-flavoured eggs from their own farms—eggs which can, under the new conditions, brought about by "Karswood Poultry Spice," be produced with abounding profit.

#### Birds for the Table.

"Karswood Poultry Spice" saves weeks of time in feeding chickens for the table. Test this for yourself by dividing your chickens into two lots. Give them all the same food, but to one lot give the spice according to directions, and watch the results. The chickens treated with the spice will be ready for the table long before the others.

## Send for a sample

For 6d. (P.O. or stamps) we will send you, postage paid, sufficient spice for 20 hens for 16 days. For Colonies and foreign countries extra postage must be remitted with order.

Please write the envelope clearly to the address below.

Be careful to write your name and address clearly, and we should be obliged if you would tell us the name of your local dealer—either Chemist, Grocer, or Seedsman, from whom you would like to obtain supplies in future. You will certainly want more.

#### Note the Economy.

- A 2d. packet will supply 12 hens for 7 days.
- A 6d. packet will supply 20 hens for 16 days.
- A 1/- packet will supply 20 hens for 32 days.
- A 7-lb. tin will supply 140 hens for 32 days.
- A 14-lb. tin will supply 280 hens for 32 days.
- A 28-lb. tin will supply 560 hens for 32 days.

Monthly Figures				
(day to day figures supplied on application)				
Eggs laid from Nov. to March				
with and without				
KARSWOOD POULTRY SPICE.				
	Pullets.		Old Hens.	
	with	without	with	without
	Spice	Spice	Spice	Spice
November	230	72	177	53
December	459	194	320	155
January	441	215	258	134
February	563	338	362	231
March	931	556	618	474
TOTALS	2324	1405	1765	1347
Total Eggs with Karswood Spice	4389			
Total Eggs without Karswood Spice	2452			
Increase by using Karswood Poultry Spice	1937			
During the period eggs varied in price from 4 a shilling to 10 a shilling.				
1937 eggs actually sold for	£15 10 0			
Cost of Karswood Poultry Spice used was	1 4 0			
Clear Profit by using Karswood Poultry Spice	£14 6 0			

While the 100 birds not fed with "Karswood Poultry Spice" were suffering badly from the inclement weather, the other 100, thanks to the daily tiny quantity of "Karswood Poultry Spice," were in the pink of condition—"tight in feather" and excellent in every other way—and were laying eggs in much larger numbers. The contrast in the condition of the two lots of poultry was so astounding as to be noticeable to the most casual and inexperienced observer.

#### Larger Eggs, too.

Moreover, the contrast in the size and quality of the eggs was no less noticeable than in the poultry themselves. "Karswood Poultry Spice" is invaluable as an egg producer. It does not force the birds, therefore there is no deleterious effect as with cayenne and other condiments. "Karswood Poultry Spice" is guaranteed to contain no cayenne or other injurious ingredient. "Karswood" is a pure spice which

Obtainable from all Chemists, Grocers, and Seed Merchants,  
 Packets: 2d., 6d., and 1/-.  
 Tins: 7lbs., 6/6; 14lbs., 12/-; 28lbs., 22/6.  
 If your local tradesmen cannot supply, please send remittance to the Manufacturers. Any of the sizes will be sent, carriage paid, to any place in the United Kingdom. (Foreign and Colonial orders should be accompanied by extra postage.)

Sole Manufacturers:  
**KARSWOOD**  
 E. GRIFFITHS HUGHES (KARSWOOD) LTD.  
 712, Deansgate Arcade, Manchester.



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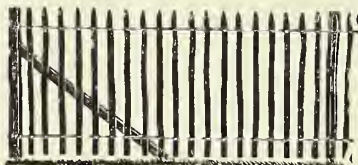
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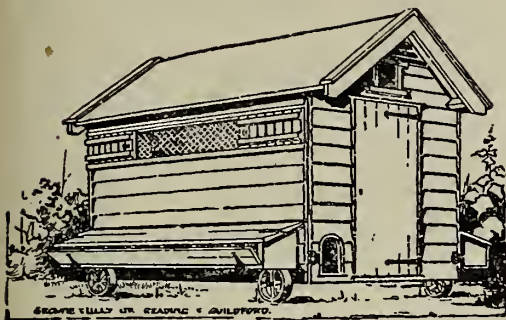
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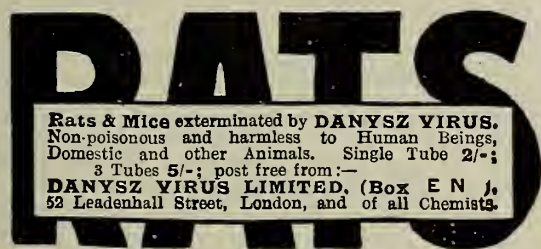
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Pen 3—Ditto,—speckled Sussex hens.

Pen 4—White Orpington cockerel—1st cross Orpington-Sussex hens

Sittings of above, 3/0

Sittings 15 eggs or 12 eggs and unfertiles replaced once if returned within 14 days.

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**AUSTRALIAN White Leghorns, 1912** Cockerels—from imported pen, cock sired by brother to winners of the World's Record in 1911; dams, "in breeding absolutely my best" (wrote Mr. Padman) —12/6 each. Ditto, second generation, 10/6. Miss Gillett, Walpole, Haylesworth, Suffolk.

**CAM'S DREADNOUGHTS.**—My four White Leghorn Pullets laid 324 eggs in 16 weeks and have proved themselves to be World's Champion Winter Layers. My strains of White Leghorns, White Wyandottes, and Buff Orpingtons have won more prizes in the last four years' laying competitions than any two Firms, proof of honest dealing. I can now spare few breeding pens of 1910-11 hatched birds. Now is your chance to get England's best layers. 1912 Cockerels ready 10/6 to 25/- each. Lists free.—Apply E. CAM, The Glen Poultry Farm, Hoghton, near Preston.

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