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THE
PRACTICAL
POULTRY KEEPER

LEWIS WRIGHT

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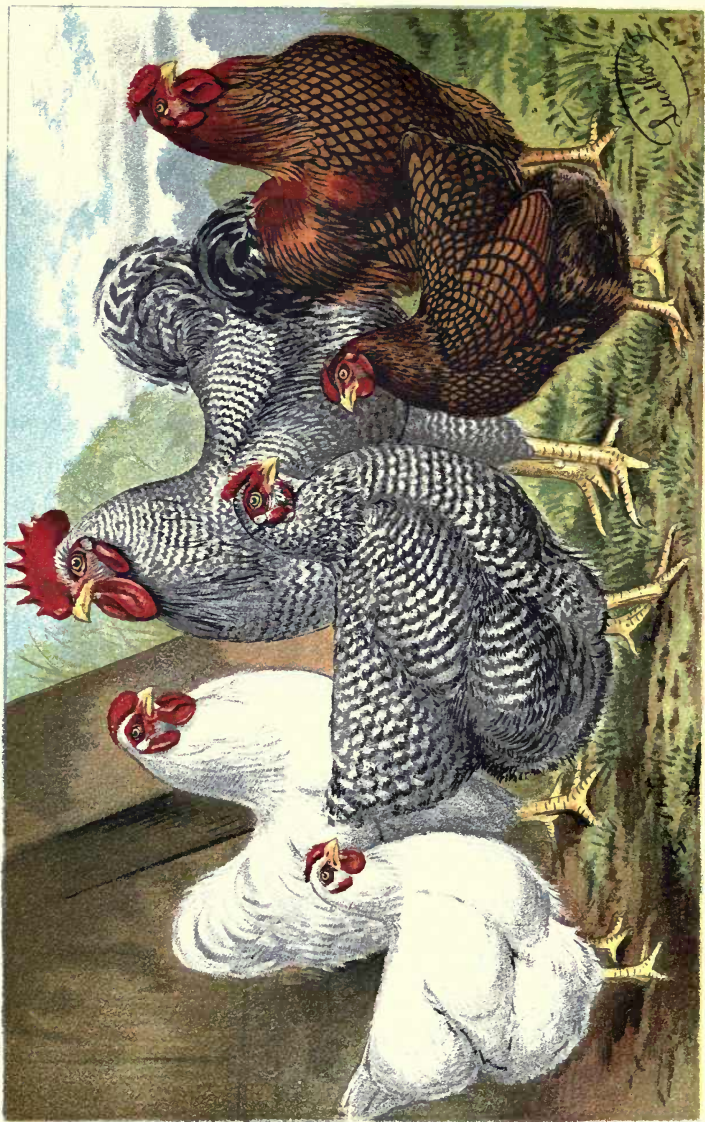




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CASSELL & COMPANY, LIMITED, LONDON.

GOLDEN WYANDOTTES.

PLYMOUTH ROCKS.

WHITE WYANDOTTES.

THE PRACTICAL
POULTRY KEEPER.

BY
LEWIS WRIGHT

WITH EIGHT COLOURED PLATES AND
OTHER ILLUSTRATIONS

CASSELL AND COMPANY, LIMITED
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PREFACE

TO THE NEW AND REVISED EDITION



THE first edition of this work was published in 1867, its object being to give practical details in such a practical way that it might be put into the hands of a person totally ignorant of poultry-keeping, with the reasonable certainty that its instructions would be understood by him, and if followed would command success. The writer does not think now, any more than then, that such a work previously existed ; and such an implied opinion may possibly account for the singular hostility with which his own efforts were then received and reviewed by some who claimed to be the leading authorities in the poultry world. Time proves all things, however ; and the constant demand for rapidly-succeeding editions has proved that THE PRACTICAL POULTRY KEEPER did fulfil its intended purpose, and supply some real want, and was both understood by, and welcome to, the people for whom it was written.

After numerous minor revisions for some of the many successive impressions, the Twentieth Edition called for more extensive re-casting, and was set up afresh in entirely new type, with Coloured Plates in lieu of the older black illustrations. That edition also has, since 1885, been many times reprinted, with occasional minor corrections. But the time has at length come when another entirely new edition seems to be demanded. In this edition, fully one half of

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the contents have been entirely rewritten, and all of the remainder thoroughly revised.

The work in its new dress is considerably enlarged, and two of the Coloured Plates are devoted to varieties of poultry which have been recently introduced. Endeavour has been made to embody the essence of that progress in and increase of knowledge which has taken place in many points, and to take note of the many changes which have taken place, during recent years. The facts and the truth are becoming more defined respecting the vexed question of poultry-farming, and some endeavour has been made to set forth that truth, and to correct the exaggerations which have been published on both sides. The author has done his best to make this new edition of *THE PRACTICAL POULTRY KEEPER* as practical as ever, whilst embodying the best knowledge and methods of the present day; and he commits it to the judgment of the public for whom it is intended, in hope and with some confidence that it may continue to find the same acceptance as before.

March. 1899.

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THE PRACTICAL POULTRY KEEPER.



CHAPTER I.

HOUSES, RUNS, AND ACCOMMODATION.

WHERE poultry are to be kept, however small or large the number, the first practical question is, of course, the house and run, or number of such, which they are to occupy. And as regards the sheltered part of this, the essentials are the same, however the open runs may vary. The house must have perfect protection from weather and draught, but with ample supply of fresh and pure air, also a fair amount of light. Beside this, there must be enough shelter from the weather by day, dry underfoot. And both must be kept clean easily.

Let us first consider the smallest scale, say from four to eight fowls to be kept at the bottom of a yard or garden. If the affair has to be put up, the best general arrangement will be as in Fig. 1, a house in one corner, a roofed shed carried out at its side, and as much open run in front as can be afforded, or perhaps the whole yard. The house will be walled in ; but the shed should be open in front, though with a closed end wall, unless it runs all across, in which latter case it may perhaps comprise all the run which can be afforded. In any case, in confined space the shed should be boarded up a foot from the ground, and netted above, that the few birds may be confined in specially bad weather ;

and the roof over all should project a little in front and have a gutter. A house four feet square would really do for half a dozen ; but this would hardly give enough shelter-depth to the shed, which will be *far* better six feet to the back, hence a small house may part off four feet wide from such a shed. A long shed may already exist, and if so, will do excellently if in repair ; otherwise comes the question of

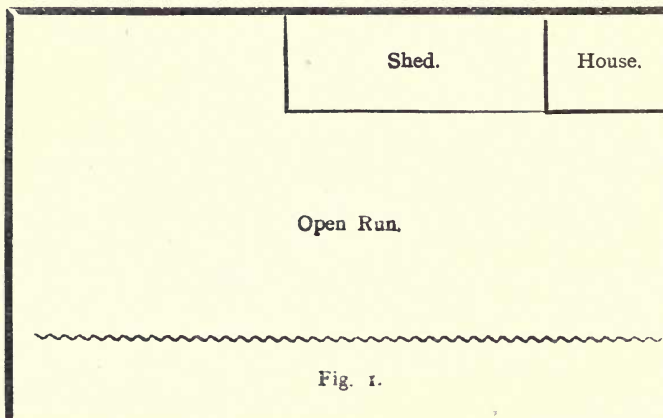


Fig. 1.

building the whole affair, which ought to be within the power of an average man, if he so desires.

If there is a back wall the matter will be simplified. Timber and planks are 12 feet long, so if the front of shed and house be a little less than six feet, or the shed that depth, the wood will cut up well. Quartering (2×3) should be used for frame and uprights, and not less than $\frac{3}{4}$ -inch for the boards. The back uprights should be clinched to the wall by staynails or holdfasts, and a horizontal piece of same section similarly fastened to the wall to support the back of the roof. The bottoms of all the uprights can be tarred and sunk in the ground ; but it is better to lay horizontal sills of

quartering either on the ground, or still better, upon a "footing" made by a row of bricks laid side by side, and halve or mortise all the uprights into the sills. There must be an upright at the corner of the house, and for a door-post, and at the gate in the shed, and its corner, and wherever else needed for strength. A horizontal timber will run all along the top of the front, and on to this and the back piece on the wall the rafters will be spiked down. The boards may be either tongued, or must be caulked by driving string into the chinks, or laths tacked over the latter. Tongued boards are best, and look neatest. The door must fit well, or rather, should be made so as to lap over the timbers all round.

Single boards are ample for ordinary English climate, but are not enough for the north or for America. More warmth can be got, when necessary, in several ways. Matting can be tacked inside in winter, but unless removed in warmer months, harbours vermin. Roofing felt is better, the tarry smell repelling insects. But the best plan of all, and which is also cool in hot weather, is to nail a skin of thinner match-boarding on the inside of the timbers both of walls and roof, leaving an air-space between. This makes a very warm house.

For roofing there are many materials. Loose tiles answer for the southern half of England, and provide ample ventilation; but in high latitudes the house would be far too cold, as is also the case with galvanised iron used alone, and which does not ventilate. Boarded or ceiled under, either makes a good roof. Wood alone also makes a good roof. Feather-edge boards may be overlapped horizontally, and tarred periodically, or thicker boards, tongued or plain, may be laid edge to edge from the highest point to the eaves. This should be coated with hot gas tar in which a pound of pitch to the gallon is dissolved.

Or the wood may be tarred, then covered with thick brown paper tacked down, and again tarred ; or calico will be still better. Or the wood may be covered with roofing felt.

An aspect anywhere from south-easterly round to the west is an advantage when the back of the house and shed is a wall, and if the wall back on to a fireplace or stable, such very mild warming is an advantage in winter. But neither is necessary if the shed is *light* and the floor *dry*.

This brings us to the floor of house and shed. The fowls will stand activity over wet runs, on which they only walk at their choice ; but cannot be kept successfully in confinement—we say absolutely that they *cannot*, for long—if the floor and walls of the house, and floor of the shed on which they depend for shelter, be not dry. However damp the ground, this can almost always be effected, by digging and taking away till hard earth be reached, then putting on a layer of broken bricks, or stones, or clinkers, from one to two feet deep, in any case enough to raise the level six inches above the ground, and on this a layer of concrete made of hot fresh-slaked brown lime, and gravel or pounded clinkers. Sometimes it is better to use a dry mixture of quicklime pounded, gravel, and tar, the smell of which repels rats and mice. If there is definite cause to dread rats, however, it is worth while to lay small-mesh wire netting over the beaten-down surface of the drainage material, and below the concrete, and to carry it a foot up all the walls.

A shed thus floored, and with the roof well projecting, and boarded up a foot or more, will be nice and dry. On the hard floor can be placed dry earth, or ashes, or sand, or straw, to be periodically removed when contaminated. On dry soil all this is not, however, necessary. Mere trodden earth will do for the house, and also for the floor of the shed in that case ; but in the shed some inches of earth should first be removed to be returned in a loose state, after the

subsoil has been levelled, and smoothed, and rammed down to a hard permanent floor. This is the proper way to keep a shed—and especially a shed which constitutes the only run the fowls have—clean. To dig it up a foot deep every two or three weeks, as some do, answers for a period ; but gradually the whole mass becomes contaminated to that depth, and the fowls begin to ail from the poisonous atmosphere. If *all* can be removed and replaced with fresh earth every three months or so, it will answer. But it is generally easier and more manageable to renew merely a few inches of scratching material, down to a hard bottom, as above indicated. The removed earth or ashes will be valuable for the garden.

Another very useful material is peat-moss litter, especially for the houses ; small sheds, however, are also often floored with it. Some scatter half an inch or an inch deep all over, and renew every two or three days ; others prefer to put in six or eight inches deep, and only rake off the top every now and then ; the whole lasting for months. The droppings mixed with the moss scraped up make admirable manure.

Where no wall is available for a lean-to erection, the back uprights as well as the front must be raised on sills, if they are to be tenant's fixtures : otherwise all may be, if preferred, sunk into the ground. A double-pitched or gable roof is much the best for such detached houses. The back and end of the shed should still be boarded up, so as to give adequate shelter.

Ready-made houses for fowls are now made and sold very cheaply by quite a number of manufacturers, in a great variety of patterns. They can be had built for a lean-to against a wall ; or entirely detached, with span, or circular, or slanting roofs. We have seen them advertised as low as 25/- for 4 feet square ; but seasoned wood can hardly be expected at such a price.

A pattern common to almost all the manufacturers resembles Fig. 2, its characteristic feature being that the floor of the house itself is raised a couple of feet from the ground, so that it forms a shelter or shed underneath, enclosed except in front. This is a very cheap and often useful arrangement, but there are two or three things to be borne in mind about it. The first is, that the sizes given in

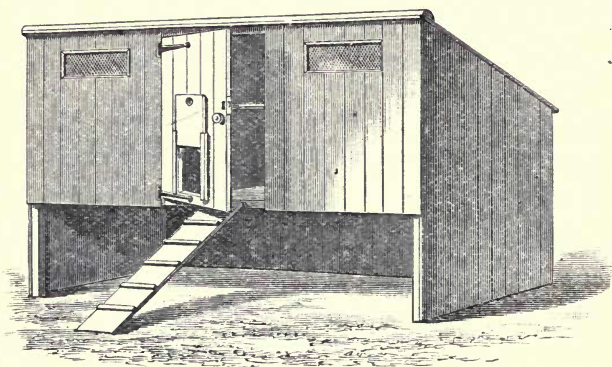


Fig. 2.—Portable House.

most price lists are not large enough for the numbers usually stated with them—thus a house 4 feet square is often given as “suitable for 12 fowls.” It is nothing of the sort: more than half that should not be placed in it, unless small breeds on a wide range. Except on such a large run, or with some other shelter available, or in some sheltered position, such as a shrubbery, the area of the ground shelter is not nearly sufficient. With such adjuncts it may be; but care should be taken to raise the ground some inches, and special care to constantly renew clean dry dusting material, unless other dusting places are available. Another point to remember is that in snow or rain, the fowls, crowding under the shelter,

are very likely, at night, to *remain* there, rather than go out momentarily into the wet to go up to roost ; this should always be looked after. Chinks may, not unlikely, open after a while in the floor, and cause draught—such must be stopped by some material if it is so. Even the entrance, in its raised position, is far more exposed than when on the

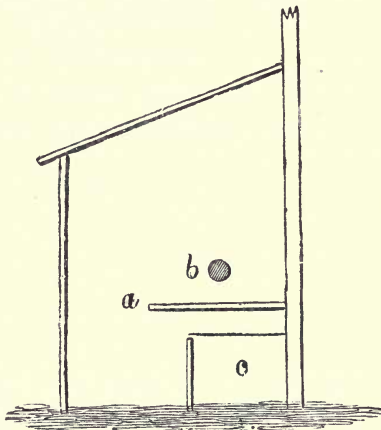


Fig. 3.—Shelf in Fowl-house.

- a* Broad shelf, eighteen inches high.
- b* Perch, four inches above.
- c* Nests, open at top and in front.

ground ; and such a house should therefore always be turned to a mild quarter. It is often convenient, and certainly better as a rule, where ready-made buildings are purchased, to get a shed entirely separate, such as are also supplied by the makers of the houses. When of proper size, and used with judgment, these ready-made houses and sheds are both cheap and useful.

Before leaving the smallest class of houses, let us consider the internal arrangements. These chiefly concern

cleanliness and *ventilation*, and there is some latitude according to circumstances. The former *must* be attended to. In the house it is easily secured by laying a board underneath the perch, which can be scraped clean every morning in a moment, and the air the fowls breathe thus kept perfectly pure. Or the droppings may be taken up daily with a small hoe and a housemaid's common dustpan. After this a handful of ashes or sand lightly sprinkled will make the house all it should be. Another most excellent plan for preserving cleanliness in the roosting-house is shown in Fig. 3.* A broad shelf (*a*) is fixed at the back of the house, and the perch placed four or five inches above it, a foot from the wall. The nests are conveniently placed on the ground underneath, and need no top, whilst they are perfectly protected from defilement, and are also secluded, to the delight of the hen. The shelf is scraped clean every morning with ease and comfort, from its convenient height, and slightly sprinkled with earth or sand; and the floor is scarcely polluted at all. Such a broad shelf underneath the perch has another recommendation, in the protection it affords from upward draughts. It is embodied in the farm poultry-house figured on page 103.

Ventilation is often not provided for as it should be, and the want of it is a fruitful source of failure and disease; though matters have much improved since this book was first written. An ill-ventilated fowl-house *must* cause sickly inmates. The great desideratum must, however, as already observed, be secured without exposing the fowls to draught between two points. But here we must distinguish. In the open air *wind* can be borne: it is definite

* We found this plan in the *Canada Farmer* about 1867, and the publicity given in these pages has made it very common all over the world. Long experience has more than ever convinced us of its merits.

draughts from some point to another point, cutting across the birds in *confined* space, that do the mischief.

In closed houses the best plan is to have free openings at the highest point of the roof; then if the only ingress be the entrance, near the front of the house, and the perch be at the back, there will be pretty good ventilation without draught. Portable houses are often made now, with an inch space at the eaves all round; another good plan is a "lantern" of slats arranged like venetian blinds above the highest point of the roof, or the angle of the wall under

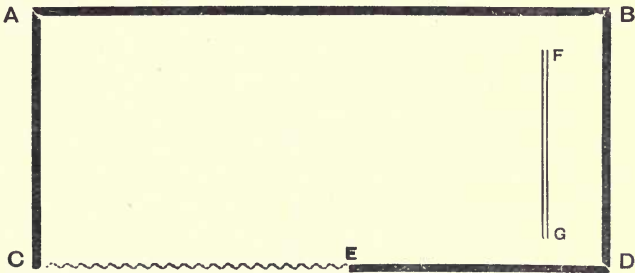


Fig. 4.—Semi-open House.

the gable may be open except for a sheet of perforated zinc. The hole will give sufficient air; the point is to secure ample egress of air for the number of birds.

But, except in severe climates poultry do best not shut in, but with free access of outer air. Major Morant advocated this plan some years ago, and we have seen its good results, poultry so housed showing very much *less* illness in winter than others accommodated in the usual manner. His principle is shown in Fig. 4, representing roughly a detached house, including shed, meant to be placed about a farm or other range. The back, A B, and ends, A C and B D, are closed; but the front, turned towards a sheltered or warm aspect, is only closed from D to E, E C being wired in, with a hole for

entrance. The perch is at F G, in the most sheltered part, but facing the open shed. Here we have pure open air, and practically no draught. In a rather boisterous situation, still more shelter may be given by such a modification as Fig. 5, where the side of the roost next the open shed is *partially* closed, E H; and the perch, F G, put back into the part most sheltered; the vacant space is however entirely open from top to bottom. This plan may be applied to such a small affair as Fig. 1 with most excellent results.

Perches must not be high in any confined place. Light

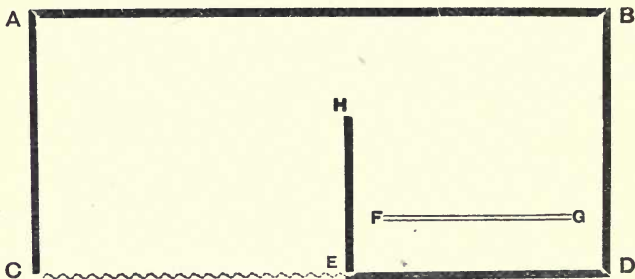


Fig. 5.—Semi-open House.

breeds can fly down from a tree, but they need a long *slant* in their flight, or they fall heavily; hence in a confined place half a yard to two feet is quite high enough. Bumble-foot is often caused by too much heavy "drop" of this kind, from height so moderate that it would not be suspected. With longer experience we have decided against the use of straight planed perches, nearly flat on top and same size all along, as we at one time used. It is far better, if such can be got, to get nearly but not quite straight small branches, with slight crooks and irregularities, and little variations in size, averaging from $1\frac{3}{4}$ inch diameter to $2\frac{3}{4}$ inches, according to the fowls.

The irregularities are of service in preventing mischief. Perches should have a flat bearing cut at each end, and be movable, that these places may be dressed with oil and paraffin every now and then, to keep away the red mite.

Large Asiatics often do better bedded on straw till they are grown, or even after. A *perfectly* dry floor will do for this, or such a shelf as described is an excellent plan. The straw will do for several days with healthy fowls, if lifted and shaken with a pointed stick every morning, and the droppings underneath taken away.

Little trouble is needed about nests. Under a shelf like Fig. 3, or in any place with no perch above to pollute them, a brick or two on the floor will be sufficient to confine a little straw. Tiers of nests are quite abandoned. Half of a cheese box does well, on the ground. Two or three partitions may be tacked together, with a front strip all along three or four inches high, to retain the straw. But the less woodwork the better, so far as laying nests are concerned; we may want a box by-and-by for the sitting hen.

Somewhere in each shed, and in the dryest part of it if any damp comes in anywhere, there must be a heap of fine dry earth, or road-dust, or finely-sifted ashes, in which the fowls may roll and cleanse themselves from insect vermin—their only means of doing so. To answer its purpose this must be renewed every now and then, and especially never allowed to remain long if it gets damp. One plan is to part off a back corner of the shed about a yard square, by two boards placed on edge, about six inches high, and to keep this space filled to the top. The only case where special provision is not necessary is where the entire shed floor is kept some inches deep in dry loose material, kept clean and renewed as above described. Then the fowls can use that at pleasure.

If chickens are to be reared, more than one small run

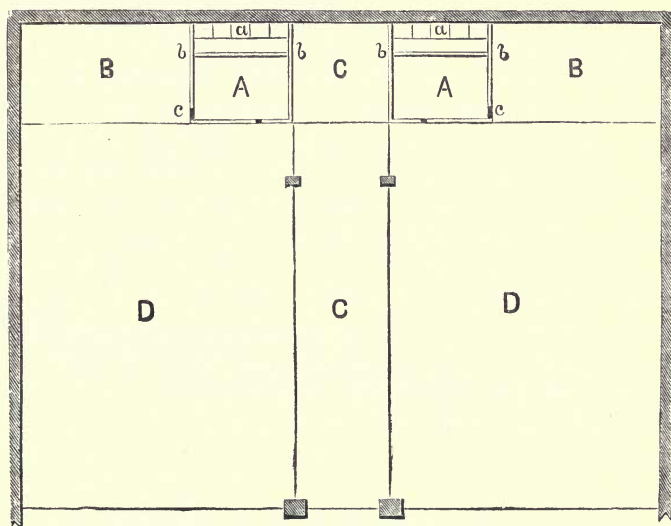
must be provided, and there are many who desire to keep poultry on rather a more extended scale than we have yet considered. Perhaps a good piece of garden can be given up, then some such plan as Fig. 6 can be recommended, and represents with fair accuracy what was our own yard for years, and, for its scale, is simple and cheap. If indeed there is, besides, a lawn or grass-run on which chickens can be cooped, it will rear in fair perfection a few of most breeds which do not require separate pens to breed the two sexes. The space here shown is twenty-five by thirty-five feet, besides the lawn or grass-run. If more can be afforded, give it, by all means; but we found this, with moderate care, sufficient, and believe it will meet the requirements of a large class of readers. The houses are here shown, as they were, closed, with perches and nests at back; but the more recent "open" or "semi-open" plan, as shown in Figs. 4 and 5, would be easily applicable, and in our opinion preferable, unless the roof consists, as it did in our case, of open tiles.

The plan, it will be seen, comprises two distinct houses, sheds, and runs, with a separate compartment for sitting hens. The holes by which the fowls enter open into the sheds, which are wired in, so that in wet weather they can be altogether confined. In dry weather the shed is opened to give them liberty. The fencing should be boarded up a foot high, as already described, not only to prevent rain splashing in, but to keep in, when necessary, young chickens, which would otherwise run out between the meshes. The holes by which the fowls enter their houses should be furnished with trap-doors, that they may be kept out at pleasure whilst either part is being cleaned. Each house should have a small window.

The yards in front of the sheds should be gravel or trodden earth; but if they can be as much as fifty feet long



ELEVATION



PLAN



SCALE

Fig. 6.

- | | |
|-------------------------------------------|--------------------------------------|
| A A Roosting and laying houses. | <i>a a</i> Nests. |
| B B Fenced-in covered runs. | <i>b b</i> Perches. |
| C C Shed and run for sitting hens. | <i>c c</i> Holes for fowls to enter. |
| D D Open runs. | |

they are better laid down in grass, which, if well rooted first, will bear small fowls upon it for several hours each day, but should be renewed in the spring by sowing when needed. Between the runs the divisions should be boarded up a couple of feet high to prevent fighting or restlessness. The height of the fence depends on the breed chosen. Cochins or Brahmas are easily retained within bounds by netting a yard high ; for moderate-sized fowls six feet will do ; whilst to confine Game, Hamburgs, or Bantams, a fence eight or nine feet will be found necessary. The netting should be simply stretched from post to post, without a rail at the top, as the inmates are then far less likely to attempt flying over. The posts may be five to six feet apart, $1\frac{1}{2}$ inch square, pointed, and driven into the ground. We do not like to see fowls with their outer wings cut. If they are never wanted for exhibition, it is better to open one wing, and cut only the first or flight feathers, usually ten in number. This will effectually prevent the bird from flying, and as the primary quills are always tucked under the others when not in use, there is no external sign of the operation. But sufficient fence is the proper plan.

The compartment for the sitting hen may be boarded in at the front or not ; we prefer it open. Her run may also be covered over or not, at pleasure, but it is better covered.

Before entering upon accommodation for large numbers of fowls, it may be well to consider more especially the subject of open runs of different kinds and sizes. In regard to the space absolutely necessary, poultry may be kept almost anywhere by bearing in mind the one important point, that the smaller the space in which they are confined, the greater and more constant attention must be bestowed upon the cleanliness of their domain. They decline rapidly in health and produce if kept on foul ground. If daily

attention be given to this matter, a covered shed ten or twelve feet long by six feet wide may, as already hinted, be made to suffice for half a dozen fowls without any open run at all. By employing a layer of dry earth as a deodoriser, which was turned over every day and renewed once a week, the National Poultry Company kept for several years such a family in each pen of their large establishment at Bromley. These pens did not exceed the size mentioned, and chicken-rearing failed; but the adult fowls were in the highest health and condition; and the company managed, with birds thus confined, to take many prizes at first-class shows. Poultry-keeping is, therefore, within the reach of all. The great thing is purity, which *must* be secured, either by space, or, in default of that, by care. Hardy fowls will sometimes thrive in spite of draughts, exposure, and scanty food; but the strongest birds speedily succumb to bad management in this particular, which is perhaps the most frequent cause of failure.

When the run is on such a limited scale, dry earth is decidedly the best deodoriser. It is, however, seldom at the command of those who have little space to spare, and sifted ashes two inches deep, spread over the floor of the whole shed, will answer very well. The ashes should be raked every other morning, using a rake with steel wire teeth three-eighths of an inch apart, and renewed at least every fortnight, or oftener if possible; or peat-moss may be used, as already described. Of course, the number of fowls must be limited: they should not exceed five or six, and, unless a second shed of the same size can be allowed, the rearing of chickens should not be attempted.

But an open run as well is far better, and the larger the better. The birds will be more active, and more hardy. And if space can be had for a *grass-run*, that will be best of all, for grass is of high food value, if not contaminated

by overcrowding upon it. But it is of no use attempting a grass-run unless sufficient space can be given for it. Six fowls of good size, such as Wyandottes or Rocks, will need a grass-run not less than twenty-five by fifty feet, which is at the rate of 200 fowls per acre; and at this rate each run ought to be vacated for purification, say, three months in the year. The grass will not be kept down by the pen of birds, and must be cut when too long, lest it form balls of tangled long grass in the crop, and lest they eat blades, part of which may be contaminated. Such fouled grass is *poison*, and all is avoided, and the grass also freshened, and insects and worms made more accessible, by mowing; also the droppings are more quickly washed into the actual soil to be absorbed by the crop, instead of remaining adherent to the long grass. This is very important in managing grass-runs. If the plot cannot be vacated, it ought to be nearly double the size; but this comes to still more, and grass-runs for larger numbers will have to be proportionately increased.

Unless this requisite space can be afforded, grass should not be attempted, but the earth kept bare. It is generally best to let it get hard and trodden, when much impurity can be swept or scraped up. It should have the surface pared off occasionally to use as manure, and now and then, if necessary, be dug up a spade deep. Some prefer to keep it loose, and dig up frequently, but we think the other plan best.

We must now consider briefly what arrangements should be made for more extensive operations, reserving, however, any really "farming" aspects of the matter for more special treatment, and rather dealing here with the breeder or fancier, who wants to breed from more pens of birds, and rear an annual stock of chickens, but still keeping a comparatively small number in one breeding-pen.

This may possibly be the case on a farm, or where a park is available, or ample range is in some way at hand. In such circumstances there is no better nor healthier plan than to scatter about, in sufficiently distant and distinct localities, a number of small detached houses, portable or not. There is usually shelter under hedges, or trees, or shrubbery, or plantation, where such a method is possible; hence such houses as Fig. 2, or still better, on the open plan of Fig. 4, answer all purposes. Even a large hogshead, with the head knocked out, turned on its side, a broad platform fitted in near the ground, and a perch near the back end, may be enough for a pen in the shelter of a copse or shrubbery. Both grown fowls and chickens will be kept in magnificent bloom and condition upon this system, the only drawbacks to which are the rarity of the cases in which it can be followed, and the time which will be consumed in going round and attending to the different lots of birds, old and young.

Ranges of pens and runs are far more usual and practicable. Here, also, detached houses and sheds may be placed singly in each run. But a range of such buildings is more convenient, and less costly in time and labour. The first example we ever met with of a plan which has since been adopted widely on a larger scale, was the poultry-yard of the late Mr. Henry Lane, of Bristol, well known in the "sixties" as the most successful exhibitor of Spanish fowls, and which is still worth reproducing as an example of this style of yard in comparatively limited space.

In this design (Fig. 7) A is a covered passage which runs along the back of all, and, by a door which opens into each, allows of ready access to any house in any weather. One end of this passage may open into some part of the dwelling-house if desired. The passage should have a skylight at top, and must also be freely ventilated at the *roof*; to secure

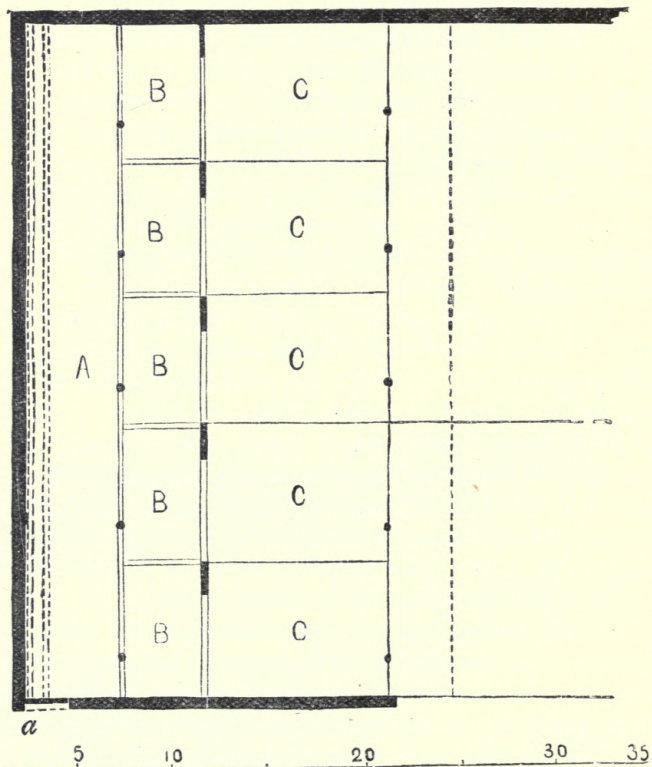
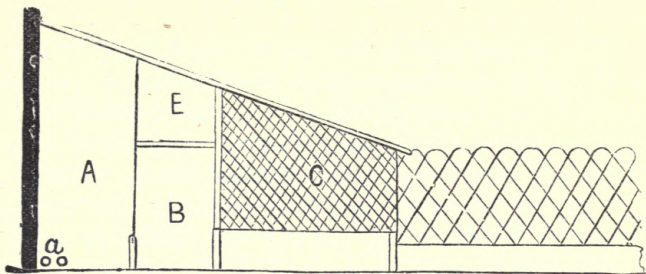


Fig. 7.—Mr. Lane's Yard.

this object by having it open at either end would cause draught, and destroy the peculiar excellence of the arrangement. The houses, B, for roosting and laying in are $7\frac{1}{2}$ feet by 4 feet, and the side facing the passage is only built or boarded up about 2 feet, the remainder being simply netted; hence the birds have a free supply of the purest air at night, whilst quite protected from the external atmosphere; and can be all inspected at roost without the least disturbance—a convenience of no small value. The nests should be reached from the passage by a trap-door, and there is then no necessity ever to enter the roosting-house at all, except to clean it.

A small trap-door as usual, which should be closed at night, communicates between the houses and the covered runs or yards, C, which are $7\frac{1}{2}$ feet by 9 feet. They are boarded or built up for 2 feet 6 inches, the remainder netted, except the partition between them and the houses, which is, of course, all board. Both houses and runs must be covered with some deodoriser, and Mr. Lane preferred the powdery refuse from lime works, which costs about 1d. per bushel, and which he put down about 2 inches deep. It always kept perfectly dry, and is a great preventive of vermin: whilst if the droppings are taken up every morning, it will require renewal very rarely. It is, however, fatal to the colour of yellow-legged breeds. In front of all is a grass-run, which should extend as far as possible, and on which the fowls are let out in turn in fine weather.

An additional story, E, may or may not be constructed over the roosting-house, and in case of emergency, by sprinkling the eggs, may be made to accommodate sitting hens, but is not to be preferred for that purpose, for reasons given in Chapter III. Every poultry-keeper, however, knows the great utility of such pens on various occasions which continually arise, and they will be found excellent

accommodation for sick or injured fowls. In Mr. Lane's establishment hot-water pipes (*a a*) were laid along the back of the passage floor, by which the temperature was at all seasons kept nearly uniform. This is not at all necessary in the greater part of England, unless in winter for exceptionally delicate breeds, like Spanish, whose combs and faces are apt to shrivel with frosty weather.

The characteristic and most valuable principle of this arrangement, is the passage or corridor at the back of a whole range of houses, from which, under cover, eggs can be reached, the houses cleaned, and the birds inspected. It also provides the freest access of air without draught or exposure. In this instance we have seen it applied to quite small pens, for breeds adapted to very close confinement—the runs being so narrow ($7\frac{1}{2}$ feet wide) that the covered sheds are arranged in front, and not at the sides of the houses. We will only give one more example, of the same system, as we applied it to a house and runs for our own use when breeding Brahmas at Crouch End, London. This plan also, since we first published it in 1872, has been extensively used all over the world; in fact one or the other of these "corridor" plans are most used of any, with such slight modifications as circumstances dictate, wherever ranges of buildings are erected.

In the actual case here figured (Fig. 8), the building covered 75×15 feet, the pitch roof being covered with loose or open tiles, and the corridor lighted by a few glass tiles interspersed where necessary.* This passage, P, was 3 feet wide, and ran the whole length from a door in the end. Each grass-run in this case, being intended for five or

* It may be worth remarking, that we got the framework put up and tiles put on by contract, in order to have a roof to work under; but after that, *all* the timber and wire-work of houses, sheds, and fencing of runs was made and put up by our own hands.

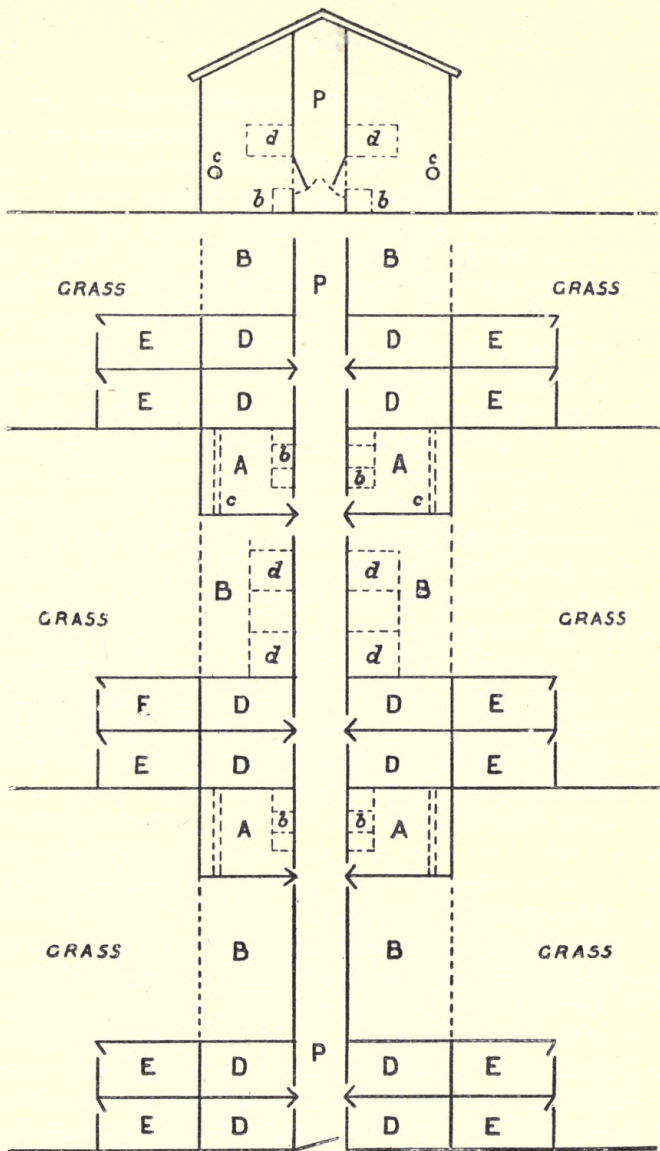


Fig. 8.—Double Range of Houses.

six Brahmas, was 50 × 25 feet, the building thus serving six of such runs. These stood very well, and being similar, one was devoted to giving every one in turn two months rest in the year. Smaller breeds would not need so much. The houses, A A, were 5 feet wide, entirely closed with match-board towards the grass-runs and open sheds, but only boarded up 3 feet high along both sides of the passage, and the rest wired. The perches, *c c*, were back against the closed side, and the nests, *b b*, next the passage, accessible by hinged boards. The rest of the 25 feet width of building being more than necessary for open shedding, B B, additional houses, D D, with small outside runs, E E, were divided off out of it: we had two of these in each run, or twelve in all. These were very useful in those days for setting hens, and also for penning birds, or single cockerels; one we used as a hospital. Our "training" pens for show birds, or for examining birds on approval, also fronted the passage, a board shelf, *d d*, 30 inches wide, being carried along at the back of one of the sheds, B, at a height of the yard-high boarding up of the passage. Behind the back of this shelf was boarded up to keep draughts from blowing through from the run, and boarded partitions divided the space into pens 30 inches wide, with wire fronts as usual. Everything except the actual mixing of the food, and young chickens, which were provided for elsewhere, was thus collected under one roof; and these also might easily be so if the scale be adapted to the work to be done.

In a large establishment many cockerels may have to be provided for singly. Convenient sleeping houses and small runs are obtainable for such purposes; but we found the twelve here provided sufficient; as they ran together till one or the other had to be separated, for show or otherwise.

The open runs were all boarded up with thin boards to 27 inches high, with 2 feet of netting above. This, however,

was for Brahmas, and more would be required for many other breeds.

CHAPTER II.

DOMESTIC MANAGEMENT OF ADULT FOWLS.

FOWLS should not be kept unless proper and regular attention can be given to them ; and we would strongly urge that this needful attention should be *personal*. Our own experience has taught us that domestics are rarely to be relied upon to mix food properly, or in many other matters essential both to economy and the well-being of the stock ; and, if any objection be made on the score of dignity, we could not only point to many ladies who do not think it beneath them to attend to their own fowls, but can aver that the most menial offices may be performed in the fowl-house without so much as soiling the fingers. Where there are children in the family old enough to undertake such matters, they will be both pleased and benefited by attending to what will soon become their pets ; otherwise the owner must either attend to them himself, or take such oversight as shall be *effectual* in securing not only proper care of his birds, but of his own meal and grain. If he be unable or unwilling to do at least as much as this, he had far better not engage in poultry-keeping at all.

Let us first give the question of food a full and practical consideration. Our object is to give the quantity and quality of food which will produce the greatest amount of flesh and eggs, and if it be attained, the domestic fowl is unquestionably the most profitable of all live stock. But there is no "mistake on the right side" here. A fat hen is not only subject to many diseases, but ceases to lay, or nearly so, and becomes a mere drag on the concern ; while a pampered male bird is lazy and useless at best, and very

probably, when the proprietor most requires his services, may be attacked by apoplexy and drop down dead. On the other hand, that fowls cannot be remunerative if starved need scarcely be proved. The almost daily production of an article so rich in nitrogen as an egg—the very essence of animal nourishment—must demand an ample and regular supply of adequate food. But we say no more upon this point, knowing that the common mistake of amateur poultry-keepers is upon the other side—that of over-feeding.

A common plan, where fowls are regularly fed at all, is to give them at each meal as much barley or oats as they will eat ; this being done, the owner prides himself upon his liberality, and insists that his, at least, are properly fed. Both in quantity and quality is he mistaken. Grain will do for the regular meals of fowls which live on a farm, or have any other extensive range where they can provide other food for themselves, have abundant exercise, and where their digestive organs are kept in vigorous action. But poultry kept in confinement on such a diet will not thrive. Their plumage, after a while, begins to fall off, their bowels become affected, and they lose greatly in condition ; and though in summer their eggs may possibly repay the food expended, it will be almost impossible to obtain any in winter, when they are most valuable.

And some who profess to correct such errors are not always safe guides. We remember a work by a writer who, of all others, has been most intolerant, and even unjust to other supposed rival authorities, in which, just after a caution against over-feeding, five pounds of barley-meal, ten pounds of potatoes, seven pounds of oats, three pounds of rice boiled, and three pounds of scalded bran, is given as a week's allowance for five hens and a cock—"of the larger kinds," it is true. At the lowest ordinary prices the cost of such a scale would amount to £4 4s. in the course of twelve

months ; and taking eggs at the high average of a penny each all the year through, every one of the five hens must lay at least 200 eggs to repay the mere cost of subsistence. When we say that 150 eggs per annum is as much as can be obtained from nine hens out of ten, it will be seen at once that poultry could not be made profitable did they consume so enormously ; and, in point of fact, we had the curiosity to try this dietary upon six fowls "of the larger kinds," and found it rather more than double what was amply sufficient.

The fact is, all fixed scales are delusive. Not only would the great Asiatics eat twice as much as many other sorts, but different fowls of the same breed often have very different measures of capacity, and even the same hen will eat nearly twice as much when in active laying as when her egg-organs are unproductive. The one simple rule with adult fowls is, to give them as much as they will eat *eagerly*, and no more ; directly they begin to feed with apparent indifference, pick over it, or cease to run when the food is thrown at a little distance, the supply should be withdrawn. In a state of nature they have to seek far and wide for the scanty morsels which form their subsistence ; and the Creator never intended that they, any more than human beings, should eat till they can eat no more. Even this rule is hardly sufficient test. The birds should be handled on their perch every now and then, and if, when thus examined, they feel either too fleshy or too poor, their rations should, if necessary, be modified accordingly. This last is the real way of apportioning their daily food to fowls.

It follows that food should never be left on the ground. If such a slovenly practice be permitted, much of what is eaten will be wasted, and a great deal will never be eaten at all ; for fowls are dainty in their way, and unless at starvation point refuse sour or sodden food.

The number of meals per day best consistent with real economy will vary from two to three, according to the size of the run. If it be of moderate extent, so that they can in any degree forage for themselves, two are quite sufficient, and should be given early in the morning and the last thing before the birds go to roost. In any case these will be the principal meals; but when the birds are kept in confinement they may have, in addition, a *scanty* feed at midday, provided the quantity be deducted from the other meals.

The first feeding should consist of soft food of some kind. The birds have passed a whole night since they were last fed; and it is important, especially in cold weather, that a fresh supply should as soon as possible be got into the *system*, and not merely into the crop. Now, if grain be given, it has to be ground in the gizzard before it is digested; and on a cold winter's morning the delay is anything but beneficial. But, for the very same reason, at the evening meal grain forms the best food which can be supplied; it is digested slowly, and during the long cold nights affords support and warmth to the fowls.

A great deal depends upon this system of feeding, which is opposed to the practice of some, who give grain for the breakfast, and meal, if at all, at night. It is certainly easier to throw down dry grain in a winter's morning than to properly prepare a feed of meal, which is accordingly given at night instead. Fowls so treated, however, are much more subject to roup and other diseases caused by inclement weather than those fed upon the system we recommend. Let the sceptical reader make one simple experiment. Give the fowls a feed of meal, say at five o'clock in the evening; at twelve visit the roosts and feel the crops of the birds. All will be empty; the gizzard has nothing to act upon, and the food speedily disappears, leaving with an empty stomach, to cope with the long cold hours before dawn, the most hungry

and incessant feeder of all God's creatures ; but if the last feed has been grain, the crop will still be found partially full, and the birds will awake in the morning hearty, strengthened, and refreshed.

With respect to the morning meal, when only a few fowls are kept, to supply eggs for a moderate family, this may be provided almost for nothing by boiling daily the potato peelings till soft, and mashing them up with enough sharps, slightly scalded, to make a tolerably stiff and dry paste. The peelings must be boiled soft and mealy, and chopped up rather small before mashing, and the sharps at least equal them in bulk. There will be sufficient of this if the fowls kept do not exceed one for each member of the household ; and as the peelings cost nothing, and the sharps very little, one-half the food is provided at a merely nominal expense, while no better could be given. A very little salt should be added, and in winter a slight seasoning of pepper will tend to keep the hens in good health and laying. This food may be mixed boiling hot over night, and covered with a cloth, or be put in the oven : in either case it will remain warm till morning—the condition in which it should always be given in cold weather.

Potato peelings may be, if necessary, eked out by scraps from the dinner table, and part of these are very valuable, especially the lean meat ; but caution is necessary. Often such scraps consist chiefly of bread-crusts and fat. In neither is there any appreciable egg-material, and if too much of them be given, prejudicial fattening with muscular weakness is sure to occur. They can be used to a certain extent, but if they abound, only to the extent that they shall not exceed between one-third to one-half the bulk of the food, the rest being made up of sharps, or sharps with a little bran. To give more will be no economy, owing to the evil effects. The green vegetables will be beneficial, if any are left. To

have much bread-scrap denotes of course great waste in a household. In any case, all the scraps used should go into the breakfast, and not be given in addition, as many do. Table scraps always need care and judgment in use.

If a tolerable stock of poultry be kept, such a source of supply will be obviously inadequate ; and in purchasing the food there is much variety to choose from. Small or "pig" potatoes may be occasionally bought at a low price and similarly treated, though experience proves that regular potato diet is not suitable, leading after a little to few eggs and derangement of the digestive system. Potatoes are nearly pure starch, and destitute of egg-making material. The peelings are, in fact, better than the inside alone, as food. The same may be said of rice. An equal mixture of barley-meal and "sharps," or of Indian meal and sharps, will make a capital food. Bran in place of the sharps sometimes seems to do very well, but has an awkward habit of every now and then causing inflammation of the bowels. In some places a cart-load of swede or other turnips, or mangel-wurtzel, may be purchased ; these when boiled and mashed with middlings or "sharps," we believe form the best soft food a fowl can have, especially for Dorkings ; but they cannot everywhere be obtained at a cheap rate, and the buyer must study the local market. Sharps should form *two-thirds* of all these mixtures.

A change of food at times is necessary, and in making it the poultry-keeper should be guided by the season. When the weather is warm, and the production of eggs abundant, the food should abound in nitrogenous or flesh-forming material, and not contain too much starch or oil, both of which, being carbonaceous, have warmth-giving and fattening properties ; but when the cold weather approaches, and the eggs even of good winter layers are fewer than in summer, some addition to the amount of carbonaceous food

will be needed. The following table has been often copied since its first publication by Mr. Tegetmeier, but its practical usefulness is so obvious that we make no apology for giving it here, with some modification to make the proportion of warmth-giving to flesh-forming ingredients more plain, and with the analyses corrected up to date.

There is in every 100 lb. of	Flesh-forming Food.	Warmth-giving Food.		Bone-making Food.	Husk or Fibre.	Water.
	Gluten, &c.	Fat or Oil.	Starch, &c.	Mineral Substance.		
Oats	15	6	47	2	20	10
Oatmeal	18	6	63	2	2	9
Middlings or } fine Sharps }	18	6	53	5	4	14
Wheat	12	3	70	2	1	12
Barley	12	1	56	4	14	13
Indian Corn ...	11	8	65	1	5	10
Rice	7	A trace.	80	A trace.	—	13
Beans & Peas..	24	2	48	2	10	14
Milk	4½	3	5	1	—	86½

To show the practical use of this table, it may be observed that whilst "sharps" or "middlings," from its flesh-forming material, is one of the best summer ingredients, in winter it may be advantageous for light fowls to change it for a portion of Indian meal. It is, however, necessary to avoid giving much maize to large fowls, either as meal or corn, else the effect will be a useless and prejudicial fattening from the large quantity of oil and starch it contains; it is best mixed with sharps or pea-meal, and is then, for the lighter breeds, an economical and useful food. Potatoes, as already remarked, are also not good in quantity as a regular diet for poultry; but mixed with bran or sharps will be found useful in due proportion, as above noted. The smaller and lighter breeds may have more of fattening foods

than the larger ones ; but Asiatics particularly are so liable to internal fat, that it is safest never to give them maize, and very little of potatoes.

One of the most valuable foods consists of heavy white oats ground up *fine*, like flour. This has to be done very carefully, with special stones, and for years was only obtainable in Sussex, where it is the common food of the young birds reared and fattened for the London market. It is rather difficult to mix into a friable mass, and a very little sharps or Indian meal helps this, or a portion of either of the baked biscuit meals now so widely sold. These are good food, but are better mixed with equal parts of raw meal of some sort. Oatmeal is, of course, first-rate food, but rather dear for common fowls.

In mixing soft food there is one general rule always to be observed: it should be scalded with boiling water, and mixed rather *dry*, so that a ball of it will break if thrown upon the ground. There should never be enough water to cause the food to glisten in the light, or to make a sticky porridgy mass, which clings round the beaks of the fowls, and gives them infinite annoyance, besides often causing diarrhœa. It is best mixed with the hands, and in the same way squeezed up into balls.

If the weather be dry, and the birds are fed in a hard gravelled yard, the food is just as well, or better, thrown on the ground. If they are fed in the shed, however, it is best to use a dish of metal or earthenware, which should have vertical sides as in Fig. 9, whatever its general shape may be. Such a trough or dish must, however, be protected, or the fowls may walk upon it, and waste a large portion. This is best prevented by having a loose curved cover made of wire, which, when placed on the ground over the dish, will effectually prevent the fowls having anything to do with the food except to eat it, which they are quite at

liberty to do through the wires, two and a half inches apart. On the whole, however, the best vessel for a few fowls is that shown in Fig. 10. The spreading bottom prevents the vessel from being overturned, and the straight sides and the top make it impossible to scratch food out. Such a vessel needs no cover, and also makes a good and simple water pan.

Where the fowls have a field to run in they will require no further feeding till their evening meal of grain. Barley is good, and in summer this may be occasionally changed with oats; in winter, for the reasons already given, Indian



Fig. 9.

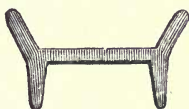


Fig. 10.

corn may be given to some breeds every second or third day with advantage. Buckwheat is very similar in chemical composition to barley, but better, and certainly has a stimulating effect on the production of eggs. We would never omit purchasing a good sack of this grain when possible, and have a strong opinion that the enormous production of eggs and fowls in France is to some extent connected with the almost universal use of buckwheat by French poultry-keepers.* Wheat was formerly too dear to be employed, unless damaged; and if the damage be great it had better not be meddled with; but of late years it has been, to the farmer's sorrow, a cheap grain, and when sound or little injured is a most valuable food both for chickens and fowls. Next to oats it is probably the best grain of all.

* It is a curious fact that buckwheat *used* to be largely grown in what are now the chief poultry-breeding counties of Surrey and Sussex.

"Sweepings" sometimes contain poisonous substances, and should never be seen in a poultry-yard.

The quality of all grain should be carefully looked after. Barley should be fair malting quality, not the cheap husky kind. Of oats, mixed horse-meat is useless; only heavy white oats, 40 lb. per bushel, are good for fowls. Much buckwheat offered is either old dried-up grain, or kiln-dried; it is the fresh dark grain that is wanted. Of maize, the small round sort is best. "Poultry mixture" should be religiously avoided. It always consists of the poorest samples, and prevents the birds getting any change. Give one good grain sample at a time, and if possible change it every week for some other.

The midday meal of penned-up fowls should be a very scanty one—a mere sprinkle of grain; and even this is worse than useless unless the other meals are sparingly given, as directed. Table scraps should never be used for this meal. More failures result in domestic poultry-keeping from thus giving starchy and fat food than from any other error in diet.

The regular and substantial diet is now provided for, but will not alone keep the fowls in good health and laying. They are omnivorous in their natural state, and require some portion of *animal* food. On a wide range they will provide this for themselves, and in such an establishment as figures at page 13, the lean meat scraps of the dinner table may be quite sufficient; but if the number kept be large, with only limited accommodation, it will be necessary to buy every week a few pennyworth of bullock's liver, which may be boiled, chopped fine, and mixed in their food, the broth being used instead of water in mixing; these little tit-bits will be eagerly picked out and enjoyed. A little is all that is necessary. When fowls, especially those not laying at the time, are much over-fed in confinement with

this kind of food, they are apt to develop various inflammatory diseases.

There is yet another most important article of diet, without which it is absolutely impossible to keep fowls in health. We refer to an ample and *daily* supply of green or fresh vegetable food. It is not perhaps too much to say that the omission of this is the proximate cause of nearly half the deaths where fowls are kept in confinement; whilst with it, our other directions being observed, they may be kept in health for a long time in a pen only a few feet square. It was to provide this that, wherever they are large enough, we recommended the open yards, when possible, to be laid down in grass—the very best green food for poultry; and a run of even an hour daily on such a grass plot, supposing the shed to be dry and clean, will keep them in health. But if a shed only be available, fresh vegetables of some kind must be given daily. Cabbage-leaves may suffice, though they are about the worst of green vegetables as regards tendency to diarrhoea. They or other refuse vegetables may be minced up and mixed pretty freely with the soft food; or the whole leaves may be thrown down for the fowls to devour; or a few turnips may be minced up daily, and scattered like grain, or simply cut in two and thrown into the run; or, if it can be got, a large sod of fresh-cut turf thrown to the fowls will be better than all. Lettuce-leaves and most garden refuse are very wholesome, also dandelion-leaves and other field salads. For fowls in a shed one of the best things is to cut a whole cabbage-head in half and hang it up by a string, which will give the fowls both green food and occupation. Something they *must* have every day, otherwise their bowels sooner or later become disordered, and their combs lose that beautiful bright-red colour which will always accompany good health and condition, and testifies pleasantly to abundance of eggs.

The water vessel must be filled fresh every day at least, and so arranged that the birds cannot scratch dirt into it or make it foul. The ordinary poultry-fountain is too well known to need description, but a better form, made in two parts, is shown in Fig. 11. The advantages of such a construction are that the interior can be examined, and the

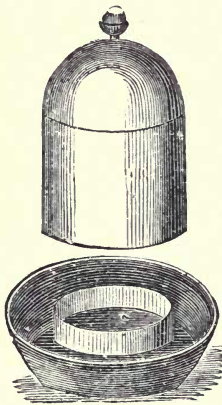


Fig. 11.

vessel well sluiced out to remove the green slime which always collects by degrees, and is very prejudicial to health. For large-combed breeds it is necessary to use shallow pans; but these must be filled frequently. When the water has to be placed in a shed filled with loose earth, to which the fowls are confined, it should be a little raised, and a piece of board or other protection be so placed as to protect it from dirt being scratched into it.

Grown-up fowls must never be left without water. During a frost, therefore, the fountain should be emptied every night, or there will be trouble next morning. Care must always be taken, also, that *snow* is not allowed to fall into the drinking vessel. The reason has puzzled wiser heads than ours, but it is a *fact* that any real quantity of snow-water seems to reduce both fowls and birds to mere skeletons.

It is well in winter to add to the water a few drops of a solution of sulphate of iron (green vitriol), just enough to give a slight mineral taste. This will in a great measure guard against roup, and act as a bracing tonic generally. The rusty appearance the water will assume is quite immaterial, but may be avoided by adding a few drops of sulphuric acid. The best plan, perhaps, is to keep a large

bottle of the celebrated "Douglas* mixture," respecting which we can speak with unqualified approval, as a most valuable addition to the drink in cold weather of both fowls and chickens. It consists of half a pound of sulphate of iron and one ounce of sulphuric acid dissolved in two gallons of water; and is to be added in the proportion of two table-spoonfuls to each pint of water in the fountain. Whilst the fowls are moulting, the above mixture, or a little sulphate of iron, should always be used; it will assist them greatly through this, the most critical period of the whole year; as also does a good pinch of powdered brimstone to each bird (mixed in the soft food) every other day, till the new plumage is nearly complete. With this aid, and a little pepper on their food, with perhaps a little extra meat, there will rarely be any lost at this time. With hardy kinds and good shelter such precautions are scarcely necessary; but they cost little, and have their effect also on the early re-commencement of laying.

In addition to their regular food it will be needful that the fowls have a supply of *lime*, in some shape or other, to form the shells of their eggs. Old mortar pounded is excellent; so are oyster-shells well burnt in the fire and pulverised; of the latter they are very fond, and it is an excellent plan to keep a large pan full of it in their yard. If this matter has been neglected, and soft shell-less eggs have resulted, the quickest way of getting matters right again is to add a little lime to the drinking water, or pound up some oyster-shells raw.

One thing more must on no account be forgotten. This is, some proportion of sharp grit or gravel, or other hard substances. Such small stones constitute *hen's teeth*, and without them the gizzard cannot perform its office of

* So called because published in the *Field* newspaper by Mr. John Douglas, then superintending the Wolseley Aviaries.

grinding up the food. We have seen fowls ailing from apparently this simple neglect alone. Flint grit is easiest to obtain, but some of that sold is too large and too sharp, and has been proved sometimes to lacerate the viscera. The best way is to make a few flints red-hot, and throw them into cold water; they will then pound up more easily, and in better condition.

Cleanliness in the house and run has already been insisted upon, and is only again alluded to on account of the value of the manure. This, collected daily, should be put in any convenient receptacle where it can be kept dry, and either used in the garden or if possible sold. It pays best to use it where possible. It should always be mixed with dry earth, soot, or fine dry ashes, before using, being very strong, and is especially valuable for all plants of the cabbage kind; it is also excellent for growing strawberries, or indeed almost anything if sufficiently diluted. If there be no possibility of so using it, it is valued by such nurserymen and gardeners as know its value; but there is often difficulty in finding those who do, and getting a fair price. There has been much dispute about this, and we have known the stored or half-dry manure sold as high as eight shillings per cwt., and as low as one shilling and sixpence; but all such uncertainty should be set at rest by the analysis of the late Dr. Voelcker, which will be found at page 97. Sometimes it will be taken by a nurseryman or gardener in part payment for things bought or work done. It should be used to profit in some way if possible.

Where a considerable number of fowls are killed annually, the feathers also become of value, and may be preserved. They are very easily dressed. Strip the plumage from the quills of the larger feathers, and mix with the small ones, putting the whole loosely in paper bags, which should be hung up in the kitchen, or some

other warm place, for a few days to dry. Then let the bags be baked three or four times, for half an hour each time, in a cool oven, drying for two days between each baking, and the process will be completed. Less trouble than this is often made to suffice; but the feathers are inferior in crispness to those so treated, and may occasionally become offensive.

Eggs should be collected regularly, if possible twice every day; and if any chickens are to be reared from the home stock the owner or attendant should learn to recognise the egg of each particular hen. There is no difficulty in this, even with a considerable number: nearly every egg, to the accustomed eye, has a well-marked individual character; and if there be any hens of value it may save much disappointment in the character of the brood to know the parentage of those selected for hatching.

There is, finally, the important matter of general plan and method to be considered. When poultry are kept as a branch of domestic economics, it will be obvious that the system to be pursued should vary according to the extent of accommodation which can be afforded, and to the object sought. It frequently happens that a regular supply of eggs is the sole object in view: and indeed if a covered shed fenced in with wire, as described in the last chapter, with a small house at the end for roosting and laying in, be the sole accommodation for the fowls, to attempt *rearing* them would be folly; and yet they may be *kept* so as to yield a good return upon their cost and maintenance.

The proper plan in such a case will be to purchase in the spring a number of hens proportioned to the size of the run, and none exceeding a year old. A cock is useless, as hens lay very nearly as well without one; and where eggs only are wanted, this is balanced by his food and his room. All these birds, if in good health and condition, will either

be already laying, or will commence almost immediately; and if properly managed will ensure a constant supply of eggs until the autumnal moulting season.* Whenever a hen shows any desire to sit, the propensity must be checked by placing her under a coop on hard ground, with water, but rather scanty food, keeping her in summer, however, sheltered from the sun. But it is much better to avoid all this by keeping only a non-sitting breed, such as one of the Spanish, Leghorn, Hamburgh, or French varieties. Hamburghs should not be kept in only a confined shed.

To buy only young and healthy birds is very important. An experienced hand can tell an old fowl at a glance, but it is rather difficult to impart this knowledge to a beginner, for no one sign is infallible. In general, however, it may be said that the legs of the young hen look delicate and smooth, her comb and wattles soft and fresh, and her general outline, even in good condition (unless fattened for the table), rather light and graceful; whilst an old one will have rather hard, horny-looking shanks, her comb and wattles look somewhat harder, drier, and more "scurfy," and her figure is well filled out.

Attempt should also be made to secure birds of a really good laying *family* or strain, for each breed differs much in individuals. Good laying is now beginning to be bred for as much as fancy points; and such birds, or eggs from them, are now advertised in the principal poultry papers. Perhaps their somewhat higher price may be an objection for a small family stock, however; and to a large extent good layers can be selected even by "eye." They will usually have

* It is as well, and often better, to start with April pullets purchased about October. Our only reason for not recommending this so much to the absolute beginner, is that he may get into the habit of attending to the fowls before the winter comes on, when it might be felt more of a tax if confronted all of a sudden.

combs rather larger than the medium of their breed, but not too large, very fresh and red-looking faces, and a neat, alert, intelligent expression. A faded, dispirited look in a bird is a sure sign of a poor layer.

Directly these hens stop laying in the autumn, and before they have lost condition by moulting, they should, unless they have proved *very* satisfactory, be either killed or sold off, and replaced by pullets hatched in March or April, which will have moulted early. These again, still supposing proper food and good housing, will begin producing eggs by November at furthest, and continue, more or less, till the February or March following. They may then either be disposed of and replaced as before, or, as they will not stop laying long, be retained till the autumn, when all but very excellent layers must be got rid of; such are worth keeping for another year. But if fowls be kept for eggs, it is essential to success that *every autumn* the older stock be thus replenished with pullets hatched early in the spring.* By no other means can eggs at this season be relied upon, and the poultry-keeper must remember that it is the *winter* determines whether he shall gain or lose; in summer, it only kept moderately clean, hens will pay for themselves treated almost anyhow.

When chickens are to be reared there is a wider choice, embracing breeds that lay the coveted brown egg. Of these may be mentioned Plymouth Rocks, Brahmas, Langshans, Wyandottes, and others; but the qualities of various breeds are more fully dealt with in our later chapters.

We prefer pure breeds, or first crosses; but the cost of a pure stock will stand in the way with many, and has to be taken into consideration. Pure stock has now become so

* Exhibitors now hatch so very early in the year that it may be well to say we mean from the middle of March to the end of April. The *very* early pullets often lay in late summer and then moult.

widely distributed that the common or mongrel fowls of the country are enormously improved compared with what we remember in our youth; and so far as domestic results go, equal success may now be attained with *good* ordinary or "barn-door" fowls. Care must be taken in the selection. They should be young, sprightly-looking birds, and for laying, with nice *tight-looking* plumage. They ought to be chosen from a country yard where their parents have been well fed. If such be obtained, they will repay the purchaser, and are handsomer and better every way than *inferior* birds of the "fancy" class. Of course this last remark does not apply to mere faults of colour. Fowls are often to be met with at a moderate price, which from some irregularity of feather are quite disqualified as show birds, but which possess all the economic merits of the breed to which they belong.

Before concluding, it may be expected that something definite should be said respecting the actual profit of domestic poultry-keeping. It is extremely difficult to make any such statement, so much depends upon the price of food, upon the management, selection of stock, and value of eggs. But in general we have found the average cost of fowls, when properly fed, to be about 1d. per week each for smaller sorts, and not exceeding $1\frac{1}{2}$ d. per week for the larger breeds; when the cost is more we should suspect waste. A good *ordinary* hen ought to lay 120 eggs in a year, and if good laying breeds are selected there ought to be an average of fully 150, not reckoning the cock. Of course, good management is supposed, and a regular renewal of *young* stock, as already insisted upon. For domestic purposes eggs ought to be valued at the price of new-laid, and from these data each can make his own calculation.

Let the whole undertaking (large or small) be conducted

as a real matter of business. If more than three or four hens are kept, buy the food by the bushel or hundred-weight, or in still larger quantities. Let a fair and strict *account* be kept of the whole concern. The scraps of the house may be thrown in, and the cost of the original stock, and of their habitation, may be kept separate and reckoned as capital invested; but let everything afterwards for which *cash* is paid be rigorously set down, and on the other side, with equal strictness, let every egg or chicken eaten or sold be also valued and recorded. This is of great importance. The beginner may perhaps manage his laying-stock well, but succeed badly with his chickens (though not, we hope, if he be a reader of this book), or *vice versâ*; and it is no small matter in poultry-keeping, as in any other mercantile concern, to be able to see from recorded facts *where* has been the profit or where the loss. The discovery will lead to reflection; and the waste, neglect, or other defective management being amended, the hitherto faulty department may contribute its quota to the general weal.

It has been a great gratification to us to observe the immense increase of this kind of domestic poultry-keeping during the last twenty years, as seen especially from any railway, in the small London suburban gardens. Since sound practical teaching has become more widely disseminated, we seldom hear the old sneer about "every egg costing sixpence," and in proof that this is not so we will conclude this chapter with one practical example. The actual figures were personally given us by the proprietor, who started his small establishment with no knowledge and no guide except an earlier edition of this work (on account of which fact the result was communicated). A small house and yard were put up at a cash cost of £1 7s. 10½d., nothing being reckoned for labour and a little waste material such as is generally to be found in a house, but

the odd halfpenny being religiously put down as the cost of a candle used to work by. On October 13th, 1885, four pullets were bought at a cost of 13s., including carriage, no cock being kept on account of neighbours: they were cross-bred, and bought on the sole guarantee that they were "well reared and hatched in March." The first egg was laid on November 13th, and subsequently these four pullets produced—in November 8 eggs, December 31, January 42, February 47, March 78, April 60, May 80, June 84, July 82, and up to August 21st, 34—in all 546. At the latter date the experiment was unfortunately broken up by an unforeseen removal. No absolute account was kept, as very many eggs were given away, but the food cost £1 os. 10½d. during the whole period, besides a few house-scrap; on this basis anyone may reckon the cost of the eggs as he pleases. The birds were *not* non-sitters, and occasionally became broody, but nevertheless averaged 136 each in the time stated. As moult was approaching, only few more would probably have been laid, but the experiment shows what may be expected when the system here described is fairly carried out, even with cross-bred fowls.

CHAPTER III.

NATURAL HATCHING AND CHICKEN REARING.

MUCH disappointment in the hatching and rearing of young broods would be prevented were more care taken that the eggs selected for setting were of good quality—not only likely to be fertile, but the produce of strong and hardy birds, with not too many hens in one harem. From scraggy, half-starved fowls it is impossible to rear a large brood, as the greater number even of those hatched will die in infancy. As to the number of hens, that will depend

on circumstances, and must be diminished for very large breeds or for confinement, or for winter and very early spring, or for a cock in his second or later years. On a wide range in summer a Houdan cockerel might have 20 hens, but an adult Brahma cock in February ought not to have more than three, and never more than five or six, even on good range.

Eggs have been known to hatch when two months old ; but we would never set, from choice, any egg which had been laid more than a fortnight ; and after a month, or less, it is useless trouble. Fresh eggs, if all be well, hatch out in good time, and the chicks are strong and lively ; the stale ones always hatch last, being perhaps as much as two days later than new-laid, and the chickens are often too weak to break the shell. We have also invariably noticed, when compelled to take a portion of stale eggs to make up a sitting, that even when such eggs have hatched, the subsequent deaths have principally occurred in this portion of the brood ; but that if none of the eggs were more than four or five days old, they not only hatched nearly every one, and within an hour or two of each other, but the losses in an ordinary season were few.

There is one partial exception to this statement, which is only generally true in reference to breeding at the *natural seasons*. Nature does not, however, intend fowls to breed in winter ; and during that season and very early spring, the male birds are far less vigorous. This is partly shown in sterile eggs, which need no comment. But growth in the egg and final hatching out are as much tests of and taxes upon strength, as anything in the future lives of the chickens ; and hence many eggs which begin to develop, have not *strength* to finish, or if they do, may not have muscular strength for what is really the great exertion of final hatching.

When the eggs are from home stock, their quality should be above suspicion. In order to ensure this, every egg before storing should have legibly written upon it in pencil the date on which it was laid. Eggs intended for sitting are best kept in bran, the *large* end downward, or else upon their sides and gently turned every day. They should never be exposed to concussion. Another very good plan is to have a large board pierced with a number of round holes in regular rows to receive the eggs.

Hundreds of years ago it was thought that the sex of eggs could be distinguished by the shape—the cocks being produced from those of elongated shape, and hens from the short or round. Others have pretended to discern the future sex from the position of the air-bubble at the large end. These and every other nostrum have, hundreds of times, been proved to be erroneous. There is not a breeder of prize poultry in England who would not gladly give twenty pounds for the coveted knowledge, and thenceforth breed no more cockerels than he really wanted; but the secret has never been discovered yet, and it is also impossible to tell, before the egg has been sat upon for a short time, whether it has been fecundated.

We have, in a previous chapter, already mentioned that the sitting hens ought to have a separate shed and run provided for them, in order that the other hens may not occupy their nests during absence, or they themselves go back to the wrong ones, as they will often do if allowed to sit in the fowl-house. An extensive run is neither necessary nor desirable, as it only entices the birds to wander, whereas in a limited space they will go back to their nests as soon as their wants are satisfied. A shed five feet square, with a run the same width for ten feet out in front, is quite sufficient for a hen.

It is best to take each hen off at a regular time every

morning, and after seeing to her wants and due return, to shut her in so that she cannot be annoyed. She should be lifted by taking hold under the wings, gently raising them first to see that no eggs are enclosed. This is the usual plan, and the only practicable one in very large establishments. But it takes time to see all the hens safely back and shut in again, and when we possessed a rather large yard for some years, and were away all day, we preferred to allot half a dozen *separate* pens for as many separate hens; these were taken off as usual, but were left to find their own way back again. Under the shed must be, besides the nest, a good-sized shallow box of sand, dry earth, or fine coal ashes, for the hen to cleanse herself in, which she specially needs at this time; and food and water must be *always* ready for her. With these precautions the hen may, without very much risk, be left entirely to herself. But it is much safer to take her off, and decidedly safer to see her back again.

Most medium-sized hens which do not belong to the non-sitting breeds, make good mothers; and so do Cochins and Brahmas. Dorkings are exemplary, and go with their chickens a long time, which recommends them strongly for very early broods. And lastly, a Game hen has qualities which often make her valuable. She is not only admirable in her care, and a super-excellent forager for her young brood, but will defend them to the last gasp, and render a good account of the most determined cat that ever existed. Some people have said that only mature hens should be allowed to sit, and that pullets are not to be trusted; but our experience does not confirm this. We have constantly set pullets, and never had any more reason to complain of them than of older birds.

The nests may be arranged under the shed any way so that no one can see into them, with the one proviso that

they be actually *upon the ground*. It is only necessary the hen should be protected from wind and rain, in order to avoid rheumatism; and this is most effectually done by employing for the nest a tight wooden box, like Fig. 12, open at the bottom, and also in front, with the exception of

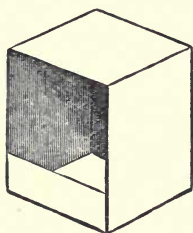


Fig. 12.

a strip three inches high to contain the straw. Let one of these be so placed in the back corner of a shed, touching the side, the front being turned to the back wall, and about nine inches from it, and the hen will be in the strictest privacy, will be perfectly sheltered, and kept cool, and never mistake her own nest for the one which may be placed in the other corner.

At ordinary seasons a damp situation is best for the sitting shed, and will ensure good hatching in hot weather, when perhaps all the neighbours are complaining that their chicks are dead in the shells. Attempting to keep the nest and eggs *dry* has ruined many a brood. It is not so in nature; every morning the hen leaves her nest, and has to seek her precarious meal through the wet grass, which drenches her as if she had been ducked in a pond. With this damp breast she returns, and the eggs are duly moistened. But if the nest be dry, the hen be kept dry, and the weather happen to be hot and dry also, the moisture within the egg itself becomes dried to the consistency of glue, and the chick, being unable to *move round* within the shell, cannot fracture it, and perishes. Such a mishap will not happen if the ground under the nest be damp and cool. All that is necessary in such a case is to scrape a slight hollow in the bare earth, place the nest-box, already described, over it, and put in a moderate quantity of straw, well broken. Care must be taken to well fill up the corners

of the box, or the eggs may be rolled into them and get addled. Some prefer to put in first a fresh turf, and this is a very good plan. Always make up a hatching-nest with perfectly fresh and clean materials.

Should an egg be broken in the nest (and the nest should be examined every two or three days, when the hen is absent, to ascertain), the eggs must be removed, and clean straw substituted, and every sound egg at all soiled by the broken one be washed with a sponge and warm water, gently but quickly drying after with a cloth. The hen, if very dirty, should also have her breast cleansed, and the whole be replaced *immediately*, that the eggs may not be chilled. A moderate hatch may still be expected, though the number of chicks is always more or less reduced by an accident of this kind. If, however, the cleansing be neglected for more than a couple of days after a breakage, or less at the latter period of incubation, probably not a single chick will be obtained; whether from the pores of the shell being stopped by the viscid matter, or from the noxious smell of the putrefying egg, it is not very material to inquire

Every egg should be marked quite round with ink or pencil, so that if any be subsequently laid in the nest they may be at once detected and removed. Hens will sometimes lay several eggs after beginning to sit.

In winter the hen should also be set on the ground, giving her, however, rather more straw. Whenever the weather be very dry, in April or later, it may be necessary during the last half of the hatching period to sprinkle the eggs freely with tepid water once a day, removing the hen for the purpose at night, and replacing her at once. Of course this is *always* necessary to success, in dry weather at least, when the hen is set in a box at a distance from the ground, as is the case in large sitting-houses. But we much

prefer the natural moisture of a damp soil, which may be supplemented by pouring warm water on the ground freely, round the nest, several times a week. The application of water must therefore depend upon the weather and common sense. In damp springs none is needed: in dry times, more or less according to circumstances.

When the number of eggs set yearly is considerable, it is worth while to withdraw the unfertile ones at an early

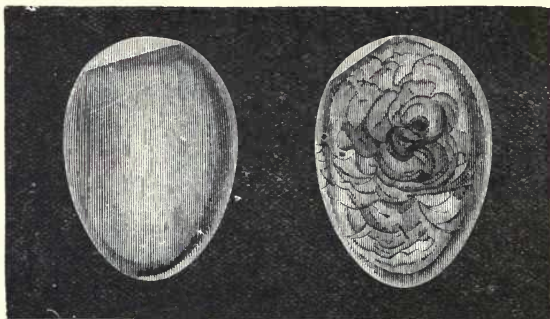


Fig. 13.—Sterile and Fertile Eggs.

period. About the eighth day let the hen be removed by candle-light, and each egg be held between the eye and the light. If the egg be fertile, it will appear opaque, or dark all over, except, perhaps, a small portion towards the top; but if it be unimpregnated, it will be still translucent, the light passing through it almost as if new-laid (Fig. 13). After some experience, and by using one of the various "egg-testers" sold for the purpose, which more completely stops the light, the eggs can be distinguished at an earlier period, and a practised hand can tell the unfertile eggs even at the fourth day. Should the number withdrawn be considerable, four batches set the same day may be given to three hens, or even two, and the remainder given fresh eggs; but if not,

the fertile eggs will get more heat, and the brood come out all the stronger. The sterile eggs are also worth saving, as they are *quite good* enough for cooking purposes, and quite as fresh even for boiling as nine-tenths of the Irish eggs constantly used for that purpose.

It is a common mistake to set too many eggs. In summer, a large hen may have thirteen, or a Cochin fifteen of her own, but in early spring eleven are quite enough. We have not only to consider how many chickens the hen can hatch, but how many she can *cover* when they are partly grown. If a hen be set in January, she should not have more than seven or eight eggs, or the poor little things, as soon as they begin to get large, will have no shelter, and soon die off. It is far better to hatch only six and rear five, or may be all, to health and vigour, than to hatch ten and only probably rear three puny little creatures, good for nothing but to make broth. For April and May broods, such a limitation is not needed; but even then eleven or twelve chickens are quite as many as a large, well-feathered hen can properly nourish, and the eggs should only be one or two in excess of that number.

A good hen will not remain more than half an hour away from her nest, unless she has been deprived of a dust-bath, and so become infested with lice, which sometimes cause hens thus neglected to forsake their eggs altogether. When a hen at the proper time shows no disposition to return, she should be quietly driven and coaxed towards her nest; if she be caught and replaced by hand, she is often so frightened and excited as to break the eggs. A longer absence is not, however, necessarily fatal to the brood; and it is no use, and only makes matters worse, to be over-fidgety. People who know the most always fuss the least. We would rather a hen went back in twenty minutes; but if she stayed half an hour we should let her,

and trust that all would probably be right. We have had hens repeatedly absent more than an hour, which still hatched seven or eight chicks; and on one occasion a hen sitting in the fowl-house returned to the wrong nest, and was absent from her own more than five hours. We of course considered all chances of hatching at an end; but as the hen had been sitting a fortnight, concluded to let her finish her time, and she hatched five chickens. We have heard of a few hatching even after *nine* hours' absence, and therefore would never, on account of such an occurrence, abandon valuable eggs before the end.

The chickens break the shell at the end of the twenty-first day, on an average; but if the eggs are new-laid it will often lessen the time by as much as five or six hours, while stale eggs are always more or less behind. Small breeds generally hatch a day or two earlier. If the eggs were fresh, and proper care has been taken to preserve moisture during incubation, no assistance is ever needed at the actual hatching. When there are chicks alive which cannot break the shell, they may sometimes be saved by careful extrication, keeping the egg in warm water at 100° the while, all but the point of the beak. These cases usually arise from want of moisture, and it is *some* preventive to "test" the eggs twenty-four hours before hatching by immersion in a pail of water at 106°. After a few minutes the "live" ones float and bob about in a curious manner; but they must be watched patiently, for sometimes they wait a while; the dead ones should be rejected. The soaking seems to do the eggs good; but it is not advisable for absolute novices to fuss too much with these expedients, which are not really needed in the vast majority of cases.

For nearly twenty-four hours after hatching, chickens require no food, and though we do not think it best to leave them quite so long as this without it, we should let

them remain for at least twelve hours undisturbed. We say undisturbed, because it is a very common practice to take those first hatched away from the hen, and put them in a basket by the fire till the whole brood is out. When the eggs have varied much in age this course must be adopted; for some chickens will be perhaps a whole day or more behind the others, and the hen, if she felt the little things moving beneath her, would not stay long enough to hatch the rest. But if the eggs are all fresh, the chicks will appear within a few hours of each other. In that case they are much better *left with their mother*; the heat of her body appears to strengthen and nourish them in a far better manner than any other warmth, and they are happy and contented, instead of moving restlessly about, as they always do whilst away from her.

Our own plan is to set the eggs in the evening, when the chicks will break the shell in the evening also, or perhaps the afternoon. Then at night let the state of the brood be *once* only examined, all egg-shells removed from the nest, and the hen, if she be tame enough to receive it, given food and water. Let her afterwards be so shut in that she cannot leave her nest, and all may be left safely till the morning. By that time the chicks will be strong and lively, quite ready for their first meal; and unless some of the eggs are known to be very stale, any not hatched then are little likely to hatch at all. If this be so, the chicks may be removed and put in flannel by the fire, and another day patiently waited, to see if any more will appear. We should not do so, however, if a fair number had hatched well; for they never thrive so well away from the hen, and it is scarcely worth while to injure the healthy portion of the brood for the sake of one or two which very probably may not live after all.

The first meal should be given *on the nest*, and the best

material for it is an equal mixture of hard-boiled yolk of egg chopped up very fine and mixed with bread and milk. Let the hen be allowed to partake of this also—she needs it—and then give her besides as much barley as she will eat, and offer her water, which she will drink greedily. To satisfy the hen *at first* saves much restlessness and trouble with her afterwards.

There is a stupid practice adopted by many, of removing the little horny scale which appears on every chicken's beak, with the idea of enabling them to peck better, and then putting food or peppercorns down their throats, and dipping their bills in water to make them drink. It is a mistake to say that if this does no good it can do no harm: the little beaks are very soft and tender, and are often injured by such barbarous treatment. *Leave them alone.* If they do not eat or drink—and chickens seldom drink the first day—it only shows they do not wish to; to fill an empty stomach is the first and universal instinct of all living things.

The brood having been fed, the next step will depend upon circumstances. If, as we recommend, the chickens were hatched the night before, or be well upon their legs, and the weather be fine, they may be at once moved out, and the hen cooped where her little ones can get the sun. If it be winter, or settled wet weather, the hen must, if possible, be kept indoors, or else be cooped under a dry shed or outhouse. Under such a shed a plain basket coop will do very well.

When a shed is not at command, the best coop for chickens we are acquainted with is one we made and described years ago, the chief feature of which is a *raised inside floor*. This coop is shown in Fig. 14, and the floor in Fig. 15. The best size is two feet square, for which twelve-foot planks, nine inches wide, will cut all the lengths without

waste ; besides this will be needed some inch-square stuff to serve as framing at each corner, and along top and bottom of the front. To these pieces the boards are nailed, and we have made three coops complete in an afternoon. Each side takes two boards two feet long, and a half board cut diagonally ; the back, two boards. The top requires three boards, each one-fifth of a plank, with slats cut from the

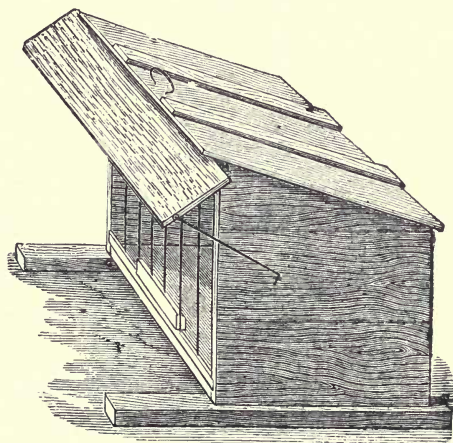


Fig. 14.—Shelter-coop.

same length over the joins ; and the fifth piece is used in front as shown. The front may be either wires inserted into the top and bottom rails, as shown, or be made of laths nailed on.

This roof, when nailed on, thus projects an inch and a half all round the coop ; but besides this there is a loose shelter-board hinged to the front of the roof, so as to be capable of detachment. This is easily done by driving two small staples into the under side of the roof, into which lock small hooks driven into the edge of the board. In a coop

thus sheltered, chickens may be left out in any weather, as we have proved for years. Much depends upon a dry floor, however, and this can only be secured by an *inside* raised floor. Fig. 15 shows the construction. The boards *a a* are nailed on the pieces of quartering, *b b*, so as *not to reach the edges*, as shown. They are cut such a size also, that the

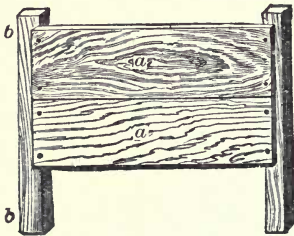


Fig. 15.—Floor of Coop.

coop fits down on the quartering *outside* the floor, loosely, all round, the quartering being also sloped off so as not to retain wet under even the edges of the coop. Such a floor will be quite dry in any weather. Or the floor may stand up inside the coop, on the ground. But it is better as drawn, because the long ends of the quartering in front, shown in both figures, are convenient for laying another board upon, on which the food and water can be placed. Or this feeding-board may be hinged to the bottom of the coop, and fastened up at night against the front, to keep all in until attended to in the morning. Since we first figured this coop, patterns closely resembling it, or with various modifications, have been catalogued by many manufacturers, and can be bought ready-made at a cheap rate.

The ordinary basket coop is only fit to be used under a shed, or in perfectly fine weather, when it is convenient to place on a lawn. Some straw, weighted by a stone, or other covering, should however be placed on the top, to give shelter from the mid-day sun.

Chickens should always, if possible, be cooped near grass. No single circumstance is so conducive to health, size, and vigour, supposing them to be decently well cared for. Absolute cleanliness is also essential, even more than for grown

fowls ; and the reason why difficulty is often experienced in rearing large numbers is, that the ground insensibly becomes tainted with their excrements. The coop should, therefore, either be moved to a fresh place every day, or the dry earth under be carefully renewed. The detached wooden bottom just described should be covered every morning and evening half an inch deep with perfectly dry earth, or fine sifted ashes. The ashes are renewed every evening in five

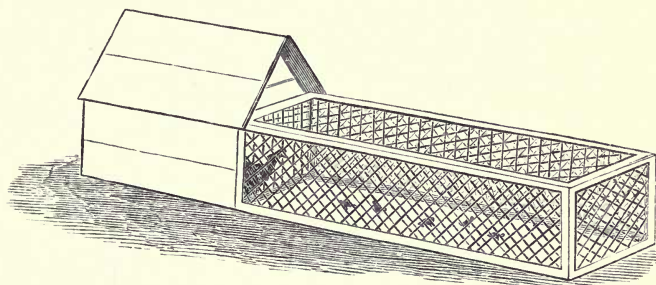


Fig. 16.—Protected Chicken Run.

minutes, and form a nice warm bed for the chicks, clean and sweet, and much better than straw.

Cats sometimes make sad inroads on the broods. If this nuisance be great, it is well to confine the coveted prey while young within a wire-covered run. And the best way of forming such a run is to stretch some inch-mesh wire-netting, two feet wide, upon a light wooden frame, so as to form wire hurdles two feet wide and about six feet long. These are easily lashed together with string to form a run and may be covered by similar hurdles (Fig. 16). In such a run all animal depredations may be defied, until the chicks are a fortnight old ; it also saves a world of trouble and anxiety, and prevents the brood wandering and getting over-tired. But after that age the chicks suffer, unless the

run can be made much more extensive than here shown. These wire runs are also largely sold in lengths as desired. They need moving every day or two to clean ground.

An enclosed run for chicken-rearing can generally be protected from cats by a sufficiently high wire fence, with no top rail. The wire must, however, be carried, or at least a narrower strip of it, up above the top, on the inside, of any wall or inner edge of a roof or fence which cats can walk along. We always found this effectual except in one case, and that cat mysteriously disappeared!

With regard to feeding, if the question be asked, "What is the *best* soft food for chickens, irrespective of price?" the answer must decidedly be—"Oatmeal." After the first meal of bread-and-milk and egg no food is equal to it, if *coarsely* ground, mixed with a little bread-crumbs and finely-cut fresh grass, and only moistened so much as to remain crumbly. The price of oatmeal is, however, so high as to forbid its use in general, except for valuable broods; but we should still advise it for the first week, in order to lay a good foundation. It may be moistened either with water or milk, but in the latter case only sufficient must be mixed for each feeding, as it will turn sour within an hour in the sun, and in that condition is very injurious to the chickens. Spratt's well-known food, or any other similar biscuit meal, is also most excellent for rearing chickens upon, but still better mixed and scalded with oatmeal.

We do not like giving egg more than one day; to do so often causes constipation, and this (by reaction) diarrhœa. But a little cooked meat, minced fine, should be given once a day till the chicks are about three to four weeks old. The cost of this will be inappreciable, as a piece the size of a good walnut is sufficient for a whole brood; and the chickens will have more constitution and fledge better than if no animal food is supplied.

After a day or two some grain must be given in addition, and a little later a grain meal should alternate with each soft meal, or nearly so. Chopped grits may be given even the first day, and the whole grits when three days old. Chicks seem to prefer grits to anything, but it is too costly diet for more than a week or two. After that, cracked and then whole wheat, dari, buckwheat, etc., will be eaten. Barley is never relished till they get large, and should not be used unless cracked into fragments, when they will often eat it heartily. A little hempseed and canary may be used when a treat is needed, as it sometimes is; but the staple grain will be as above. Millet is also excellent for them. Unless chickens have a fair proportion of grain, and access to small grit or gravel, their gizzards have no adequate work, and trouble follows.

Food must be given very often. For the first month every two hours is not too much, though less will do; from one to two months old, every three hours; and after that three or four times a day will be sufficient. To feed *very often*, giving just enough *fresh* food to be entirely eaten each time, and with occasional *changes*, to keep the appetite and digestion vigorous and keen, is the one great secret of getting fine birds. If the meals are fewer, and food be left, it gets sour, the chicks do not like it, and will not take so much as they ought to have.

After the first week the oatmeal can be changed for cheaper food. We can well recommend any of the following, and it is best to change from one to another, say about every fortnight. An equal mixture of "sharps" and barley-meal, or "sharps" and biscuit-meal, or *fine* bran and Indian meal; or of bran, oatmeal, and Indian meal. The last our own chickens liked much, and as the cheap bran balances the oatmeal, it is not a dear food, and the chicks will grow upon it rapidly. Rice is poor food,

except for Bantams, which it is desired to keep small; but boiled rather dry, a little dripping or suet stirred in, and the greasy pellets rolled in "sharps," rice makes an occasional change which is greedily relished.

Bread sopped in water is the worst possible food for chickens, causing weakness and general diarrhœa. With milk it is better, but not equal to meal.

Green food is even more necessary to chickens than to adult fowls. Whilst very young it is best to cut grass into very small morsels for them with a pair of scissors, and mix liberally in the food; afterwards they will crop it for themselves if allowed. Should there be no grass plot available, cabbage or lettuce leaves, or cress, or dandelion, or salad of *some* kind, must be regularly given—minced small at first, but thrown down whole as soon as the beaks of the chickens are strong enough to enable them to help themselves.

In winter or very early spring the chickens must, in addition to the above feeding, have more stimulating diet. Some underdone meat should be continued regularly, and a drink of warm milk early in the morning is of particular service.* They should be fed about nine or ten o'clock at night, by candle-light, and *early* in the morning. In no other way can Dorkings or Spanish be successfully reared at this inclement season, though the hardier breeds will often get along very well with the ordinary feeding. Dryness and care and shelter, with liberal feeding, will rear chickens at the coldest seasons. But shelter they *must* have; and those who have not at command a large outhouse or shed to shelter them while tender, should not attempt to raise winter or early spring chickens—if they do, the result will

* This applies either to very young chickens, or cold weather. Chickens of any growth should not have milk in mild weather, unless they are being fattened.

only be disappointment and loss. It may, however, be as well to state that there is no place so bad as a greenhouse, which almost always causes cramp, the great difficulty in early chicken-rearing. Some *loose dry* material under foot in the shed, and free run out, are what they require, and with these requirements there will probably be little trouble in any domestic operations. This subject of cramp will be more fully dealt with in Chapter IV.

There is a further important question as to what should be allowed chickens in the way of drink. The usual plan has been to let them have water by them *ad libitum*, the fresher and cooler the better; and we have shared this general practice with others. There have, however, always been exceptions to this rule amongst country rearers, especially some who have inherited traditions of Game-fowl rearing; and during the last few years there have been on several occasions lengthy discussions in the poultry papers as to whether it is not better, for about the first four weeks, to withhold water altogether, where the chickens are fed chiefly on soft food, except so far as fluid may be contained in the latter.

A careful and exhaustive analysis of all that we have been able to meet with on both sides of this question has led us to the conclusion that the preponderance of experience is upon the side of withholding water. It is to be remarked that by far the greater part of what has been said on this side consists of actual evidence as to extremely good results from this mode of treatment, and in many cases of very great improvement in results after its adoption. On the other side, a very large proportion of what has been said against it consisted of mere declamation against the supposed "cruelty." It need hardly be pointed out that there can be no *real* "cruelty" in any course of treatment which rears more chickens, if the fact be so.

And when appeal is made to "Nature," and we begin to think about it, Nature herself is, if anything, rather on the side of the dry method. The young of all small birds, at least, are reared without water. The fowl itself is believed to be an Indian bird of the jungles; and in such localities it is certain that even the old birds can only drink at long intervals, and that days must elapse, often, before young and tender broods can thus indulge. How much less can water be really required where a large portion of the food itself is mixed with fluid, as in our artificial rearing!

At all events, there is a considerable body of evidence to the effect that a large amount of the diarrhoea and other bowel complaints of young chickens is due to unlimited supplies of fluid in addition to soft food; and that many have left this off with marked advantage. Some have deprived the chickens of drink entirely for the first month; others have allowed one fair drink in the morning after breakfast (preventing any excess), and then taken it away, giving the hen drink separately. The chickens in most seasons get some drink from the dew upon the grass, and in these small quantities it is probably less injurious to them. They can be seen drinking in this manner; and the fact suggests that some little should depend upon the season. Where they are hatched very late, and the weather is hot and dry, such a regimen should not be insisted upon, especially if fed chiefly upon grain, though even then we are convinced that "water by measure" will be the best plan. But in spring, where soft food is given largely, we are disposed to think that no water in addition, beyond one drink after breakfast, and possibly a few sips, and no more, at night, will be found the best regimen.

The only actual evidence we have seen of any evil from this course, has been when the writers have adopted it with chickens a few days or more old. This is natural: such

changes should not be made with young things of any kind. Those once accustomed to drink must suffer by deprivation ; and if any change is made, it should be very gradually, and not carried to the extreme. The very worst effects of all are produced by allowing young birds to drink to repletion after prolonged thirst. But it has been noticed that chickens reared on the dry system are much less prone to this in after life.

At the age of four months any surplus chickens, if of the larger breeds, should be grown enough for the table ; and if they have been well fed, and come of good stock, they will be. For home use we say, let them be eaten as they are—they will be quite fat enough. Fattening is also a rather delicate process, success in which it takes some experience to acquire, and which must be treated in a separate chapter.

CHAPTER IV.

ARTIFICIAL HATCHING AND REARING.

To give a history of even the principal attempts that have been made to hatch chickens by heat artificially applied would far exceed our limits, and would be of no practical use. More or less elaborate machines have been constructed by Cantelo, Minasi, Vallée, Carbonnier, and others in France ; and by Brindley, Schröder, and others in England. We refer here merely to the old school. All were costly machines, and all were more or less successful in hatching with skilled management, but none were *generally* successful. We believe M. Vallée to have been the first to employ a self-acting valve to regulate the temperature ; and Mr. Schröder was, we believe, the first to provide free ventilation from the centre of the egg-drawer, and, above all, a *cold-water tank under the eggs* to provide a moist

atmosphere ; a point further experience has shown to be of much importance, though actual tanks of water are no longer employed. After Mr. Schröder's machine many others were brought forward, and in the United States Mr. Jacob Graves and others constructed elaborate incubators. The principal object with all inventors was to ensure an equable temperature, but few of the ingenious contrivances employed really secured this, and adequate attention was not, as is now known, paid to the *proper amount* of dampness, or to purity of the atmosphere.

In 1877 the practice of artificial hatching was revolutionised by what was termed a "Hydro-Incubator," exhibited by Mr. T. Christy, at the Dairy Show held at the Agricultural Hall, London. This machine was modelled upon one used for some little time previously with success in France, made by Messrs. Roullier and Arnoult, and it consisted in the main of a large hot-water tank over the egg-drawer, of peculiar construction, from which a few gallons of water were drawn off twice in every twenty-four hours, to be replaced by boiling water ; thus keeping up the temperature. When so many had vainly devoted money, pains, and complicated apparatus to keep up a regular supply of heat, that a simple machine should succeed which depended altogether upon a re-supply of boiling water every twelve hours, appeared to all simply ridiculous. Such, however, proved to be the case. "Hydro-Incubators" were sold literally by hundreds, and were the first to make artificial hatching a practical reality.

It was some time before it was understood why it was that this success had attended so rude a machine. The secret lay in two points mainly. In the first place, the hot-water tank was *very large* compared with all other apparatus previously made, holding for a 100-egg machine about twenty or twenty-four gallons. The enormous "specific

heat" of water makes a large body of it like this very much more "steady" in temperature than tanks of less content. But much more than this, the construction of the tank was found to be peculiar; and was, in fact, the great excellence of the invention of Messrs. Roullier and Arnoult. If we take a Florence flask of water containing a few particles of bran, and apply a lamp to the *bottom*, we shall see how the heated water rises and circulates, and the whole becomes very hot in a very short time. But if we apply a hot plate to the surface of the water in an open glass vessel, there is scarcely any movement, and it is a long time ere the heat reaches the lower portion of the fluid. This time may be increased still further by horizontal partitions, which compel the hot water to take a roundabout course. The tank in the hydro-incubator was not only large, but furnished with such partitions; and the boiling water was always supplied *at the top*. Thus the heat percolated very slowly downwards, and while the water drawn off (from three to six gallons) is generally about 146° , and replaced by water at 212° , the temperature of the *bottom* layer, which acts upon the eggs, only varies in a small degree, and that in a regular manner within certain limits, which appears actually beneficial to the eggs. The heat was also given to the eggs from above, but this had been done in many previous machines.

For a year or two attention was confined to minor improvements in this "hot-water" form of machine. The first of these was the freer supply of ventilation. Gradually also was arrived at the proper area of damp earth underneath the eggs to provide the proper amount of moisture; these machines using, in place of cold tanks, earth baked to kill all life, and moistened with water on each occasion when the eggs were attended to. Still later it was found, that during the first eight or ten days the eggs did well in a close atmosphere with little ventilation, whilst later on they

absolutely needed fresh air ; that, as the embryos grew, the eggs themselves did far more in imparting heat to the machine ; and that to be putting in cold eggs amongst others far advanced was most injurious to the total results. Hence it was found preferable to provide drawers, by which these different conditions could be preserved.

Incubators worked by hot water are still made to some extent ; but simple as this system was, the provision of gallons of boiling water every twelve hours was found such a tax on most householders that there was a demand on all sides for supplementary apparatus. The further step was soon taken of carrying circulating pipes from a small boiler into the tank of the machine, and this is now the usual method of working even "hydro"-incubators. Instead of withdrawing from three to six gallons of water, to be replaced by boiling water, every twelve hours, at the same periods the lamp under the boiler is lit for a short time, so as to convey more heat into the tank, the water in which is never renewed, beyond filling up now and then the trifling loss from evaporation.

Finally, however, manufacturers and the public have returned to the old system of employing the constant heat of a lamp. This is carried out on either of two systems, known as the "tank" and the "atmospheric" systems respectively. In the tank system the hot-air from the lamp is carried constantly through flues which traverse the tank, the amount of heat being controlled by some form of regulator. In some machines very large tanks are employed, which, for the reasons already given, "steady" the heat sufficiently, with a variety of more or less effective regulators. But the same result may be obtained with smaller tanks by a more sensitive and perfect regulator. Of these one of the best is the capsule regulator invented by Mr. Hearson, which since the expiry of the patent is more

generally used than any other ; and there is no question that his incubator known as the "Champion," for which it was designed, in the earlier years gave a very great stimulus to artificial hatching by really automatic machines. It depends for efficiency upon the fixed boiling point of a fluid. Just as water boils at 212° , so sulphuric ether boils and expands into vapour at 94° . Other liquids boil at higher temperatures ; and as a mixture generally boils at a heat intermediate between that of its two components, it is easy to prepare a slightly modified ether which shall boil (at ordinary barometrical pressures) at 98° or 99° , the *lowest* admissible incubator temperature. The capsule regulator consists of a few drops of such volatile fluid enclosed between two brass plates, soldered together all round their edges into a close flattish capsule. Then, directly the heat of 98° is exceeded, at atmospheric pressure, the two plates "bulge" under the ether vapour which is formed. The boiling temperature is increased by pressure or weight upon the capsule ; and hence we have a very powerful and easily adjustable force, which acts upon the regulator.

The machine for which this regulator was invented is still a deserved favourite, and we will take it as a type of its class, or of the "tank" machines. Its present form is shown in Fig. 17. The tank A A is traversed by the flue L L, which really returns again to the same side in which it enters, but is shown carried out at w on the other side to simplify the diagram. The heat enters from the flame x of the lamp T from the bottom L of the chimney ; and the top v of the chimney is covered by the valve, or damper, F. When this rests close on v the heated air does not escape there, but the whole has to traverse the entire flue L L to the exit w. When the damper is raised, some of it escapes and if much raised the whole heat escapes at F, none going through the flue. This arrangement is worked by the

regulator capsule *s*, lying on a little shelf fixed above the eggs, under the tank. A rod, *o*, presses on the top plate of the capsule, and is carried up to *P*, very near the pivot end of the lever *G*, where there is an adjusting screw, *P*; there is also on the lever a small sliding weight, *H*. By this screw and weight the temperature is adjusted; and when this is

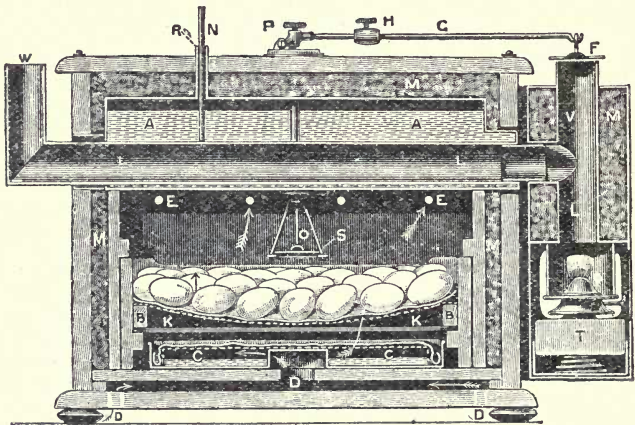


Fig. 17.—Hearson's Champion Incubator.

exceeded the damper *F* is raised and the heat decreased. Ordinarily the damper "plays" a little above the top of the chimney.

With regard to the other arrangements, the incubator is packed around with non-conducting material, *M*. The movable egg tray, *BB*, has a concave bottom of perforated zinc, on which the eggs lie; this concavity is to bring the outer eggs nearer the tank, to compensate for the somewhat less heat at the edges. The tray rests on strips of wood, *κκ*, which are wider one way than the other, by which the tray can be raised or lowered somewhat, according to the average size of the eggs. Ventilation holes, *EE*, are pro-

vided round the egg-chamber ; the main supply of air enters through the aperture D, passing through a coarse fabric kept moist by dipping into the tray of water, c c.

It is impossible to describe the many variations in pattern of the "tank" type of machine. The majority have rather larger tanks than the above machine, which so far is at

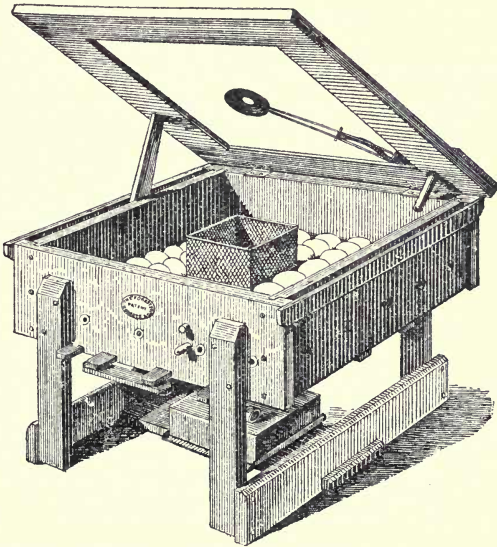


Fig. 18.—"Forester" Incubator.

least on the side of safety. The steadiness given by a water-tank enables a variety of regulators to be used besides the capsule form. Some work by the expansion of mercury, others by that of a large bubble of air, or a few drops of ether, imprisoned behind mercury, in a glass tube of V-form. Christy's thermostat consists of a bar of two metals wound into a spiral, which untwists more or less with changes of temperature ; even a plain metal tube bent into a curve

will alter that curve with any change of temperature. The latter kinds of thermostat are independent of barometrical pressure, whereas all depending upon expansion of vapour are affected by it, and need watching on that account. In spite of this, on the whole some variety of capsule is found the most generally satisfactory form of regulator, and is most used.

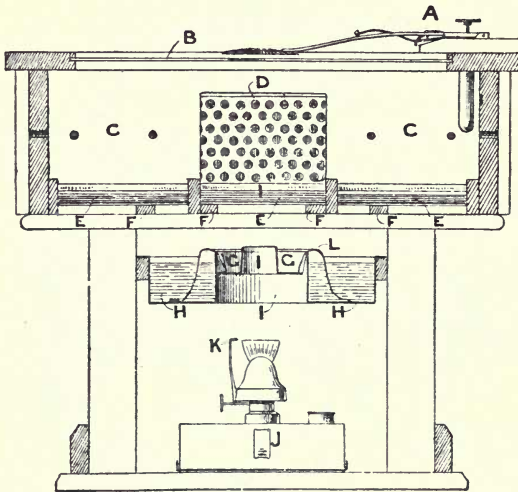


Fig. 19.—The "Forester" in section.

In "atmospheric" machines there is no water-tank, but heated air passes direct into the egg chamber. There may be said to be two sub-types of this class, and we will take as our illustration one from the simplest of these, in which more or less of the products of combustion from the lamp are admitted, as well as pure heated air. The example is Messrs. Roberts and Co.'s "Forester" machine, Fig. 18, giving the general arrangements clearly, while Fig. 19 is a section. Here *cc* is the hatching chamber, closed by a pane

of glass, B, on the top, the lever of the regulator A raising or lowering a valve over the centre. The lamp, J, is furnished with a wire gauge, K, to which the top of the flame is set. The heated air rises through the central aperture, II, in a water tray constructed in two stories, the lower one, H H, being filled with water, which rises by capillarity through the cloth, L, into the higher inside trough, G G. Thence the moist vapour, as well as heated air, passes into the incubator through the central square aperture, also lettered I, surrounded by the perforated guard or shaft, D; EE and FF are the bottom of the hatching chamber, formed of a flexible covering which "sags" between rods, and which being drawn along or pushed back by the rods, FF, gently and steadily, turns all the eggs at one time. An arrangement like this is applied to some other incubators.

We figure the regulator separately in Fig. 20, being peculiar in both form and action. It is a metal reservoir rather than capsule, resembling a shallow funnel with closed top and bottom, and containing a portion of volatile fluid properly adjusted for temperature. The peculiarity is, that while the tubular portion descends into the egg-chamber, the broader top face is *exposed to the outer air*. This principle we have not happened to come across as yet in any other machine, and it seems to us valuable, since it anticipates external changes in the temperature, which have to be considered in an incubator, as described further on. The precise working of the valve as the top of the funnel bulges with the heat, is of course adjusted as usual by the milled head of the screw.

Very great objection has been made to this simple class of machines, especially by manufacturers of tank machines, who say that they "cannot" hatch properly; and a very recent treatise on incubation states that the method of passing heat from the lamp straight into the chamber "is

now quite discarded in good incubators, as the carbonic gas from the lamp is as injurious to the developing chick as it would be to human beings." This last statement is altogether an error; the lower the form of life the less of pure oxygen is required, and even a baby requires far less than a grown-up person, or a Chinese than a European. Nevertheless, at one time we fully shared this opinion to all intents and purposes, and have only been convinced to the

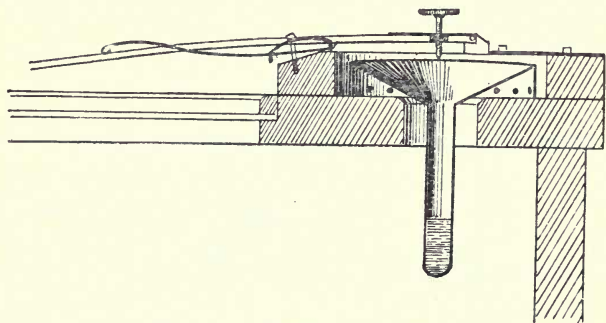


Fig. 20. — "Forester" Regulator.

contrary by a mass of evidence we could not disregard, to the effect that such simple machines have over and over again hatched remarkably well; genuine testimonials to that effect are innumerable. As they are the cheapest, we feel bound to state this. The one condition appears to be that a large proportion of *fresh* warm air enters along with the lamp fumes. In the above the most direct fumes pass out, the valve having a small aperture in the centre always free, playing more or less open as well, and being directly over the lamp, and large quantities of fresh air entering also. In another very simple machine of this type, well known as the Wilson-Wilson "Cosy Coop," a portion of the fumes also escape, and the outside air is admitted freely through all the

sides of the machine, which consist simply of porous fabric, and not of wood or metal. The same result is thus obtained by widely different means, and the satisfactory results in hatching are also similar. Indeed, when adequate attention can be given, and only small hatches are required, these primitive machines appear to suit many people best of all.

Atmospheric incubators are however also made, mostly of large size, in which the lamp fumes are all carried off through flues, and do not enter the machine. The Westmeria is one example of this type (the same manufacturers also make a tank machine), and Hillier's is another upon the same principle. The makers of the latter consider they have obtained an improvement in working by connecting the chambers of *two* incubators together through a flue, the two distinct regulators correcting or "averaging" one another.

It is impossible to describe in detail the various incubators on the market, or to give precise directions for working, which vary according to the pattern, and are sent out with each machine. It may be well to say that we have satisfied ourselves concerning, we think, every one that has held a market for two seasons, that so far each of these has on many occasions hatched well. More depends upon management and experience than on the precise pattern of machine. At the same time we are bound to say that for regular work on any scale, we have found the most regular results, so far as they have reached us, to be from good tank machines.* A few general points of management may, however, be added, which are not always explained or emphasised in the detailed instructions supplied to purchasers.

1. These latter should always be most carefully perused,

* In America, on the other hand, the incubator most generally used is a hot air machine.

and studied, and *carried out*. If even a particular oil be indicated, to use a commoner quality may quite possibly bring about disaster.

2. The machine should be in as quiet and undisturbed a place as a sitting hen. Sudden noises or concussions are known to cause deformities. As near as possible to a regular temperature will also save much trouble. Cellars do well, if neither very cold nor hot ; and in the large hatching concerns of America, it is found worth while to arrange the incubator-rooms half-way under ground. The machine must not be in a draught, or eggs will be chilled when airing, unless a piece of coarse sacking or other porous material be laid over them while being aired.

3. The temperature should be regulated and steady for a day before any eggs are attempted. The first trial should be made with cheap, but fresh and strong eggs. Loss may be thus saved. After all we cannot *quite* imitate Nature, and any weakness in the eggs is found out.

4. It is of very great importance to possess as a standard one really good "clinical" thermometer, such as doctors use, with which any new thermometers can be compared. The one by which the machine is run should be just at the top of the eggs in the drawer, *on a fertile egg*. It seems too often supposed that the machine once regulated needs no further attention. This is not so. In most machines the bottom of the egg is much cooler than the top, and the centre a sort of mean between the two. Hence the thermometer should read *higher in cold weather* in the proportion generally of about 1 degree to 10 degrees of outside temperature, though incubators differ in this respect.* Hence the regulator frequently needs a little adjustment accordingly, and it must be found by experience how much movement of

* The principle of the regulator shown in Fig. 20 seems likely to meet this condition automatically to a large extent.

the sliding weight, or turn of a screw, is needed to alter about one degree. Again, as the chick grows, it adds real *animal* heat to the chamber, which will have to be compensated, and must always be watched against. If it be found that eggs habitually hatch late, a degree higher should be tried ; if habitually early, the converse. This is the only safe rule, because the precise position of thermometer, or other points, may affect the *apparent* temperature at which an incubator works best.

5. For these reasons it does not answer to be putting in fresh eggs during a hatch. The chill to the others can be avoided by heating up the new ones first ; but in any case they upset the regulation, lacking the animal heat of the others. It is, however, very important to "test" the eggs and withdraw sterile ones ; and still more so to withdraw any addled or decomposing eggs.

6. The eggs should be carefully turned twice a day to prevent the germ adhering to one side, as it does in many cases if left in one position. At the morning turning, the eggs may be aired or cooled for five to ten minutes in warm weather, provided the incubator can be kept closed and warm whilst this is done. In cold weather they are better put back again as soon as turned, if by hand. Where the eggs are turned mechanically, however, five minutes may be allowed, which refreshes the air in the air-cell. It is now known that airing *has been much overdone*.

7. So also has ventilation, which is most injurious if causing any draught over the eggs. They need very little ventilation during the first week or ten days—then gradually more. In heavy sultry weather, when a fire will hardly burn, hatching will be greatly promoted by making a breeze about the incubator occasionally, fanning the air with a piece of thin board.

8. Another point which has been much over-pressed is

that of *moisture*. One circular before us claims that the special machine described "evaporates treble the amount of moisture of any other machine, hence its great success." It is simply a disastrous mistake. As a rule we believe it to be true that hot-air incubators, especially such as admit lamp-products direct, need more moisture than tank machines, owing to the greater dryness of their atmosphere. But having investigated this matter very carefully, some results are simply baffling to all theory we have been able to frame, and make mincemeat of explanations published by some pretentious treatises which purport to declare the "laws" of the process. To take one of the most startling, which reaches us from America, where the summers are far hotter and dryer than here: Captain Casey reported (from the celebrated Aratoma Farm, Katonah, New York) on hatches with a leading American incubator, known as the Prairie State machine. The incubator is a hot-air one; the locality is on high table-land; the incubator-house (differing from the usual American practice) is two feet above the ground; the time was the hot and dry August of 1896; the windows of house open on all sides. *No moisture whatever was used*, and yet out of 227 fertile eggs 212 strong chickens were hatched; and we have other very similar instances.

We are, however, convinced that eggs do as a rule need more moisture in incubators, the eggs not being gradually greased as by the body of a hen, which checks evaporation. We have reason to believe that wiping with a very slightly greased cloth when turning, might prove a promising line of experiment bearing on that point. But we also believe that more chickens are lost by too much moisture than from any other cause; that little is needed the first week, and that after that it should be graduated according to weather, giving more in brisk dry weather than in close. Excess acts by *packing the egg too full* to hatch. The air-cell

should enlarge during incubation so that about the eighteenth day* it occupies say one-fifth of the space—unless it does, the chick is too compressed to get out ; just as, if too dry, the membrane may be too hard for it. Sometimes the chick may be even deformed by the compression. This fact will give the key to the *probable* cause of chicks being dead in the shell, and to the owner's general management of moisture. If the membrane be dry and leathery and the air-cell large, more moisture is probably required in running ; but if, on the contrary, the chick seems to *fill the entire egg*, or nearly so, then too much moisture is the cause of failure, and it must be reduced. There is another point (this is chiefly established by Mr. James Rankin, long known in America for his incubator work). In too moist an atmosphere, rather too high a temperature, if it should also occur, is four times as fatal.

For more minute details the reader must be referred to the directions with his own machine : but if these ignore any of the above considerations, which have been well weighed, he will do well to examine any persistent ill-luck in the light of them.

Eggs of water-fowl do best as a rule with about a degree less temperature than hen-eggs, and rather more moisture the last few days. It is also well to mention that ducklings are often a day or two after pipping before they get out.

The artificial rearing of chickens must be regarded as a question entirely distinct from the artificial hatching of them, and may often become advisable, or even necessary, when they have been hatched under a hen. The mother may die just when her care becomes most necessary ; or she may be a valuable hen, whose eggs are much wanted, and

* At any time after that the chicken may burst through the membrane into the air-cell, and then appears to occupy more space.

whom it is not advisable to subject to the wear and tear of a young brood. And lastly, many persons consider that it is absolutely *better* to bring up chickens by hand, even when they have been naturally hatched. All this is quite independent of the immense numbers of chickens now hatched in incubators, for which artificial rearing is indispensable.

For chickens hatched towards the end of April, or later, the very simplest form of artificial mother may be made to answer, since in such weather their own animal heat alone is sufficient. Many an odd brood has been reared through May by rigging up a mother out of a piece of sheep-skin mat, tacked round the edges only to a board about nine inches wide and fifteen inches long, so as to fall a little slack by its own weight when turned with the wool downwards. If this board is nailed on four pegs at the corners so that it may slope from about four inches high in front to about two inches behind, it will do very well, if set upon dry earth or ashes, renewed perfectly clean every night and morning. Occasionally, however, a chick will entangle and hang itself in the wool; and a better way of making the covering is to sew a number of flannel strips about two and a half inches long and three-quarters of an inch wide by one end to a piece of canvas. They cannot get entangled with these, and, moreover, the flannel strips are more easily cleaned, which is done by turning the inside up and well shaking clean dry earth into it every day, afterwards shaking it free. But only late chickens can be reared in this simple way.

For earlier ones some heat is required, and the first stimulus to artificial rearing in this country was given by an apparatus brought out, about 1873, by Mrs. Frank Cheshire, a section of which is shown in Fig 21. This mother was heated by a zinc tank, shown at A B, about one inch deep, and hermetically closed, with the exception of one aperture for filling and for safety. It was fixed on the top of the

mother in rather a sloping position, like a roof, and along the lower edge ran a flue, shown at E, the flue being surrounded by water, and heated by a small lamp. Under the slightly sloping tank was made to slide from the front a framework of wood, roofed with canvas, on which were sewn flannel strips, K, as already described. With this apparatus was used a small temporary mother, consisting of the canvas top and flannel strips only, placed in one end of a tray or small box floored with dry earth or ashes, and covered by an

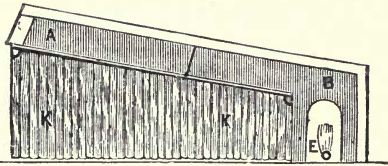


Fig. 21.—Mrs. Cheshire's Artificial Mother.

india-rubber bag filled with warm water, and wrapped in flannel. In this the newly-hatched chickens were placed the first day, to familiarise them with the habit of running in and out from under the flannel; and on first placing them in the larger mother, a small park of wirework was fixed in front to keep them from wandering too far until they had got to know their way about. Beyond that, very little trouble was necessary.

We reared all our chickens with this apparatus one season, with no failure or difficulty; and several breeders of our acquaintance were fully as successful. But during a second season, when pressure of work made it necessary to turn over all management to a servant, there was considerable mortality, and very few chickens really did well. This experience also we found to be extensively shared by others. We gradually traced most of these comparative failures chiefly to two causes: the first being sheer neglect to attend

to the necessary daily deodorisation of the apparatus ; and the second, too high a temperature combined with lack of ventilation.

By the kind assistance of many friends, we were able to make something like an exhaustive investigation into the matter, and the results were remarkable. In searching for the best returns, we gradually found we almost always came at the same time upon the *lowest temperatures* employed. We found that a heat under the mother which seemed only nicely warm to the hand, and was in fact only that of a hen, was simply murder to the chickens. One cause of the great difference in result between the heat of a hen's breast and the same heat in an artificial mother, it appeared, consisted in the closed sides of most mothers as at first constructed. The heated and foul air *escapes on all sides* from under a hen, whereas in all the early machines it was confined by the flannel and by closed ends of board.

Brooders of this kind are now superseded. Where the "coverlet" plan, as it may be called, is still followed, the covering material is left open on all sides, and is still better if somewhat higher towards the edges, as is the body of a hen, so that the foul air can escape readily. A very useful small apparatus may be made by arranging a sufficiently large hot-water tank over a brooder of flannel strips as described, and suspending the whole at the proper distance from the floor by three or four cords. The whole moves a little from the motion of the chicks, which renews the atmosphere and causes ventilation. This plan answers well for a small brooder, if half an inch of clean dry earth be renewed under it daily, and the whole be placed in a shed or shelter-coop. Peat-moss litter, however, is the favourite material for the floor of a chicken-rearer.

But "coverlet" brooders are now generally discarded altogether. The best plan is found to be, heating a chamber

sufficiently, with nothing touching the backs of the chicks ; the chamber being amply ventilated. In some a tank of heated water at the top is used, in others hot-air flues, also at top of the chamber ; a still more general plan is that of a central lamp with glass chimney in the centre of the chamber, surrounded by a wire guard to keep the chicks from coming too close to it. One advantage of the latter plan is that by the light of the lamp the chicks can be fed at night. The great American "brooder-houses" referred to in Chapter VII. are usually heated by a couple of iron pipes, nearer the floor at one end of the house ; the chickens nestle under these, but not touching ; and day by day or week by week are passed along to where the pipes are higher, and so gradually hardened off.

Over-heating is easily avoided in apparatus of this sort, as the chickens run out when too warm. Still it must be guarded against, a temperature of about 80° being about right at first : remember, however, that this means *with the chickens in* ; if it be started at 80° , when empty, and left so, the heat of the birds will soon make it much more. It may be kept thus for a fortnight in cold weather ; but should be reduced in warm. There should be an outer sheltered run as well, so that they are independent of the weather ; but all the catalogues describe apparatus in detail, and we need not do so here. We need only add that most people will do best to keep only about fifty together in a smaller rearer, than more ; though when experience has been gained, and many are reared, the number can be extended.

A wooden floor does not answer for the run, not even when covered with earth, and great care is needed to keep all sweet ; peat-moss being a great help in this respect. But it is a good plan to keep two rearers going for one brood, one for day and the other for night, keeping each one exposed to the open air meantime.

The greatest difficulty in rearing early chickens is a complaint usually known as *cramp*, but which, in many cases do not belong to actually different complaints, at least arises from quite different causes, though the most prominent symptom appears the same. The limbs appear gradually to become stiff, so that the body "rocks" in its gait; then the claws are flexed, till the chick walks more or less on its knuckles; finally death ensues. Whole broods are carried off in this way. The complaint may occur in birds reared under a hen, and even then is not so simple as it looks; when it attacks the denizens of a "brooder" it is still more complicated.

The connection of "cramp" with cold or wet in winter months is plain enough as a general rule; and when these are the sole causes, it is simply a case of rheumatism, to be treated by warmth, gentle friction of the limbs and claws, with any of the stimulating liniments advertised in the newspapers, and a grain each, twice a day for each chick, of salicylate of soda. But this simple case scarcely ever occurs, and if it does, is such a symptom of debilitated constitution that cure for the time is scarcely desirable. Birds so delicate, are better dead before they can propagate their weakness.

More commonly, overheating in the brooder creates an *artificial* delicacy to cold and wet; the birds emerge perspiring and relaxed, and so fall a prey to exposure which they would withstand easily if kept in a healthier temperature. For the same reason others may succumb to inflammation of the lungs. Here, by regulating the heat to healthy conditions, the above treatment will greatly help the patients, who may make permanent recovery. This class of cases has much decreased since "coverlet" brooders have been less used.

But the greater number of cases of "cramp" are due to *over-feeding* and *meat feeding*, aided probably by a little too

much heat also in many cases, and in others by a hard floor. The hard floor causes a sort of true cramp, and the over-feeding accumulates poison in the tissues, and there is no exercise to work it off. They are more like cases of gout than anything else. Gout and rheumatism, as all doctors know, are close allies. Here also the salicylate will do some good and is perhaps the best medicine, and the liniment will do good too, working the claws about to flex them. But the only real remedy, and the sure preventive, is *plenty of running about*; and the food must be scanty enough to *make* them run, and come out to search for it. This kind of cramp has often carried off chicks kept altogether in a warm box! It constantly attacks those packed in a greenhouse. If such chicks are taken in time, *put out* in the air, but with dry ashes or peat moss under-foot, in the brooder, and kept just enough starved to make them hungrily active, the cramp disappears—it is *gout* from over-feeding and laziness. Very young chickens, up to five weeks old, should have the best of food and be sedulously attended to, but always kept *hungrily active*. If over-heating be avoided, such birds are not attacked by cramp.

The feeding will not differ from that already given, except that while young, and until they can find for themselves upon ample range, it is generally necessary to mix a portion of fine grit with the soft food; never forget that it is *especially* necessary in thus rearing chickens to keep them rather hungry, and consequently active. On the other hand, the young birds must never be *neglected*. Remember that chicks with a hen, if at liberty, can almost always procure *some* food—enough to maintain life at least—if their regular meal be forgotten; whilst those reared in this manner are *entirely* dependent upon their owner's care, and one forgotten meal, even if not fatal at the time,

frequently lays the foundation of mortal disease, by leaving the poor little things with no strength to endure any inclemency of the weather.

Finally, it ought to be mentioned that it never answers to rear chickens *partially* upon this system. If they are allowed to get used to the hen's call, they fret and pine for days, and some of them never recover. Or if there are hens with their broods in the same run, they will run to them and get pecked, and fret in the same way. But if either hatched in an incubator, or taken from the nest before the hen has called them to food, they thrive at least as well as with the natural parent, and grow up tame and familiar to a degree almost beyond belief, knowing, as they do, no other friend but the hand which feeds them.*

CHAPTER V.

TABLE POULTRY. FATTENING AND KILLING.

THE chickens killed for home use, where poultry is only reared in a small way, will be ready for table any time after about four months old, according to the size of the breed. If they have been thoroughly well fed from the shell, they will need no further fattening at all, but will be covered with plenty of good meat, which to average people in this country is really more palatable than a fatter condition. They should simply be fasted for about eighteen hours before being killed, which may be effected in either of the ways presently described, if anyone be available with the necessary skill. If this be not the case, the simplest and most certain way of avoiding unnecessary suffering is to chop the head off, after which there can be no consciousness. The fact

* Those who wish to try their hands at constructing apparatus may find assistance in a little handbook on "Incubators and Chicken Rearing: How to Make and Use" (Cassell & Co.).

that even after such an operation, a chicken will sometimes run and flutter about all over a yard, is a simple proof that such "reflex" muscular action does not necessarily denote suffering when fowls are killed in other ways.

For supplying the market, things have to be more methodically considered and carried out, as condition and *appearance* have more influence than anything else upon the prices realised for table poultry. Considering the most general points first, and whatever crosses may be employed, great judgment in selecting the breeding birds is required to produce a really good table fowl. Though not quite everything, a good and well-developed breast is the chief object to aim at; and it may be well to point out in what a good breast consists; for this does not always seem well understood, embracing as it does at least three distinct qualities.

1. A good breast must be *deep*, especially in front. On this depends the breadth of the slices cut from it. Internally, this quality depends upon depth of the keel of the breast-bone; externally, it is marked by the fowl appearing, when looked at sideways, as deep through the body at the shoulders as behind. This is true, although the contour may be widely different. For instance, in the ideal contour of a Dorking, the equal depth at shoulders is seen at once, in the general resemblance of the body to a parallelogram. No such square form can be seen in a Game fowl, whose breast shows a beautiful curve. But it will be seen that a well-shaped Game fowl's body is much like a fir-cone in figure, the thick end representing the shoulders; hence the greatest depth is still through the shoulders and breast. The same is true of the pheasant, and of every good table fowl. An application of this simple rule will show the serious deficiency of many Langshans upheld as the "true type" by some injudicious writers.

2. The breast must be *broad*. On this depends the number of slices it will yield. Internally, this depends upon the width of the flat part of the breast-bone. Externally, it is seen on looking at the front of the fowl. The Brahma, even of the true type and not bred to Cochin models, will often exemplify failing here. The breast is deep, and often long; but it is apt to be narrow. Hence the need of carefully choosing any Brahma selected as a cross.

3. The breast must be *long*. On this depends the length of the slices cut from it. Very few Langshans we have seen had this fault; it has been lately more and more common in Cochin-bred Brahmas. It is curious that some turkeys are *particularly* bad or short in breast, a fact showing that careful selection has the matter in perfect control.

Stock of the varieties chosen can always be found, except perhaps amongst some Asiatics, sufficiently free from the faults here pointed out; and by thus using judgment, a good table model can be secured. The ideal model is seen in the breast of a well-reared pheasant; and next to that, perhaps, in that of a fine Dorking or old-fashioned Game fowl.

There are many crosses to choose from, and opinions rather differ as to the best; there probably is no best. It is a mistake to suppose that French *breeds* are better than English; we have heard one of the most celebrated French feeders declare that the English Dorkings as she saw them at the Crystal Palace show were "perfection" from a fatter's point of view; and so far from endorsing the narrow and biassed *obiter dicta* of certain dogmatic writers in this country, the French have recently built up their own most favourite table fowl (the Faverolle) mainly upon a basis of light Brahma, the very cross which such writers have treated with scorn! In America, again, that identical

yellow skin and flesh is preferred, which in England is disliked. These facts, and the fact that the fine fowls sent up from Sussex and Surrey, as seen alive in the fattening pens, are of a very decided "all sorts" or miscellaneous description, should cause more catholicity on this subject than some supposed authorities display.

The cross most often recommended is that of Indian Game on Dorking hens. It is a good one, and was a better one when *first* recommended than it is now. Recent fashion for the extreme height of the Malay has much impaired both this cross and that of the exhibition Game fowl, both alike tending now too much to long but narrow breasts, and the Indian cross somewhat to yellow skin. We consider a well-modelled Old English Game cock with white legs a better cross, and recent shows of dead poultry have borne this out. Rocks and Wyandottes, if well selected, make good fowls, and so do crosses between them and Dorkings or Houdans. Nearly any Dorking cross is good if the other element be selected as above described; also Houdan crosses, which have the two merits of ensuring (if the cock be used) fertile eggs, and generally a quick *early* growth. Brahmas should be crossed with Houdan or Dorking. Some cross, as a rule, grows faster and is hardier than a pure breed. Upon the kind of supply intended will depend to some extent the character of the cross.

Let us first consider what are called sometimes *petit poussins*, and sometimes "milk chickens," which are killed from four weeks old up to six weeks, good specimens realising from 1s. 6d. to 2s. each during the early months of the year. They weigh about half a pound each, and much resemble in general appearance plump pigeons. Chickens have been marketed for many years in France at this size, Houdans being at first chiefly used, but lately nearly all have been Faverolles. The trade in England is quite

recent, and chiefly confined to the very best shops in London and a few large towns, nor is the price so great as in France; still the price pays for such young birds. The market for these innocents does not, however, seem increasing much.

Chickens meant for this purpose should be hatched early, and fed for a fortnight in the usual way, but encouraging them to eat as much as possible. After that they are fed almost entirely upon soft food, especially finely-ground oats, mixed with milk or skim milk and a little fat. During this time at least they must be perfectly sheltered. All should be killed of the same size, respecting which the shop should be consulted. Nothing is better than a Houdan-Dorking cross.

In America by far the largest chicken trade is in what are called *broilers*, chickens weighing from one to two pounds each, or even less, and killed at from six to ten weeks old, according to their progress. The name is derived from the fact that they are usually split in two down the middle, and the halves broiled on a gridiron. This is a very profitable age and size to kill chickens, as they only need good feeding on chiefly soft food, fat not being desired. They are raised in large establishments called "broiler-farms," as described in Chapter VII. There has only so far been a limited demand for chickens of this size in England; but of late some signs have been apparent of a slight increase; and at any time such "broils" might become popular as a "new dish." Here, again, *early* growth, as in Dorkings, Houdans, a cross of the two, or Faverolles, would be desirable. They are fed in brooder-houses and very small yards, but not otherwise fattened, or crammed.

Older chickens, sold as "spring chickens," or "Surrey fowls," or "fatted fowls," form the bulk of the *best* British

trade ; and it is the best trade which pays. To obtain this there must be high feeding from the very shell. This high, and what may be called *even* feeding, from the shell, is of the greatest importance, as the want of it is the cause of a most common defect. If an ordinary English fowl, badly fed, is examined, there will be found to be *hardly any meat on the back* ; indeed, many people have an idea there never is any meat there ! Now the effect of even several weeks good feeding upon a thin chicken is to deposit either flesh or fat *in places*, but not to produce that even clothing with meat *all over*, which is the perfection of chicken-rearing. Moreover, fat so deposited is gross and disagreeable, whereas, even feeding rather deposits it infiltrated amongst the muscle, giving tenderness and juiciness to the whole, as is seen on a larger scale in well-marbled beef. So well understood is this in France, that it is usual, as Mr. T Christy has again and again pointed out, to expose the poultry there with the *backs uppermost*, the exact contrary of English practice, though there has lately been some imitation of French practice in a few of the better West-End shops. If the back is well and evenly covered with flesh, the breast *must* carry as much meat as the build of the fowl admits of ; but the converse is by no means the case. Whether or not better knowledge may lead to such a general reform in the matter of shop display, this method of judging cannot be too widely known by purchasers ; and the raiser should never be satisfied till he can produce chickens with the back nicely covered to a smooth surface, which can only be secured when the early rearing has been attended to. Concerning this nothing need be added to the previous chapters.

A large number of the fowls fattened even in Surrey and Sussex never reach this standard, for the simple reason that the fatters depend upon supplies collected by higglers from

many small rearers around. Even these are not sufficient, and of late have had to be supplemented by large numbers from Ireland. While all these are greatly improved, a great part of them can never be made up into first-class birds, and return little or no profit, which is made for the most part out of the better ones.

Chickens and young fowls are put up to fatten at various ages, the process requiring from two to four weeks, more usually about three. In the very early months small ones sell well, and later on they must be fattened larger to yield a return. Most of the Sussex fatters confine the birds in barred or slatted pens about three feet long or wide, in which are penned five or six birds, and one writer on the subject has been very severe upon all who even mention the single-bird system. But this system of a single pen about ten inches wide for a single fowl is the usual one in France, and has been adopted by Mr. C. E. Brooke, past-master of the Poulterers' Company of London; much depending upon actual experience of the fatter and temperament of the fowls. Some fatters, again, place the rows of pens in the open air: except in very mild weather this exposure must retard the process. Mr. Oliver, the largest fatter in Sussex, uses roomy sheds, the sides of which are formed of brush-wood, which allows free ventilation without any strong draught. The droppings should fall through barred floors.

When first penned the chickens should be fasted for the whole day succeeding a night, only giving a meal in the evening; this causes a keen appetite. It is usual merely to *feed* them for about ten days at first, from troughs in front of the pens. English fatters use almost exclusively finely-ground oats, mixed at first with milk and water, for this first week, made into a paste. Gradually this becomes whole milk or skim milk (sour does as well) to which is added, first a little and then a little more, of some kind of

fat, melted and mixed with the food. Sometimes fine barley-meal is used for a portion of the food. In France fine barley-meal and buckwheat-meal is the chief staple,* often with some maize-meal, but also mixed with milk and more or less fat. To keep the blood cool it is customary in France to add chopped boiled nettles two or three times a week. Some Surrey feeders use a portion of bran with the same idea, but the green stuff seems far the best method, though more adapted to small operators like the majority of French fatters than to gigantic establishments such as Mr. Oliver's.

The last week or ten days, when the birds cease to "feed" heartily or make evident progress that way, they are crammed. This has been done in three ways. The food may be mixed into stiff paste and rolled into sticks, cut into lengths about the size and two-thirds the length of the little finger. These are dipped into milk or whey and passed down the gullet till enough has been given. Or the food is mixed "thin," about the consistency of thick cream, and given through a funnel, the end of which is blunted and guarded by india-rubber to avoid injuring the gullet. The first of these used to be the usual plan in England, and the second in France; but of late both have been more or less superseded by the third plan of administering the food by *cramming machines*, in which a large cylindrical reservoir is filled with the same semi-liquid food used in funnelling, which is forced out by a piston through a rubber tube passed down the gullet of the bird. The first machines

* A writer already alluded to has also been very sarcastic upon the subject of barley-meal, which, he affirms, is never used by "any practical fatter." It is a fact that the French *do* use it largely, and Sussex fatters to a less extent. But it is finely-sifted good meal, with most of the fibre sifted out. And the French combine it with the cooling ingredients above mentioned.

used in Surrey much resembled a sausage-machine, and required two operators, but these have been abandoned for a pattern of which Hearson's (Fig. 22) may serve as the type, the single operator working the piston by his foot.



Fig. 22.—Hearson's Crammer.

With such a machine three or four hundred birds can be crammed in an hour.

In all cases, by whatever method the bird is crammed, one hand is kept on the crop, and the supply stopped when it is felt that it is properly filled, a point which is of course only acquired by experience. If on the next occasion food

be still left in the crop, this must have been miscalculated, or else the bird has turned sick, in which case a meal must be missed. The number of meals per day will vary from two to three, but in either case the hours should be equally divided, and kept to regularly. It is much the best to keep the place in semi-darkness between meals.

There are various modes of killing—all of them very effectual in practised hands. One is to clasp the bird's head in the hand, and give the body a sharp swing round by it, which kills by parting the vertebræ. M. Soyer recommends that the joints be *pulled* apart, which is effected by seizing the head in the right hand, placing the thumb just at the back of the skull, and giving a smart jerk of the hand, the other, of course, holding the neck of the fowl. In Surrey they also use the thumb, but hold the neck against the thigh. In France, having first hung up the bird by the legs, they thrust a long, narrow, and sharp-pointed knife, like a long penknife, which is made for the purpose, through the back part of the roof of the mouth up into the brain, and draw it all through the brain to the front. By either plan, death will be almost instantaneous. The fowls, it is true, often kick and struggle a good deal for some time ; but as they will do this equally after decapitation, this must be due to muscular contraction rather than any form of actual life.

Fowls should be plucked at once, whilst still warm : the feathers then come out much easier. The small hairs are then singed off with a piece of lighted paper. Some afterwards dip them just *one instant* in boiling water ; but this practice is not universal.

The fowl having been properly bred, properly fed, and killed, the next question is that of dressing for market. Here English custom stands much in need of improvement, and it is against the true interest both of producer and

consumer, since it tends to make poor fowls look as nearly as possible like good ones, to the chief advantage of the middleman. It is common to smash down the keel of the breast-bone with a round roller or handle of the knife, making the breast *look* broad and plump, which is then exposed upwards to tempt the purchaser. It will be obvious, however, that this process cannot make meat; and the splinters effectually prevent the carver from getting a nice even slice, even from a good fowl. So inveterate is this custom, that even a good raiser will find it impolitic to run counter to it all at once—it is never wise to be too rash in *any* reform. But every *purchaser* of a fowl should, for his or her own sake, insist on an unbroken breast; and if the clubs and gentry of London were to refuse any poultry that has been mutilated, reform will gradually spread. It is here especially that the recent exhibitions of classes for dead fowls may do great good; for at all such classes broken-down breasts are “disqualified,” and thus the eyes of the public are educated to judge of the specimens in an un mutilated state.

Art can, however, do much which is quite legitimate, in regard to this point. Mr. Christy, who has devoted great attention to the subject, and several times gone to the expense of bringing over French fowls, and even French operators, has pointed out how these latter obtain the same object. The fowl being plucked and “stabbed,” the hairs carefully singed off with lighted paper, and the gut washed (not drawn), the dresser places his knee against the back, and forcibly compresses the body held by the ribs and breast. Sufficient padding must be used to prevent bruising of the back, if the ordinary clothing is insufficient. This forces the back and upper ribs towards the breast, the ribs bending or giving way in the middle; and it will be readily understood that the process, carrying with it the contents of the

body, forces up the meat at the sides of the breast. The breast is thus also made to look flatter than it was ; but it is done by *really bringing more meat there*, where the carver wants to get as many slices as he can, and is therefore a gain to all parties. The body would spring back again if allowed, but it is not allowed. The hocks are at once tied together with a piece of string over the breast, the pinions drawn through them, and the bird then placed on a shaping-board, modelled to receive it. In reality this is like a long trough, in which many fowls are closely packed side by side. Wet cloths are then laid on the back, and the fowl is pressed again. More cloths are then applied, cold water is poured over all, and the fowl is kept so twenty-four hours or more, till it is set quite stiff in the shape desired.

Another plan adopted is to place the bird on its back upon cloths, and press the breast firmly down with the flat of the right hand, which causes the ribs to give way, and squeezes up the meat in virtually the same manner. In many districts of France the pressed birds are sewn up tightly in wet cloths after being pressed together as described, the design and effect in both cases being the same.

The Surrey model of shaping is simpler and somewhat different. Many of the best dressers now lay the back against the thigh and press the breast hard down with the flat of the hand, cracking the ribs and plumping the breast much after the above French manner ; some press so hard as

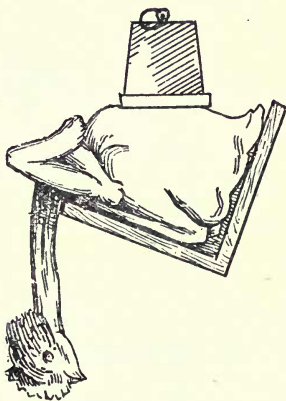


Fig. 23.—Shaping Trough.

to break the breast-bone down, but not splintering it. The vent has first been emptied as far as possible by pressure, and the hocks tied loosely together. The fowl is now taken in both hands with thumbs across the back, the stern knocked or jammed square against the wall, so as to flatten and square it, and placed in a trough or press of two boards (Fig. 23) meeting almost at a right angle, of which three are generally arranged in one frame, as in Fig. 24. The width of the

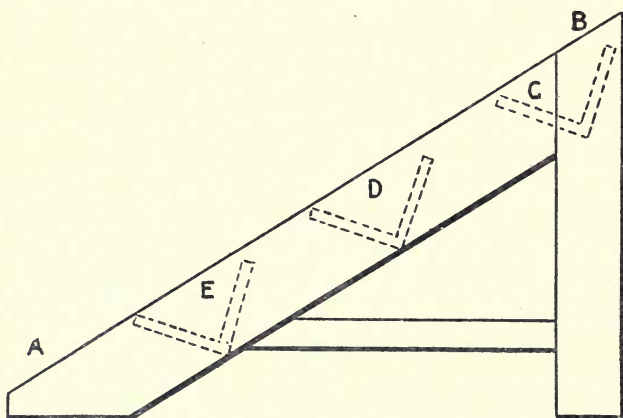


Fig 24.—Stand and Troughs.

boards or size of trough depends upon the size of the fowls, and large fatters have various sizes—in any case, a trough should be filled by one size, the necks hanging over in front. The first bird is pressed hard against one end of the trough, and a heavy brick or a weight jammed up to it; the next is pressed hard up to this one, and so on, always keeping a weight jammed close up to the last, or till the trough is full, all being thus tightly wedged together. A board as long as the trough and four inches or so wide is then laid all across the backs of the row, at the forward or shoulder end of the

carcases, upon which heavy weights are placed, and the whole are left to grow cold and "set"; they are put in the trough when quite warm. In this way the "shape" is attained so desired in Leadenhall Market. Of late, however, there has been some tendency towards dealing with the very finest birds individually, shaping them in cloths, more in the French way.

Dead poultry are always *exhibited* "trussed, but not drawn," and should be prepared with absolute simplicity, but with the utmost neatness. Such tricks as gilding the comb and legs (which we have actually seen done) only entail defeat. Success rather depends, if the judge knows his business, upon a breast and back really covered with meat, evenly laid on; a nice, delicate, well-finished skin; and not too great a size of bone compared with the size of the fowl. The "trussing" cannot be too simple; as much as will keep the hocks, backs, and the wings in shape, is all that should be attempted; and this is easily accomplished if the bird has been moulded into shape, and allowed to "set" cold in the French manner. Actual trussing *for the spit* is not the business of the raiser, since it involves piercing the skin and flesh, and such wounds promote decomposition. This process should, therefore, be deferred till the fowl is on the eve of consumption; moreover, the precise method differs in different localities, and according to whether the bird is to be roasted or boiled.

With respect to old fowls, in the market they are an abomination; but at home it is often needful to use them. If so, let them be gently boiled or simmered, nearly an hour for each year of their age, after which they can be roasted if preferred. Unless very aged, they will then be tolerable eating. Another plan which has been tried with success is to wrap them in vine or other large leaves, and bury them for twelve or more hours in sweet earth before cooking.

CHAPTER VI.

POULTRY ON THE FARM.

THE contents of the previous pages will have made it abundantly clear, that in first return of gross profit over and above their food, poultry are far superior to any other class of live stock. If there were no drawbacks to this, large poultry-farms could not fail to be highly profitable; but there is one tremendous drawback, which prospectuses of such undertakings always omit to state. It is, that the profit has to be collected in a vast number of very small sums, from a great number of small animals, which yet cannot be dealt with in one large flock like sheep. Hence the liability to many small losses and wastes; while the realisation of the products demands such detailed oversight, and so many separate acts, that the cost of accommodation and labour and marketing is relatively very large.

These facts account not only for the general want of success in poultry-farming as such, but for the general neglect of poultry in England *as part of the stock on the farm*. Left pretty much to themselves, the returns have not been duly collected, nor even a profitable stock secured. In France, where most of the land is cut up into extremely small occupations, the labour of looking after the small number of fowls it will carry with the other stock is never felt or counted. On the larger English farms, it must be provided for and paid for, if it is given at all; this is grudged, or any due return disbelieved in, and so it is not given, but just a few fowls kept to supply the family with eggs, and no more thought about them. They are of quite uncertain age, some of them very old, and many very bad layers. What kind of stock *would* pay under such circumstances? But it has been proved over and over again, that poultry upon a farm will pay uncommonly well if judiciously

managed, and their numbers calculated according to what the farm is.

First of all, let it be remembered that while poultry require an acre for every hundred head if for their own exclusive use, ten or a dozen per acre can be run upon land without in any way interfering with other stock. The manure dropped by this number fully returns all the grass eaten, while it is absorbed quickly enough to keep the land fresh, so that other grazing is not interfered with, as it would be by a greater number. Many injurious insects and grubs are also devoured by them, to the profit of the crops.

Secondly, supposing other matters merely balanced, the manure of the fowls dropped at night in the houses represents a profit of *one shilling per head per annum* for large cross-breeds, and sixpence to ninepence for smaller birds. We found that Brahmas dropped at the rate of 56 lbs. per annum under their perches. After keeping a few weeks in casks, this is reduced by drying to about half the weight; samples of both—fresh and moist from the night before, and thus kept and partly dried—were analysed and valued for us by the late Dr. Voelcker. The actual samples for this analysis were from Dorkings, and were sent by Mr. O. E. Cresswell. The following was the analysis:—

	Fresh Manure.		Partially dried Manure.
Moisture	61.63	...	41.06
* Organic Matter and Ammonia Salts ...	20.19	...	38.19
Tribasic Phosphate of Lime	2.97	...	5.13
Magnesia, Alkaline Salts, &c. ...	2.63	...	3.13
Insoluble Siliceous Matter (Sand) ...	12.58	...	12.49
	<hr/> 100.00	...	<hr/> 100.00
* Containing Nitrogen	1.71	...	3.78
Equal to Ammonia	2.09	...	4.59

Dr. Voelcker accordingly valued the moist manure at £2 per ton, and the stored sample at £4 4s. per ton. Most of

the sand was probably scraped up from the floor of the house. As regards its application, Dr. Voelcker recommended that for most farm crops, a mixture should be kept of two parts burnt gypsum and one part mineral superphosphate ; and that one part of this should be mixed with three parts of fresh chicken manure. Kept under cover and turned over once or twice, and finally passed through a sieve, this treatment would absorb the surplus moisture, and reduce the whole to a fairly dry and friable condition, in which it should be used at the rate of 8 to 10 cwt. per acre. It may also be mixed with soot, or dry earth and burnt ashes, but should *not be mixed with lime.*

Hence it will be seen, that a dozen of fowls per acre, with a very little gypsum and phosphate, will give a farmer the greater part of the manure he requires. Dr. Voelcker specially reports upon the manure as "a much more concentrated fertiliser than *the best descriptions* of ordinary farm-yard manure, which seldom yields more than $\frac{3}{4}$ per cent. of ammonia," whilst stored chicken manure by the analysis yields $4\frac{1}{2}$ per cent., and even the moist, fresh-dropped sample over 2 per cent. Let it be once understood what heavy money payments may be thus saved on artificial manures,* and the labour of proper superintendence will no longer be grudged to the poultry.

* A practical farmer wrote to the *Live Stock Journal* as follows on this point :—"There is still the most important item to mention—so far as farmers are concerned—the manure. I have this year fully tested its value both for corn and root crops. I dressed a ten-acre field of oats in four two-and-a-half-acre lots, alternately with artificial top-dressing at £9 per ton, and poultry manure, in equal quantities, and if there was any difference it was in favour of the poultry manure. The result was about the same with swedes and turnips : 8 cwt. of poultry manure proving much better than 6 cwt. of artificial manure, costing per ton £7 10s. This year my artificial manure bill amounts to less than one-third of what it was in 1876, and my thirty acres of swedes and turnips are better than I have had them for years."

Thirdly, attention must be given to *improvement of the stock* in laying properties. It will be seen in Chapter VIII. that *any* property may be developed greatly in a few generations by careful breeding; and it will also be seen why the utmost fecundity must not, and cannot, be expected from the stock bred by fanciers. These breed for the points of the show-pen, which have their own use in preserving the distinctive races; but in seeking these chiefly, laying properties are apt to take a second place. Still the fecundity is there, and capable of development like any other property. Probably a hen which lays less than a hundred eggs per annum does not pay; but it has been proved, over and over again, that an average of one hundred and fifty per annum can be obtained by those who will breed for it,* and the process is as simple as possible.

The first thing, on many farms, will be a rigorous weeding out of all the *old* stock. Mr. Fowler has left it on record that in one case where this was done, and a "general slaughter" made, the change to young fowls alone made a difference of £20 per annum, without any special selection of birds. But selection must follow. Laying breeds may be selected,† or, if there is a prejudice against "pure breeds," there is a very simple plan which every farmer will understand in a moment, and which has been repeatedly tried with good results. Watch the neighbouring market, and find out who brings in *a good lot of eggs in winter*. Buy his eggs, and set them; and a fairly good laying stock

* This number has actually been considerably surpassed, as stated in Chapter VII., by many large American poultry-farmers.

† The most successful direct cross we ever heard of in actual fact was the produce of two Light Brahma hens with a black Hamburgh cock. From six of these chickens and one of the Light Brahmas were produced, from Jan. 1st to Dec. 31st, 1879, a few more than 1,500 eggs! This is considerably over 200 each, and is the highest number from half-a-dozen fowls we ever heard of. The Brahmas were themselves good layers.

will be ensured to start with. Next, cockerels of the laying breeds can be purchased to cross on these. Then the *best layers* only of the hens should be bred from, and a few cockerels also kept *from these best layers* to cross with the pullets so bred. It is as simple as A B C; but in this way the average can be infallibly raised; exactly in the same way as cows can readily be bred to give 60 per cent. more milk than most farmers are content with.

Where eggs are the chief thing—and on an ordinary farm we believe they pay best—a different stamp of fowl must be kept, from what would be a good stock for chickens. On the latter head nothing need be added to what has been before said; broadly speaking, fowls will be selected for the table which *tend to lay on flesh* when well fed. Fine laying fowls, on the other hand, tend to a *sparse* habit of body, and are weedy by comparison, even in the same breed: the best *laying* Houdans or Brahmas are more weedy-looking than the best table fowls. Good layers also generally tend to large combs. But the one rule is, breed *from the best only*, and the stock will steadily and rapidly improve. A cross of a good laying pure breed, for three years, on a fine dunghill breed, selected by the “winter egg test” just mentioned, will have become seven-eighths pure, while the dunghill foundation will ensure hardiness; and by thus using crosses of Minorcas, Andalusians, Leghorns, or Black Hamburgs, a splendid laying strain may be built up in a few years. Of late years skilled breeders have devoted attention to specially breeding *good layers*, with as much care as others breed exhibition poultry, and either eggs or stock can be had from them at a moderate price.

Fourthly, the selective breeding here spoken of, and which lies at the very foundation of all profit, involves separation of the fowls into distinct flocks, and a somewhat close personal oversight. This is a crucial point. The

fowls must be *made a business* if they are to be *made to pay*.

After examining the state of affairs on various farms, we are convinced that on many it will be far the best to keep enough fowls to occupy a man's *whole time* in looking after them, with just a little general superintendence from the owner, his wife, or daughter. Female labour is not adapted for it, since there will be heavy weights to carry, and long tramps over heavy ground, while the work must be done in all weathers. The fowls want special attendance, and can afford to pay for it, provided the man be made to feel that his employer takes real interest in the results. He must understand that the master both means and expects to *make money* out of his charges, and then he will probably do as near his best as he is constitutionally capable of. For the right sort of man must be found for this business. We have a vivid recollection of *some* agricultural labourers we have met with, whose doings—or want of doing—would have given Job much exercise of spirit. Scolding is no use with them; they haven't it *in* them to do any good, where they have to think now and then. The poultry ought to have one of the smartest men on the farm, and if he is "smart" in the Lancashire sense, they will pay his wages. It will sometimes happen that this sort of work, with its variety and sense of responsibility, will just suit a man or intelligent big lad, who does not shine in the steadier, duller routine, but rather shirks work in that on account of its monotony. Variety will sometimes *make* a man like that, and get value out of him where nothing else will.

In the chicken-yard, if many chickens are reared, the help of the labourer's wife will be useful, and may be required; here the labour is both lighter and nearer home.

To arrange for a labourer engaged in other things, "just to give an eye to the fowls," never answers. "We have seen

it tried often, and it never has done so. On such a system, the fewer fowls are kept the less the owner will lose by them; and there is no more to be said about it. Rather than attempt such a half-system as this, it will be better to go on in more the old style, with a limited number in the farmyard. Even here, by killing all the old fowls at once, and thereafter killing them before they get old, with judicious selection, and more systematic looking after the eggs—all which may be carried out by a wife or daughter without difficulty—*some* profit may be got out of the fowls, instead of the certain loss which they are on many farms. But we are here more especially considering the cases in which it is determined to make them a part of the regular business of the establishment.

The needful separation into flocks will generally be easily managed on a farm. Fowls have a strong sense of locality, and in the main will keep to their own field; and as a rule the simplest plan will be to put the hedges and fences in fair repair, and then let each field have its own flock. The house can go anywhere convenient—probably in a corner, where the fencing is good. A very large field will often take a house and flock in each corner, for one flock should not exceed twenty-five. Some practical men prefer movable houses on wheels, the locality of which is moved occasionally; and one or two of these should always be used on arable farms, as they can be moved out to the stubble after harvest. One farmer we knew made a hard concrete floor for each house, and kept it in one place; this is least trouble as regards the manure. On many farms there are buildings here and there, opening out to different parts of the farm, which can be utilised. The great thing is, in the cheapest but some effectual way to break up the system of letting all mix indiscriminately in the farmyard.

The fowls will, be it remembered, absolutely benefit the

land. In some cases it may be well to keep them off shallow-sown seeds for a fortnight ; but as a rule, if the seed is properly drilled, and the fowls duly fed, they will not touch it, but confine their ravages to insects and larvæ. They may crop a little green food ; but even this may be almost prevented by letting a strip of grass grow around their house, and in any case the damage will be infinitesimal,

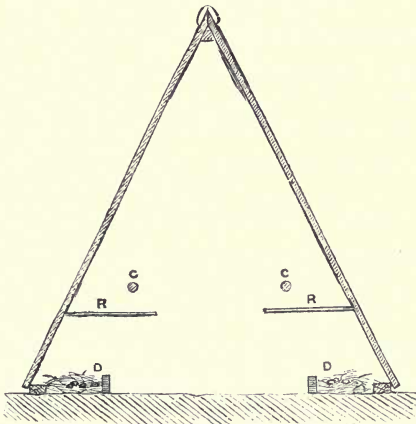


Fig. 25.—Cheap Poultry-houses for the Farm.

unless the farm, or that part of it, is "over-stocked" with them. A dozen per acre are the outside to be kept in this way ; and the largest field should have no more than thirty in one flock. Generally a few yards of netting used judiciously here and there, to eke out other fencing, will keep the flocks separate.

The houses may be of any cheap and handy form ; but that shown in Fig. 25 was given us by a practical man as the cheapest he had tried of several. The main feature is the triangular section. It is constructed either of match-board, or rough slabs with the joints covered by caulking-

pieces ; and is put together with the very least labour possible, by simply nailing the boards to timbers lying on the ground and to a ridge-pole at the top. The width is seven feet, and the height about eight feet. At a height of twenty inches from the ground a shelf, R, is fixed at each side, hinged to the walls ; and over these are the perches, C C, thus carrying out the system shown in Fig. 3, page 7. The nests, D D, are made under the shelf with bricks, or anyhow, and are got at by raising the shelf. In this plan we get strength ; a good slope to throw the rain off ; floor-space where wanted ; height in the middle for the attendant ; and the shelf gives freedom from draught. The ridge should be covered by a strip of felt, or an inverted metal gutter, arranged so as to give space all along the ridge for ventilation. A house twelve feet long roosts fifty birds, and the cost was given us as £3 to £3 10s. It would be better shorter for thirty birds.

Separate shed accommodation, and dusting-places, are scarcely ever wanted in the fields, as the fowls get both under hedgerows, or in other natural places.

The fowls kept for laying only will need feeding only twice a day, and should therefore, for obvious reasons, be kept in the most distant locations ; while the more substantial accommodation nearer home will be devoted to breeding-pens and the rearing of chickens. The labour will be lessened by the fact that the laying birds, having free range, may be fed, and indeed are best fed, with grain only. Water may be provided at any convenient point in each lot, as the fowls will soon learn the place. Often a small stream can be so managed, or a drain so cut and utilised, as to save all trouble.

Where poultry are kept upon a farm in this way, the attendant's day will be something like the following, taking, for example, the spring of the year :—

Up early, he will first clean out the coops or artificial mothers and feed the young chickens ; also feed the breeding-pens, if confined near home, since in that case they require rather more careful *régime*. Then he will start on his first round, with sufficient grain in a couple of buckets slung on a yoke for carriage. At each house he will scatter his corn widely for each flock, and give a brief glance over ; and in some cases he may scrape up the night's manure at the same visit, leaving each house clean and trim as he goes. In other cases, however, such delay would bring the other flocks crowding round him ; and it will generally be better to feed all first, taking the houses on the return journey ; at the same time collecting all eggs already laid, noticing what hens are on the nest, or if any appear sickly. There should be a covered barrel at each house to store the manure.

By the time all this is gone over, if necessary dividing the houses, so as to clean half at a time every two days only, the chickens will want another feed, after which there will be the cleaning of the houses and belongings of the breeding-pens. Indeed, any fair number of chickens will furnish ample occupation all day for any spare time. A mid-day collection of eggs is desirable where practicable, but will not always be so. Towards evening another round must be taken to feed the laying stock, at the same time gathering the rest of the day's eggs ; the chickens having their last feed afterwards, the very last thing, and being then made snug for the night.

All through some watch must be kept, in order to have a good idea towards the end of the season as to which are the best layers, with a view to draft these, so far as wanted, into next year's breeding-pens. It will be seen that the only possible way of getting all this done is to do it systematically.

Kept in this manner, poultry have never failed to "pay"

upon a farm. The only rent chargeable to them, as they actually benefit the land, is interest upon houses, fence, and utensils; where corn is grown they get the tailings at the lowest possible cost; and the manure finds its full value. Eggs will in the main pay best; but a proportionate number of birds will of course be sent to market from the surplus cockerels, and the slaughter in the yearly renewal of the stock. The conditions laid down are not hard ones, nor difficult to understand. But more than the dozen fowls per acre should not be attempted, and cannot be, without leaving the ground of "poultry on the farm" for the more doubtful speculation of "poultry-farming," the result of which may be a very different matter, and must be separately considered.

We could give many actual cases showing how poultry invariably do pay when kept upon a farm, in some such manner as above described; but will only select two from numerous replies to a series of questions which we distributed rather widely some years ago, and a third from a public report, for its instructive lessons as to causes of failure.

One correspondent in Derbyshire had about 90 acres, on which he kept about 100 hens, with some turkeys and ducks. On these his balance sheet for the year showed a profit of £30, and he wrote, "I am satisfied they pay the best of anything kept on the farm at the present time." This may serve for a small stock on a small holding.

Our second case is a large farm of 700 acres, in the occupation of Mr. J. Knox Lyall, Peepy Farm, near Storksfield-on-Tyne, the result given us being the fourth year. An old man getting unfit for other work cared for the poultry as his sole duty, his wage of 1s. 3d. per day and the rent of his free cottage being charged, as well as all the food. The total weekly expenses never exceeded £2 (how

many farmers would spend that weekly on their poultry as part of their farm management?) and the receipts for the year were £130, showing a profit of at least £30, besides eggs and fowls used for the household, which were not charged in the above. The eggs were, however, *counted*, and in all 28,300 were laid in the year, by a stock of 220 hens and 17 ducks. To replace a portion of these, 80 pullets were reared, some ducklings also; and 112 cockerels, 86 ducks, and 73 hens sent away. The fowls were in three flocks, and fed twice a day, not being made a hobby of in any way, but made strictly a part of the farm management.

The third case we cite as a supposed "failure," though it will be seen it is hardly so, while the reasons for even the partial failure are clear and instructive. It is the report of Mr. Druce, Assistant-Commissioner of the Royal Commission on Agriculture, published in 1882, of the experience of Mr. Carrington, of Kimbolton, who had given up a large farm owing to the depression, and tried a large stock of poultry on a small farm of 100 acres. His stock in October, 1881, amounted to 1,800 head, which would soon be reduced by 300 or more, kept in nine yards near the house, and in lots of about 150 each in the fields. All were light Brahmas. A man and boy were employed, and their labour (£58) was all charged, with £38 for rent, £18 10s. depreciation and renewal, and £15 interest on £300 capital sunk, besides the food. The gross receipts were £461 11s. for eggs and fowls, £3 for feathers, and £27 for manure; the surplus or "profit" came out as £25, which is rightly described as not very satisfactory. The case has therefore been paraded as a "failure."

Let us see what it teaches. 1. Even as it was the fowls paid the interest on the capital as well as the £25, the whole being better than *any other branch of the farming!*
 2. The fowls here averaged 18 per acre, not enough for real

"poultry-farming," but too many decidedly for that *poultry on a farm* which we are here considering. 3. The fowls were fed thrice daily, or distinctly overfed; and light Brahmas were just the breed to suffer from this, and not a judicious choice anyway. 4. The flocks were far too large. 5. The direct results of these mistakes, all evident *à priori* to any practical poultry-keeper, are seen on comparing these figures with Mr. Lyall's above. The latter got a gross receipt of £130 and profit of £30 from only 240 birds, while Mr. Carrington got only a gross receipt of £460 from 1,800 birds, which ought *pro rata* to have returned at least £750. Bearing all these things in mind, and that notwithstanding the fowls paid *best* after all, the results are distinctly encouraging, though specially worth citing for the lessons which they convey.

The case of vermin and thieves we have not felt called upon to deal with. In some places one or the other literally make the profitable keeping of poultry upon a farm *impossible*. This especially applies to the preservation of foxes, which in not a few localities absolutely prevents any attempt at what would otherwise be a productive industry. Whether this ought to be so under present agricultural circumstances, is a grave question, but one we do not feel called upon to discuss.

CHAPTER VII.

POULTRY FARMING.

THERE is no doubt that poultry kept to a much larger extent than usual as part of farm stock, in the manner described in our last chapter, have paid and will pay well when so managed; but the question whether "poultry farming," as generally understood, can be made profitable, is not one to be answered with similar certainty. The most

opposite opinions have been expressed upon it, and we have been subjected again and again to very pointed attack on the part of certain professed authorities, on account of the opinion we have held, and still hold, that it is *capable* of being, more or less, answered in the affirmative. On the other hand, it is strange how inveterate seems the notion that poultry farming is an easy outdoor business, in which an unlimited demand makes success certain. From both points of view a little discussion seems desirable.

We have never had any doubt at all as to the inevitably disastrous result of "embarking" in poultry farming on the part of the many novices who seem disposed to such a course. People would not think of going into any other business in that way; and poultry farming is a *peculiarly* complicated business, especially demanding apprenticeship and personal experience, as well as commercial "push" and aptitude. It moreover demands, as of necessity, gradual and progressive *preparation*, if it is to succeed, because one cardinal condition of success is a staff of birds cultivated for prolific laying. We have from the first preached that; but it is only lately that this kind of breeding has really been seriously taken up in England at all.

There are, however, various kinds of operation that might be termed "poultry farming," and we had better be definite. Some of these are admittedly remunerative. The large fattening establishments in Sussex, briefly described in Chapter V., might be so termed; but we exclude them, because the birds are not as a rule raised on the ground, and so little ground is needed for mere pens that it can hardly be called a "farm" in any sense. Where ducks are hatched as well as fattened in large numbers, it may, however, fairly be called a farm; and it seems strange that there should be any absolute law of nature ordaining that one kind of poultry may be profitably reared, but that

another cannot. The success of "duck farming" is, however, admitted; and we will relegate it, too, to that special name. It is also admitted that when locality, and capital, and skill, and character have been adequate, there are various examples of establishments for breeding high-class or prize stock solely, being remunerative. This also, however, it may be granted, is not what is generally meant.

On the other hand, we cannot limit the term, as some would do, to the *sole* production of fowls and eggs for table. A dairy farmer remains so still, though he finds it best also to grow a few acres of wheat, or though there be a demand for his Shorthorn bull calves, or though he has a range of piggeries as well. Similarly, the runs of a poultry farm, when matured, *ought* to furnish some subsidiary revenue from fruit-trees, and hay or grazing; and any successful and intelligent poultry farmer *ought* to have, and will have, stock and eggs to spare which are worth more than market prices. By a poultry farm ought to be considered any establishment where the principal aim is the growth of poultry and the production of eggs, not entirely or principally for exhibition purposes. So understood, we still believe that success is possible in such enterprises; indeed, it can now be affirmed that on a greater or less scale some success has actually been attained, even in England, contrary to what is often so confidently asserted. In America success is by no means rare, in some rather large concerns, though under some difference in conditions which we must point out.

There are, however, we believe, three absolute conditions of such success. Of these one at least, and generally two, have been missing in all the "failures" of which so much has been made, and quite properly so, had not the argument been pressed too far.

(a) The first is very simple, and consists in *adequate*

runs. Years ago, in the first lines we had ever written on this subject,* we stated that an acre was requisite for 120 fowls. We would rather now give that quantity to 100 fowls; though it is probable that on gravelly soil, by systematically leaving every run vacant for five or six months annually, 200 might be managed, their manure being consumed in grass or hay.

(*b*) The second is, that every poultry farmer must serve a thorough practical apprenticeship in some way; when he begins at all for himself, begin quite in a small way, making his first few hens *pay as they go*; and only extending as they do pay, and as the market opens out before him. If they do not pay when few, he will find it out, with perhaps the knowledge that success in this field is not for him. But if he is to discover that, he had better do so before sinking capital in the discovery.†

* In the first edition of this work. Mr. Tegetmeier has never ceased to deride our supposed ignorance on the ground that at that time, in 1867, we treated seriously a professed account of a French farm, published under the *imprimatur* of the French Ministry of Agriculture. He has systematically omitted to state that while we did make that mistake, we made the above exception and correction as regards the main essential of the problem, and that we at least knew enough to condemn and refuse to describe Mr. Geyelin's "small-pen" establishment at Bromley on that ground; whereas he at the same date in his "Poultry Book" published a drawing and full description, *his* comment being that so far as it had gone that experiment appeared to have been successful, though its ultimate success "cannot be regarded as definitely settled until after the experience of several breeding seasons." Such time was not needed, nor would such a comment have been made, by anyone then a competent authority on this subject; though doubtless Mr. Tegetmeier has—as we certainly have—learnt a great deal since then.

† This is the key to some criticisms regarding our views which have been recently published by Mr. E. Cobb. It would have been better not to gather those views from a chapter in "The Illustrated Book of Poultry," written so far back as 1872, and twice successively superseded by later text; time teaches much on such subjects as these.

(c) The third is, that during this preparatory period he is *breeding up his layers* as he goes on. This is indispensable. The question of an egg farm, especially, being profitable, rests mainly on the eggs over 120 per annum from each bird. American experience has proved that 175 per annum each is perfectly practicable, as will be shown further on.

Not much needs be said in regard to (a). If the runs are kept large, a quarter of an acre for 25 fowls—and this is a number which should not be exceeded in a flock—much grass will have to be cut at intervals, since long grass is injurious every way, and, moreover, *prevents* the manure from sinking into the ground. This cut grass will hardly be good for stock, and is better burnt or composted with manure, or the ashes mixed in the dusting places. On the whole we think it better to run the birds on one-third or even one-half the space, for half the year. There will

Still Mr. Cobb's misconception is rather extraordinary. He specially objects to our then postulate of 1,000 fowls laying each 150 eggs per annum, estimated at a cost of 2s. 6d. each; saying that no such number can be "picked up" that will lay such a quantity, especially at such a price. That is true enough; but we had carefully explained that the birds were to be *bred up* to that standard as part of the preparatory work. That being pointed out to him, Mr. Cobb rejoins that this makes the matter worse, since "no one can hire land, pay wages, erect accommodation," etc., and breed during several years such a flock of birds, "so that *then* the capital invested shall be fairly represented" by the 2s. 6d. each. This brings out the fundamental misunderstanding. It is obvious that all gradually sunk in "accommodation" is so far represented by that (less depreciation), not by fowls; for the rest, our contention and meaning throughout has been that all must be bred up and gradually extended from small beginnings, the fowls being made—using a phrase repeated hereafter—"to pay as they go." Capital is not thus sunk in them at all, beyond cost in breeding and rearing. This is more fully set forth and actually illustrated by example in the following pages; and the best reply to such crude objections is that the method has been thus actually carried out in all the successful examples cited in the text.

still be grass to cut, but not so much, and after some time for purification and growth, the grass or hay on the fallow runs will be of real value. But such a fallowing system requires obviously a system of *movable fences* on one side of a range of houses, or row of detached ones. The most economical plan would be to arrange dividing fences in 50-yard lengths, then each will take a roll of netting with no cutting or waste, easily fixed on small pins driven sloping into stakes, and easily removed to the other set of runs when the shifting took place.

Fruit trees are desirable, as much for shade and insects, as for their produce. Filberts would often be more valuable, and not tempt appetite; but it is a mistake to state, as some do, that bush-fruit is altogether unsuitable. On the contrary, gooseberry and currant trees are about the best shelter of all for *young* chickens; and runs devoted to these will not be injured, as they can only at most reach a few of the lowest berries.

In regard to (*b*) it is not only indispensable to get the personal experience, and to get it gradually, if ruinous loss is to be avoided, but it is always to be remembered that the would-be poultry farmer has to *make his market*, just as every other business has to gradually build up its connection. Some seem to think that a demand is always waiting, at tip-top prices. It is no such thing. Every large dealer of any kind has his clients already; and private customers have to be sought and secured; and any *special* product especially, such as newly-hatched chickens, or fowls bred for laying, or eggs from them, at better than market prices, has to be bred up, and a "character" for it earned, and to become known. People often write asking "where" produce of one kind or other can be sold at good prices; and the answer is, *nowhere*, in the sense they mean. Such a selling connection has to be built up and got together. A large

business which pays, is only to be developed out of a small one which already pays.

In regard to (c) nothing need be added, except that all successful experience shows it to be of *vital* importance. This has for many years been recognised in America: it has only been to a very small extent recognised in England, and that is one very general reason of many failures. It will not fail to be seen how intimately the considerations under (b) and (c) are connected together.

It is very desirable, if possible, to cultivate a connection in some special product, with direct customers. Fowls really bred for egg-laying always have a value, as have eggs from them; this has been found out by several successful poultry farmers in England. Even prize stock is often quite compatible with commercial products. A trade has also been developing for newly-hatched chickens, which are largely purchased to be reared by the purchasers. Some find a demand for *petit poussins*. There is also much to be learnt about marketing: eggs need to be both clean and fresh, and *sorted* into sizes, if any reputation is to be obtained. Details necessary to success on fattening, dressing, and packing table poultry—all these also have to be acquired; and not only acquired, but also taught to any servants employed: this is yet another reason why it is simply impossible to “start” right off in a concern of any size. Where the business has been thus gradually studied, grown into, and built up, with personal experience, there are proofs even in England, and still more in America, that success is possible, both on large and small scale; but only, be it understood, *with an amount of hard work* which most people have no idea of. We will cite a few examples from both sides of the ocean.

The first case is on a small, almost allotment scale, and reached us in reply to a series of printed questions sent out

some years ago through the secretaries of the various farmers' clubs. It was near Chesterfield, in Derbyshire, the tenant having one acre and two roods of land, of which the two roods were in fruit and vegetables; and the run beside of two acres of wood. A pig was kept, and fruit trees were also planted in the runs into which the acre was divided. The figures of profit and loss were not given us, but the concern was said to "pay well," being looked after by a mistress with twenty years' experience. The main fact stated to us was, that the egg production from this holding was 50,000 annually, nearly all sent to London direct to private customers, with whom the tenant had gradually *made his market*.

A second small example of purely egg farming, reproduced by Mr. Sutcliffe, and which was published in an influential paper with name and address of the owner, is instructive on account of its two years' figures, and the lesson conveyed in the second year's especially. In 1894, there were 320 first-cross hens "kept" for egg-production, on a three-acre field with large houses near the centre, £56 being invested. They were valued at 3s. 6d. each, and about 9d. each per annum allowed for depreciation, with £9 2s. for rent and taxes. The food bill only came to about 3s. each per annum, which will certainly be too low in general. This year's balance sheet allowed also nothing for labour, but various incidentals are charged. The eggs sold were 2,907 dozen, for £157 2s., and (with above low food bill and no labour) the profit was given as £74 3s. 3d. There were 34 deaths, which are duly charged at £6, beside the depreciation.

The second year's work (1895) is peculiarly instructive. This year there were 43 deaths (a high rate, and charged £7 10s.), rent and taxes are raised to £14 8s. 6d., and £12 is added for labour on the three acres. But this year the

hens are described as "especially bred and kept for egg-production." The result of this is that whereas the first year only gave about 115 eggs per bird, the second returns 130 per bird, and the profit is given as £109. The food, as we again repeat, does not cost so much as would generally be the case, but the *effect of the increased egg-production* stands out clearly, and with an average of over 150 each, would be still more apparent.

We may next take a few facts respecting the rearing and fattening of poultry for market in Sussex, from the official report to the Royal Commission on Agriculture in 1894, by Mr. Henry Rew. It there appears that the Sussex fatteners pay up to 3s. 6d. each (these top figures only in April and May) for fine well-grown chickens, but cannot get enough, so that they are obliged to purchase a certain number of inferior Irish ones as well. The vicar of Heathfield states that three acres and a cow, or, better still, six acres and two cows, plus poultry, provide a decent living; and Mr. Rew cites cases of men who began as labourers, and had attained independence by working up rearing or fattening, till they could get a bit of land. As a rule some rear, and others fatten. The fattening alone we have already relegated to another class of undertaking; and as regards a great portion of the chickens reared, the objection may be made that they are only a bye-product, and belong properly to operations dealt with in our last chapter, as merely "poultry on the farm."

But in regard to some of the instances given by Mr. Rew there is more than this. We will take three. One small farm of 19 acres is all in grass, and five cows are kept. About 600 chickens are *reared* during the year, and others are also purchased, and fattening also carried on. The cream from the cows is made into butter, and the skim-milk given to the chickens. Another holding of

27 acres is remarkable as having been bought at the age of thirty-three by a young man who began life as a labourer, but started first rearing a few fowls by his cottage, then extending operations and also fattening them, till he reached his present position. His farm, also, is all in grass, on which five cows and a few sheep are also kept; butter is made, and the skim-milk used for the chickens. All the time he has worked "as long as there was daylight," and to this his success was due.

The third of Mr. Rew's cases is that of the largest *rearer* he met with, but who also fattens. His farm is of 200 acres, of which two-thirds were grass, and there are 8 acres of hops and $3\frac{1}{2}$ acres of wheat, the main cereal crop being oats, which are fed to the fowls, besides large quantities of purchased food. He had 10 cows, 18 two-year-olds, 10 yearlings, and 10 calves, besides 7 horses. He had farmed for eighteen years, and took up poultry ten years ago because he was "bound to find something beyond corn and stock to make his farming pay." He *rears* about 8,000 chickens for fattening, buying about 2,000 more; for the year given the sales were 10,443 fat fowls, and the labour bill came to £250. The capital invested was £600, on which five per cent. interest was charged. Besides this the net profit shown was £268, and in some years considerably more had been made.

These cases are certainly more than merely "poultry on the farm" as fairly understood. Poultry are not the sole product, it is true, but they are the mainspring of the operations. Not only do all the oats grown go to the chickens, but a great part of the produce of the cows. Mr. Rew expressly reports that "cows and chickens are, as I learnt from several witnesses, complementary to each other," as the chickens need the skim-milk, which indeed has in most cases to be largely supplemented from other farms.

This fact, and the other fact that by these arrangements 30 to 40 birds per acre are reared in these examples, place them far above cases in which poultry is a "mere adjunct" or "bye-product" on a farm. The fowls are the key-stone of the system.

But there is also much to be done outside and beyond the mere food market, and we have already remarked on the desirability of cultivating a market for specialised products. The Coaley Poultry Farm, near Dursley, is carried on by Miss Edwards. She does not wish some figures published which she has kindly sent us; but her business has steadily increased from small beginnings, and is still increasing. It very largely consists in pure-bred fowls for stock at very moderate prices, with prize specimens at higher rates; in eggs for sitting, regularly graduated in price according to the month, and quality of the pen; and, especially, in *newly-hatched chickens*, hatched in incubators, and sent off within thirty-six hours of hatching, at prices ranging from 9s. per dozen up to 16s. per dozen, according to month and quality. Of course any connection of this kind can only be built up gradually; for character or reputation is indispensable to it, besides the stock to sell. All this takes time, again teaching the necessity of beginning gradually, and making the fowls *pay as they go*.

One more English example, of the same sort but on a larger scale. This is the well-known poultry farm of Mr. Simon Hunter, Sowerby Grange, Northallerton, to whose kindness we are indebted for the following particulars of a business which has now become of great extent, and is no ephemeral one, but resulted from a long and varied experience. For fourteen years, he informs us, he occupied a farm in Wensleydale, where he bred and kept large flocks specially to lay eggs for market. From the first he was one of the very few—even fewer then—who bred such

birds *from selected layers*; and he got his average up to 160-170 eggs each, and reckoned a profit of nearly 5s. per annum per bird, after allowing for labour: prices realised were from 6 to 17 for a shilling, according to season. The fowls numbered here from 70 to 80 per acre, and at the end of the term, he tells us, the land seemed getting rather foul.

For seven years (we write in 1898) Mr. Hunter has now occupied 43 acres at Northallerton, where on an average he reckons about 2,000 head, or slightly under 50 to the acre. A large quantity of eggs are still sold in local markets, and a few of the culls from the chickens, which realise about 2s. 6d. each; but the main part of the business has been developed in other directions. Pure-bred stock bred for laying, as this has always been, possesses a character and value of its own, and about 3,000 to 4,000 sittings of eggs are sold annually at prices averaging about 6s. per dozen. Pure-bred birds are also sold, some for mere crossing as low as 5s. each; others, of better quality, ranging up to exhibition specimens, at prices from 8s. 6d. to £5. This connection has, of course, been a gradual growth of time, and character, and systematic advertising.

Details of the farm are very interesting. The fowls are in runs of a quarter to half acre, each with a house 7 by 7 feet, with peat moss on floor, and a good large shed containing half a load of coal ashes. The runs have 10 to 30 birds in each, preferably not over 20, and are grass all over; of course with only this number they never look foul. Half or more of the whole farm is mown every year, and grows about £100 worth of hay. This sweetens it and uses up the manure. To arrange for this, two lots of birds are put together for about six weeks, say from the middle of May to end of June, while the grass grows; after it is cut they go back to the now clean and sweet ground. Some years nearly all the farm is cut in this way, and an average of

40 sheep is also kept to keep the grass down, being changed from pen to pen as required. The land is part gravel, but mostly strong clay. It is well drained, and clumps of evergreens are planted in many runs, while others are shaded by hedges. The fences vary from 5 feet to 6 feet high, and are of wire netting, 2-inch mesh and No. 18 gauge, on posts 12 feet apart, with barbed wire at the top to keep it taut. There are *six miles* of this fencing, and about a hundred hen houses, besides small ones and sheds. Water is laid on every pen in iron pipes from a spring; the cost of this, of wells, and drainage, was heavy, but it is considered well spent, as once laid on the water requires no attention and is always fresh.

The houses cost about £3 each. The roofs are all double-boarded with a space of three inches between, which in winter is stuffed with hay: this keeps cold out, and is considered a very successful method. Wire and wood for fencing costs about £5 more per pen of a quarter acre. The total cost of fitting up, draining, and stocking, is reckoned at about £3,000. Without going into precise details, it may be stated that the Northallerton farm was purchased out of the proceeds of the former one in Wensleydale; has been fitted up and improved out of its own proceeds (again the "*pay as they go*" principle); and is now clear, with a good balance in the bank, "*all out of poultry farming*," as Mr. Hunter himself writes us. There are now four regular assistants, with other occasional help, chiefly in the hay season. The fowls are fed on soft food in morning and grain at night, chiefly wheat, short oats, and Indian corn for the light breeds only. In winter a horse is used about every week, boiled down and mixed with the soft food. The average cost of food per bird on this farm, including flint and shell grit, which is purchased for them, is reckoned at about 5s. per annum.

Is this a fair specimen, and can such success be repeated? Yes; and no. Yes; because what man has done, man may do; and there are other examples of great poultry businesses, such as those of Messrs. Abbott, W. Cook of Orpington, J. W. Cook of Lincoln, and others, also built up on more or less similar lines. No; because success is *not* easy, or common. Such success never can be so. It has come not from poultry only, but from untiring industry, personal knowledge, practical skill, and business management of a high order, combined with systematic and judicious advertising. These qualities are by no means common anywhere, but especially in poultry farming; and without them the results would have been very different.

We will now cross the Atlantic. For most of the details that follow we are indebted to articles describing various American poultry farms which have appeared in *Farm Poultry*, Boston, and have been collected and sent us by the editor, Mr. A. F. Hunter; but some of them are from details which he has kindly sent us direct. One or two details only are gathered from some other journals.

As an example of a small American farm, we may take that of Mr. R. S. Norton, of Falmouth Foreside, Maine. It is small, only about seven or eight acres, half an acre being in fruit; besides which there is a garden, and a cow is kept. His gross annual sales are about 2,000 dollars, of which about 200 dollars are eggs bought from neighbours when he is short for orders. His old mother always kept about 75 hens, and "made them pay"; when she died he bought the other children's shares, and began to extend. It always paid, but the results of some improvements in management are interesting. In 1894 he put up another house, 50 feet long, in four pens, and spread his birds out more; next year his egg-yield *went up a third*, from 29,726 to 39,551. He therefore put up another house and further

divided them, a hundred being put in the new four pens, 25 in each. The result was 70 and 75 eggs a day from that hundred, while the others, more crowded, were laying only 40 to 50 per cent.

Mr. C. H. Wyckoff, of Groton, New York State, began sixteen years before the date of the account, without any capital, his father being security for the purchase of his farm, his own weekly wages being devoted to paying the interest on the price. His first year he had 25 mixed hens; these were replaced by Rocks and Brown Leghorns, from which he realised 75 dollars during winter and spring, which was invested in Leghorn eggs. Thus he went on upon the principle (obligatory on him, since he had no means other than the hens and his labour) that the hens *must pay their way* as he proceeded—that all-important rule we have tried to enforce. As he could, therefore, he improved the yard, and put up buildings, and extended stock. It took some six years thus to “get fairly under way;” but for about ten years the place had been paid for, and his sales average 4,000 dollars a year, of which seven-eighths is earned by Leghorn hens. We can only take a few details. In 1898 he had on the farm seven double-houses, each 12 by 40 feet, each half of which has a run 33 by 128 feet, the pen taking 50 fowls. The houses are built of double timber with building-paper between, which is warm enough in winter not to need heating. Plums and peaches are planted in the runs, and realise about 200 dollars per annum. There is also a brooder-house 16 by 60 feet, and a few odd single houses. Five or six hundred hens are kept for winter laying, and 1,500 to 2,000 birds are raised every year. The Leghorns are bred with care for laying, and *six hundred* of them averaged one year 194 eggs per bird! Three 300-egg incubators are in use.

Mr. Isaac Wilbur, Little Compton, Rhode Island, is

believed to have about the largest poultry farm in America ; and it has been the gradual growth of forty years, on a 200-acre farm which has been in the family for generations. Forty years ago the chief produce was beef ; and the first step was to multiply the usual farmer's flock of fowls by two, for which Mr. Wilbur was duly ridiculed by neighbours ; now he has a hundred houses, each with about forty head. These are an exception to the usual poultry farm practice in America, being scattered over several fields on the unfenced or "colony" plan, recommended by Mr. H. Stoddart a quarter of a century ago. The houses are about 8 by 12 feet, and placed about 150 feet apart, in long rows, with no fences at all. A low waggon with the food is driven from house to house in turn twice a day, and at the second trip eggs are collected ; the breakfast is cooked vegetables and mixed meals, the last feed whole (Indian) corn. The houses are rough and cheap, costing 20 dollars each, and no pains are taken to make them wind-tight ! The most surprising thing to us is that such shelter should be enough for the American climate anywhere ; but the farm is close to the seashore, where snow is unknown, and the fowls "run" all the year. Hence they are hardened and become hardy ; but the egg-yield must suffer, and it is not to be wondered at that a year ago Mr. Wilbur was planning a new large house on the plan of adequate shelter and "scratching shed," somewhat as presently described of Mr. Hunter's own farm. Several other farms on the open or "colony" plan are devising similar modifications. One avowed reason for such changes is the admitted danger of contagious diseases in the colony or unfenced system. We have an account of one case, where a thousand hens were kept in flocks of forty each (Orange Co., New York), in which "a scourge of roup swept through the flock" in 1895. Such an occurrence means wholesale disaster

for at least one year, and may not be overcome even then.

The chief part of Mr. Wilbur's stock are of a local breed called Rhode Island Reds, somewhat smaller than Rocks, with evident Cochin blood, and laying a brown egg; the usual prevailing colour is cinnamon and buff. It will be seen that the birds are at perfect liberty to go from one house to another; but they seldom mix much, if any. This is practically prevented by the method of renewing stock, all the houses in one row being emptied and refilled at one time, and the fowls shut in the houses for two days, and then let out a little before night for their feed, so that they return quickly to roost; after that they are allowed liberty. There are no cocks with them, as eggs only are wanted. Besides his own eggs, Mr. Wilbur collects, and ships altogether about 150,000 dozen yearly. He also raises and collects and dresses poultry, keeps about 100 sheep, and 40 cows for raising veal. Every branch pays, and one man has been in his employ forty-two years.

The business of Messrs. Knapp Brothers, of Fabius, New York State, has been carried on for many years. The brothers were born on a farm where it was a struggle for bare necessities, and the eldest taught school to eke out the produce of a small farm bought on credit, with a few cows to make a start. They kept a few hens for their own supply, like others; but keeping strict account they found *the hens beat the cows*, and that 23 had netted them a dollar apiece in the year. Next year they increased to 35 hens; then they introduced Leghorns and kept 60, which brought 180 dollars gross cash. Next year to that they started with 200 hens. By this time they had really good stock, and began to exhibit with success, and to advertise and sell prize stock as well as market goods, selling £100 worth (500 dollars) of prize stock and eggs their first season. Later

their show career has been wonderfully successful, and their sales of *this* kind in birds and eggs average 4,000 dollars per annum. But they still market great quantities of eggs for eating, gathering from farmers round as well as their own, totalling lately about 100,000 dozen a year. Private customers are still sought as far as possible, and 120 dozen weekly go to the Fifth Avenue Hotel in New York. White Wyandottes and white Leghorns are the stock chiefly kept.

Mr. Hunter's own experience is very interesting and instructive. His farm was intended, when begun, to be his principal industrial concern; but as he was gradually led into journalism it could not be developed as first expected, while on the other hand results were probably noted and tested with a care for figures which might not otherwise have been possible. The farm of 30 acres is fifteen miles from Boston, and was bought fifteen years ago, with the idea of keeping all the fowls in moderate flocks, with sufficient range, however the number might be extended.* Experiment led him to believe that the necessary space was about 10 square feet of house-room and 100 square feet of yard or run, per bird. His first house was 36 by 15 feet 3 feet being a passage-way and the rest divided into three pens, 12 feet square, with a yard of same width and 100 feet long; and his first year ended with 75 good pullets of his own breeding on hand, and a profit of one dollar and one cent. In the new house were placed 45 of the pullets, 15 in each pen. The second year gave a profit of 234 dollars, and the laying stock was 130 head; and the house was now lengthened 72 feet, giving six more pens; the third year, 157 layers gave a profit of over 3 dollars each. The plant

*The farm and results are described in various numbers of the *Boston Farm Poultry*; but we are also indebted to English articles in *The Feathered World*.

was gradually enlarged, until in 1898 Mr. Hunter had two houses respectively 150 and 168 feet in length, giving 27 pens each 12 feet square, housing, at 15 birds in a pen, 405 fowls. The second house was given yards 25 feet longer, or 125 feet, and in this, with 15 birds, grass keeps green all the growing season—the nearest 20 or 30 feet are worn bare, but the farthest 50 feet gets so long that it has to be cut several times each season. It will easily be seen that such houses, with yards all supposed to be 125 feet long, which is to be preferred, take just about 400 fowls on one acre.

Further experiment, however, tended to show that the closed houses alone were not best for the American climate, which compels the fowls to be often confined altogether in winter. Mr. Hunter now prefers to build a cheaper and lower range of shedding without a passage-way, 10 feet wide, and to give each pen 18 feet of it, divided into 8 by 10 of closed house, and 10 by 10 of wire-fronted shed, which also in some weathers has to be closed by semi-transparent curtains of waterproof muslin. In each of these he places 25 fowls. The yards are of same length as above, but he prefers to divide them, giving each pen a single run 50 feet long, and every pair opening into a double run of grass 36 by 75 feet, in which each flock runs on alternate days. (This alternate plan we doubt the wisdom of.) Every roosting-house has a good window, which swings open if required. Thus, in hot weather there can be the freest ventilation, while in cold all can be shut in. The run partitions are two feet of boarding surmounted by four feet of two-inch netting.

The results depend upon breeding management. The pullets are bred for *time* of laying as well as for amount of laying. Mr. Hunter has found it, he says, "easy to get a 50 per cent. egg yield in November and December, 60 per cent.

in January and February, and 70 to 75 per cent. in March and April." It is quite possible to get an average very soon of 150 to 175 eggs per year, which means a profit of $2\frac{1}{2}$ to 3 dollars each bird; and he considers that he now has an average of 200 eggs each, well in sight.

These few examples have been purposely selected of farms on different scales and somewhat different plans, but, above all, from cases which have stood the test of time and experience. Many others before us have not been thus tested, and may turn out successfully or not: in fact there are, as in England, not a few cases of admitted failure. The most common kinds of poultry enterprise in America are what are known as "broiler farms." In these a long shed, perhaps 200 feet long, and 10 or 12 feet wide, is divided into pens about 10 by 6 feet, with a yard outside about the same size. These are heated by hot-water pipes extending all along, nearer the floor at one end, and gradually rising towards the other, under which the chickens crouch for warmth. About 50 chickens will be placed in each, and each lot will be moved one pen along every day, thus gradually getting a little less heat, till they weigh about $1\frac{1}{2}$ lb. each, when they are marketed. A few of these broiler farms appear to have stood the test; but with time many have certainly failed, and shut down. Several enormous establishments on a more general plan, such as the mammoth farm on Fisher's Island, may or may not succeed, but have only had four or five years' experience. But the above cases, which could be added to, are not open to these objections; and it is important to consider carefully what may be the probable reasons for the more generally successful American results in this field of enterprise.

One reason, beyond doubt, is the methodical *breeding for eggs*. For a quarter of a century we have urged this in every work from our pen; but not till very lately have

breeders in England taken the matter up, and even now it is only done by a few, who mostly advertise their stock as so bred. In America they are sharper, and the *farmers themselves* (i.e. the successful ones) do it. What would 175 eggs do even here? *In America they get it.* One man records 210 each from 11 white Wyandottes. Mr. R. S. Norton got 178 each from 280 fowls—white Wyandottes and barred Rocks. Mr. Wyckoff actually got, one year, 196 each from 600 white Leghorns.

A second reason is the kind of market demand for fowls. Very few large fatted fowls or ducks are wanted; the chief call is for “broilers” of about $1\frac{1}{2}$ to 2 lbs. These need no fattening, only feeding in their pens, and are ready at three months old. It is manifestly less trouble and risk to raise chickens to such a small age, and allows much more crowding, because if they can be kept healthy till then no more is wanted. Hence the crowded “broiler” plants. It is pretty clear, however, that these entail great risks, and have been carried too far as regards want of space and air.*

A third reason undoubtedly is the keener intelligence and greater energy of American farmers; for it is largely *farmers*, originally, who have taken to this business. The outlay in their great ranges of poultry houses, brooder houses, and broiler houses can only be explained on the supposition that much is done personally, by working early

* In some recent papers we see an account of an enormous plant arranged to turn out 300 broilers *per day*, which is proudly announced as “the largest in the world,” as it probably is. It has been started by Mr. Loughlin, a city business man, who has already made two respectable fortunes, and no less than 60,000 dollars have been sunk in it, showing that people “embark” in such projects in America too. The establishment is, however, the most excessively crowded of any which we have seen described, the chicks being kept (indoors) up to a month old, at the rate of *six per square foot of floor*. We need hardly say that it has not been tested, and that its ultimate success would be to us a very great surprise.

and late with an energy and manual skill of which English farmers have not even an idea. In an account of Mr. Latham's plant (Lancaster, Mass.), not included in the above because not giving actual results, but the tested success of which is guaranteed by the fact that he had previously built two poultry plants on other ground, and was now building the third on a new farm "to get things *right*," we find his new plan to be a shed 360 feet long and 14 wide, of which 4 feet is passage-way. The rest contains twenty sections, each with a roost 8 by 10 and open scratching shed 10 by 10, with a run 150 by 18 feet in front of each. These houses are raised a foot above ground level, and are built on a stone and mortar foundation. If put up by paid labour, this must mean a heavy capital per acre.* Such enterprises show, moreover, an *adaptability* of mind

* Since the text was in type we have received from Mr. Hunter direct replies on some points here discussed, and which have impressed us so strongly. They emphasise and confirm the conclusions here expressed. He works out his own stated profit per bird by reckoning his 175 eggs each (this is not theoretical, but *actually attained*) at the average price during six years past of $27\frac{1}{2}$ cents per dozen (varying from 15 cents to 42 cents) at which they are collected from him by the grocer as "strictly fresh" ones. The food costs 1.35 dollars each. He sells his birds after *one* year's laying only, at about 50 cents each. Thus he reckons 3.15 dollars profit; but this allows nothing for the cost of the fowl, an important omission. Nothing also is charged for labour, on the theory that most American farmers are small freeholders, and that this labour is the "way they make their living." Yet if any more labour has to be hired, which must be beyond a certain scale, this principle cannot apply, though it does apply to the small rearers and feeders in Sussex. His buildings for the 400 fowls on one acre are reckoned to cost about £300 (*on one acre*) if put up; but here, again, as we have supposed, "the cost is reduced by we small farmers doing our own work." Most of his were so put up. He states, finally, that, as a rule, there is no difficulty with the fowls fouling the land, with any reasonable runs; the soil is mostly sandy loam, and grass or other green crop seems able to dispose of "all it gets." The differences which have struck us as above, between American and English circumstances, are thus confirmed and emphasised.

very characteristic; in fact, upon American poultry farming, it is very plain, there are bestowed attention, method, and cleanliness, at a stretch or tension of which few English farmers, and far less English labourers, would be capable.

A fourth reason may perhaps lie in the difference of what may be called *pecuniary and social conditions*. In America a given cash return represents more than in England. Actual cash is scarce, and the farmers form a more rural and scattered community, raising a great deal of food on their own farms. A thousand or two thousand dollars actual cash, with a considerable food product and a country family life, may thus mean a scale of living and comfort very different from an "income" in England of £200 or £400 respectively. Probably much may be attributed to this difference in pecuniary and social circumstances.

Another great difference is to be found in climate. We are continually reminded, in reading accounts of American poultry farms, of the fact that *less run* seems thought necessary for a flock than in England is the case. Through great part of the winter it is more or less the custom to confine the (reduced) stock within covered sheds, such as are termed "scratching sheds" by Mr. Hunter, well provided with scratching material, and kept clean. This is necessitated by the snow and intense cold. During this interval the outer runs are at least vacated, and often ploughed up and sown with winter rye, which consumes the manure and turns it into food for next spring. This alone alters the conditions materially, and doubtless it is better to crowd fowls into smaller space and leave the run really empty for half the year. In this way it is probable that even in England 200 per acre might be kept, and some grass or hay secured as well, as we have pointed out. But beyond this, we believe the *dry* weather during the time the fowls are out on the runs is far less prejudicial as regards

fouling the ground. The droppings are dried up and cease to exhale poison; and that this is far less noxious seems to be proved by the guano islands, which are simply buried in the accumulations of years, but in a desiccated state. In England we have *damp* excrementitious matter, which means diffused sewer gas. These climatic differences have not, we think, received enough consideration.

Finally, it will have been observed that in all the tested instances cited above, the undertaking was begun in a small way, and the fowls made to "*pay as they go.*" There were no novices "embarking" in it. A few were bred first, and laying was bred up to, and business extended *as it paid and opened out.* From small, to greater and greater, paying as it went, that has been the method of all the really successful cases from which the above examples are taken. And we are sure that this is the only possible path to successful poultry farming.

CHAPTER VIII.

BREEDING FOR POINTS.

It is impossible to breed poultry which shall continuously approach even a fair exhibition standard, without understanding the main principles which underlie such breeding. The produce of "prize" birds at a given show may be worth a great deal, or from this point of view may be worth nothing. Any such difference in value depends, of course, upon the fact that the birds in question may be likely to produce the desired class of chickens, or may not. That anyone can understand; but when we remember that the valuable bird and the worthless bird may *look* almost exactly alike, we want to understand why this is so. Here, again, everyone understands something about it, for one may be cross-bred and yet look like the pure-bred. We *knew* a

cross between a dark Brahma cock and white Cochin hen win as a light Brahma; it was admitted to us. All know what breeding from that "light Brahma" would result in. But when the same difference in breeding value extends, though in perhaps less degree, to even pure-bred "prize" birds matched in a breeding pen, it is important to understand what we are about.

The first point that appears as the result of inquiry into the breeding value of a pen of birds, is that the valuable pen is of "Mr. A.'s strain." Observe, not that they are merely of a "prize" strain, in the sense that their parents have won prizes; but they are *Mr. A.'s* strain. What that means is the main clue to the mystery. There is no charm, of course, in Mr. A.'s or any other name only—by any other name the birds would be as good. It is something our Mr. A. has *done* that has made the pen from his strain valuable. What that was is what we want to know.

The chief matter at the bottom of it is one of the very barest simplicity; and yet the phrase, "Like produces like," in which it is supposed to be embodied, is not true in a sense often supposed, and, if so understood, may even throw a breeder off the track, by leading to that very idea of the value of stock merely from "prize strains," which has been denied above. Let us see what it does really involve.

The "family likeness" of children to their parents is familiar to all; as also the fact that it is generally more conspicuous to strangers than to the family. In most cases it can be clearly traced, however, and it can be seen that it does not lie in any one feature as a rule. In other cases some very strongly-marked feature is the predominant mark, and in some no obvious likeness can be traced at all, while there may be obvious mental or moral resemblances. Supposing the father to have a pronounced Roman nose, the feature will probably be recognised in a portion of his

offspring, while it may fail in other children, whose faces, nevertheless, show other resemblances, complicated perhaps with stronger resemblances to the mother, or to *other* members of the families of both parents. So much is apparent to all.

But further ; in many cases, where no obvious resemblance can be traced to the direct parents, a very striking one often appears to the *grandparents*, or even to other ancestors still further back. Thus we see that features have a greater or less tendency to reappear in posterity, even beyond the next immediate step in the family pedigree ; and some extraordinary features, such as the possession of six digits instead of five, are often thus transmitted through successive crosses with great pertinacity. Many facts of this kind have made it certain that every feature in every animal has *some* tendency to repeat itself, and would do so, more or less, were it not counteracted by other tendencies. If one parent has black hair and the other brown, the black-haired parent has a tendency to repeat that feature in his children ; but this is modified or counteracted by that of the other to transmit brown ; and *both* are modified by the colour of the hair in ancestors further back. And the result in any immediate case is impossible of prediction, because there are so many discordant tendencies ; marriages having taken place quite irrespective of the colour of the hair.

The breeding which is to succeed in producing the "points" of exhibition poultry consists in throwing *all* these tendencies into one desired direction, so that the influence of remote ancestors, of great-grandparents and grandparents, as well as of the parents, combine towards the desired point. Let us take a case. It would be very easy to find a fowl which, from some cross with the Dorking generations back, and never repeated, exhibited the fifth toe. Though really due to the far-back cross,

such a fowl may be so rare in that farm-yard stock of to-day, that we may almost call it an individual variation ; however, we have got it. Breeding from such a hen, it is probable that a few (and only a few) of her chickens may show the fifth toe, the greater part reverting to the common type. Mating a five-toed cockerel of this produce to a five-toed pullet, the number of five-toed progeny will be somewhat increased ; but still (supposing as we have done, no *appreciable* Dorking blood in the farm-yard), not many ; and the four-toed progeny will still have little tendency to produce five toes. But from these five-toed chickens again select a pair to breed together ; we shall now find the tendency vastly increased ; probably half the progeny might be five-toed, and even the four-toed ones would produce more or less five-toed chickens. In the next generation the tendency would be so increased that probably very few four-toed chickens would occur ; and in a generation or two more a four-toed bird would be as rare as the five-toed one originally was. We have accumulated into one direction the transmissive tendencies of many successive generations, and we have now a *strain*, a race which we can *depend upon* with almost absolute certainty to produce birds with five toes.

Now suppose, we will not say the first single hen herself, but even our first pair of birds from her with the five toes, to be still alive after six years, as might easily be the case, we might probably select from our last progeny a pair that as nearly as possible resembled them both in that and other points—we might be unable to see any difference at all between them as to the point in question. But their *breeding value* would differ enormously. The first pair have no tendency to be relied upon to any extent ; the last pair can be depended upon as regards nearly every chick. The first gives us nothing beyond individual features on

which we were able, by care and system, to *build* a "strain"; the other pair represents work done, a point fixed, a "strain," which only requires ordinary care to preserve its character.

Breeding for one point only is thus an absolutely simple matter. But the reader will be aware that every fowl is bred for many points which must be combined. Here the puzzle really begins, and the novice usually finds that, as he attempts to deal with any one of those points which need improvement, he is very apt to lose in some other already attained. Obviously the reason of this is the fact that the *faults* as well as the good points in a parent, tend to be reproduced. But even more, it is impossible to say when the tendency to revert to any past fault apparently overcome is practically lost: *absolutely* lost it never is, and the fault may crop up again on any provocation after even twenty generations of absence. Hence every time a bird is purchased to cross with, it may introduce tendencies towards features which are not wanted, and may even not appear in itself at all. Thus we can understand the ill-success of most novices in breeding. As each fault becomes distinctly apparent to such an one, he is apt to select or buy a bird to correct it. And every time he does this some influence really is exerted, and if this were followed up the ground gained might be secured. But little is done towards *fixing* the point by this one step; while the following season some other point probably appears to need correction, and he goes off after that. And so he is apt to go on, apparently getting little further. Some, on the other hand, do get out of this uncertainty, and found a real "strain," as shown by their steady improvement. The uncertainty, therefore, can be overcome: how are we to find our way through the maze?

Let our young breeder consider this fact. While there

are many faults he knows too well may occur in his chickens at any time, which he half anticipates, and when they occur puts down to his own want of skill ; there are other defects which, if they did occur, he would consider clear proof that he had been *swindled* in the stock he had purchased. Suppose he breeds dark Brahmas ; he may find no uniformity in pencilling, or bad striping in the hackle, or some decided fault in shape or carriage. But ask if he expects ever to find a single comb, and he at once says, No. Whence comes this difference ?

Let him think, and he will see. It is simply that the pea-comb has been regarded as such an absolute *sine quâ non* in the Brahma that for many generations birds which did not possess it have *never* been bred from. It was not always so ; we can well remember single combs. But for many years now that point has been imperative ; in regard to it, therefore, *not one single link in the chain of succession* has ever been dropped during all these years, and thus every year has added to its fixedness. That point has become sure, and we learn thus that uncertainty is not necessary in regard to any point. To overcome such uncertainty is the task of the breeder, and the necessary process is not to lose a link in the succession, or any ground already gained, but to keep a definite method steadily in view. But now we come face to face with difficulties in this, and the methods by which they can be overcome.

One of the first practical points, and one of the first difficulties, is that he cannot do without a very considerable amount of *in-breeding* ; while, on the other hand, it is soon found that this course has its limits, reached in the physical weakness and deterioration which result from too close breeding of the same strain. It is not only that every cross may introduce unknown tendencies to faults already more

or less overcome, as above explained. Beyond that, we have spoken above of faults apparently overcome, cropping up again under "provocation." Mr. Darwin has clearly shown by a large amount of evidence, that the *mere fact of crossing* between two entirely alien families, has a peculiar tendency of itself to produce reversion to such *long-lost* characters. Thus it is that when two different breeds of poultry are crossed, there is always more or less production of that black-red plumage which it is believed was the colour of the wild jungle race of fowls; or, when two non-sitting breeds are crossed, there is a considerable recurrence in the progeny of the long-lost instinct of incubation. In less degree the same applies to unrelated families of the same breed, which have tendencies to different defects, or even which have gone through a *different course of breeding* in regard to the points bred for. Let us suppose two strains of brown Leghorns, bred with equal care, but of which one had been (in the manner presently described) bred *first* for plumage, and in second place for head and comb; while the other had been bred first for head and comb and secondly for plumage. The result of crossing the two, might too probably be many chickens which "threw back" to the earlier defects of *both!*

Hence it is important that a cross should not only be good in itself, but the product of a similar *course* of selection to the yard crossed. Even then we should avoid too *sudden* a change of blood, which still brings with it more or less reversion to—we do not know what. If a bird can be got from a yard with some of the same blood as our own—generally possible—that will be best. If not, let a male bird be secured and paired first with one good hen, and the best produce from this mating used for the more general cross. By this means much risk is avoided, and much time may be saved; since it may take years to get rid

of the mischief from any rash experiment which turns out badly.

We come now, however, to the great principle of breeding, in that *course* of selection above alluded to. We have to harmonise the necessity for keeping up the continuous attention necessary to any point we want, with the claims of the other several points, which are so seldom found all together in perfection. The first step is to consider the points required in relation to their *comparative* difficulty and value, the difficulty and the value being usually synonymous. Doing this, the breeder at once sees that some points are obtained much more easily than others, a single mating being often enough sufficient to obtain one property in a good proportion of chickens, whilst generations of selection are needed for others. Where this is not so evident, some points will still be found of more *value* than others. All this being weighed, the proper procedure will begin to appear. Picking out one or two of the most difficult and valuable points, fasten attention on that one, or at most two, and *keep it there*. In selecting the very first stock for breeding, and ever afterwards, give such heed as is practically possible to other points also, of less moment, but *never lose sight of these*.

Also provide at the outset at least two, and, if possible, more pens, not closely related, but yet somewhat related, in order to avoid the necessity of crossing until the strain is thoroughly established. We thus avoid the danger of dropping unawares some link in the succession. Otherwise we risk that in the following way. We find some defect in our own stock needs remedy by a cross, though second to another all-important point to which we devote *chief* attention. We find a cross which gives us what we want, and also appears all we could desire in our most-valued point; hence we think we are not at all risking the

work we have done in the latter. But it may only too likely be otherwise ; for the bird may be almost the *only* one in the other yard which is excellent in that chief point, and in such case he spoils all. The only way of avoiding such results for certain, is for the same breeder to have bred both parents, when he knows the course of breeding and the latent tendencies of each. Two breeders who have had long acquaintance and know each other's yards thoroughly, can thus greatly assist each other if their course of selection corresponds ; and breeding might in this way become much more easy, were it not for a foolish jealousy too often found, or for a selfishness which leads each to expect *all* the benefit from some proposed exchange. In such matters there must be both give and take if such mutual help is to be secured.

In default of this, however, if, say, three families are started from three related good hens (making up the pens if necessary with common hens), the chief advantages of crossing can be enjoyed for many years without its evils ; keeping, of course, careful pedigree records. Where another person must either breed together brother or sister (the worst in-breeding of all) or obtain fresh blood, a breeder thus provided can take a bird from one of the other families, which in his "course" of breeding has reached about the same point by the same path ; he thus keeps his strain in his own hands, and can carry out all the necessary details of selection with full knowledge of what he is doing.

It will probably be of most help to the reader now to apply these principles to an actual case, as we verified them in experience with dark Brahmas. We reached them by studies in Darwin, and believed we should find them sound, and did so ; and it is scarcely too much to say that some blood of the strain so formed runs more or less in the veins of nearly every winner of the present day. Having almost

wasted a year or two, though breeding from really good stock,* we set ourselves to consider the points of the fowl, and what had been found the comparative difficulty in producing them? The first obvious fact was that the plumage of this breed differed more than some in the *two sexes*, that of the pullets being (at that date, years ago) far more difficult to obtain than that of the cockerels, and the most difficult point of all being *a breast well pencilled up to the throat*, at that time really rare. The next most difficult point then was a *neat* pea-comb, then size, then shape and leg-feather. The last, however, in this breed seemed very easy to get, a single mating often giving it; but the pencilling, and breast-marking especially, was *very* hard to get; the number of well-pencilled birds now which will breed the same in turn, have been formed by this very method, but did not then exist. Every reader will, we hope, see the conclusion reached; viz., to fasten attention chiefly on breast-marking, and *keep* it there, paying such heed as possible to other points, but never dropping this. A few mistakes were made which ought to have been avoided—we will, therefore, rather say how we would *now* proceed in starting a new yard to produce pullets for exhibition.

There should be two pens at least, even if only one *good* hen or pullet could be afforded for each, pencilled as well as possible to the throat, and with other points as well developed as can be afforded. The cockerels also should be of the best pullet-stock possible, a point to be referred to more fully presently. The number of hens should rather be made up with other fowls whose eggs could be distinguished

* Our very first birds, the first time shown (at Bristol) took first prize, beating Mr. Boyle, the most successful exhibitor of that day. But the produce—didn't!

readily, than with inferior hens of the same breed. Supposing inferior Brahma hens were added, and the cockerel be a good breeder, he may very likely "throw" (a word which just expresses the happy-go-lucky plan which hinders so many amateurs) some well-marked pullets from these poorer birds. The novice thinks this is a gain. In some sense it is, since he may have some to sell; but from the breeding point of view it is a *loss* of ground and time, since it *puts back* his strain. He will breed again from some of these birds, and then they will *throw back to the poorer parent*, and he has lost ground. At this stage he can only afford to breed from the best he has.

From these original hens or pullets there will be the very first season some pullets equally well pencilled. How many in proportion depends: if the mothers were well-bred and the cockerels also, and they are not too distantly related, it may be many; if the mothers were the pick from inferior parents, few; but some there will be. If there are really many, from either hen, it shows the mating itself has "nicked" well, in which case the male bird should be kept, for he is valuable. From this produce we select a few of the best pencilled pullets, next to this point looking to the combs and other points as before; if there are one or two which to the pencilling add good general quality, these should not be parted with at any price; at this stage the owner cannot *afford* to do so.

There are now several ways of mating these pullets. They may be put up with their own father, an excellent plan if he has bred well; or with the cock from the other pen, also a good plan if *he* has bred well; or with a selected cockerel from the other pen. If there are enough, and there is room, all three plans should be adopted, and four or six pens mated up for next year, which will provide families enough to go on with for a long time; and,

moreover, several distinctly different probabilities of a good result.

Next year's breeding will show marked advance; not so much in the pencilling of the best birds, as in the *proportion* which are good. This *proportion* is the real test of progress in a strain, not what some individual bird is. Out of these we shall have little difficulty in finding the few we want for breeding which are also good, or fairly good, in comb, size, shape, etc. Already the advantage will be found of *never* dropping the main point. We shall, though imperfectly, still have made it *so far* certain in the strain, that we can, without dropping it, begin to *select for the other points as well*. It will be still more so in every succeeding generation, but we need not follow the process further.

It will even be found that when the most cardinal points are *thoroughly* secured, a little may be occasionally risked; and this is another great advantage of such a course of breeding as here described. These points will have become at last so fixed that a bird a few degrees worse in one of them may occasionally be bred from for the sake of some other point badly wanted. But let the nature and reason of this procedure be understood. It is simply that the main point, known to be so fixed, is probably only accidentally somewhat deficient in the bird so chosen, which is therefore *trusted* to revert to the more perfect type in his or her progeny. Such a step should only be taken with caution, and never repeated through two generations, nor should a bird really bad in such a point be so used. It is only that one not quite so good in the first points may be occasionally *risked*; and that even so it is a risk, should be remembered. It is also plain that the best birds, from the breeding point of view, must not be sold, but kept for breeding. This will not always be synonymous with the best for exhibition; but we cannot expect to make steady progress if, at any early stage

especially, we part with what represents the ground we have gained.

These dark Brahmas will also illustrate for us the further question we must consider, of breeding for cockerels or pullets distinctively. In many breeds there are exhibition points belonging to the two sexes, which are very difficult to combine in one strain. Here, the desired colour for pullets now is even dark pencilling all over on a clear, almost dirty-white, ground, while for cockerels is sought a glossy black breast and fluff, with sharply striped hackles and clear wing. It will soon be found that there is a sort of natural incompatibility between the two. Supposing we mate with a good pullet a black-breasted cockerel whose black fluff is laced with white, a number of good pullets may probably result, with some too dark for present fashion; but it will be found that most of the cockerels are either ticked or laced on the breast feathers, and ticked or laced on the fluff. This shows us that such a colour corresponds with the type of pullets which is sought; and, in fact, for breeding pullets alone, these marked cockerels make the best which can be had, and breed them with such ease and certainty that it is best to breed in this way. It will also be found that if one of the black-breasted cockerels which occur is mated with one of the *darker* pullets, more black-breasted cockerels are produced. In this way we glide into cockerel-breeding and pullet-breeding pens, which is becoming more and more general in other than self-coloured varieties. But we have always felt it to be a misfortune and mistake, and due solely to an artificial and false standard. It really makes every so-called breed thus treated into *two breeds*. In this case it only needs to tolerate slightly darker and richer ground for the pullets, and a little lacing on the fluff of the cockerels, to breed both from one pen; or contrariwise, if the clear pullet ground be insisted on, it

only needs toleration for exhibition of slightly ticked or laced breast in the cockerel, to breed both from one pen.* The present plan, also, only secures lighter ground-colour by the loss of another beautiful point, for the pullets are gradually now losing that *striping of the hackle* which used to be such a beauty in the dark Brahma, a bastard transverse "pencilir g" taking its place. We cannot, however, enter further into this here, and only point out the principle of this division of the sexes in breeding.

It is well worth while to add, that exactly the same procedure will develop any *quality* in fowls, such as that of laying. Here the procedure is simplicity itself. It is only to hatch chickens from eggs of the selected best layers, and in successive generations to match the best laying pullets of the progeny with cockerels also the progeny of the best layers. This has for years been done on American poultry farms, with the result of raising the egg-product in some cases to 175 per bird over a large number. Only lately the same methods, which we have explained over and over again from thirty years ago, are being carried out in England, and with rapid approach towards the same results.

We hope that this chapter will make clear what an amount of intellectual gratification, quite apart from success at exhibitions, is to be derived from watching the steady progress of a strain towards a determined point. Also how the individuality of a breeder must become ultimately stamped upon it, so that *his* birds can be distinguished, and become known as his. This strange power man possesses of

* The cockerel with which we won the cup at the Crystal Palace and Birmingham in 1872 was perfectly black-breasted, and only a little laced on the fluff. Claimed at Birmingham by Messrs. Newnham & Manby, he was the progenitor, as is well known, of the most uniform and remarkable lot of *pullets* ever sent out of one yard. But the accepted pullet colour then was perceptibly richer in tone than now.

so moulding other animals to his will is a mysterious approach, though in a lower degree, to the Divine operation shown in the development of species. It is a similar though lesser example of the power of intelligent Will to modify both the inorganic world and the forms of life which inhabit it.

CHAPTER IX.

BREEDING AND REARING OF PRIZE STOCK.

IN purchasing stock to commence breeding, if the reader be inexperienced, he should, if it be possible, secure the assistance of some friend upon whose judgment he can thoroughly rely; failing this, he should endeavour, not only by studying the descriptions, but by frequenting good shows, and seeing and comparing the live birds themselves, to become acquainted with the main points of the breed to which his preference inclines. To buy of unknown advertisers is a risk, and it will generally be found more economical in the long run to apply, in the first place, to known and eminent exhibitors whose character stands too high to admit the suspicion of any wilful deception. Such breeders, it is true, will generally demand high prices for really good stock; but then the stock *will* be good, which is by far the most important point. Birds may also be purchased at shows; and good specimens may often be picked up at a very moderate price, especially out of the large "selling-classes" * at the Crystal Palace or Birmingham. A beginner should, however, if possible, get some experienced friend to help in such selections, and even then one cannot always escape loss; for some very old birds will

* Selling-classes are classes in which prizes are given for fowls entered for sale at prices not exceeding fixed moderate sums, generally £2 to £3 per pair.

look uncommonly fresh and young, or a hen may be sold for some vice. We knew of an uncommonly cheap purchase of a fine Dorking hen, apparently worth many times her price; and it was only found after purchase that she was an inveterate egg-eater, and unfit for that reason to be in any breeding-yard.

The strongest chickens are bred from fully adult fowls in their second season, but it is difficult to get very early and fertile eggs from such stock. Next to this the strongest and best chickens are produced from a cockerel nearly a year old mated with hens twelve months older; but, unfortunately, the chickens of such parents have a large proportion of cocks. Some breeders therefore prefer a two-year-old cock with well-grown pullets not less than nine months in age. Such a cock is, however, very often, not fertile extremely early in the season, and it may be needful to depend upon cockerels for *early* chickens. It must not be supposed that good chickens are not to be expected from such birds. In this case, however, it is advisable that all the fowls should be early hatched; if not, the chickens are usually backward in fledging. It is the very early chickens which most need strength of constitution, hence every effort should be made to get the two-year-old hens laying early. To do this they must be hatched early and moulted early, and if they belong to sitting breeds, much can be done to influence early laying by letting them sit for some weeks late in the season, which gives them a rest and brings them on again.

Much also can be done to promote due vigour and fertility of second-year male birds, by giving them a fair portion of animal food and a little cayenne, avoiding too much starchy food. Liverine is found to have a direct influence upon the sexual vigour. Brood cocks should often be felt upon the perch. A really gallant bird will

often not take food enough in company with his hens ; and, while any fattening must be avoided, if this is so, and he gets the least " poor," he must be fed *by himself* to the necessary amount if he is to be active in the cold weather. An adult bird should not have more than three hens or pullets in the cold weather, though more may have to be added when the spring comes on.

The above chiefly refers to very early breeding, for October and November showing. The really *best* specimens, however, are rarely those bred so early, but are found amongst those hatched late in March and during April. For these, the adult cocks and hens can be brought on without difficulty.

Long experience has ascertained that the male bird has most influence upon the colour of the progeny, and also upon the comb, and what may be called the " fancy points," of any breed generally ; whilst the form, size, and useful qualities are principally derived from the hen. The above fact therefore becomes of great importance in selecting a breeding-pen. For instance, a cock may have been hatched late in the year, and therefore be decidedly under the proper standard in point of size ; but if his colour, plumage, comb and other points—whatever they may be—are perfect, and he be active and lively, he may make a first-class bird for breeding, when mated with good hens. A hen, again, if of large size and good shape, is not to be hastily condemned for a faulty feather or two, or even for a defective comb, if not too glaringly apparent—though the last fault is a serious one in either sex. But a very bad coloured or faulty-combed cock, however excellent in point of size, or a very small or ill-shaped hen, however exquisite in regard to colour, will invariably produce chickens of a very indifferent order.

The care and preservation in good condition of valuable

fowls is an important point. With regard to mere regimen, nothing can be added to what has already been treated of. But it frequently happens that, on account of the high price, only one or two first-class hens can be afforded; and if they be penned up by themselves, the frequent attentions of the cock will soon render the hens unfit for exhibition, or even cause temporary paralysis or sterility. To avoid this, one, two, or more of ordinary hens should be added, taking care that the eggs be of a different colour, or otherwise easily distinguished from those of the breeding-pen itself. The plumage and health of the hens or pullets will then be preserved, without injuring the character of the progeny. The same precaution must be observed in spring if hens are absent from the run on account of broodiness; and some cocks require far more than others. Of course, it is best in an established yard to mate the cock with three or four good hens of his own breed.

The number of hens, if good size and vigour are desired, should not exceed four in the large breeds, unless on a grass run, when we may allow six. The finest fowls of the larger kinds are bred from the proportion we have stated. Houdans and some others require more.

For early eggs the breeding birds ought to be put together early in December, and it is ruinous to exhibit them afterwards. Mating should be decided upon carefully, and then not altered if possible; for many cocks turn very sulky if separated from mates they have really become attached to. This leads us to the question of paternity when the male birds are changed. It has been placed beyond doubt by many experiments that there is *no real rule* about this, but that the results are very variable. As far as a rule can be laid down, it seems that in most cases when a cock is changed, after about six days the chickens will mainly belong to the second. But it also appears that

in many breeds, and most of all Game, if a cock be taken away the rest of the batch will be still fertile, and there are many recorded results showing that in some sense a chick may have *two fathers*, or owe certain points or traces of points to each. It is not certain that the effects of a first foreign cross are ever *quite* obliterated. Practically, however, after six days the eggs may in most cases be depended upon as bred by the last mate.

As eggs are often purchased for hatching, it is necessary to allude to the frequent disappointments experienced in this respect, and which are far too frequently attributed, in no measured terms, to fraud on the part of the seller. Such fraud may be occasionally practised. We knew of one case where the fact was put beyond a doubt by examination, proving that the eggs purchased from a well-known exhibiter were actually *boiled*; but the great majority of breeders would scorn such proceedings. It should be remembered, in the first place, that highly-bred birds are seldom so prolific as more ordinary stock, and are generally too fat for full health and vigour. Too many eggs—the full dozen—are likewise very often set at seasons when the hen cannot give them heat enough; so that all get chilled in turn, and disappointment ensues. Bad packing also causes its share of failures; and, lastly, eggs are sometimes kept a week or fortnight after receipt before setting, which is always, but especially after a railway journey, most injurious. We can only recommend—1. That a hen be ready for the eggs before they are ordered. 2. That they be procured from a breeder of known honour and probity. 3. That especial directions be given that they are well packed. 4. That they be “rested” about twenty-four hours after arrival, but then placed with no more delay under the hen. And 5. That in cold weather the eggs be divided, so as not to exceed the number stated under each hen, if hens

are used to hatch them. That eggs hatch better after "resting" as above stated, is a fact that has been clearly proved.

Eggs are best packed in small baskets, with the top tied down. If in boxes, the cover should be tied down or *screwed*, not nailed on any account, or every egg will be endangered. The best packing is to wrap every egg rather loosely in a piece of paper, and then very carefully in a separate wisp of soft hay; and, finally, to imbed the eggs thus guarded, and not too tightly, in a basket with more soft hay, *with the large end down*. Chaff or bran is too solid. Eggs so packed will go hundreds of miles without injury.

The chickens being hatched, let the utmost care be taken of them in every way. The object in this branch of poultry-breeding is not to get a profitable amount of meat with the least possible expenditure in food; but, the birds being presumably good in quality, to get them by *any* means to the best possible condition, and often to the greatest possible size. Although size is never the first point considered, except perhaps in the case of Dorkings, it not unfrequently gives the casting vote between two contending pens, and is itself a most desirable point in all the large breeds.

The best stock foods are undoubtedly oatmeal, biscuit-meal, and wheat, and for valuable chickens they should be used liberally. After the age of cramp has passed, cooked meat may be given every day rather freely, provided it is not likely to injure the comb, as presently mentioned. One of the very best staples for soft food during the first fortnight is a teacupful of breadcrumbs, another of oatmeal, a spoonful of bone-meal, and half a teacupful of cut grass, made by taking a good wisp of clean fresh grass, and cutting off an eighth of an inch at a time with large scissors or shears,

mixing this small green chaff with the meal. This may be scalded, or mixed with milk in very cold weather, crumbly. Enough for the day can be mixed dry, if kept in a cool place, and moistened as required. After a fortnight biscuit-meal instead of crumb may be mixed with the oatmeal, or biscuit-meal mixed with the fine ground oats of Sussex, and a little later biscuit-meal and barleymeal do well; and the grass can be omitted if there is a grass run, but not else. When grass cannot be had, minced lettuce or dandelion will do if obtainable, or mustard and cress can at least be grown, and must if nothing else can be done.

In cold weather a little sulphate of iron, or "Douglas mixture," should always be added to the water, and a little bread soaked in ale may be found beneficial. Warm milk to drink in the morning is excellent. For weakly chickens it is most strengthening to mix up a raw egg with their oatmeal. Above all, unless they have a good run on grass, the supply of green food must be unlimited.

Feed often—every two hours, if possible, from daybreak, and let the food be always fresh, nothing being ever allowed to remain. Do not omit a feed at ten o'clock p.m., until daylight feeding lasts till at least seven o'clock, or later. When a month old, gradually reduce the number of meals till it comes down at three months to four times a day. If this is neglected, appetite will fall off. Also, leave off milk with the warm weather.

If a good field or other grass-run be at command, the chickens will of course have it, and it will go a long way in supplying all other defective arrangements. But to our own knowledge some of the finest and largest fowls we have ever seen have been reared in a gravelled yard not more than eighteen feet square. In such circumstances, besides the most scrupulous cleanliness and good feeding in other respects, there must be green food *ad libitum*—really fine

chickens *cannot* be reared without it, their plumage in particular being of a very inferior appearance, and quite devoid of that beautiful "bloom" which is now indispensable to success in the show-pen.

It is necessary to give one more caution. Do not let large chickens roost too soon—never before they are at least three months old. If they leave the hen before the proper age for roosting, let them have every night a good bed of nice clean dry ashes or peat moss. We never allowed our own chickens while with the hen to bed upon straw; ashes are much cleaner, and if supplied an inch deep are warmer also. To this plan we attribute a very small proportion of losses, even in very severe weather. When larger, straw makes a very good bedding; but it must be shaken up with a fork every night, and renewed and the floor cleaned every three days.

With such treatment and good shelter, if the stock be good and the number has been judiciously limited, the breeder will not fail to bring a fair proportion through the most inclement season, and they will be sure to reach a good standard in point of size, having the best time of the year before them when they really begin to grow. As they come on they require special looking after in several respects.

1. The *sexes* require pretty early separation, the more so the smaller the runs. This affects the question of size most materially in the larger breeds, and even in the smaller it prevents youngsters giving themselves the airs of adults at two months old, as they often will, and persecuting the pullets, which are brought on to lay too early and ruined in condition before the exhibition season comes round. In most breeds the sex can be determined at a very early age. As a rule, of course, the heads of cockerels are larger and bolder, and combs higher. In most breeds the pullets fledge

the quickest, especially on the back and down the breast. In most, the carriage of the cockerels is taller and more upright; and in nearly all Asiatics the first wings of the little cockerels are smaller, narrow, and pointed, and dark; while in the pullets they are broader and rounded at the end, and, if pencilled, with more marking on them.

2. The *combs* may require to be carefully considered. In breeds where large upright combs are desired in the cockerels it is not easy to avoid twisting, falling over, or thumb-marks, from either weakness or overgrowth. Both are liable to be produced by either using much meat or by warmth. It is very unadvisable to keep a cockerel of either of the Mediterranean breeds under a hen after his comb has begun to grow up at all, or in a warm brooder of the type which has flannel over him. A brooder should be chosen for such birds of the type where the chickens come *round* a lamp or hot-water bottle, and this should be kept from getting too hot. On the other hand, it of course helps a fine and well-falling comb in the pullets, to give animal food and rather more warmth.

3. *Vermin* must be specially guarded against. Any such not only affects health and growth terribly, but it specially affects condition of *plumage*, the more so because when show-time approaches it is not always advisable to allow dusting, for fear a bath not *absolutely* clean and dry may injure it. The chickens should be often examined, and a liberal use made of insect powder if required.

4. *Colour and colour-feeding*.—As they begin to drop their first or nestling feathers and grow the plumage in which they will appear, its *colour* demands care and attention, as does also that of the shanks in yellow-legged breeds. The most valuable help of all in this matter is plenty of green shade, but in default of that, *any* shade. Much sun tans white plumage, in cockerels especially; and, perversely,

also bleaches buff and brown or cinnamon plumage, and has some, though less, effect upon even black and red.

It has also long been known that food has considerable effect upon colour. Yellow or red maize will make most white fowls much more yellow than white maize or other grain; and much hempseed will darken the ground-colour of a moulting Brahma hen. It has also been known for many years that the constant use of *iron*, whether in natural chalybeate streams or given artificially, tends generally to intensify colour, whether in legs, plumage, or yolks of the eggs.

The most remarkable effects of food upon colour are known in canaries, in which (or rather in some of which, for the effect varies greatly in individuals), the constant administration of cayenne throughout the whole period during which the feather is growing converts a rich yellow into very deep *orange-red*. This fact, coupled with the success of some breeders in showing rich lemon-buff in the many buff varieties of fowls which have become so popular since 1890, has led many to the conclusion that the best specimens owe their fine buff colour, and even other colours, like the bay of golden Hamburgs its richness, to special *feeding* as well as careful breeding; and "colour-feed" for poultry is often now advertised in the poultry papers. This appears to chiefly depend upon cayenne, or the cool variety of cayenne, also used for canaries, which is said also to deepen the colour of buff poultry. Such colour-feeding as is practised appears to consist chiefly of cayenne in some form, with the addition of two to five grains per fowl per day of saccharated carbonate of iron, the form in which iron seems to be most easily assimilated. If such feeding is tried, on varieties supposed to require it, it must be remembered that it can only succeed if carried on without intermission *during the whole period of the growth of the feathers, from*

first to last; the same applying to adult moulting fowls. In America it is believed that the copious feeding of cut-up clover also assists the colour of buff breeds.

As to the actual effect of such expedients, opinion differs somewhat. We believe that it has been at least grossly exaggerated, for the very simple reason that we can trace no marked advance in the colour of buff Cochins since the days when no one pretends such things were used. The more tightly-feathered buff Leghorns, etc., do appear to show a richer colour, and we can understand that such tight plumage might prove more amenable to feeding, just as some canaries do; on the other hand, such plumage in itself would appear a better buff. On the whole, it is probable that a shade or two may be thus gained in fowls amenable to it, for all do not behave alike. But that such difference can be made by food alone as some aver, we have at present no reliable evidence whatever. The matter is, however, now quite open and above-board, and any reader can either try the materials here mentioned, or any of the "colour-feeds" advertised, using them according to directions.

In regard to the colour of shanks, deep yellow maize is certainly very good for this, but in white varieties inadmissible. Ferruginous soil in grass is the best; and lime rubbish as a covering for small runs must be avoided where yellow-legged breeds are kept. Sponging the legs with tepid water at night tends to keep the colour. No other means should be used with chickens of the year, and yellow-legged breeds are better not attempted on chalky soil, unless ample grass run be at command.

5. *Rigorous selection and sorting* are required, taking out all which are not manifestly up to the mark, that the rest may have more attention. This is a point in which all beginners fail, without exception. They do weed out

and kill just a few of the worst; but the rest, they think, do not look so very bad, and perhaps they may improve; and so they are kept on, crowding the yard so that there is neither fresh ground nor fresh air for what good birds there may be. Now, the beginner may make up his mind that only his *very best* fowls will have the slightest chance; and that to keep all these birds alive destroys what chance he has, besides "spoiling his eye." If he knows enough to really select the best *quarter* of those he has reared past chickenhood, he may be absolutely certain he has retained more than all really worth keeping; and these few will grow into finer birds for such severe weeding, to which the experienced breeder with limited space always subjects his yard.

Where grass-run is unlimited this does not much matter, and chickens may be kept without much detriment till full grown for table use. But the owner of a limited yard, who wants to make and maintain a reputation, cannot afford this. The matter is very simply illustrated. Let us suppose he can manage to rear really well for the show-pen two dozen full-grown chickens, and no more, besides what adult stock he must hold over for next season's operations. The novice will probably hatch about forty, and after losing half a dozen, weed out barely a dozen more of the worst. He cannot expect much from the rest for the first year or two. But the experienced breeder, even with better-matched stock, would act differently. He would hatch at least sixty, and very likely eighty birds, killing a fair proportion as soon as their very first feathers, at a fortnight old, told him they would be no good; and then, at a still early period, he would kill *half the remainder*. Keeping only the pick, he can hatch more. Later on, when his breeding has become more certain, he can be less severe; but experienced breeders always weed out much earlier

and more severely than novices can find it in their hearts to do.

With proper care, and attention to such matters as these, there ought in due time to be available for exhibition some really good birds. They may not win, since somebody else may have better; but there should be some that will not disgrace the yard.

CHAPTER X.

EXHIBITION.

CHICKENS are rarely fit for exhibition until at least six months old, or even more. If the cockerels and pullets have been separated, as recommended in the last chapter, there will rarely have been any eggs laid before this time; and stimulating food should now be partially discontinued to retard their production as long as possible, bearing in mind that the commencement of laying almost, if not quite, *stops the growth*, which it is desirable to prolong as far as possible for exhibition birds. In this respect the fancier and the ordinary poultry-keeper proceed upon contrary principles; the one endeavouring to get his pullets into laying order as soon as he can, the other using every expedient to procure a precisely opposite result, for a pullet scarcely ever looks quite so well as just before she lays for the first time, and experienced exhibitors generally try to secure this. If a pullet seems almost ready to lay before it is desired, changing her to a fresh run every ten days will often postpone laying for some weeks.

For young birds in perfection, six to eight months is usually the best age to show the larger breeds; but a month or two more is often to the advantage of cockerels. Hence the predominance of cockerels in the earliest broods alluded to in the last chapter is not altogether an evil. For very

early shows chickens must often be shown younger, and for such shows forward, "pretty" birds are often most successful; but such rarely make the finest fowls in the end. These, and the most successful at the really great shows, are more often found amongst the slowly-maturing, big, raw-looking birds, especially those hatched late in March and early in April.

The greatest care should be taken of all selected chickens, and of adult fowls as they get through the month. Every night it is advisable to see that they are actually on the perch, or on *clean* straw, not lying on dirty ground. Leg-feather should be cared for by keeping grass-runs mown short and tender. In wet weather the birds should be confined. If a cockerel which promises well is backward in making-up or furnishing, it generally brings him on a great deal in these respects to put him with a couple of common hens.

Two or three weeks before a show, it is often well to give a little special diet with a view to improve the gloss of the plumage. This cannot be given continuously, since one element of gloss is that the fowls be in what is called "close" feather and the highest health. But if to thoroughly healthy birds there be given linseed twice or thrice a week for three weeks, velvety lustre will often be improved greatly. The linseed is to be stewed into a thin jelly, and this jelly (with seeds and all) used hot instead of water to mix the meal with, taking enough for the proper friable consistency.

We can remember when a cock and three hens were shown together, and our own first exhibit was a cockerel and two pullets, then known as a "pen of birds." Then the cock was shown separately, and a pair of hens or pullets; now the rule is single birds. The pair or trio of hens was a much better test of the real quality of a yard, and a "matched pair" was worth much more than two single

birds; but the single bird system has vastly multiplied entries, and is better for exhibitors in every way.

A week before a show the exhibits should be penned, using pens rather larger than at shows, in order that they may be used to the confinement, and get tame. To the latter end they should be often visited, and used to being turned about with a judging-stick; if after each occasion they are thrown a few grains of wheat or hempseed (allowing for all this in their diet) they will rapidly become tame and familiar, coming to the front of the pen. Such penning also cleans the darker colours very effectually; and if before they are penned the legs and heads are thoroughly washed, and care has been taken of the birds in their runs, for such colours very often no more will be needed. A nail-brush is often very handy for cleaning heads and legs, in other cases a sponge may suffice. The pens should first be covered with gravel or grit, and over this clean chaff, the droppings being often taken away, and both materials renewed whenever necessary.

For light-coloured fowls, however, or for such as have much white in their plumage, the cleansing process above described will often be found insufficient. In such cases the birds must be carefully *washed* with soap and water before sending off, and good or bad washing may make all the difference between winning and losing.

A large tub or pan must be provided, and half filled with warm water. The very first step is to clean thoroughly the feet and legs, which always are of a colour to need this in light-coloured fowls; and if they are dirty, the water in which they are washed should be thrown away and clean substituted; a hardish brush will generally be useful in scrubbing the shanks. The head is washed next, using a soft nail-brush on the comb if needful; after that the first step is to thoroughly *soak* the plumage by the use of a

sponge. Then it is to be *thoroughly* washed with a sponge and good yellow soap, the great point being to ensure that it really is quite clean, and rubbing freely almost every way, except up or nearly up the feather, which must be avoided. Being sure the fowl is quite clean, the next great point is to be sure, by change of waters, that every particle of soap is washed out of the plumage. If any is left in, the feathers will clog or look ragged ; but if all is got out, the bird being partially dried with a towel first, is afterwards left in a lined basket in front of a good fire to dry gradually. Some dry almost in the hand, turning the fowl round and round occasionally on straw. It is a good thing to give the last rinse with *cold* water, to prevent catching cold, and also to prevent any debilitating effect from the hot water used in washing. It must always be done if the bird appears faint, as it sometimes will. Many people think that the addition of an ounce of borax and a spoonful of honey to the last tub of water makes the plumage "web" better in drying and look more lustrous. We were never able to satisfy ourselves that it made much, if any, difference.

Some people never seem able to wash fowls well ; but it may be said in brief, that *thorough* washing and *thorough* rinsing are the only secrets. For white fowls it is well to use a very little "blue" in the last water, to heighten the apparent purity of the white. If overdone, this will defeat itself, and look ridiculous ; a very little suffices. The object is to make the white look bright and free from yellow ; not to make it look blue. Really yellow plumage cannot, however, be whitened in this way. Of course the sun has much influence on this point, and green shade has much to do with exhibiting white fowls. But breeding has even more, and there are strains which appear far yellower, even when shaded, than others allowed full liberty in the sun.

If they have had an extensive run on country grass,

however, with adequate shade, the whitest fowls scarcely ever need washing, except as regards their feet and legs, giving also attention to the comb and wattles, if necessary. It is the poor dwellers in towns who have to take such precautions, and have so much to contend against. Yet, in spite of all this, we often see town breeders beating the very best country yards; and the fact proves that care and good

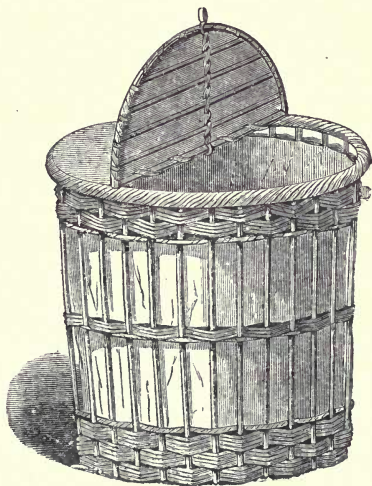


Fig. 26.—Exhibition Hamper.

system are of even more importance than any mere natural advantages.

In regard to that beautiful bright red of the comb and wattles so desirable, this *cannot* be given to a fowl which is not naturally in high health. But when a bird is healthy the scrubbing helps to bring it out; and if finally a very little fresh butter is rubbed in, and then wiped as thoroughly off as possible with a damp cloth, about the best is made of it. A greasy-looking comb is disgusting, and soon becomes

dull in colour. We have seen the head sponged with strong vinegar, and this does brighten the comb *for a while*; but most birds become dark afterwards, and the other is the more certain treatment.

The head and comb should be gone over the very last thing, any bent or broken small body-feather removed, and the whole body may be smoothed over with a silk handkerchief, with quite perceptible results in some cases.

As to the best form of hamper, general experience approves most of a round shape, of a size to give just ample room to the fowls which have to be shown. The usual pattern for a single bird is that shown in Fig. 26, of skeleton wickerwork, with a flat cover hinged in the middle. This is lined with coarse linen, canvas, or other cheap material. It is better to be too large than too small; and the straw should be put in deep, with a deep hollow in the centre, which will keep the bird there and avoid damage to the tail. Many shows now allow two or more pens to be sent in one hamper, which saves considerably in carriage. In such cases, the usual shape is an oblong with rounded ends, and a partition in the middle. When fowls are thus sent, the greatest care should be taken that the labels are so attached that there may be no chance of mistake about the proper pens. At almost every show there are errors of this sort, to the inevitable loss of the exhibiter, who cannot expect busy officials to remedy the results of his own carelessness.

All has now been done that can be done, and the rest must be left to the decision of the judges. As a rule, these are impartial, but there are regrettable exceptions. Some are known to have certain invincible prejudices, which prevent them from judging certain classes in accordance with the general rules as understood by the majority; there are others, far above any pecuniary corruption, who

are not above manifesting very obvious ill-will to the exhibits of those who in any way aggrieve them; only now and then is there any virtual proof of real corruption. The vigilance of the poultry press is making these exceptions more and more rare. The breeder should know definitely and authoritatively *what* he is to seek after. There are certain standards of excellence which are now generally recognised by breeders, and by most judges; and no individual judge has any right to depart from these without, at least, sufficient public notice, or until public discussion in the periodical press devoted to such matters has ratified the change. In the meantime, it is our opinion that exhibitors have decidedly a right to know beforehand *who are to judge* their birds; and this is now conceded at all the best shows. To call upon them to send their best stock, in the dark, to a show where, it may be, a judge's known prejudices on certain points give them no chance of a prize, is evidently unfair.

But we are leaving the fowls, and must return to them, though we have little more to add. Whether they require any special treatment on their return will chiefly depend upon the system of feeding which has been pursued during the period of exhibition. If, as is the case still at some small shows, the easy plan of feeding on whole barley *ad libitum* has been retained, the birds may be more or less feverish and disturbed, and need a corrective. But such feeding cannot be too strongly condemned. The proper feeding is either barley-meal or oatmeal or biscuit-meal in the morning, mixed rather dry, and given before the public are admitted, with grain only in the evening; and, in each case, only as much as the fowls will eat at once, without leaving any in the pens. Only these two meals should be given, as the birds have no exercise, and do not require more; besides which, the natural excitement of the show is

best counteracted by a rather spare diet. Water should be given in tins, and only in limited quantity—not left *ad libitum*—till the birds have had time to slake their first thirst after the journey. Barley ought also to be used sparingly, as it is too hard to be properly digested in a show-pen. Grit is now usually provided.

Fowls fed as here recommended will generally be returned in as good condition as they were sent, and require no attention at all beyond seeing that they do not get too much water and green food at first. But if the system on which they have been fed is unknown, or, in any case, if they appear either feverish or “overdone,” give each a rather scanty meal of biscuit-meal mixed with warm brandy and water; let them have two or three sips *only* of rather tepid water; and then administer a third of a tea-spoonful of Epsom salts to each bird. This will probably be at night. Next morning feed them on meal only in moderation, see that they cannot drink to excess, and give them some chopped lettuce, or a large sod of grass, but no other green food until it is seen what effect this has upon them; afterwards, if all seems well, let them return to their usual diet. It is in all cases safest not to let them have much grain, and to put them on an allowance of water, for the day after their return.

As a rule, there will be little injury from exhibition, and the same birds may be shown to a fair extent without suffering. They want care and attentive examination after each competition to see that they are not losing health; if it appears so, whatever other engagements may have been made, let them have rest till completely recovered; otherwise, property worth scores of pounds may be sacrificed for “just one more cup,” to the owner’s lasting regret. In any case, there should be sufficient rest and recuperation before exhibition specimens are put up for breeding.

CHAPTER XI.

COCHINS. LANGSHANS.

THE Cochin breed, as now known, appears to have been imported into this country about the year 1847, those so-called exhibited by Her Majesty in 1843 having been not only destitute of feathers on the shanks, but entirely different in form and general character. No other breed of poultry has ever attracted equal attention, or maintained such high prices for such a length of time; and the celebrated "poultry mania," which was mainly caused by its introduction, will always be remembered as one of the most remarkable phenomena of modern times. To account in some measure for this, it should be remembered that no similar fowls had ever been known in Europe; and when, therefore, Cochins were first exhibited, it was natural that their gigantic size, gentle disposition, prolificacy, and the ease with which they could be kept in confinement, should rapidly make them favourites with the public. But the extent to which the passion for them would grow no one certainly could have foreseen. A hundred guineas was repeatedly paid for a single cock, and was not at all an uncommon price for a pen of really fine birds; and although these prices have been equalled recently by other breeds, it must be remembered that in those early days there was not nearly the same number of poultry shows to win prizes at, which now adds to the money value. Men became almost mad for Cochins, and all England, from north to south, seemed given over to a universal "hen fever," as it was humorously termed. Their advocates would have it that the birds had no faults. They were to furnish eggs for breakfast, fowls for the table, and better morals than even Dr. Watts' hymns for the children, who

were from them "to learn kind and gentle manners," and thenceforward to live in peace.

Such a state of things, of course, could not last, and the breed is now perhaps as unjustly depreciated by many as it was then exalted ; for Cochins still have real merits. They might have stood much higher if a rather different type had been adopted, for many of the early birds had very good breasts ; but unfortunately early fanciers adopted the contrary model, and so spoil the breed as a table fowl.

As now bred for the show-pen, the breed presents the following characteristics :—The cock ought not to weigh less than 10 or 11 lb., and a very fine one will reach 13 lb.; the hens from 8 to 9 or 10 lb. The larger the better, if form and general make be good. The neck is rather short, the hackle flowing widely at the bottom over a very short and broad back, which should rise at once into a broad saddle in the cock, and an ample "cushion" in the hen, whose tail is nearly buried in it ; there should appear almost no actual back at all. The body is correspondingly short, but very deep down to the setting on of the thighs ; the legs being short and set widely apart. The breast should be as broad and full as possible consistent with these requirements, but must necessarily appear high and little developed, and this want of breast is the greatest defect in the Cochin formation from a table point of view. The shanks are to be most heavily feathered down the outside to the ends of the outer and middle toes, the thighs well furnished with soft downy fluff, standing out in a sort of globular mass, and the hocks well covered. The fashion in hocks has varied much. When this book was first written, any sign of vulture-hocks (stiff feathers projecting from the hock) was rigidly disqualified at all shows. This led to fraudulent plucking ; and to avoid this some approach to vulture-hock was gradually allowed ; later on a rage for

heavy feather at any price came in, and for many years it is to be regretted that vulture-hocks have predominated. We say it is to be regretted; since long and wide experience has convinced us that with vulture-hock is usually combined a tendency to coarse skin and want of breast. The fashion was resisted in America for years after it had conquered in England, and the "English type" is barely tolerated there even now. The tail should be as small and low as possible, with very little quill in it compared with other breeds. The general character of the Cochin is "lumpy," the small wings being deeply tucked in between the cushion or saddle above, and fluff below.

The head of a Cochin should be neat and small; the comb single, very moderate in size, evenly serrated, and fine in texture. Ear-lobes red. Red or dark eyes are best; yellow eyes generally go with buffs, and are a little more apt than red to become blind. In blacks the eyes are dark.

Whites must be pure in every feather, a sandy or red tinge being a great fault. The shanks yellow; a greenish tint was once common, but rarely occurs now, and would be a great fault. This variety requires green shade to show it in perfection, and maize must be rigidly avoided, as it promotes a straw tinge. Any tendency to straw in the hackle of a bird kept in fair shelter must be rejected in breeding-stock.

Buffs are of various shades, from very pale to quite a dark cinnamon colour. The hen should be as nearly alike as possible all over, except that the hackle is a richer and deeper golden tint always. The cock's breast and under parts match the hen; his hackle and saddle are richer, with a clearer gold or red-orange character. His wing should be even and rich all over, not grizzled with lighter feathers; there may be a little black in the tail, but the less the

better ; and the inner flights are often more or less black, which is better than white. White in the tail is a great blemish. Buffs tend to breed rather lighter ; and the cock should, therefore, always be chosen of perfectly sound colour on the wings, and, if possible, a shade or two deeper than the hens which really match him. On the other hand, a very much darker cock, or one with very dark wing, usually breeds spotty or patchy chickens. The legs yellow, or with a reddish tinge. A rich lemon buff is most preferred, and some people think the colour may be improved by the "colour-feeding" described in Chapter IX. We have been unable, so far, to trace any improvement in Cochin colour since this practice was introduced.

Partridge Cochins are very differently coloured in the two sexes. The cock for exhibition has black breast, under parts, and thighs. His hackle and saddle feathers are rich orange-red, striped with black. The back and shoulders of wing are almost crimson ; the secondaries bay on the outer edge, with a black spot on the end, edging the point of the wing. Across the centre of the wing is a broad "bar" of green-black. The tail is black, white being a great blemish. The pullet or hen has also an orange or rich yellow hackle striped with black ; the rest of her plumage consists of dark pencillings on a lighter ground. Formerly this was really partridge in character, or grouse ; but for years now the pencilling has exactly resembled in character that of the Dark Brahma, which has been crossed to produce it ; the pencilling being black on an almost yellow ground. The legs are dusky yellow.

This modern type is difficult to breed, and separate pens are practically required for the two sexes. For cockerels, an exhibition-coloured bird, with solid black under parts, is mated with hens or pullets that have specially well-striped hackles, and dark bodies, with small pencilling almost covering

the ground-colour, which is also pretty dark—quite a dull-looking colour, more after the older style. For pullets, on the other hand, the hens or pullets must be of the exhibition type, and the cockerel or cock *bred* from hens or pullets of this type; but his breast and thighs will have each feather either ticked or laced with lemon or orange—his hackles may also show signs of marking. The exaggerated value put on Brahma type of pencilling has almost destroyed size, shape, and grand “character” in Partridge Cochin hens, and these points need much attention, the type having been got by a cross and only perpetuated by close interbreeding. The colour of the Partridge cockerel, we fancy, may possibly in some cases be improved by colour-feeding.

Cuckoo Cochins are a peculiar bluish-grey mottle all over; each feather crossed by bands of light and dark blue-grey. They are seldom of good shape. The colour is bred as in Plymouth Rocks.

Black Cochins nearly disappeared for many years, from want of stock, and the attempt to breed black fowls with yellow legs, which was unnatural. The importation in 1871 of the black-legged type known as Langshans, however, revived the breed, and very good black birds are now sometimes seen. Some approach to dusky yellow in the legs is preferred, and as heavy feather as possible.

The *merits* of Cochins have already been hinted at. The chickens, though they feather slowly, are hardier than many other breeds, and will thrive where others would perish; they grow fast, and may be killed when twelve weeks old. The fowls will do well in very confined spaces, are very tame and easily domesticated, and seldom quarrel. They cannot fly, and a fence two feet high will effectually keep them within bounds. As sitters and mothers the hens are unsurpassed; though they are, unless cooped, apt

to leave their chickens and lay again too soon for very early broods. Lastly, some are prolific layers, especially in winter, when eggs are most scarce. This quality can be much developed by breeding from hens which do not sit so frequently.

Their *defects* are equally marked. The flesh is inferior to that of other breeds, though tolerably good when eaten young ; there is, however, always a great absence of breast, which excludes the fowl from the market, and confines it to the family table. The leg, which contains most meat, is, however, not so tough as in other breeds. The want of breast is best overcome by crossing with the Dorking, the result being a very heavy and fairly proportioned table fowl which lays well, and is easily reared, but is still rather coarse. The hen, excellent layer though she is, has also an irresistible inclination to sit after every dozen or score of eggs ; and this is apt to be very troublesome, except where a regular and constant succession of chickens is desired, when it becomes a convenience, as broods can be hatched with the greatest regularity. Finally, this breed is peculiarly subject to a prejudicial fattening, which, if not guarded against by the avoidance of too much or too fattening food, will check laying, and even cause death by disorder of the liver. To keep them in health Cochins require *special* attention to a plentiful and daily supply of green food, without which they rapidly fall into ill-health.

On the whole, this breed is of little value as a market fowl unless crossed with the Dorking or Crève-cœur ; neither will it be found profitable where eggs are the chief consideration, and the hens cannot be allowed to indulge in their sitting propensities.

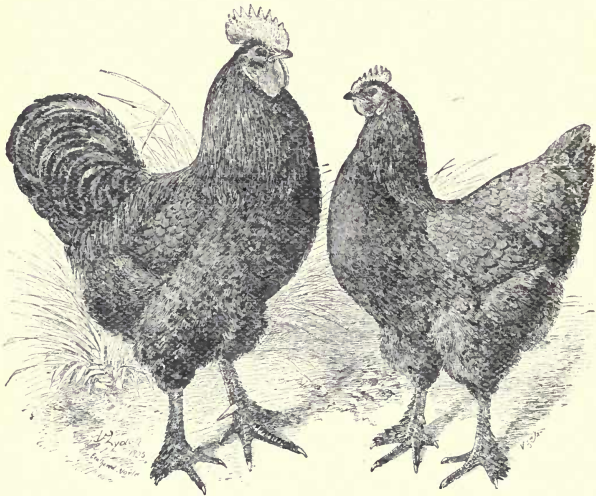
LANGSHANS.—About 1871, importations were made—chiefly by Major Croad, but there were others—of large

black Cochin-like fowls from North China, which presented some differences of type from the Cochins previously known, in a greater or less degree.* In some there was the massive fluff and abundant feather of the Cochin, with a loose plumage; and this inability to see and exhibit consistently any distinct type, obstructed for years the general perception of any such type, which was further hindered by the extraordinary personality and abuse of others displayed by the few earlier breeders of Langshans. Gradually, however, it began to be seen that in the fowls called by this name (that of the locality whence imported) there were both distinctive features and points of a better economic fowl than the Cochin as now bred. The leg was not only black, but showed a crimson tinge between the scales which was characteristic; the full dark eye (probably derived from Java blood) is very constant; the tail strongly tended to much greater fulness, and many of the specimens (by no means all) had the prominent breast so lacking in present-day Cochins. There was also, as the fowl became better known, a clearly visible tendency towards smaller bones for the same size of carcass; to tighter plumage and better laying (good layers tend to tight feather); and the flesh was white. The Langshan was seen to have points of its own, and to be an introduction of undoubted value.

It is to be regretted that the same extraordinary personal jealousies which hindered the earlier recognition of the breed as such still hinder that of a good, or even

* The fowls now shown as Langshans would not be confounded with Cochins; but it was very different then. The portraits published in 1877 by Miss Croad present the Cochin type in a high degree, and such fowls would be rejected now with indignation as not "pure." Dr. Gabb states that he has bred from Miss Croad's own stock birds both feather-legged and clean-legged, rose-combed and single-combed, and also crested specimens.

fixed type, beyond the general points which probably all would agree in, of a well-furnished tail carried rather high, scantily-feathered shanks (a mere fringe of feathers) little fluff, a good breast, and close and glossy plumage, with a green gloss which true votaries religiously term "sheen." Extraordinary and unfortunate caprice has been manifested in regard to height on the leg. At one time a moderate



Miss Croad's Langshans.

length and compact body seemed on the point of acknowledgment, when another of the many lamentable controversies set in upon this point, and the type accepted by the Langshan Society became higher and higher, until at the Palace Shows of 1896 and 1897 we *measured* prize cockerels as high between the thighs from the floor of the pen, as several Malays. This provoked a reaction, such birds being stigmatised by a few of the old breeders as

crossed with Game. And the protesting parties being also desirous of recognising blue and white varieties, which the original Society refused to acknowledge, an Association was formed, which encourages a more moderate proportion. Miss Croad herself has given in her adhesion to this school, and the engraving illustrates a pair of her birds. No *fixed* type can thus be given; but in a breed so useful for the table it is a matter for regret that a legginess which is so prejudicial to this should have been accepted, with the result that the shorter-legged model is chiefly found now amongst the "Orpingtons." The leggy birds are also extraordinarily subject to leg weakness, and this defect needs to be specially guarded against in breeding-stock, and in chicken-rearing. Purity of race is chiefly to be found in the comb, which is fuller in front and less arched in the middle than a Cochin's; in the black and crimson shanks and feet; and in the full dark eye.

The *merits* of the breed are great as a producer of delicate white meat, a hardy fowl and good forager, and a prolific layer. Some lay small eggs, but this can be remedied by good selection of breeders. The only particular drawback is prevalent leg weakness in the leggy type. The best cross is with the Minorca, which produces one of the best layers known, winter and summer, and a very handsome bird besides.

There have lately appeared *white* and *blue* Langshans. The white is, of course, a sport, such as occurs in all black breeds. Its points are the same, except that the shanks become more a lightish slate-colour than black. The blue colour is the blue-dun of the Andalusian, and may be either a sport or more probably due to some mixture of the white and the black. Economic qualities and general characteristics should be similar to the black original

CHAPTER XII.

BRAHMAS.

It is unnecessary to say much at this date about the origin of Brahmas. Exhaustive investigation of a large amount of original material, both in early manuscript and early print, for which we were chiefly indebted to Miss Watts, and which was not accessible to previous writers, enabled us to show beyond doubt that the fowl, as imported into America, had an Indian and not Chinese origin, as alleged by Mr. Burnham for reasons of his own. Burnham states that he got even his own birds from Dr. Kerr; and Dr. Kerr *himself* stated in print that these came from Calcutta, though it suited Burnham to change this into Shanghai. On the other hand, there are too many marks of the same great race as the preceding about them for there to be any mistake on that score. That they are closely allied to Cochins is as clear as that there are many well-established differences both in make and disposition. The one thing certain is, that the fowl immediately sprang originally from the comparatively coarse and unformed "Chittagong" fowl still found about the Brahmapootra river, and which some think was a kind of amalgamation of Cochin, Malay, and Dorking. However this may be, some very fine specimens appear to have reached America in at least two importations, one to Dr. Kerr and another to a Mr. Cornish; and either from Mr. Cornish's alone, or from both, the Brahma has undoubtedly been bred, somewhat modified by selection, as with all our other races of fowls.

The most visible peculiarity is in the comb, which is totally different from that of any other variety, except one or two which also hail from India or the Indian archipelago. It resembles *three* combs pressed into one. In a first-class

cock the effect is such as would be produced were a little comb, about a quarter of an inch in height, laid close to each side of his own proper comb, twice as high, the centre one being thus higher than the others. In the hens the comb is very small, but the triple character should be equally evident, and the formation is quite plain even when the chicks first break the shell. The comb should not rise high behind. When first introduced, single-combed Brahmans were occasionally shown, but are now extinct.

The neck of a Brahma cock should be, if possible, fuller in hackle than a Cochin's, and flow well over very wide and flat shoulders. The saddle rises more, till it merges into a nearly upright tail spread more or less out laterally like a fan, and with more feather than a Cochin's. The breast is deep and full, coming down low—another point of difference. There is in the true model less fluff, and the whole plumage is close rather than loose, while the make and general habits are sprightly and active. Generally speaking, the really typical Brahma is *square* rather than lumpy; otherwise there is a great deal of general resemblance, and the same remarks as to leg-feather and vulture-hocks apply. The size is about the same, but the highest weights recorded have been in Brahmans, several cocks having been weighed which scaled from 17 to 18½ lb. There are two varieties exhibited, known as Dark and Light. Light Brahmans are mainly white all over the body; but the cock's hackle should be sharply striped with black, and the saddle-feathers either less so, or may be nearly or quite white, which is preferred. The tail and inner flights are black. The leg-feather also has usually more or less black or grey in it. All over the plumage, though white on the surface, often will appear grey under, when the feathers are parted, giving an idea as if the grey or black was *in* the plumage and the white surface *on* it. White in Light Brahmans should be

clear blue-white, and not creamy. In the hen, the hackle and spot where it falls between the shoulders are marked with black like the cock, but her cushion is white. Some birds, however, have white fluff. Tail and inner flights and leg-feather as in the cock.

The great difficulty in breeding Light Brahmas is to get sufficient of the black marking, without getting black marks or splashes in undesirable places. There is a constant tendency to produce spotted backs in particular, the black, which seems to saturate the feather, having a tendency to break out on the surface ; hence, dark under-fluff should be mated with light, or with white under-colour. As a rule, pullets are best bred from hens with rather too dark hackles, and a cock sharply but slightly under-marked ; cockerels from the reverse. The black stripes should run well up the feather, and come well round the front of the neck as well as behind. Many birds have been shown evidently crossed with white Cochins ; but the result is loose feather and fluff, and mossy hackles. It is to be regretted that the judges have given prizes to this model.

In Dark Brahma cocks the head is silvery white, running into a silvery white hackle sharply striped with black. The breast, under parts, and fluff are dense black for exhibition. At one time the breast might be mottled with small white spots, and this marking is most valuable for pullet-breeding ; but fashion is now against it, as it also is against any white margin to the feathers of the fluff, which is also valuable for breeding pullets. The back is white, with a little black marking between the shoulders ; saddle-feathers silvery white, striped with black ; tail coverts more and more filled up with dense green black as they approached the tail, which is glossy green-black. The shoulders of the wings are silvery white, with more or less of black run through it ; secondaries white on outer web, and partially black on inner



COCHINS.

DARK BRAHMAS.

MALAYS.

web ; the coverts form a glossy green-black bar across the wing. Clearness of the white, and sharpness and density of black, are the chief points ; and straw-colour, or any stain of brown or red, are great blemishes.

The pullets or hens also have silvery hackles, thickly striped in the middle with black. The rest of the plumage is a ground of very pale grey to lightish iron-grey, marked or pencilled over with what may range from darker grey to glossy black. It is particularly necessary in a show bird that the breast should be pencilled over as closely and almost as darkly as the back, and this is now general, though when this work was first written it was the rare exception. The leg-feather should be pencilled like the body, and also the fluff.

There have been considerable historical changes of fashion in the colour and marking of Dark Brahmas. Years ago Mr. Lacy bred for a brown ground ; but it is now generally admitted that the proper colour for all Brahmas is *pure* white, black, or grey, and the hens are now sought of a nice medium colour, the pencilling as dark as it is possible to get it, and moderately fine, on a grey or almost dirty-white ground.

For breeding cockerels perfectly black-breasted ones are essential. The whole under parts must be dense in colour, and the hackles pure in colour, straw-colour being both a great fault and strongly hereditary. The pullets or hens must have sharply-striped rather than very dark hackles, but the darker they are in reason the better, and neat heads and combs are particularly essential. For pullet-breeding the hens or pullets must have every breast feather (and the rest too) thoroughly well pencilled, "filled up" over the feather, and free from any streakiness. But the cock must be particularly selected as known to be *bred* from such a hen as this. Such cocks may either have a small white spot on

the end of each breast feather, and a slight white edging to the fluff, or the white on the breast feathers may be a narrow edge or lacing; such breed the best-marked birds, but they *must* have good broad black stripes in their neck and saddle hackles. If well descended as above, however, good black-breasted exhibition cocks may also be found to breed good pullets;* but the hackles are essential, and some white lacing on the fluff, which is not now allowed in exhibition birds.

This sharp separation of pullet-breeding stock from the other has not been altogether a gain to Dark Brahma pullets. Clearer ground colour has been gained, but the old beauty of a *well-striped hackle* has been lost. Most of the best pencilled pullets and hens now have pencilled hackles, near the base at least, and some nearly all up the neck. So general is this rule that breeders may not unlikely make the defect (for it came in *as a defect*) one of the "points," as the fox endeavoured to do with the loss of his tail.

The ear-lobes are red, and should fall below the wattles in both breeds. And it is a great matter, so far as appearance goes, that the head and beak be short and not

* A striking example of this may be mentioned in a cockerel bred by ourselves, which won the Crystal Palace and Birmingham cups in 1874, and was perfectly black-breasted. Claimed at the latter show by Messrs. Newnham and Manby, this bird was the progenitor of a large number of pullets, perhaps the finest as a lot ever bred by one yard, and whose blood is to be found, we believe, in all the winning strains of pullets down even to the present day. The same was the case with Mrs. Hurt's noble strain, from which half the blood of the above bird was derived. On the other hand, the excellence of the same mixture of blood as regards exhibition cockerels may be judged not only from the specimen referred to, but from the fact that another cockerel of nearly the same breeding, purchased from the produce of a sitting of eggs sold by us, was the chief progenitor of Mr. Lingwood's celebrated strain of cockerels, for years pre-eminent at the leading shows. Some narrow white lacing on the fluff, however, was necessary for pullet-breeding.

long, and with a gentle though lively expression. The legs are yellow in the Light breed and in Dark cocks, slightly dusky yellow in the Dark hens.

The economic merits of Brahmas are high. Before being spoilt by breeding to the Cochin type, the pullets and hens were capital layers, several instances being recorded in the earlier days, and we ourselves having had two instances, of hens which have laid over 200 eggs in a year. They do not sit so often as Cochins when pure bred, usually laying from twenty-five to forty eggs first. Both fowls and chickens are hardy, and grow very fast, being early ready for table. The pure race is also white or pinky, not yellow in skin, and white in flesh ; in fact, the race when unspoilt compares almost exactly in the same way as the Langshan with the modern Cochin, including the point of a deep breast. Brahmas bear confinement quite as well as Cochins, being, however, far more sprightly, and less liable on that account to prejudicial internal fattening.

Unfortunately, the extreme care in breeding for marking during late years has very much impaired the laying qualities of many exhibition strains, and also their constitutions. It is still more to be regretted that imitation of the Cochin model has impaired to some extent the table qualities, the loose lumpy plumage bringing coarse skin and coarse flesh, and the want of breast losing one of the characteristic points of the fowl. There are breeders and judges who adhere to the old model, and it cannot be too much insisted upon. At the best, however, the flesh, though superior to that of the Cochin, is much inferior after six months to that of the Dorking, and the pure breed is not, therefore, a good market fowl.

A cross with Houdan, Crève, or Dorking produces magnificent birds, hardy as hardy can be, of most rapid growth, and carrying immense quantities of meat. Such

crosses should always have the attention of the market raiser who does not succeed with pure Dorkings. A cross with Minorcas produces a very fine and hardy laying stock.

CHAPTER XIII.

MALAYS, ASEELS, AND INDIAN GAME.

THE Malay was the first introduced of the gigantic Asiatic breeds, and in stature exceeds that of any yet known, except the leggy type of Langshan. The cock weighs, or should weigh, from nine to eleven pounds, and when fully grown should stand two feet six inches high. But the general size of this breed has of late deteriorated.

In form and make Malays are as different from Cochins as can well be. They are exceedingly long in the neck and legs, and the carriage is so upright that the back forms a steep incline. The wings are carried high, and project very much at the shoulders. Towards the tail, on the contrary, the body becomes narrow—the conformation being thus exactly opposite to that of the Shanghai. The tail is small, and that of the cock droops. The back is convex in profile, unlike that of most other breeds, so that the back of the neck, the back, and the tail, form a series of three nearly similar convex curves, inclined at an angle. These curves and the projecting shoulders are the most characteristic points; and when these are good, prizes usually go to the fowls which are longest in shank and thigh, in which some are enormous.

The plumage is very close, firm, and glossy, more so than that of any other breed, and giving to the bird a peculiar lustre when viewed in the light. The feathers are also unusually *narrow*. Over the point of the prominent breast-bone the plumage generally disappears from friction.

The colours vary very much. Pure white is very beautiful, but the most usual is that well known under the title of black-breasted Wheaten Game. The legs are yellow, but quite naked, and remarkably large in the pattern of the scales.

The head and beak are long, the latter being rather hooked. Comb a sort of lump, covered with small prominences like warts. There is a manifest tendency to produce pea-combs when small in size, pointing clearly to a possible influence on the Brahma, and to relationship with Indian Game fowls. The wattles and deaf-ears are small, the eyes yellow or white, with very prominent eyebrows overhanging the eye, making the top of the head very broad and giving a sour or cruel expression, which is added to by the naked and snaky appearance of the head and throat. This is not belied by the real character of the breed, which is most ferocious, even more so than Game fowls, though inferior to the latter in real courage.

Malays are subject to an evil habit of eating each other's feathers, a propensity which often occurs in close confinement, and can only be cured by turning them on to a grass-run of tolerable extent, and giving plenty of lettuce, with an occasional purgative.

The chickens are delicate, but the adult birds are hardy enough. They appear especially adapted to courts and alleys, and at one time might not unfrequently have been seen in such localities in London.

The principal merit of Malays is as table fowls. Skinny as they appear, the breast, wings, and merrythought together carry more meat than those of most other breeds; and, when under a year old, of very good quality and flavour. They also make good crosses with several breeds. Mated with the Dorking, they produce splendid fowls for the table, which also lay well; and with the Spanish or

Minorca, though both parents are long-legged, the result is usually a moderately-legged bird of peculiar beauty in the plumage, good for the table, and, if a hen, a good sitter and mother. They have also been extensively crossed with the English Game fowl, in order to increase the strength, stature, ferocity, and hardness of feather.

The great drawback of Malays is their abominably quarrelsome disposition, which becomes worse the more they are confined. The hens are also inferior as layers to most other breeds; and on these accounts the pure strain is not adapted to general use, though useful in giving weight and good "wings" to other varieties of fowl.

ASEELS AND INDIAN GAME.

The only originally pure strain of Indian Game is now called the Aseel, to distinguish it from the following, and was introduced into England by Mr. Montessor. This variety has some general resemblance to the Malay, possessing a carriage which slopes downwards to the low-carried tail, broad and prominent shoulders, eyebrows considerably overhanging, and a smallish pea-comb. The shoulders are, however, rounder than the Malay's, the body much more compact and low on the leg, and the legs stouter in proportion. This breed is of the most indomitable courage, and so quarrelsome that it is very difficult to rear the chickens. In Bengal these birds are much esteemed for fighting, showing both pluck and endurance, and a champion has been known to change hands for as much as £60. The hen is a very poor layer, and, as even two hens with one cock often quarrel, it will be understood that the Aseel is not very generally kept. It is, perhaps, most remarkable of all known for symmetry and hardness of pure muscle, and feels heavier in hand for the apparent size than any other. Hence it comes out very

meaty on the table. The colours are generally either allied to the "black-red" type, or more often various mottles and splashes of black, red, and white.

The fowl generally known everywhere now as "Indian Game" is different, and of composite origin, there being little doubt that it sprang from a former importation of Aseels early in the nineteenth century, crossed with Malays, and very possibly also with some of the English Game fowls in Cornwall. For many years it was purely a Cornish fowl, and has been termed Cornish Game; but the Malay cross has destroyed the fortitude of the true Game race, and, as the breed has been more cultivated and fixed, has more and more predominated. These birds have, in fact, often appeared at shows under the name of Pheasant Malays, chiefly distinguished by the plumage of the hen, and the extraordinary gloss on both sexes; the comb has often been more "knobby" than a real pea-comb, and the size, stature, and carriage have gradually been developed to nearly the Malay standard, with, however, rather more rounded shoulders and compactness of form. In 1870 a large and fine class we saw at Plymouth were nearly as compact and short-legged as Aseels, and all with true pea-combs; and even as late as 1890 the thighs and shanks were described as only "moderately long and not stilty." But the fashion for excessive height in English Game has since corrupted this breed also, which often lately has had almost Malay proportions, and nearly a Malay head, though with a finer comb.

The face of the Indian Game should be smooth and fine, and brilliant red, as also the ear-lobes; the pea-comb as regular as possible, and wattles very small. The hackle of the cock is short and green-black in colour, with brownish-crimson shafts; back chiefly green-black mixed with some crimson, the black more predominating on the

saddle ; wing bow chestnut or crimson, wing bar green-black ; tail green-black ; breast and all under parts green-black. The green-black everywhere indescribably glossy. The shanks are deep yellow. The hen's hackles are glossy black with a bay shaft ; tail quills black, more or less pencilled ; body feathers a chestnut-brown ground-colour, rather broadly laced—there should be on the feather *two* lacings, though only one is usually visible—with rich black, the black so glossy that it almost seems to stand up on the feather. There is no more beautiful plumage than that of the Indian Game hen.

This breed has considerable economic merit. It is not over-quarrelsome, and the hen is a very fair layer, though not in the first class. The breast and merrythought are specially large and full of meat, and the chickens grow very rapidly, more especially in the earlier stages. The breed has the power of imparting these qualities to crosses, even more than the Malay, and is valuable and much used in this way. Crosses on the Dorking often take prizes at shows of table poultry, and on Wyandottes, Rocks, and Orpingtons (or short-legged Langshans) also produce very fine table fowls. The earlier type, when this cross began to be fashionable, was a much better cross for these purposes than the more leggy type can be said to be, however, and at some of the recent shows the Indian Game cross has been obviously surpassed by that with Old English Game. This matter may, however, be largely controlled by judicious selection of the birds used for crossing ; and we were glad to see at the principal shows of 1898 some evident reaction against the leggy type in judging the Indian Game classes.

CHAPTER XIV.

GAME FOWLS.

THIS is the celebrated race of fowls, bred from time immemorial for the purposes of the cock-pit, and in which courage was so developed by the severe selection of combat that a breed was finally obtained which did not know how to yield. Happily cock-fighting in England is now a thing of the past, except amongst a very few who carry on their cruel sport upon the sly ; but it is very interesting to notice that this cessation of the old purpose for which it was bred has worked gradually a very great change in the shape and formation of the Game fowl. The modern exhibition race is very different in many respects from the old fighting race. The old fowl was moderately short on the leg, not very long in the neck, not short in feather, but with a full hackle, and with a rather large fanned and spreading tail, carried tolerably high. All these points have been changed.

As now bred for exhibition, the head and beak of the cock should be rather long, but strong at the base of the bill ; eyes rather prominent, and the red skin smooth and fine, giving a snaky look to the head. The ears must be red. Neck decidedly long, with hackles as short as possible, very little spreading on the shoulders, if at all. Back to be flat, and wide between shoulders, narrowing regularly to the tail ; and breast correspondingly broad and full, and stern narrow, the whole body rather resembling in shape a short fir-cone with the point for the stern, which must be carried well above the hocks, not let down between them. Saddle hackles close and short ; tail narrow and rather short in the sickle feathers, which should be gathered together, or a whip-tail as it is called, each one just about

clearing its neighbour, but not spread more, very moderately raised. Wings strong and not too long, carried "free," with points covering the thighs. Legs and thighs are now desired *very long*, the shins neither very flat (flat-shinned) nor very convex, but medium convexity. Shanks cleanly scaled, and set on firmly. Spurs low, feet flat, with toes well spread out down on the ground, the hind toe particularly coming well out flat; for it to spring high, and drop to the ground behind, is being "duck-footed." The whole body when felt or "handled" to feel as hard as a board nearly. The hen is of the same make in proportion. The lowering brow and prominent shoulders of the Malay must be particularly avoided, but the general formation closely resembles that breed, and is as full in stature.

The four principal colours now seen at exhibitions are known as Black-breasted Reds, Brown-breasted Reds, Duckwings, and Piles.

In the Black-red cocks the colour is as follows:—The hackles of the head and neck are bright orange-red, the saddle hackles being about the same colour; the back, wing bow, and shoulder coverts rich crimson or claret, shading off into orange on the saddle. The breast, thighs, and under parts dense black, the wing bar and tail black with steel-blue reflections. The secondaries of the wings clear bay, with a black spot on the ends. The most difficult point is to get the bright colour without any brown or rust among the black of the under parts. Darker and duller reds are much more free from this fault, but not so much valued in the show-pen. The hen has a golden hackle striped with black; the breast salmon-red or reddish-fawn, shading off to ashy-grey on the thighs; back, wings, and upper feathers of tail brown, covered over with small partridge marking, free from coarse pencilling. The difficulty here is to keep free from red or foxy colour, or

patches, especially on the wings. The legs in both sexes are willow or olive ; eyes, bright red.

There is a sub-breed much used in breeding Black-red game, called Wheaten Game. The colour is confined to the hens, and consists mainly in a lighter breast—very pale fawn or cream colour, and the rest of the body a reddish fawn, resembling the skin of red wheat. This colour is bred by the lighter-coloured cocks, and hence is used to breed brighter colours when the cockerels are getting too dark. But with long careful breeding among the Black-reds themselves these variations have become less, and the Wheaten is gradually dying out.

In Brown-reds, the modern cocks are now sought with lemon-coloured hackles striped with black ; back and shoulder coverts also lemon with a black centre ; breast, each feather laced with gold or lemon on a black ground, and the shaft of the feather also showing gold. Another colour is similar, but the marking is darkish orange rather than lemon. Formerly the lacing on the breast was dispensed with. In hens, the hackle should be black edged with bright lemon, and the rest a bright, greenish-black, laced with lemon on the breast only. Hens without lacing—all black except the hackles—formerly were fashionable, and are sometimes shown still ; but the lacing is preferred. The legs should be extremely dark willow, almost black ; the eyes very dark brown, almost black ; the faces a very dark purple or gipsy colour, red faces being almost disqualification in practice. There is a sort of strong *dark blood*, in fact, running through the whole bird.

Duckwings are very handsome birds. The cock's face is bright red, head white, hackle verging more to a straw-colour lower down ; saddle hackles straw or yellowish ; back, wing bow, and shoulder coverts rich gold or light orange ; bright steel-blue bar across the wing ; breast and

under parts black. The hen's head is silvery grey ; hackle silver grey striped with black ; breast salmon, shading off to grey on thighs ; rest of plumage generally, a silvery grey, evenly pencilled over with darker grey, total effect being a beautiful silvery or frosted kind of grey. The legs of both sexes are willow ; eyes, bright red.

This breed—at present at least—is occasionally bred with the Black-red, putting one of the brightest-coloured Black-red cocks to Duckwing hens. Occasionally also a Duckwing cock is put to a Wheaten hen. The Black-red cross used to be employed very frequently, and the result was more crimson or claret colour in the backs of the cocks than is tolerated now. At present the best breeders consider once in half a dozen years quite enough for a Black-red cross, which is chiefly used for hardness of feather ; and the probability is that ultimately it will be entirely abandoned, and the birds bred true.

There has, in fact, always been a true breed, called "Silver" Duckwings, which were never crossed. In this pretty variety the cock's hackles and light parts are clear white, free from straw, and the breast a purer or brighter black ; the hen resembles the usual Duckwing, except for rather a purer or more silvery colour. There is no doubt the ordinary Duckwings arose from crossing this breed with the Black-reds ; and as the Duckwings are bred more and more without Black-red aid, the tendency will be, as it has been, to return to the pristine purity of colour, or rather freedom from colour, and predominance of pure black, white, and grey shades.

Pile Game may briefly be described as in general Black-reds, with *white* substituted for *black*, but the red colours as before. It is well known that black and white are convertible colours, so that many black Cochins were originally bred from whites, and white Minorcas have been bred from

blacks. Hence the Pile cock has the same colour on his wing, but a *white* bar ; and hackles that would be slightly marked with black are marked with white instead, though this is disliked just as black is in the Black-red hackle. Generally a very little black or coloured ticking runs through the white, and is not objected to. Yellow legs are the colour for Piles ; and light willow are also shown, but not liked so well. Once white legs were fashionable, but are now most unpopular of all as regards exhibition Game.

Piles have to be occasionally crossed from the Black-red to keep up the colour ; but all the Black-red chickens from such a cross should be destroyed, as they are of little value, and corrupt the Black-red blood, which it is so important to nearly all other varieties should be kept pure.

Whites, blacks, blacks with brassy (or yellow-marked) wings, and Silver Birchens (the cock like the Silver Duck-wing, the hen a dark dirty grey) are still occasionally shown, but very rarely, except in the Old English classes.

Game cocks are generally "dubbed," or have the comb and wattles cut off close to the head with shears, at about six months old—the right age is when these appendages have ceased to grow. Of late an agitation has commenced against the practice, and the Society for the Prevention of Cruelty to Animals has obtained a conviction against it as cruelty. It is not improbable that, as the fowls are bred for generations purely for the show-pen, without any reference to fighting, the necessity for dubbing the exhibition variety may gradually die out. But at present, all who actually breed the fowls consider it necessary ; and it is indeed almost impossible to keep them without it, unless every cockerel can be kept separate, which is difficult, owing to their great flying capabilities. If they do meet, as a Game cock is so built that he strikes with his spur wherever he holds with his beak, the result to an undubbed bird is either

death or terrible suffering, as has been proved over and over again, even from a very few seconds' encounter; whereas dubbed ones can generally be separated before much injury is done. In these circumstances, hot abuse of the practice by those who know nothing about the matter shows more zeal than discretion. The time may however come, from the reason stated, when dubbing may no longer be necessary in the show bird.

OLD ENGLISH GAME.

The excessively stilty development of the exhibition Game fowl during recent years has provoked a reaction, which has brought into fashion again the original English race, which had been preserved in the interim solely by the care of the breeders who still practised cock-fighting in out-of-the-way corners. The grand old breed has of late filled large and popular classes at all the principal shows, and can be seen, even on cursory inspection, to be totally different in many points from the preceding. Almost the only point of formation in which the two agree is the general shape of the body itself, which is tolerably round in the hands, and broad at shoulders, tapering towards the tail, somewhat like a fir cone. But even here the Old English Game is shorter and more compact.

The radical differences are as follows:—The long neck of the cock is very strong at the junction with the shoulders, and, instead of being very scant and short in hackle, is very long and full, the hackle flowing over the shoulders. The back is broader and shorter, the saddle hackles also being full. The wings are longer and stronger, with tendency to meet under the tail. The tail, instead of being very short, narrow in feather, and carried low, is carried high, and is very full and expanded—a good flowing tail, with quill feathers broad and hard. The thighs are

stout and short instead of being thin and long, and the shanks moderate instead of stilty. The whole is most symmetrical and handsome, and much broader in breast than the other type. The hen is of similar formation.

There is much greater latitude in colours, and especially of the shanks. The usual exhibition colours are found, but there are other kinds of reds, also duns and blue-reds, and spangles or mottles. Where legs in the exhibition Games have been willow as in Black-reds, or yellow as in Piles, the Old English Games are allowed to be white, willow, or yellow, or in some breeds black or blue slate. Crested varieties, called "tassels," bearded ones, termed "muffs," and a variety with hen-tailed cocks, termed "hennies," are also recognised and shown. Lord Derby's old breed of Black-breasted Reds with white legs is much esteemed. On the whole, the chief recognised colours are most generally exhibited, but with the greater variety in colour of the shanks above noted.

The judging of these birds has not always been happy or consistent, and it is much to be hoped that the breed may not be spoilt as the other has been. In some cases a clear tendency has been shown to give prizes to those highest on the leg, the artificial model of the other breed influencing the eye of the judge. In other cases some favourite colour of leg has evidently had too much weight, in yet others too plump condition.

The Old English Game fowl is a fairly good layer, and hardy where it can have liberty; but it is chiefly valuable as a cross for the production of table poultry. For this purpose it is superior to the leggy type of Indian Game, giving white skin and flesh and white legs (if a white leg be selected), and a *broader* formation. A cross between this breed and Dorkings is probably the very finest table fowl that can be produced, and with other breeds it is good,

giving good breast and wings. For this purpose the largest birds are preferable, and the white-legged varieties. The Henny variety is one of the best, and also one of the best layers.

CHAPTER XV.

DORKINGS.

THIS is a pre-eminently English breed of fowls, and is, as it always will be, a general favourite, especially with lady fanciers. The general predilection of the fair sex for Dorkings may be easily accounted for, not only by the great beauty of all the varieties, but even more, perhaps, by their unrivalled qualities as table birds—a point in which ladies may be easily supposed to feel a peculiar interest.

The varieties of Dorkings usually recognised are the Grey or Coloured, Silver-grey, and White. We believe the White to be the original breed, from which the Coloured varieties were produced by crossing with the old Sussex or some other large coloured fowl. That such was the case is almost proved by the fact that fifty years ago nothing was more uncertain than the appearance of the fifth toe in Coloured chickens, even of the best strains, and that rose-combs were also common. Such uncertainty in any important point is always an indication of mixed blood; and that it was so in this case is shown by the result of long and careful breeding, which has now rendered the fifth toe permanent, and finally established the variety.

In no breed is size, form, and weight so much regarded in judging the merits of a pen. The body should be deep and full, the breast being protuberant and plump, especially in the cock, whose breast, as viewed sideways, ought to form a right angle with the lower part of his body. Both back and breast must be broad, the latter showing no



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DUCKWING GAME.
PILE GAME.

GREY DORKINGS.

BLACK-RED GAME.

approach to hollowness, and the entire general make full and plump, but neat and compact. Hence a good bird should weigh more than it appears to do. A cock which weighed less than 10 lb., or a hen under $8\frac{1}{2}$ lb., would stand a poor chance at a first-class show; and cocks have been shown weighing over 14 lb. This refers to the Coloured variety. White Dorkings are somewhat less.

The legs should be white, with perhaps a slight rosy tinge; and it is imperative that each foot exhibits behind the well-known double toe perfectly developed, but not running into monstrosities of any kind, as it is rather prone to do. An excessively large toe or a triple toe, or the fifth toe being some distance above the ordinary one, or the cock's spurs turning outward instead of inward, would be glaring faults in a show-bird.

The comb may, in Coloured birds, be either single or double; but rose-combs are now scarcely ever seen. The single comb of a cock should be large and perfectly erect. White Dorkings should have double or rose combs, broad in front at the beak, and ending in a raised point behind with no hollow in the centre.

In the grey or Coloured variety the colour is not absolutely uniform, and formerly many colours were shown, the cock's breast being sometimes black and sometimes speckled, with more or less colour on his back and sides, and lighter or darker hackles. On the other hand, hens were shown of a kind of red speckle all over, and also a grey speckle, as well as darker. From such the birds were termed "grey" Dorkings, and they were not so large as those shown now. In or about the year 1858, Mr. John Douglas, then in charge of the Duke of Newcastle's aviaries at Clumber, crossed the English breed with a cock from India. This bird was not a Cochin or Malay, as often alleged, but of distinctly Dorking type in everything but

the fifth toe, and was probably the result of some Dorking cross in India on some Asiatic bird unknown. He was very large, and the progeny was on an average at least two pounds heavier than the old English stock, and much more uniform in plumage, the hens being very dark, verging in parts upon a brownish-black, with robin breasts, and the cocks more black-breasted. Few had not the fifth toe, and all soon came true in that respect ; and this cross has now influenced all the exhibition stock, greatly increasing the size and hardiness of the fowls, without losing any important point, except, perhaps, in one exception : that is, that with the habitual dark colour has crept in a dark or sooty foot, and even leg. There is no evidence that this is due to the cross, for the cross with even Cochins does not tend to dark legs, though it often does to yellow ones ; and the first results, when the cross was strongest, were not dark-legged ; it is simply that very dark colour tends to produce dark legs in all fowls, and this is by no means inconsistent with white skin and meat. But dark legs do look out of place, to say the least, in a Dorking ; and of late there has been a disposition in many quarters to lay more stress on the colour of the legs and feet, even at the expense of some size, and to return to more variety in plumage. That the Coloured Dorking ought to be judged as a table-fowl chiefly is undoubted, and acknowledged by all ; but some judges lay more stress upon the colour of the legs, as against the greater size and dark plumage preferred by others.

In the Silver-grey Dorking, however, colour is imperative. This variety was a chance offshoot from the preceding, improved by careful breeding, and a cross with Lord Hill's breed of Silver Duckwing Game, the colour of which was aimed at. The Silver-grey colour is as follows :—cock's breast a pure and perfect black ; tail and larger coverts also black, with metallic reflections ; head,

hackle, and saddle feathers, pure silvery white, in which a little black streak is now allowed ; and the wing also white, showing up well a sharply-marked and brilliant bar of black across the middle. A single white feather in the tail would be fatal. Hen's breast salmon-red, shading into grey at the thighs ; head and neck silvery white striped with black ; back "silver grey," or fine dark grey pencilling upon light grey ground, the white of the quill showing as a slight streak down the centre of each feather ; wings also grey, with no shade of red ; tail dark grey, passing into black in the inside. The general appearance of both birds should be extremely clean and aristocratic.

The White birds should be what their name implies—a clear, pure, and perfect white. There is generally in the cock more or less tendency to straw or cream colour on the back and wings, and we would by no means disqualify a really first-class bird in all other points on account of it ; but it is decidedly a fault. White Dorkings are usually smaller than the Coloured, but of late years this variety has been much improved both in size, fecundity, and hardihood. It deserves remark, also, that when shown in a class with other colours, White Dorkings always appear smaller than they really are, and have repeatedly proved *heavier* than Silver-greys, which the judge has preferred solely on account of their *apparent* extra size.

Cuckoo-coloured Dorkings are sometimes shown, and have even had classes now and then, but are almost always small. They have, however, the general reputation of being the hardiest of all the Dorking varieties.

Dorkings degenerate from in-breeding more than most fowls, and therefore require more change in blood. If over-fed, they also suffer more than many from exhibition ; but this fault and its effects are far less common now than formerly.

These fowls are peculiarly subject to what is called "bumble-foot," a tumour or abscess in the ball of the foot. It appears to be mysteriously connected with the fifth toe, according to a law discovered by Mr. Darwin, that "excess of structure is often accompanied by weakness of function." It can often be removed surgically, and the wound dressed with lunar caustic, without coming again : other cases are more obstinate, and seem to resist all treatment. We think on the whole it is less general than formerly.

The great merit of Dorkings has already been hinted at, and consists in their unrivalled excellence as table-fowls. The meat is not only abundant and of good quality, surpassing any other English breed except Game, but is produced in greatest quantity in choice parts—breast, merrythought, and wings. Add to this, that no breed is so easily got into good condition for the table, and enough has been said to justify the popularity of this beautiful English fowl. It should also be noted that the hen is a most exemplary sitter and mother ; and, remaining longer with the chickens than most other varieties, is peculiarly suitable for hatching early broods.

The Dorking is not, however, a good layer, except when very young. The chickens are also of delicate constitution when bred in confinement, and a few weeks of cold wet weather will sometimes carry off nearly a whole brood. But when allowed unlimited range the breed appears hardy, and as easy to rear as any other, if not hatched too soon. At Linton Park the chickens were all left with the hens at night, under coops entirely open in the front, and grew up in perfect health, whilst the old birds frequently roosted in the trees. It is in confinement or on wet soils that they suffer ; and the only way of keeping them successfully in such circumstances is to pay the strictest attention to cleanliness and drainage, and to give them some *fresh turf* every

day, in addition to other vegetable food. With these precautions, prize Dorkings have been reared in gravelled yards not containing more than 300 square feet.

CHAPTER XVI.

SPANISH, MINORCAS, LEGHORNS, ETC.

ALL round the coast of the Mediterranean—at all events, round the European coast—are found fowls of obviously one general type, though differing in minor points. They have high single combs, large wattles and ear-lobes (the latter more or less white), smooth legs, and close plumage; and they are all non-sitters, laying white and comparatively large eggs. We have often thought that the Roman Catholic religion, with its great number of days on which flesh is forbidden, may probably be answerable in some degree for the development of this type of fowl, and those with similar non-sitting qualities in France. The varieties here described come to us from Spain and Italy.

SPANISH.—This breed has been longest bred to a standard, and stands alone in the development of white skin, not only into really immense ear-lobe, but into a white cheek or "face," meeting under the throat. For a long time it was the only breed for which classes were provided at all shows, and one of the most popular, being celebrated everywhere for the abundance of its immense white eggs; but it has lately been so closely bred for such an excess of white face, that it has become far less fertile, and so delicate that there are few breeders of it, and very few entries at even large shows, its place amongst useful poultry being now taken by the Minorca and other varieties. It must, however, still be regarded as the head and aristocrat of the family.

The fowl, undoubtedly, did come from Spain, and is a Spanish Don all over. The cock should carry himself stately and upright, the breast well projecting, and the tail high, though it ought not to be carried forward, as in some birds. The legs are blue or dark lead-colour, and rather long. The size is rather degenerated—the old standard was 7 lb. for a cock and 6 lb. for a hen: this breed, however, weighs more than it would appear to do. The plumage is jet black and very glossy in the cock, the hen is less so, but pure black. White or speckled feathers may appear with age, but are fatal in a pen. The comb in both sexes is single and very large; the cock's perfectly straight and upright, the hen's falling completely over on one side. The spikes should be large, regular and even. A twist or thumb-mark in the front of the cock's is a very common fault, but spoils a bird.

The most important point is the white face. This must extend in an arch, high over the eye to the base of the comb, except a narrow line of feathers, and be as wide and deep as possible, reaching sideways to the wattles in front and ear-lobes behind—the whole surface like "white kid." The ear-lobes also as large and deep as possible, equally fine in texture, and as free as possible from folds or wrinkles, which take from its value. Red specks or blush where white ought to be, spoils the fowl. There are always more or less minute feathers or hairs studded over the face, naturally, and it is understood and allowed that these may be pulled out with tweezers before exhibition. The beauty of the face cannot be seen without this, and attempts to stop it years ago were utter failures; but it is doubtful whether the practice does not deter some from keeping the breed.

Spanish chickens are delicate, and must be kept from damp with special care. If this be neglected they die off, though they seem seldom to develop actual roup like many

others. They feather very slowly, and should not be hatched early in the year. The cocks are less vigorous than most other breeds, and it is better not to allow more than three hens till genial weather has set in. As the chickens grow, any showing blush should be cleared out to make room ; the blue faces promising best as a rule. As they develop, scabs or eruptions are very apt to appear with the least over-feeding, and meat is also apt to cause pecking at one another. A portion of bread and milk, with an occasional ten grains of Epsom salts, and grass run, seems to suit them best, but they should be kept in on wet days. Birds drawing near to exhibition should have the faces gently sponged with tepid milk and water, and after gently drying, be sparingly dusted over with oxide of zinc to keep the skin dry ; but no white must be left on for the show-pen. Chickens which grow any coloured feathers must be at once discarded ; a few white feathers often appear, to moult out afterwards.

The very large comb is apt to fall over with the present delicate stock. Something may be done to check this as the critical age approaches, by sponging with any strong astringent, or applying hazeline cream ; but some breeders fix on the head a light wire frame, to hold the comb in place. Hens for breeding should be chosen with combs thick at the base, and springing up a little before falling over ; stock thus bred will rarely require help if healthily reared.

Spanish left at liberty, even of good quality, will sometimes become rather rough and blushed in face if exposed to cold winds. In such cases, shelter by high walls, and shutting up for the last few days in a dimly-lighted room or shed, will generally put matters right. This course is, indeed, generally required to exhibit Spanish faces in fine condition, but has been much overdone ; and such excess of

it has had much to do with the modern delicacy of this breed. Mr. Teebay found Spanish kept at large and allowed to roost in trees, became *hardy*; but no doubt their faces would hardly pass muster now. Such an extreme standard for face has, however, ruined the breed.

Spanish seldom develop catarrhal roup; but if cold seizes them they seem to shrink and shrivel away. They require much care in moult, when comb and wattles seem to shrink to almost nothing. They are better kept in at this time, if possible, and even very gentle warmth is often best for them; but they should be carefully hardened off again. Hampers in which Spanish are sent for exhibition in winter should be lined with flannel.

The breed is rather subject to the occurrence, in rapid succession, of air-bubbles under the skin, a well-known sign of debility in chickens. Whenever this is the case, the bird should have a little port wine, and nourishing food in which two grains of saccharated carbonate of iron per day is mixed, the bladders being pricked as they arise.

MINORCAS.—This is now by far the most popular and generally useful of the Mediterranean breeds. It was known for many years in the West of England, and steadily advocated by us, before attracting any attention elsewhere or having any class of its own at exhibitions; but it began to “move” at last, and is now one of the most generally kept of all fowls. In 1883, *after* this movement had begun, two classes at the Crystal Palace contained 32 entries; in 1897 six classes contained 166 entries. This is not to be wondered at when we remember that the fowl is hardy, of a colour that can be kept anywhere, a splendid layer, and its eggs probably the largest of all. One breeder found four pens of hens averaged 220 eggs each; another’s



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BUFF LEGHORNS.

MINORCAS.

BROWN LEGHORNS.

seven pens averaged 184; another averaged 180, with several birds, 200.

Several importations can be traced, including one by Sir Thomas Acland about 1834, from which several strains descend; but there is evidence that the breed was already in Cornwall and Devon, owing to that locality's Spanish trade. The breed differs from the Spanish (though it was itself very generally known as "the black Spanish" for many years) in having the face red, the comb considerably larger and higher, and the wattles also longer and more pendulous; the ear-lobes only are white, and much smaller than in Spanish; the tail is larger and more flowing; the body larger and more massive; and the plumage with less green gloss. The head must be broad, or the high comb cannot be carried firmly; and this should be evenly arched with a few large spikes. The ear-lobe should be narrow, called "almond"-shaped. The hen's comb falls over, and her lobes are rather more rounded.

To preserve this fine breed will require some caution against exaggerated judging, of which there have several times been symptoms, but which so far has provoked reaction. At times quite exaggerated combs and wattles are preferred, so large as to tax the bird's strength and hinder feeding; once attempt was made to enlarge and broaden the ear-lobe as in Spanish, which even brought traces of white face; the last fad was to prescribe "five" spikes in the cock's comb. These tendencies appear to be now checked, but not until perceptible harm had been done to size, hardiness, and laying. To check these evils, probably, the breed was crossed with Langshan or Orpington blood, of which more than half the pens at some shows have shown traces, in stature, lustre, size of shank, scaling on the shank, and even the crimson tinge. This has done good upon the whole, and the cross, though often unknown,

seems now to have permeated all strains ; but the process should not be carried on indefinitely, and will not be needed unless the exaggerated lobe of the Spanish be again indulged in.

Comb is one of the chief difficulties in breeding. It should be handsomely arched, with few and broad spikes : more is not now insisted upon. Even more than in Spanish, it is necessary to choose hens for breeding whose combs are thick at base and "start" well before falling over. For breeding, cocks often have to be dubbed, the large comb causing great infertility, which disappears when it is taken off. In frosty weather the combs and wattles should be greased, to avoid frost-bite. Fine lobes for exhibition require care, as in the Spanish fowl, to keep them from cold winds.

The Minorca is not a bad table-fowl, being pretty plump and with white skin. Its cross with the Langshan has been already referred to as a splendid layer, and is also a good table-fowl. The cross with Houdan is generally of a very nondescript appearance, but almost always a splendid layer. Perhaps the flesh of the pure breed is a little dry, and there is no fowl in which *larding* the breast makes such a difference in the result.

A white variety of Minorcas is occasionally seen. Its general qualities are similar, but it is not, so far as we have heard, so good a layer. The legs in this breed are either pale slate, or we have seen white.

ANDALUSIANS.—The first birds known under this name were really imported from Andalusia in 1851, and purchased by Mr. Coles, of Farnham, from whom the stock got distributed, again chiefly in Devon and Cornwall. This stock differed considerably from the fowls now shown, having less Minorca and more Gamey style, the comb of the cock being

also lower in front and with more numerous, narrower serrations, while the hens often had upright or prick combs. These tendencies, however, still exist, and seem to show that, however crossed, more or less of the original blood still persists. Breeders have since crossed the fowl with either Spanish or Minorca to improve the comb, the pure-bred type of which is quite different from the Minorcas', having a less convex arch in the front, reaching further behind the head, and with more spikes. The hen's must fall over, but prick combs are still found.

The other characteristic of the breed is its colour, which is of a slaty-blue or blue dun. The lightest are almost of a dove-colour; but such are useless for exhibition, a decided bluish-slate of rather dark tint being required. The breast and under-parts of the cock match the hen in this respect. But each body-feather must now, moreover, in an exhibition bird, be *laced* with much darker blue, purple, or it may be practically black. The cock's hackles and upper plumage are also dark purple, or black with purple lustre; the tail also sound dark colour. The face is red, with no trace of white; ear-lobes white, but narrower than in most Minorcas. The latter are very apt to be rough, but should be smooth and soft.

In breeding for exhibition, the parents should be slightly darker than the colour desired: if only one be darker, the excess should be a little more. The sexes do not require separate pens; but on the whole more show pullets are produced with the proper colour of hens and a darker cock, while more good cockerels occur from dark parents on both sides. Lacing must be even and distinct, and the ground-colour go right down to the fluff of the feather. A rather large-combed cockerel or cock is best, to avoid, as far as possible, prick-combed pullets. Colour will always, however, be the chief difficulty; besides those which come too

light or blue, a great many will occur of black and white. Some attribute this to "crossing," but it is not so, and always is a difficulty with this colour, for the simple reason that the colour itself is composite, and the product of *crossing colours*, generally of white and black. The produce of such crosses is very erratic ; but out of a *large number* of such crosses there will be some black, some white, some black and white splashed or pied, some of the "cuckoo" or blue barred colour noticed under ANCONAS, and also found in PLYMOUTH ROCKS, etc., and some of this blue-dun Andalusian colour. Blue ducks have been bred in the same way. The colour never arises otherwise, and its components are always cropping up, and can only be kept down by careful weeding. So far from black blood being "injurious," the improved lacing of modern birds is due to it, just as the lacing of the Sebright had to be refreshed from the Black Bantam. When the lacing gives out, or the ground-colour becomes light, the use of a black Andalusian will often repair the defect. This should always be done rather than go to the Minorca, or use birds in which the lacing has got mossy, or black stain spread over the ground. A pure black bird impairs lacing much less than those with such defects, and will sometimes work much improvement. Of course white and black Andalusians could easily be bred, but would only differ in head and comb from Minorcas. On the other hand, the shape of the comb shows that some Minorcas have beyond doubt been crossed with these black Andalusians.

Economically, this breed stands high. It is one of the best layers of pretty large white eggs, and a better *winter* layer than the Minorca. It is far more precocious ; almost ridiculously so, since cockerels will often crow at seven weeks old ; they should be separated at that age. Pullets usually lay at six months. The flesh is white, with plenty

of breast, but the carcass is not very plump. At liberty it is a very active forager, and a capital farmers' fowl, while confinement does not make it dirty. It is also hardy. We have thought it rather more than usually addicted in confinement to feather-eating, and so have several of our correspondents; but others have repelled this charge, and it is not safe to generalise too much from personal experiences which may have had special causes. Its best crosses will be the same as those with Minorcas; but it may be worth noting that whenever the latter have lost hardiness or laying properties by too close breeding, the Andalusian cross gives a fowl most hardy and fertile, with no other striking difference.

ANCONAS.—This name has been given to different fowls of different origin. From about 1860 to 1880 those so known were cuckoo-coloured fowls, of the same type as the preceding, and with dark legs; their origin being no doubt a cross between black and white. This colour and marking, however, when it once appears, is far more permanent than the blue dun, and generally persists as a whole, though with tendency to black, white, and coloured feathers about tail and hackles, which have to be carefully bred out. The birds may very likely have come from Ancona, round which all colours and crosses exist amongst fowls of this type; they were rather small and short-legged, and all the specimens we came across had the reputation of being splendid layers and hardy, as cross-bred birds of laying strains generally are.

About 1883 another variety was introduced, this time undoubtedly from Ancona, where mottled fowls of one kind or another seem to abound. These birds more resembled the Leghorn type, to be next described, having yellow beaks, and legs also yellow, more or less mottled with black. The plumage also differs completely, being mottled or

splashed black and white, just like the mottling of the Houdan. It is remarkable thus to have received two different fowls from the same locality, composed of the same colours, but which have amalgamated in a different manner.

These latter are the fowls now known as Anconas. The heads and combs are distinctly Leghorn, with white to creamy ear-lobes. The hackles are black edged with white, rest of the plumage as described above. Attempts have been made to get the creamy ear-lobes discarded for white, and the black spots or mottling on the yellow leg rejected ; but it is much to be hoped these may not succeed, since they must ruin the usefulness of the breed, and the points are in a way typical.

Anconas are very hardy, and splendid layers. The cocks are very ardent and vigorous, and Mrs. Bourlay, one of the principal breeders, states that eggs are most fertile generally when each is mated with about nine hens. They surpass Leghorns as *winter* layers, and stand frost and snow well. The chickens grow rapidly, and generally lay at five months. When full-grown they do best fed rather sparingly, as stock ; but if full-fed, or put up a week or two, make plump and delicate, though small, table fowls. There is, however, one point to be borne in mind. All these splashed Anconas appear to be of a wild and nervous nature, like pheasants ; and the chickens, though hardy as regards exposure, require room and *fresh pure ground*, as pheasants and turkeys do. When reared in confinement with others they appear to die off from this reason.

LEGHORNS.—These fowls also belong to the great Mediterranean race, though the first two varieties known of them came to us from America, where, however, they had been received from Leghorn. These two original varieties were the White and the Brown, the first of which were sent over

in 1870 to Mr. Tegetmeier; the Brown in 1872 to us. Since then one or two other varieties have been imported, and at least three made or bred in England. The breed may be described as generally resembling the Minorca in features, with the same type of comb and wattles, and laying also white eggs large in proportion to its size. But the size is relatively smaller; the legs are yellow instead of dark, the head and face are finer and smoother, with more or less yellow beak, and a creamy rather than white ear-lobe (this being connected with the yellow in beak and legs), and the attitude and carriage are more sprightly, wide-awake, and "dainty" in appearance.

In America the type of Leghorn differs entirely from the English. The birds are smaller and more sprightly, and the tails of the cockerels, as in the original birds sent to England, are still retained upright, or squirrel fashion, which in England is so disliked. In comparison the English bird is more massive, and Minorca in character. The difference arises mainly from the demand in America for "broilers," whereas the English prefer a good-sized fowl and a large egg.

White Leghorns are probably the purest in blood, but have been crossed with white Minorcas to increase size and counteract the tendency to cream or yellow plumage. This is connected with the yellow legs and beak, and is the chief difficulty in breeding from an exhibition point of view. The yellow leg itself is difficult to preserve in some localities, rather damp clay grass runs being the best for leg colour. It is not necessary to put up two pens, but if this is done, the thinnest combs should be chosen for pullet breeding, the thicker for cockerel breeding. A White Leghorn cockerel crossed with Plymouth Rock hens produces pullets of wonderful laying qualities. In America the pure breed is still considered as about the best layer they have.

Brown Leghorns may be described as generally of the colour of black-breasted red Game. They were at first the hardiest variety and best layers of all, but having been crossed to improve size and colour, and then in-bred to remove effects of the cross, many strains have suffered heavily. They have since recovered in great degree, but few exhibition strains equal the White as layers. As a rule they are shorter on leg, and squarer in body, than other varieties. The cock differs from the Game colour in that the hackle is a little striped. Typical birds of both sexes can be bred from one pen ; but for show cockerels, bright cocks are mated with hens rich in hackle-colour, even if a little ruddy on wing ; pullets from darker cocks with more solid striping, and hens or pullets free from ruddy feathers, even if rather ashen in colour. In America the cocks are allowed more stripe in the hackle than in England, which makes breeding somewhat easier.

Pile Leghorns have been bred, as in Game fowls, by crossing the White and Brown varieties ; in at least one strain an outside Pile cross was also employed. They lay well and are hardy, but are not easy to get true to colour.

Duckwing Leghorns were formed by crossing with Game and Silver-grey Dorking. There are Golden and Silver Duckwings ; the Silver breeding pure, as in Game and Dorkings, while the Golden Duckwings require occasional crossing as in the similar Game varieties. They are good layers, but must be considered as chiefly exhibition birds.

Black and Cuckoo Leghorns need only be mentioned. The Blacks are too near Minorcas and too difficult to breed with yellow legs to be general, but are usually very good layers. They are said to be wild.

Buff Leghorns have become very numerous and popular. They appear to have been bred from Italian





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HAMBURGS.

Silver-Spangled

Hen

Golden-Buff

stock, crossed with weedy Buff Cochins. The crossing has introduced much difficulty in breeding sound, rich buff unmixed with white or black ; but the colour seems to suit the close plumage of this fowl particularly well. White must be absolutely avoided in breeding stock, rejecting black also as far as possible, and selecting hens of a sound rich buff, with cocks, if possible, rather darker, as in all buff breeds. Heavy weeding is required in Buff Leghorns, and some think that the best birds owe a shade or two to colour feeding ; but we must say that, so far as we think we have been able with any probability to trace this, the effect has been patchy and uneven, more in the shape of a bricky colour on the wing and tail coverts. In America the preference is for rather lighter buff than in England ; but on the other hand, we often see one side of the flights white in England, which we are informed would in America be disqualified. Buff Leghorns are very attractive looking, and good layers ; on grass they look particularly well.

The multiplicity of varieties in Leghorns is a misfortune in a breed of this kind. The White, Brown, and Buff are most worthy of cultivation. A rose-combed variety is too obviously like a pencilled Hamburgh.

CHAPTER XVII.

HAMBURGHS.

UNDER the name of Hamburgs are now collected several varieties of fowls, presenting the general characteristics of rather small size, brilliant rose combs, ending in a spike behind, projecting upwards, blue legs, and beautiful plumage. None of the Hamburgs ever show any disposition to sit, except very rarely in a state of great

freedom ; but lay nearly every day all through the year, except during the moulting season.

SILVER-PENCILLED.—The size of this exquisite breed is small, but the shape of both cock and hen peculiarly graceful and sprightly. Carriage of the cock very conceited, the tail being borne high, and carried in a graceful arch. The comb in this, as in all the other varieties, to be rather square in front, and well peaked behind, full of spikes, and free from hollow in the centre. Ear-lobe pure white, free from red edging. Legs small and blue.

The head, hackle, back, saddle, breast, and thighs of the cock should be white as driven snow. Tail black, glossed with green, the sickle and side feathers having a narrow white edging the whole length, the more even and sharply defined the better. Wings principally white, but the lower wing-coverts are often a little marked with black, showing a narrow indistinct bar across the wing. The secondary quills have also a glossy black spot on the end of each feather, which gives the wing a black edging. The bar on the wings is not now sought as formerly, and a white wing is preferred, the bird being now in fact principally white, with a fine black and edged tail. Such birds are useless to breed pullets from, however, which needs more colour ; and in fact cocks are often bred now from nearly white hens valueless for anything else.

The most frequent fault in the hen is a spotted hackle instead of a pure white. The rest of the body should have each feather distinctly marked, or “pencilled” across with bars of black, free from cloudiness, or, as it is called, “mossing.” The tail feathers should be pencilled the same as the body ; but to get the quill feathers of the wings so is rare, and a hen thus marked is unusually valuable. General form very neat, and appearance remarkably sprightly.

Pullets are bred from cocks too dark for exhibition, and sometimes from hen-tailed cocks, which are not uncommon. Only pullets usually bear showing, the marking usually getting grizzled with age; a hen which does preserve it well is unusually valuable for breeding.

GOLDEN-PENCILLED.—The form of this breed is the same as the preceding variety, and the black markings are generally similar, only grounded upon a rich golden bay colour instead of a pure white. The cock's tail should be black, the sickles and side feathers edged with bronze; but tails bronzed all over are often seen. The colour of the cock is always much darker than that of the hen, generally approaching a rich chestnut.

GOLDEN-SPANGLED.—Whilst the markings on pencilled Hamburgs consist of parallel bars across the feathers, the varieties we are now to consider vary fundamentally in having only one black mark at the end of each feather, forming the "spangle." This black marking varies in shape, and though only one variety is recognised in each colour at poultry exhibitions, it is quite certain that both in gold and silver there were two distinct breeds, distinguished by the shape of the spangle.

The best known of the two varieties, and the most often seen, was the breed long known in Lancashire under the name of "Mooneys," from the spangles being round, or moon-shaped. The ground colour of the pure golden "Mooney" Hamburgs was a rich golden bay, each of the feathers having a large circle, or moon, of rich black, with a glossy green reflection. The hackle should be streaked with greenish black in the middle of the feathers, and edged with gold. Tail quite black, even in the hens. All the spangles should be large and regular in shape. The cock of this breed was rather small, and was coarse in head with reddish deaf-ears, the latter point being

common to the hens also. Many of the cocks were also hen-feathered, and such were once shown.

The second variety was known chiefly in Yorkshire as "Pheasant fowls," and differed greatly in the plumage. Instead of the spangles being round, as in the "Mooneys," they were crescent-shaped, approaching the character of lacing; the marking was also seldom so sharp and definite, being often a little "mossed." In the cock the crescent spangles on the breast ran so much up the sides of the feathers as really to become almost a lacing. But the ears were white, and the cocks had much smarter and neater combs.

At first Yorkshire cocks were shown for their smart heads, with Mooney hens. Then the cocks were bred between Yorkshire cocks and Mooney hens; and this lasted for many years. Two sets of birds were still required, pure Mooneys for the hens, and the cross for cocks; gradually, however, the mixed blood began to be used on the pullets to improve their red deaf-ears, and thus the strains slowly amalgamated, combining the good points of each; until pullets are found with all the Mooney marking and good heads, while some of the cockerels have all the marking needed for pullet breeding. At last, therefore, breeding has become comparatively simple, it being sufficient to select hens or pullets large and good enough in marking, and with good heads, and then to mate them with a cock as deeply spangled as possible. This is how Spangled Hamburgs are now usually bred, though a few still profess to breed Mooney pullets pure. Even in these, however, the white ears betray the foreign blood. The present Gold-spangled cock has a jet green-black tail, and is spangled as regularly as possible, especially in regard to two bars of spots across the wing. Some birds, almost *too* dark for exhibition, if good in head, breed excellent pullets.

SILVER-SPANGLED.—In this class two similar varieties existed. The Lancashire silver “Mooney,” with large round spangles, resembled the golden, substituting a silvery white ground colour. The outside tail feathers in the hen, however, differed from the golden Mooney, being silvery white, with only black moons at the tips. The moons on wing covert feathers in both sexes should form two black bars across the wings; the more regular these bars the more valuable the bird. The Silver Pheasant-fowl of Yorkshire had smaller spangles, and not so round, without, however, running into the crescent form of the Golden Pheasant-fowl. The tail was white in both cock and hen, ending in black spangles. The cock’s breast had also far less spangling than the Mooney breed.

The history of this variety resembles that of the preceding. At first hen-feathered Mooney cocks were shown; then Yorkshire Pheasant cocks; then followed the gradual amalgamation; and at present most breeders follow the simple method of putting the most perfect hens or pullets to promising dark and heavily-spangled cocks, as already described.

Many Spangled Hamburg chickens are *pencilled* in their chicken feathers, the true spangling only appearing with the adult plumage. This goes to show the original unity—though, doubtless, very far back—of the spangled and pencilled races.

BLACK HAMBURGHES.—There is much doubt about the real origin of this fowl. Many think it was first produced by crossing Silver-spangled with Spanish; and the frequent signs of white round the eye, the smooth lobe, and the larger egg, are strong arguments for this; also many birds used to be seen with a sort of spangle of extra iridescence on the ends of the feathers. The greater size and darker legs are also quoted. But old fanciers affirm that the breed

was known generations ago, and that *all green*, free from spangle, was the correct colour. Our own opinion is for the Spanish cross ; but it has been long bred out in all but the whitish face, which still appears occasionally.

The combs of Black Hamburgs are larger in proportion than in the other varieties, and the deaf-ears much larger and more kid-like in texture. The plumage is not so much black, as a magnificent green gloss. The best coloured birds are apt to show *purple* reflections, especially in the cock's hackles. These must be avoided for cockerel-breeding ; on the other hand, these very birds often breed the most lustrous pullets, the purple being apparently a sort of excess in lustre.

REDCAPS.—There is occasionally met with in Lancashire and Yorkshire, under this name, a coarse, large sort of gold-spangled bird, very irregular and poor in marking, and with immense combs often hanging over on one side. They may have been originally some kind of Hamburg mongrel, and, while of no exhibition value, are the best layers of the whole race.

Hamburgs are in many circumstances a profitable breed. Except the Gold-spangled, which are all poor layers, they are good layers when a good strain is secured. Each hen will lay from 180 to 220 eggs in a year ; and if these are generally small, the consumption of food is comparatively even more so. Though naturally loving a wide range, there is no great difficulty in keeping them in confinement if cleanliness be attended to. If so, the number must be very limited : where six Brahmas would be kept, four Hamburgs are quite enough, and they must be kept dry and *scrupulously* clean. Perhaps the Silver-spangled and Black are best adapted for such circumstances. With a good egg-market near, the Redcap is one of the most profitable fowls a farmer can have. The pencilled birds

are, as already remarked, most certainly delicate, being very liable to roup if exposed to cold or wet; they should not, therefore, be hatched before May. The spangled are hardy, and lay larger eggs than the pencilled; but the latter lay rather the most in number. For profit, however, we should recommend the Black Hamburgh, on account of the large size of the eggs; and some strains of this variety are certainly most extraordinary egg-producers.

Hamburghs are too small to figure much on the table. They carry, however, from the smallness of the bones, rather more meat than might be expected, and what there is of it is of good quality and flavour.

CHAPTER XVIII.

POLISH. SULTANS.

UNDER the title of Polands, or Polish fowls, should be collected all varieties which are distinguished by a well-developed crest, or tuft of feathers on the top of the head. This crest invariably proceeds from a remarkable swelling or projection at the top of the skull, which contains a large portion of the brain; and it is worthy of remark, that as the comparative size of this protuberance invariably corresponds with that of the crest springing from it, the best crested chickens can be selected even when first hatched. It is also remarkable that the feathers in the crest of the cock resemble those of his neck hackles, being long and pointed, whilst those of the hen are shorter and round; and this difference forms the first means of distinguishing the sexes.

The comb of all Polish fowls is likewise peculiar, being of what is called the two-horned character. This formation is most plainly seen in the Crève-cœurs, where the two

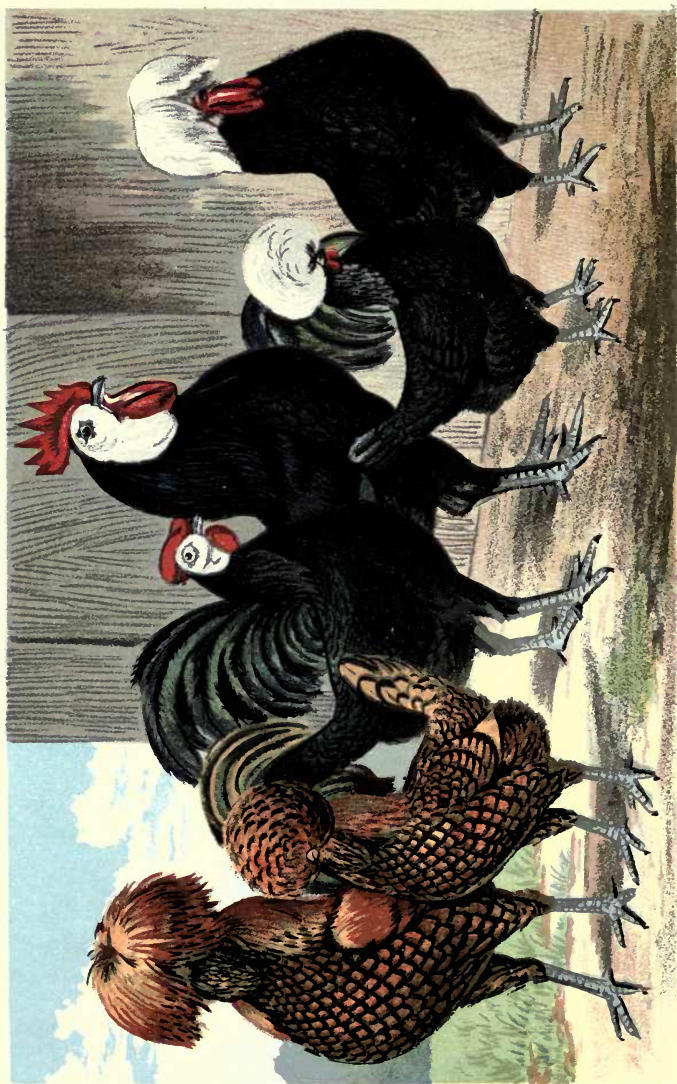
horns are very conspicuous. In the breeds more specifically known as Polish the comb should be almost invisible, but what there is of it will always show a bifurcated formation.

Under the title of Polish fowls might perhaps be included the Crève-cœurs, Houdans, and Gueldres, if not La Flèche ; but we shall for convenience of reference describe these crested fowls in a separate chapter on the French breeds, and confine ourselves here to the other tufted varieties, including the more recently introduced Sultans.

WHITE-CRESTED BLACK.—This is the most generally known of all the varieties. The carriage of the cock, as in all Polands, is graceful and bold, with the neck thrown rather back, towards the tail ; body short, round, and plump ; legs rather short, and in colour either black or leaden blue. There should be almost no comb, but full wattles of a bright red ; ear-lobes a pure white. Plumage black all over the body, with bright reflections on the hackle, saddle, and tail. Crest large, regular, and full, even in the centre, and each feather in a *perfect* bird we suppose of a pure white ; but there are always a few black feathers in front, and no bird is therefore to be disqualified on that account, though the fewer the better. Weight from 5 to 6 lb.

Hen very compact and plump in form. Plumage a deep rich black. Crest almost globular in shape, and in colour like the cock's. We never yet saw a bird in whose crest there were not a few black feathers in front, and we doubt if such were ever bred. Where they do not appear, the crests have always been "trimmed," and in no class does this practice so frequently call for the condemnation of the poultry judge. Weight of the hen 4 to 5 lb. This variety is generally delicate and subject to roup.

BLACK-CRESTED WHITE.—There is indisputable evidence



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WHITE-CRESTED BLACK POLISH.

SPANISH.

GOLDEN-SPANGLED POLISH.

that there once existed a breed of Black-crested White Polands; but, unfortunately it is equally plain that the strain has been totally lost. Its disappearance is the more to be regretted, as it seems to have been not only the most ornamental, but the largest and most valuable of all the Polish varieties. The hen described by Mr. Brent dwarfed even some Malay hens in the same yard.

WHITE-CRESTED WHITE.—This breed, and those which follow, differ from the white-crested Black Polands not only in greater hardihood, but in having a well-developed beard under the chin, in lieu of wattles. They are large fine birds, and the crest is finer and more perfect than in most other colours. They are also among the best in point of laying. The plumage needs no description, being pure white throughout. The variety, though not extinct, is, however, now very scarce and seldom seen.

SILVER-SPANGLED.—In this variety the ground colour of the plumage is a silvery white. Formerly birds were shown with moon-shaped black spangles, and this was once considered correct; then for many years *laced* feathers have been the correct thing, except that the cock's back shows some approach to spangling occasionally. The sharper and blacker the lacing is the better. The cock's sickles still show a broad tip or sort of spangle at the end, as well as the edging, and the ground is apt to be grey in these feathers, which dark colour, indeed, breeds better pullets. The lacing of his breast is very important for show purposes, many cocks being nearly black in the upper part. During the last year or two we have occasionally seen birds with the round spangles again.

The crests should be full and regular, not hollow in the middle, and the feathers here also are laced in hens and more tipped in the cocks. A few white feathers are apt to appear with age. The deaf-ears are small and white,

wattles none, being replaced by a dark or spangled beard and whiskers. The size of this breed is very fair, the cocks weighing 6 to 7½ lb., hens 4 to 5½ lb.

GOLD-SPANGLED.—This breed resembles the preceding in black markings, only substituting rich golden ground for the white.

BUFF or CHAMOIS POLISH resemble the Golden-spangled in the colour of the ground, but the spangles present the anomaly of being *white* instead of black. They were first produced, there can be no doubt, by crossing the Golden-spangled with White birds, just as Piles were produced from Black-red Game. At first these birds did not breed at all true, showing probably a recent cross; but of late some very fine importations have been made from the Continental shows, which may give this pretty marking a better chance. These foreign specimens have been larger and finer than any we have seen bred in England.

Blue, grey, and cuckoo or speckled Polish are occasionally shown, but are evidently either accidental occurrences, or the result of cross-breeding, and cannot be recommended even to the fancier.

All the Polish breeds are rather liable to grow up "hump-backed," or "lob-sided" in the body. Of course either defect is a fatal disqualification.

SULTANS.—This breed was introduced by Miss E. Watts from Turkey. The birds are very ornamental, differing greatly in appearance from any of the varieties hitherto named. In size they are rather small, the cocks weighing only from 4 to 5 lb. They make most exquisite pets, being very tame, but at the same time brisk and lively; and their quaint little ways never fail to afford much amusement. They are well adapted to confinement.

The plumage is pure white, crest included, in which they therefore resemble the white Polish. They differ,

however, very greatly in appearance. Their legs are very short, and feathered to the toes; the thighs being also abundantly furnished, and vulture-hocked. They are likewise amply muffled and whiskered round the throat, and the tail of the cock is remarkably full and flowing. The crest differs from that of most other Polish, being more erect, and not hiding the eyes. The comb consists of two spikes in front of the crest. The legs are whitish, and when first imported and shown had the fifth toe of the Dorking, but of late this feature is uncertain, and seems left an open question. At one time Sultans were even shown without beards, but in this case judging has returned again to the earlier standard.

There is a breed known as Ptarmigans, which is evidently a degenerate descendant from some former importation of Sultans.

Some special precautions are necessary in rearing Polish chickens. The prominence in the skull which supports the crest, is never completely covered with bone, and is peculiarly sensitive to injury. On this account Cochins, or other large heavy hens should never be employed as mothers. A Game hen will be the best. The young also fledge early and rapidly, and usually suffer severely in the process; they therefore require an ample allowance of the most stimulating food, such as worms, meat, and in bad weather bread steeped in ale. Above all, they *must* be kept dry.

Polish fowls have certainly solid merits. They improve in appearance, at least up to the third year. In a favourable locality they are most prolific layers, never wanting to sit, and the flesh is remarkably good. They appear also peculiarly susceptible of attachment to their feeders. And lastly, they suffer remarkably little in appearance or condition from exhibition or confinement. Their great fault is

a peculiar tendency to cold and roup—the white-crested black variety being the most delicate of all. The dense crest becomes during a shower saturated with water, and the fowls are thus attacked in the most vital part. No birds are so affected by bad weather. They can only be kept successfully in warm, genial situations, on well-drained ground, with a chalk or sand sub-soil, and with ample shelter to which they can resort during showers. In such circumstances they will do well, and repay the owners by an ample supply of eggs. Closely confined in a dry shed they also do well, if only kept *rigidly* clean and free from vermin.

Polish breeders should not seize their birds suddenly. The crest so obscures their vision that they are taken by surprise, and frequently so terrified as to die in the hand. They should, therefore, always be first spoken to, or other-made aware of their owner's approach.

CHAPTER XIX.

FRENCH BREEDS.

SEVERAL remarkable breeds of fowls have been introduced into England from France, which it will be convenient to describe in one chapter. They all deserve the careful attention of the mercantile poultry breeder, possessing as they do in a high degree the important points of weight and excellent quality of flesh, with a small proportion of bones and offal. These characteristics our neighbours have assiduously cultivated with most marked success, and we cannot avoid remarking yet again on the results which might have been produced in this country had more attention been paid to them here, instead of laying almost exclusive stress upon colour and other fancy points. Most

of the French breeds have more or less crest, which naturally places this chapter next to that on the Polish fowls. It is remarkable also that most of them agree in being non-sitters, or at least incubate but very rarely.

CRÈVECŒURS.—This breed has been the longest known in England. The full-grown cock will not unfrequently weigh 10 lb., but $7\frac{1}{2}$ to 8 lb. is a good average.

In form the Crève is very full and compact, and the legs are exceedingly short, especially in the hens, which appear almost as if they were creeping about on the ground. In accordance with this conformation, their motions are very quiet and deliberate, and they appear the most contented in confinement of any fowls we know. They do not sit, or very rarely, and are tolerable layers of very large white eggs.

The comb is in the form of two well-developed horns, surmounted by a large black crest. Wattles full, and, like the comb, a bright darkish red. The throat is also furnished with ample whiskers and beard. The plumage is black, but in some of the largest and finest French birds it is not unfrequently mixed with gold or straw on the hackle and saddle. Which is to be preferred will depend upon circumstances. Judges at exhibitions always insist upon a pure black all over; and if the object be to obtain prizes, such birds must of course be selected both for breeding and show purposes; at the same time we should fail in our duty were we not distinctly to record our opinion that the golden-plumaged French birds are often by far the largest and finest specimens. It should be remembered that the French have mainly brought these breeds to perfection by seeking first the *useful* qualities, and it is beyond doubt that the rigid application to them of our artificial canons has seriously deteriorated the breed in practical value. A large globular crest seems the chief point in English judging,

whereas the French were content with much more moderate development in this particular, and looked more to the body and general size and shape of that.

The merits of the Crève consist in its edible qualities, early maturity, the facility with which it can be both kept and reared in confinement, and the fine large size of its eggs. The hen is, however, only a moderate layer, and the eggs are often sterile, while the breed is rather delicate in this country, being subject to roup, gapes, and throat diseases. This delicacy of constitution appears to improve somewhat as the fowls are acclimatised and less in-bred. Altogether we do not recommend the Crève as a good breed for general domestic purposes.

LA FLÈCHE.—In appearance this breed resembles the Spanish, from which we believe it to have been at least partly derived. It exceeds that breed, however, in size, the cock often weighing from 8 to even 10 lb. Both sexes have a large, long body, standing on long and powerful legs, and always weighing more than it appears, on account of the dense and close-fitting plumage. The legs are slate-colour, turning with age to a leaden grey. The plumage resembles that of the Spanish, being a dense black with green reflections.

The look of the head is peculiar, the comb being not only two-horned, much like the Crève-cœur, near the top of the head, but also appearing in the form of two little studs or points just in front of the nostrils. The head used to be, and still is in France, surmounted by a rudimentary black crest, but English fanciers have sought to breed this out, and the presence of crest is considered a disqualification at English shows. On an average the French birds are somewhat taller than those now bred in England. The wattles are very long and pendulous, of a brilliant red

colour, like the comb. The ear-lobes are dead white, like the Spanish, and exceedingly developed, meeting under the neck in good specimens.

The appearance of the La Flèche fowl is very bold and intelligent, and its habits active and lively ; at the same time it appears very subject to roup in our climate. As an egg producer, it is as nearly as possible similar to the Spanish, not only in the size and number of the eggs, but the seasons and circumstances in which they may be expected. In juiciness and flavour the flesh approaches nearer to that of the Game fowl than any other breed we know ; but is more tender, while having less of what is called "gamey" flavour. This breed is much used to produce the magnificent capons and poulardes so celebrated in the Paris market, and which sell for a guinea or thirty shillings each in French money.

The cocks suffer much from leg weakness and disease of the knee-joint, and do not bear the fatigue and excitement of exhibition so well as most fowls.

HOUDANS.—This fowl in many respects resembles the Dorking, and Dorking blood has evidently assisted in its formation, probably crossed with the mottled ANCONA (p. 205). Houdans have the size, deep compact body, short legs, and fifth toe of the Dorking, which in form they closely resemble, but with much less offal and smaller bones. The plumage varies considerably, but is always some mixture of black and white, arranged in a sort of irregular splash or speckle all over. Some hens become nearly white as they grow older, the breed getting lighter with age. To avoid this, some breeders have been in the habit of crossing with the Crève, and the result has been seen in young birds almost black, and with the plain two-horned Crève comb instead of the peculiar comb of the

Houdan ; but a reaction speedily set in against this, and what seems now desired is a true Houdan comb, and somewhere about an equal amount of black and white in the plumage. English judges unfortunately lay most stress upon crest ; and the result has been a marked deterioration in prolificacy, as in the Crève.

Some Houdans are very large—we once weighed a hen 10 lb., but this is rare. The wattles are pendent and well developed, although the breed is well whiskered. The comb is most peculiar and characteristic, resembling the two leaves of a book opened, with a sort of strawberry-looking lump in the centre ; in the hen it is small. Crève combs are now usually disqualified.

Many of the first imported Houdans lacked the fifth toe, and this feature might easily have been bred out. Unfortunately English breeders went the other way, and rather insisted on it, far more than the French did ; with the result that bumble-foot is now often seen, as in Dorkings. The legs are in colour a sort of mottle of white, pink, and blue.

As to the merits of Houdans, the unspoilt stock is one of the most valuable breeds ever introduced into this country, and in general usefulness surpasses all the French varieties. Better table-fowls are none, the laying powers are great, the chickens fledge and grow faster than almost any breed, and the eggs are invariably prolific—indeed, the ardent Houdan cock requires more hens than almost any other. There is also no hardier variety known. Such a strain is emphatically a farmer's fowl, wherever the eggs can be hatched by other breeds or an incubator. In breeding for crest, colour, and toes it is to be regretted much has been lost, and many exhibition strains are rather poor layers ; so that for economic purposes it is generally better to procure stock, if possible, direct from France.



CASELL & COMPANY, LIMITED, LITH. LONDON

FRENCH FOWLS.

LA FRÈCHE.

ROMANS.

GRANDS...

BREDAS OR GUELDRES.—This fowl is of exceedingly well-proportioned shape, with a wide, full, prominent breast. The head carries a small top-knot, and surmounts a rather short, thick neck. The comb is very peculiar, being hollowed or depressed in the centre, which gives to the head a most singular expression. Cheeks and ear-lobes red; wattles ditto, and in the cock very long and pendulous.

The thighs are well furnished and slightly hocked, and the shanks of the legs feathered to the toes, though not very heavily. The plumage varies; black, white, and cuckoo or mottled being mostly seen. The cuckoo-coloured are known exclusively by the name of "Gueldres," and the black bear chiefly the name of Bredas; but it is much to be desired that one name should be given to the whole class, with simply a prefix to denote the colour. We prefer ourselves the black variety, the plumage of which is beautifully deep and rich in tone, with a bronze lustre; but others prefer the cuckoo or Gueldres fowl. This is quite a matter of fancy, all the colours being alike in economic qualities.

The flesh is excellent and tolerably plentiful, very large cocks weighing as much as 8 or 9 lbs. They are good layers, and the eggs are large; as in most other French breeds, the hens do not sit. The chickens are hardy, and the breed is decidedly useful.

LA BRESSE.—This fowl is hardy and large,* but we cannot consider it as a distinct or established breed. The birds are *all* colours without distinction, presenting exactly

* In a most hostile review in the *Field* of the first edition of this work, our "gross ignorance of French fowls" was said to be proved by thus describing as "large" the La Bresse race, which it was categorically affirmed were, on the contrary, "much smaller" than the preceding. We made the statement originally after actually weighing a cock over 10 lb. as he ran in his pen; but it also happens that Mr. Tegetmeier has since given,

the appearance of very large and fine barn-door or cross-bred fowls ; and we believe that it is, in fact, no breed, but a mixture of fine specimens of different races. We have, in fact, never seen any reason to modify this opinion, formed many years ago ; and there is tolerable evidence that English Dorkings have several times been crossed on their own stock by the La Bresse farmers.

COURTES PATTES.—At the Paris Show of 1878 the reporter of the *Live Stock Journal* gave the first English description of these fowls. They are black, with single combs, and *extremely* short legs. They sit well, and were said to have been produced by the La Flèche breeders in order to hatch their non-sitting varieties. They were also said never to scratch in a garden. Some months later specimens were imported by Mr. Christy, but the last characteristic was found not to hold good, at least in English gardens. They are hardy, good layers, and good in flesh, but do not seem to breed very true in colour and some other points. The *extremely* short legs gives them a quaint appearance, and are the most characteristic point.

FAVEROLLES.—The village of Faverolles, in the Houdan district, has given its name to the last really important breed produced in France, unknown before about 1885, in his revised edition of the "Poultry Book," a table of the average weights at the exhibition of dead Poultry in Paris in 1864. These weights are given as follows :—

	La Bresse.	Houdan.	Crèveœur.
	lb. oz.	lb. oz.	lb. oz.
Unprepared	6 1½	5 4	4 11
Prepared for Cook	5 5½	4 3	3 14
Cooked	3 3¼	2 15¼	2 12½

The average was taken from five birds each, and shows that of all three breeds the La Bresse were the heaviest. A reference by the editor to his own figures might, therefore, have otherwise directed the charge so recklessly brought against us.

but which has gradually to a large extent displaced its predecessors, so that the Houdan itself, in its original neighbourhood, is now in a great relative minority compared with the interloper. This is not without reason, as the Faverolles (spelt with an *s* at the end) combines large size, early maturity, great hardiness, great laying powers, and fine flesh; being also a good sitter and mother. French breeders themselves consider it the best fowl yet produced in their country for purely economic purposes. The birds are said to average 150 to 180 eggs per annum in France, of a light brown colour.

It is a curious comment upon the theories of some English writers upon table poultry, who in former years have so lauded the superiority of French judgment (and justly so), that the French have built up their last and best fowl, not with such crosses as Indian Game, but on the fowl we have so many years recommended for this purpose—the Brahma. It has been evolved, merely by economic selection, from a mixture of Light Brahmas and English Dorkings with the native Houdan fowl. Thus the type in the Houdan district varies much, specimens being found of all colours, with single and rose combs, with four and five toes. The fowl has, however, gradually settled towards one prevailing type, as follows:—The head is rather short, with single comb midway in size between that of the Dorking and Cochin; wattles and lobes (red) rather small, and more or less concealed by feathered beard or bib, and side whiskers; neck short, with abundant hackle; breast and body long and full; legs short and carriage low; shanks slightly feathered, and white or pinky-white in colour; feet with five toes; tail very moderate and carried rather high. The size is large, and general appearance distinctly Asiatic. Colours and markings are very nondescript in the native district, but have tended to settle into three types. *Ermines*

are black and white, practically the colour of the light Brahma. *Greys* somewhat resemble the general effect of silver-grey Dorkings. And there is a *buff*, or, rather, salmon-colour, or salmon-buff and cream, which has, perhaps, found the most general favour in England, as most distinctive from other breeds.

The Faverolles is a splendid utility fowl, as the French have made it. But it has been made by *crossing*, and its good qualities fixed by breeding only for *these*, quite irrespective of fixed exhibition points. And in proportion as it is bred for such points, which in so nondescript a bird outwardly, means necessarily much in-breeding, its valuable economic qualities must be lost.

There are several less known breeds of more or less definite or indefinite type known in France, chiefly by the name of the districts where they prevail. The Le Mans fowl appears a kind of sub-variety of, or to be allied to, the Crève, but with rose or cup comb and little or no crest. In the Bourg district, the fowls are largely white, with evident traces of the English white Dorking. The district of Barbezieux is rather famous for a black fowl with white ear-lobes and very glossy plumage, the breast very prominent, and the tail close and carried rather low, the legs with large scales. These features seem rather distinctly to point to some modification of the La Flèche or similar breed by Indian Game—the only instance in which the influence of this latter breed may *possibly* be traced in the fowls of France.

CHAPTER XX.

AMERICAN BREEDS.

WHATEVER its original source, it has already been recorded how the Brahma itself was introduced into this country

from America ; but this happening so long ago, and during the first burst of the poultry enthusiasm, that fine stock became, as it were, absorbed into the general catalogue, and is scarcely thought of as American now, though no other or really Eastern stock has, from that day to this, been ever added to the original strain, whatever that was. During more recent years, however, several other races have also been introduced, which can most conveniently be described in a chapter by themselves, with the exception of Leghorns, which have been already detailed amongst their proper relatives of the great Mediterranean race. They are all of the useful class.

DOMINIQUE.—This was the first of the series to reach this country, but has since been eclipsed by the superior size of the next to be described. The name represents the plumage ; the “Cuckoo-colour,” as we call it in England, viz. a dark blue grey banding on a light grey ground, being called “Dominique” marking in the States. This fowl was at one time very widely distributed, especially amongst the Southern States and in the West Indies. It has a rose comb like the Hamburg, the blue cuckoo marking all over, and yellow legs, thus resembling, in all but comb and legs, the Scotch Grey, to be hereafter described.

PLYMOUTH ROCKS.—In the poultry mania period, Dr. Bennett gave this name to a fowl he compounded out of *four* breeds crossed together, and which naturally became extinct soon after. Years afterwards the name was revived and given to a much finer breed, which has become very popular both in America and this country, where it now has large classes at shows. There is no doubt that it was produced by crossing the American Dominique, just described, with some breed of Cochins, and the Black Java,

presently described. The comb is single and straight, not very large, and thick at the base ; ear-lobes bright red, and rather smaller than in Cochins ; wattles more developed, but fine. The eyes are generally bay, and large ; the beak yellow, some horny streak being permissible. The legs should be bright yellow, and rather short. The body is compact and deep, with a full, well-rounded breast : this is essential to good stock, and poor breast a great fault, however good other points. The saddle, or cushion, is full and rather high, but not globular as in the Cochin, nor so fluffy, and the fluff on the thighs is compact and moderate.

The plumage is what is known as "cuckoo-colour," but the standard of colour is not absolutely uniform. In America it is described as "greyish-white" barred with "bluish-black," both sexes are demanded alike on breast and body, and the barring is decidedly narrower and finer, and the effect more black and white than in England. Both sexes cannot, or but rarely, be bred of this colour from the same pen of standard birds : the cockerels will do, but the pullets will not be right. The nearest mating is with the standard cock to have a portion of the pullets of the same ground-colour, but darker in the barring. In England the recognised ground-colour is darker, more of a slate-colour,* and with very deep barring, larger and not so sharp in pattern. The hens seem to be recognised as slightly coarser in pattern than the cock, and slightly darker in colour generally ; if such hens be selected, marked distinctly and evenly all over, such will be good mating. Another mating which often produces good results for the English standard, is a cock a shade or two darker than the usual standard, with hens or pullets a

* That is, as it appears on the bird. A single feather of this cuckoo-colour, on a sheet of paper, always appears much whiter.

shade or two lighter ; but such a cock with standard hens would breed much too dark birds of either sex.

Apart from these niceties of a somewhat unnatural sex standard, the colour is in itself difficult enough to breed. It is itself a *composite* colour, originating in a cross of white with black, or some very dark colour. Hence the black and the white components, together with straw and red feathers, continually tend to "sport" out, especially in the hackles and tails of the cockerels, whereas every feather should be properly barred of the blue-grey. Besides this, the black from the Black Java is peculiarly apt to appear, and, what is curious, especially in the hens ; black hens or pullets will be bred anyway, and the more if the mating is at all too dark, as above. Hens or pullets must have the tails perfectly barred, or scarcely any of the male progeny will be so. In regard to colour of the legs, pullets which are distinctly of a dusky yellow generally make the best coloured legs as hens ; while chicks with clear yellow legs as a rule become paler in their second year.

White Plymouth Rocks were founded upon sports from the barred variety, and still occasionally breed barred specimens, though these are disappearing. In all but colour they should resemble the parent stock. Owing to the less difficulty in breeding for colour, they have lately become known as decidedly better layers, many strains ranking high in this respect. *Blacks* were attempted to be bred from the black sports, but have made no way owing to the insuperable difficulty of keeping clear yellow legs in this colour.

Bufs are a more recent introduction, due to crosses with Buff Cochins or Lincolnshire Bufs (p. 241). All we have seen had distinct Cochin heads, and at first the shape was inferior, but of late this has been largely remedied. There is still a great tendency to ticking of black or white in this

colour, which requires the same care in breeding as the Buff Leghorn.

Except for the yellow leg and skin, the Plymouth Rock is an excellent market fowl, making very early and rapid growth. It is almost always a good layer; and some Whites bred for this point are first-class layers—170 in a year has been recorded. Like all breeds founded upon crosses, it is hardy where not too much inbred, except that, from some unknown cause, it often shows a mysterious propensity to weakness, gout, cramp, or some affection of the legs and feet. A flock of the barred variety looks particularly well upon a grass farm. A cross between Rocks and a White Leghorn cock, on an average produces, perhaps, the most prolific and all-the-year-round layer of any cross we know.

BLACK JAVAS.—This is a very fine large black fowl, well known in the United States ever since 1850, and which it is very strange should not have been seen in England before 1885. Had it stood alone then as a large black fowl, it must have become very popular; but the Langshan and the Orpington, in which its own blood undoubtedly runs, had already occupied the field, and it has only at present become very sparingly diffused, though the purest and most distinctive large black breed of any. As already noted, it was used in the production of the Plymouth Rock, and the Langshan obviously owes to it the character of its head and comb and eye, and the beautiful gloss of its plumage.

The Java should weigh about 10 lb. in cocks and 8 lb. in hens, the plumage being close, and very glossy black with green reflections. The legs are also black, with some tendency to get willow with age. The deaf-ears and wattles are only moderately developed, and bright red. The body is full and deep, yet with a sort of Hamburg symmetry on a more massive proportion, with legs moderate in length

and clean; and the cock has a full and flowing tail compared with most Asiatics, the carriage being very sprightly and graceful. Two of the most marked characters are the eye and the comb. The former is peculiarly large and full, brown in colour, and of a characteristic soft and yet sprightly expression, which can often be traced in less degree in the Langshan. The comb is single, and rather low, with the serrations barely perceptible at the very front. This also is often seen in Langshans.

Economically the Java is hardy, and a good layer of brown eggs. The meat is very white and juicy, exactly resembling that of the Langshan. The hens are clever sitters and good mothers. The cocks, as usual in black breeds not very largely bred, are very liable to red or gold hackles, and to get rid of this and any awkwardness of carriage, and select good layers, are the chief points in breeding.

There are *white* Javas in America, bred from sports, and from crosses of these *mottles* have been bred, as no doubt cuckoos could be. But such colours lose that magnificent gloss, which is one of the attractions of the original Java.

WYANDOTTES.—This handsome breed is believed to have principally originated in crosses between Dark (some think Light) Brahma, Spangled Hamburgh, and Polish fowls. The first has given the general shape, the second the comb, and the third the lacing. It originated as a large fowl with *laced* plumage, and so far filled a distinct gap amongst varieties of poultry. The first *bred* in England are believed to have been shown by Mr. T. C. Heath in 1884, and since that date no fowl, probably, has made so much progress in both exhibition quality and general popularity. At first the breeding of the recently-mixed blood to any decent type was simply *awful*: from the best

stock, the great majority were sooty, mongrel-looking birds, worth about half-a-crown apiece. But this gradually mended, and though still a very difficult fowl to breed for show points, it is possible to do it with reasonable success from good strains.

Laced Wyandottes are both Silver and Golden ; the lacing being exactly similar, but the ground-colour in one being white, in the other rich golden bay, which some allege is improved in certain cases by colour-feeding. The head is wide and short, of the Brahma type, with deaf-ears and wattles of moderate size and brilliant red. The comb is rose, but much narrower than the Hamburg, less expansive at the top—in fact, spreading out but little above the base—and with a shorter peak, which must turn rather downwards, so as to follow the line of the top of the head. This downward curve backward of a smallish rose-comb is one of the breed's characters. Taking the Silver laced as a type, the hackles of the cock are white with a black stripe coming to a point something short of the end, and there must be no soot or black outside this stripe. The breast and under parts are white, heavily but evenly and sharply laced with black, the fluff also plainly showing lacing ; tail and upper coverts black with green gloss ; back silvery white ; wing bow white ; wing coverts heavily laced in the Polish manner, with broader lacing at the tips, showing two laced bars and sometimes three ; secondaries white with lacing on outer edge, flights black on inner and white thickly laced on outer edge. The fluff on thighs should be laced as well as possible, and the under-fluff should not be white or peppered, but slate-colour, a little peppered with *dark* grey, and the fluff at the roots of all feathers also slate colour with grey—another point from the Brahma. The general carriage of Brahma type, but more rounded form and fuller breast.

The hen's hackle resembles the cock's, only shorter and broader. Secondaries and primaries of the wing same as the cock, and her tail also is black, the coverts black with white centres. All the rest of the body—breast, shoulders, back, and cushion white, sharply and evenly laced with dense green-black, free from soot or speck in the centre, and as uniform in width all over the bird as possible. Her under-fluff also should be slate colour. The legs (clean) are bright yellow. The size is large medium, cockerels weighing about 7 lb. and adults a pound more, and females a pound less.

The same description applies to Golds, with the difference in ground-colour, and the fluff is almost black, a little powdered with yellow.

The principal faults in marking and colour are light fluff, crescents or spangles on the breast instead of lacing round the feather; lacing inside the very edge of the feather (double lacing); soot or moss inside the lacing; lacing so heavy as to show hardly any centre, or very narrow lacing, or any great inequality of lacing; spangled instead of laced bars in the cock; rusty or brown lacing instead of black. In regard to the last point, however, fine pullets often moult out brown or mossy as hens, and such will *breed* as well as before; still, such as preserve their colour are to be preferred, and by degrees this tendency may be bred out.

The sexes are generally bred now from separate pens; choosing for the cockerel pen a standard show bird with good breast-lacing, rather broad, and putting with him pullets with lacing rather broader than desirable, but black, even if the cushion be a little sooty in the centres. (It has been said that as hens these birds may come brown and mossy). For pullets, on the other hand, it seems best to choose exhibition females, putting with them a cockerel

whose breast-lacing is decidedly rather broad or dark, and whose lower tail-coverts are laced with clear-ground centres. These well-laced lower coverts appear necessary to breed well-laced, clear cushion feathers in the pullets. If only one pen can be put up, most breeders prefer to put with such a cock or cockerel, as first described, a couple of the dark birds there mentioned, and others nearer to standard lacing, and above all, clear and sharp on the cushion. Then the first pair will probably breed good cockerels, and the lighter ones fair pullets.

Buff-laced have recently been produced, in which the colour is buff beautifully laced with white, instead of black. As in the case of Chamois Polish, the lacing seems more accurate than when the marking is black. Good classes have appeared at the Crystal Palace, but the breed is in very few hands, and its popularity remains to be seen. There appear to be two quite distinct strains. In one the buff is very dark, almost a bay, and the white edging very crisp and bright, but with very plain approach to *blue* lacing at top of the breast—this blue may probably show descent from Andalusian. The other is a lighter buff, with a broader white lacing not so sharply cut out, but is quite free from the blue tinge anywhere.

White Wyandottes were probably in the first place a sport from silvers, but have been aided by a white Dorking cross, which has left its mark in coarse combs and a rather Dorking body, points which still need attention. Needing less care, except in these features, this is no doubt the hardiest and best layer among all the varieties.

Buffs were produced by a Cochin cross. It is still very difficult to find birds free from black ticks, or white feathers. In breeding there is little chance unless a cockerel can be secured of sound even buff colour, a shade or two darker than desired, with hens even all over, and free from black

in hackle or tail. If even all over, the hens may differ a little in shade ; and indeed such an assortment is most likely, amongst them, to hit the mark.

Partridge Wyandottes are rather frequently exhibited, and there were fair classes at the Crystal Palace in 1898. The colour and pencilling is not only pretty, but seems to suit the real Wyandotte shape very well ; only unfortunately that shape has so far been much lacking, the deficient Cochin breast being but too prominent in those exhibited. This fault will doubtless be corrected in time.

Cuckoos are also seen occasionally. Such multiplication of varieties is very undesirable in a purely cross-made breed of this kind. Moreover, as the very idea of the Wyandotte originally was a large useful bird with *laced* plumage, it is difficult to see what selfs and quite different markings have to do with it. It is certainly a pity that three varieties with so much in common as Buff Wyandottes, Buff Rocks, and Buff Orpingtons, all depending upon Cochin blood for their origin, should be encouraged.

Like most cross-made breeds, the Wyandotte is hardy when not too much inbred, its shape is extremely good for table, and it is a wonderful layer of brown eggs, which, however, are on the average a little small. The White variety being easiest to breed, is the best layer, so far as we know, and a large flock of birds of this colour has been known to average 175 eggs in a year.

JERSEY BLUES are still bred in America, though not popular ; in England they have as yet not established any footing. They may be described as in shape a Plymouth Rock, slightly larger, with slightly longer neck and shorter tail, but with the colour of the Andalusian, both in legs and plumage. They are no doubt a sport from the Plymouth Rock, but a much less attractive fowl.

It is a little remarkable that while Americans are generally admitted to have scarcely equalled English breeders in the precision of exhibition points, they have far surpassed them in the skill with which they have produced new and valuable breeds, with really difficult points, out of complicated crosses. It is almost as remarkable to observe how, by breeding consistently to a close-feathered type, known to be connected with table quality and fertility, they have thus produced, like the French, excellent table-fowls and surpassing layers out of Asiatic materials.

CHAPTER XXI

MISCELLANEOUS BREEDS.

UNDER this chapter we may collect several breeds which rarely have a class of their own, but usually compete together in a mixed class provided for such waifs and strays; or which, like Orpingtons, though filling good classes, are less distinctive in character. Sultans usually compete in the "Variety" class, but have already been described under Polish fowls.

SCOTCH GREYS.—This breed is rarely provided for in England, but in Scotland often fills large and good classes. It might be called the Scotch Dorking. It is of the cuckoo or Dominique colour, has single upright combs, and red faces and ear-lobes. The legs vary a little, from bluish to mottled blue and white like the Houdan, and nearly white; and there have been advocates of all. The size is about that of the White Dorking, and the shape and carriage are more sprightly than that of English Dorkings, somewhat resembling the free and agile style of the Game fowl. The flesh is good, and the bird hardy and a good layer, usually

becoming broody once in the season, and being then a good mother. It stands the Scottish climate better than most fowls.

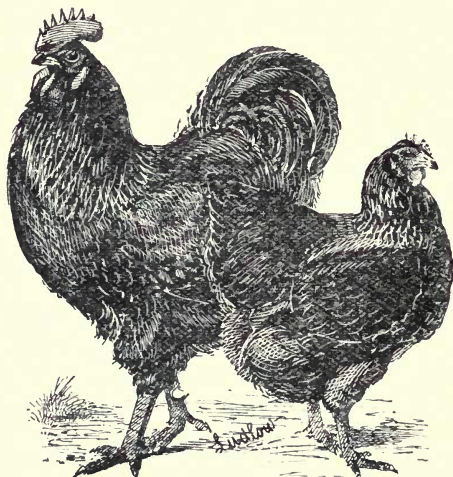
The difficulty in breeding, as usual, is to keep the colour and marking good; black, white, and coloured feathers being apt to appear.

ORPINGTONS.—This breed was manufactured by Mr. W. Cook in the little Kentish town whose name it bears. Mr. Cook's account of the process is that he crossed large Minorca cocks with black Plymouth Rock hens, again crossing the produce with clean-legged Langshans, breeding afterwards by selection. The Langshan probably contains Black Java blood, and the Rock almost certainly does; it is not, therefore, strange that the double cross of Asiatic blood should have to all intents and purposes expelled or overpowered the Minorca. Besides this, however, many subsequent Langshan crosses have taken place, and it is known that many clean-legged Langshans have been used and *exhibited* as Orpingtons. The fowls as now exhibited and known resemble in every visible point cobby, short-legged, clean-legged Langshans, showing the real merits of that fowl in its best form. One exception may be made in the fact that in some specimens there is a yellow tinge in the shanks from the Plymouth Rock cross, which in a Langshan would entail disqualification.

The black Orpingtons are massive and deep in body, with prominent breasts, and short, clean legs. They are hardy, capital layers, good eating, and very general favourites. They also lay brown eggs, and have the gloss of the Langshan breed. Besides the single-combed variety, which has the typical Langshan head in every point, from rose-combed Langshans has been bred a rose-combed variety of the black Orpington. These birds, from some

accidental peculiarity in the rose-combed Langshans employed, as a rule lay smaller eggs than the single-combed birds.

The original Orpington is a most useful introduction. Even though in many cases all but Langshan blood has probably been expelled, by reversion to the stronger Asiatic



Orpingtons.

blood, the fowl has been bred to a compact, plump, well-bodied type which Langshan breeders have unfortunately neglected or departed from. We thus have to go to the Orpington sub-type for a large black fowl of really satisfactory table conformation. Except for the prejudice against black legs, we have seen Orpingtons at exhibitions of table poultry which left little to be desired, and were claimed by London poulterers at a very early hour.

A *buff* Orpington has been lately introduced, or at least

a fowl so-called by Mr. Cook ; but as this was bred quite differently—it was stated to be compounded of Hamburg, Dorking, and Buff Cochin—there is not a single element really in common, and there are serious objections to such methods of nomenclature. There are, moreover, strong grounds for the belief that the real origin of the variety was rather in a local breed gradually formed during many years in Lincolnshire, apparently from a foundation of Buff Cochin on Dorking and farmyard fowls, and known as the Lincolnshire Buff. These fowls were not bred to a precise standard, some having yellow and some white shanks, some clean and some scantily feathered ; but what they had attained was far more "fixed" by long local breeding in the French manner, than any absolute recent cross. Many of these Lincolnshire birds were admittedly purchased by Mr. Cook, and it is known that many others, selected for smooth white legs, have been purchased and exhibited as buff "Orpingtons," while yellow-legged ones have on the other hand been shown as Plymouth Rocks. It is much to be wished that these large, smooth-legged buff fowls could have an independent name of their own, since they have notoriously nothing to do with either the original Orpington or Rock fowls. The buff "Orpington" is supposed to be bred to the same standard as the black, except for its white shanks and buff plumage ; but this has not been the case hitherto, all we have seen being much taller, and less massive and broad in shape. Of all these manufactured buff varieties, probably this white-legged one is best adapted for the English market, as yellow legs are for the American ; but breeding for buff colour with white shanks is attended with difficulties, and by the time these are quite overcome and yellow shanks banished, we fear the process of overcoming them will have impaired some of the economic merit the fowl originally possessed.

DUMPIES, OR CREEPERS.—This is a local Scotch breed; and has long been known under such names as Bakies, Go Laighs, etc., but is now getting rather uncommon. It has never been much valued in England. The principal characteristic is the extreme shortness of the shank, or leg bone, which should not exceed two inches from the hock-joint to the ground. In other respects they most resemble Dorkings, lacking, however, the fifth toe, and being more hardy than that variety. The hens are fair layers of rather large eggs, and as mothers cannot be surpassed. The plumage is generally an irregular speckle, and it is difficult to get them any uniform colour. The cock should weigh 6 or 7 and the hen 5 or 6 lb.

Dumpies certainly deserve to be better known. They have no particular faults, and, combining as they do very fair laying with great hardiness and first-class edible qualities, they must be considered decidedly profitable fowls. They also make splendid sitters for small and valuable eggs. Their general resemblance to Courtes Pattes (described on page 226) will not fail to be remarked.

SILKIES.—This fowl has a class at some shows. It possesses two distinct peculiarities. The webs of the feathers do not cling together as in other breeds, but hang loose as silky or woolly fibres, which makes the bird appear much larger than it really is, the actual weight of the cock being generally about 3 lb. and of the hen about 2 lb. The colour is usually pure white, but black and other colours are occasionally seen. The second peculiarity is the dark tint of the bones and skin, from which the name of "negro" fowls is derived. The skin is of a very dark violet colour, approaching to black, even the comb and wattles being a dark purple, and the face a livid blue. The bones are also covered with a nearly black

membrane, which makes the fowl anything but pleasant to look at upon the table ; but if the natural repugnance to this can be overcome, the meat itself is white and very good eating, indeed, superior to that of many other breeds.

The comb should be rose, but is seldom very good in shape. There is also a crest on the top of the head standing rather up. The legs are feathered with silky feathers, and have five toes ; they are black, or rather blue in colour. The leg-feathering is peculiarly apt to drop off in the show-pen, or after washing ; and as it is one of the points in judging, this makes winning with Silkies very much a matter of speculation.

The chief value of the Silky fowl is as a mother to Bantam, or other small and delicate chickens, such as pheasants or partridges. For such purposes they are unequalled, the loose long plumage affording the most perfect shelter possible ; and another useful point is that a full nest of eggs will usually tempt the bird to sit within a few days at any time. They are, of course, peculiarly susceptible to cold or wet, and have little other value than that stated, except from their singular and not un-ornamental appearance.

There is an occasional silky sport from the ordinary Cochinchina fowl. The plumage resembles that of the preceding variety ; but in every other point the fowl is a true-bred Cochinchina. The loose feathering being no real protection from wet, this breed, like the other, is delicate in our climate.

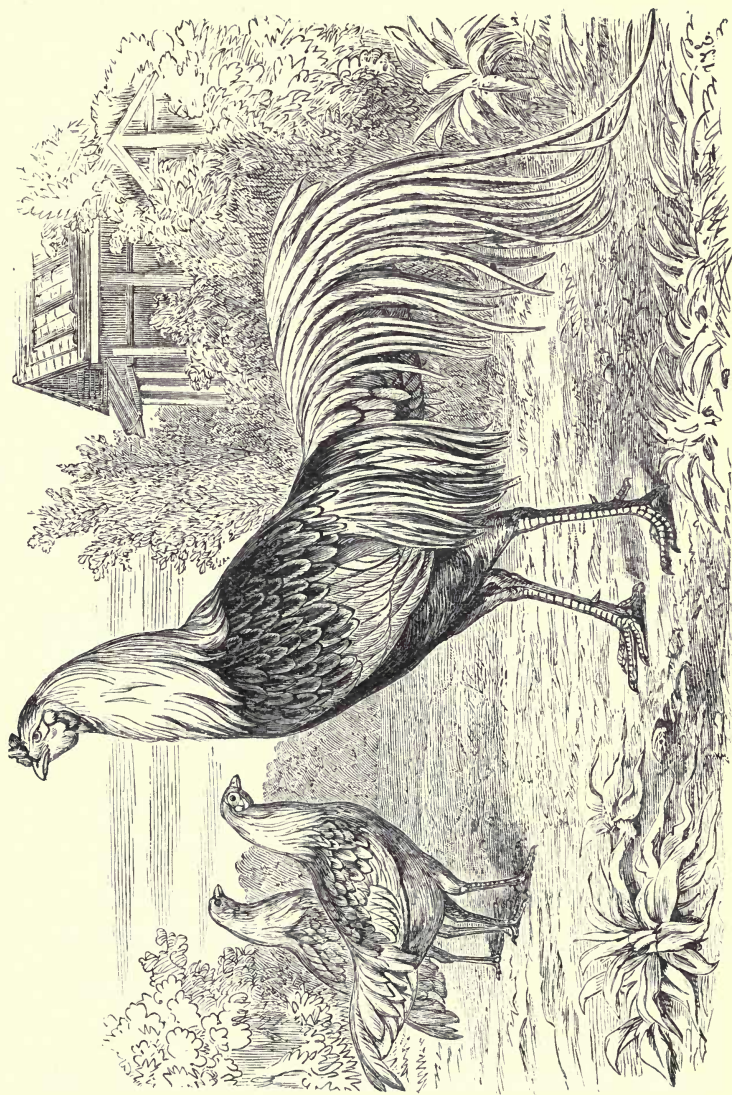
FRIZZLED FOWLS present a most remarkable appearance, every feather in good specimens being curved, or turned back from the body, so as to show a portion of the under side, like the curved feathers in the tail of a common drake.

The colour of the plumage is generally white, and the comb double : but black and various colours are also seen.

Frizzled fowls are, as might be supposed, often delicate, and uncertain layers, though we have met with other strains which were stated to be hardy, and very good in the latter respect. They are very common in the Mauritius, where they are reckoned amongst the most useful poultry. As a rule, however, their peculiar plumage cannot and does not suit a damp climate. We may add that, though "frizzled," the plumage should not be *ragged*, but every feather sound and neat. The handsomest of all are black. There are also Frizzles so small as to be shown in Bantam classes.

RUMPLESS FOWLS are of various colours, the only essential characteristic being the absolute want of a tail, or of any approach to one. It is, indeed, exceedingly difficult to breed any particular colour, as few persons have interest in the breed sufficient to persevere long enough for securing uniformity. The handsomest are white ; black also looks well ; but speckled are most common. The size also varies much, ranging from 7 lb. each, down to Bantam size.

NAKED NECKS.—On several occasions there have appeared at exhibitions some fowls imported from Austria, and stated to be bred in Transylvania, with the curious, and to ourselves, hideous peculiarity of having no feathers on the neck. The heads are feathered, and the appearance is just as if the entire neck below the head had been plucked, except that the skin is of a red colour. Other points have differed, and we have seen one bird of a pair with clean, and the other feathered shanks. The only merit of the fowl is singularity, but of a kind that is singularly repulsive.



Yokohama Fowls.

YOKOHAMAS, PHŒNIX FOWLS.—There have been introduced from Japan, through German importers, some very peculiar fowls, mostly known in England under the above names. The general character of the bodies and heads, and the colours, resemble that of Game fowls; Piles and Black-reds being the usual colours. The peculiar point is the *immense* length of the cock's hackles and streamers. Those called "Phœnix" have been longer in feather than others shown as Yokohamas; but we believe the whole class to be one race at the bottom, and it is to be hoped that some one name may be adopted. In Germany, for want of stock, many have had to be crossed with common Game fowls; and even so, tails three and four feet long have been produced; but sickles nearly seven feet long have been dropped by some of the importations, and at Tokio, in Japan, there are said to be feathers nearly 27 feet in length. The illustration is engraved from a painting made in Germany.

This breed is of course of purely ornamental value, and much care is required to keep the plumage in good order. Length of feather, if in decent condition, will naturally be the chief point in judging.

CHAPTER XXII.

BANTAMS.

THERE is not the slightest reason for supposing that any of the diminutive fowls known as Bantams are descended from an original wild stock. They are in many cases the exact counterparts of ordinary domestic breeds, carefully dwarfed and perfected by the art of man; and even where this is not so, the process by which they were produced is occasionally on record. They are, in fact, more than any other class,

“artificial fowls,” and their attractiveness consists rather in their beauty than in any economic value.

SEBRIGHTS.—Cock not to exceed twenty, and hen sixteen ounces. For exhibition still less is preferable, but not for breeding. Carriage of the cock, the most conceited it is possible to conceive of; head thrown back till it touches the nearly upright tail; wings drooping halfway down the legs; motions restless and lively, always strutting about as if seeking for antagonists. The bird is, in fact, “game to the backbone,” and will attack the largest fowl with the utmost impudence.

Plumage close and compact, and *every feather* laced with black all round the edge. The shoulder and tail coverts are the parts most likely to be faulty in this; but in first-class birds every single feather must be properly edged right up to the head. This part usually appears darker from the smaller size of the feathers; but the nearer the head is to the rest of the body in colour the better. The only exceptions allowable in the lacing are on the primary quills or flight feathers of the wings, which should have a clear ground, and be only tipped with black. The tail feathers ought to be laced, and in the hen must be so; but in the cock this is rather rare. In his case a clear ground colour throughout, nicely tipped with black, may be allowed to pass instead. The cock must be perfectly *hen-feathered* throughout, his tail not only square and straight, without sickles, but the neck and saddle hackles resembling those of the hen. The late Mr. Hewitt, however, a most eminent authority on this breed, remarked to us that while this is imperative for exhibition, he always found such cocks nearly or quite sterile, probably in consequence of the long interbreeding necessary to maintain such a point in perfection. He recommends, therefore, that a cock for breeding should

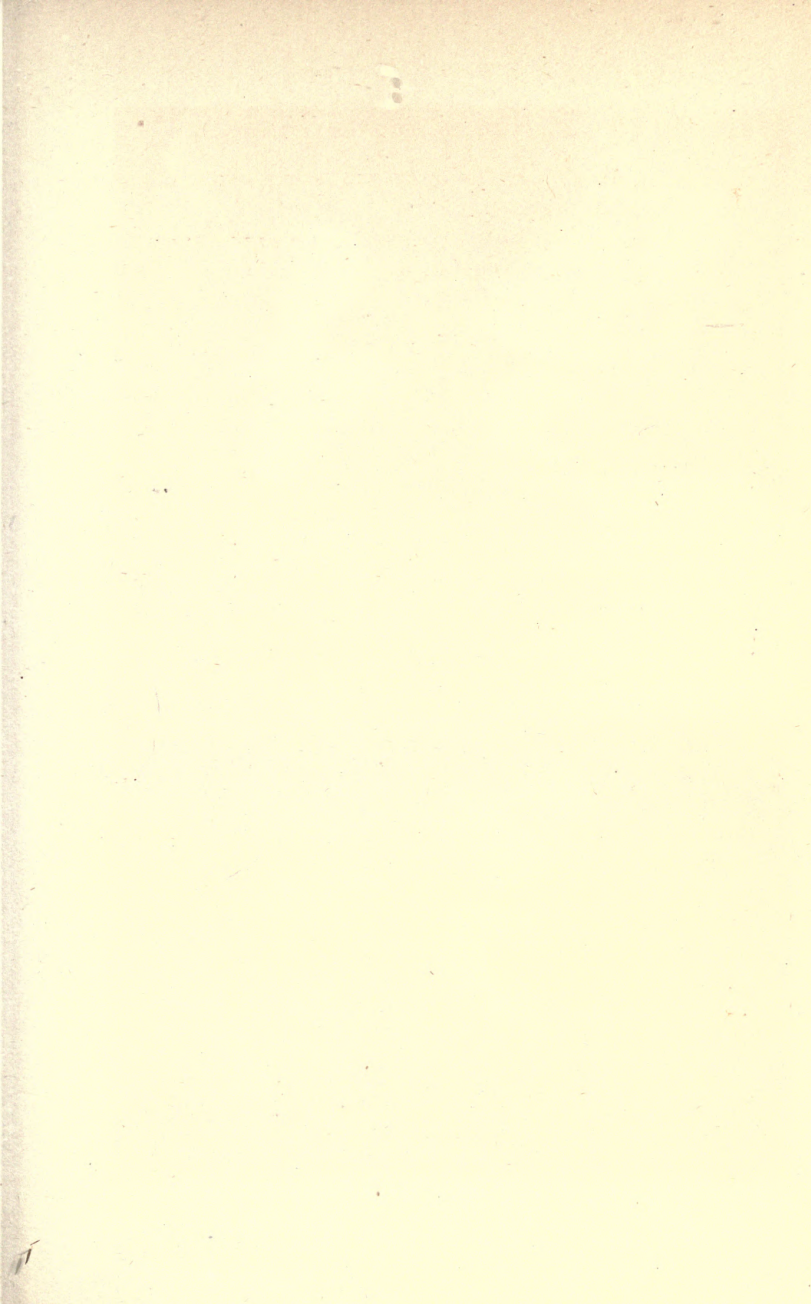
show a slight approach to sickle-feathering, when the eggs will become productive.

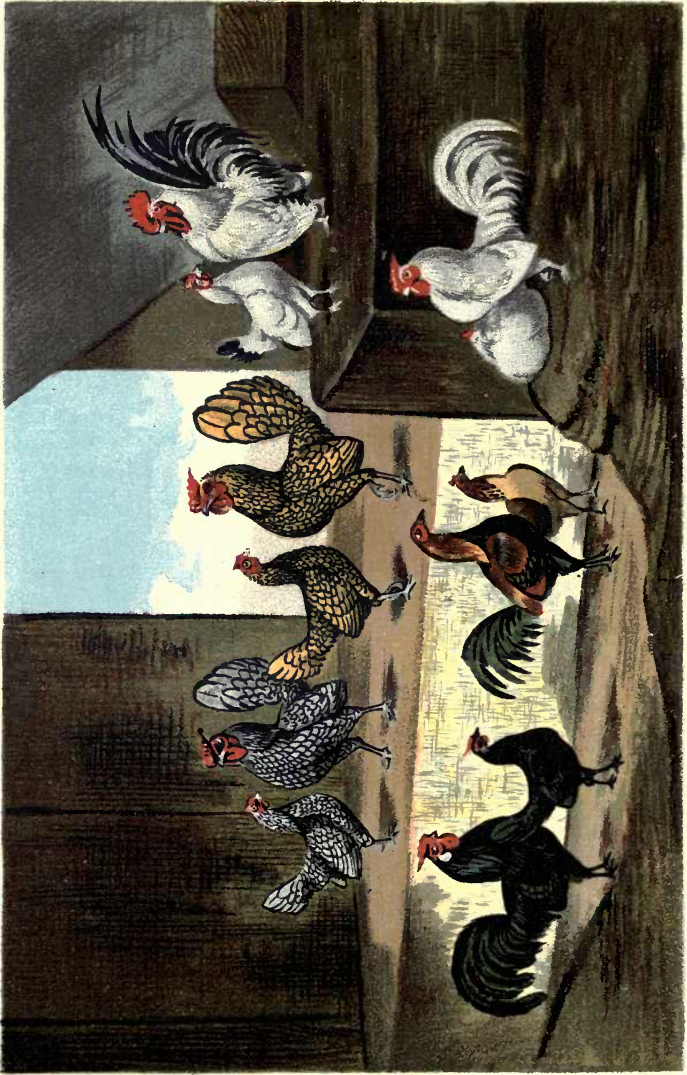
The comb should be a perfect rose, with a neat spike behind, pointing rather upwards, and free from any depression, and rather livid in colour. Face round the eye rather dark. Eye itself a sparkling red. The ear is bluish. Bill slate-coloured ; legs blue and clean.

There are two varieties. In the gold laced the ground colour is a rich golden yellow. In the silver laced, a pure white. In both cases the ground must be perfectly clear and unsullied, varied only by the clear black line round each feather, which constitutes the lacing.

These remarks apply to the original strain, and those on colour of comb, face, and ears, still apply to the Golds. For many years, however, breeders used to cross their Silver with Golden, and the result was that the silver ground became yellower and yellower, until the so-called "Silvers" hardly ever won in competition with good Golds. Just as matters came to this pass, an entirely new strain of Silvers of dazzling whiteness and dense black lacing burst upon the scene from Scotland, and carried all before them. How they were bred has never yet been divulged ; but their combs were *bright* red, the ears fairly white, and though the hen-tail was good, the carriage of the cocks is far less strutting than that of the old strain. The superiority of this new Silver strain in lacing and hardiness has now, unfortunately, in its turn all but extinguished the Golden Sebright.

BLACK.—This is one of the most popular Bantam classes. The plumage is a uniform black, with no trace of rust, or any other colour, and in the cock, with a bright lustre like that of the Spanish fowl. Tail of the cock full and well arched ; legs short, dark blue or black in colour, and





CASSELL & COMPANY, LIMITED, LITH. LONDON

BANTAMS,

GOLDEN SERRIGHT,

SILVER SERRIGHT,

JAPANESE,

perfectly clean. Comb a bright red rose. Ear-lobes white ; face red ; in brief, the bird should resemble a miniature Black Hamburg. Cock not to exceed twenty, hen eighteen ounces.

There have been changes of fashion in this breed of Bantams. At one time a slim, upstanding Gamey shape and carriage were bred for. In reaction from this came a plump body and cobby style of bird with high tail. The Hamburg type as regards shape and symmetry is now accepted, particular stress being laid upon neat combs and smooth, well-developed ear-lobes.

Black feather-legged Bantams have now and then been shown under the name of Black Booted. We have seen them with the foot-feather as long as their bodies. During recent years they have been very much ousted by the far more widely known Black Pekin, or Cochin breed.

WHITE.—Except that the legs are white and delicate, all other points are similar to the Black Bantam, changing the colour of the plumage from black to a spotless white. It should, however, be remembered that while the white ear-lobe is required by *most* judges, as in the black variety, there are some who prefer a *red*, and this latter we must express our own decided opinion is much the smartest looking, and harmonises better with the white plumage. The most usual fault is a yellowish colour in the cock's saddle. A single comb is, of course, fatal.

A very pretty feather-legged White Bantam was not unfrequently seen ; but this also is nearly displaced now by the White Cochin variety.

NANKIN.—This is one of the old breeds of Bantams, and at one time nearly disappeared, but attempts have been recently made to re-introduce it. The ground colour is a

pale orange yellow, usually with a little pencilling on the hackle. The best tail, to our fancy, is a pure black, with the coverts slightly bronzed. The comb is rose; and the dark legs should be perfectly clean.

CUCKOO.—These Bantams should be miniature Scotch Greys. A strain also exists which, like these in other respects, has a rose comb.

PEKIN OR COCHIN BANTAMS.—This most remarkable of all Bantam breeds was first introduced in 1860, the original progenitors having been stolen from the Summer Palace at Pekin during the Chinese war. They were first shown in 1863. They exactly resemble Buff Cochins in colour and form, possessing the feathered leg, abundant fluff, and all the other characteristics of the parent breed in full perfection, and presenting a most singular appearance. This strain, however, became practically extinct. The importations were very few, and several even of these died, the breed being delicate; and the owner of what was the chief stock for many years, seemed to care more for having something which no one else had, than for saving the breed, which might have been done by spreading it amongst a few other hands. Further birds were, however, imported in 1884, and by crossing these with the few left, and with other feather-legged varieties, this quaint breed was resuscitated, and is now well spread. Blacks and Whites are also bred of fine quality, as well as the original buffs; and of late, thanks to the efforts of the late Mr. W. F. Entwisle, Partridge Cochin Bantams have been added to the list, being, however, as yet rather large.

JAPANESE.—Several strains of Bantams have been imported from Japan. All agree in being exceedingly

short-legged, and most have very upright tails. Some are cuckoo colour and feather-legged, but what is usually known as *the* Japanese Bantam has short, clear legs, a white body, and a very upright or squirrel tail, the sickles, or rather scimitar feathers, being dense bronze black with a sharp white edging. The combs are single and upright. This variety is shown in the right-hand upper corner of the plate.

GAME BANTAMS.—In Game Bantams the plumage is precisely similar to the corresponding varieties of the Game fowl, from which they were undoubtedly obtained by long interbreeding, and continually selecting the smallest specimens, occasionally, perhaps, crossing with a Bantam to expedite the process. The carriage and form must also be similar, and the drooping wing, so common in other Bantams, would infallibly disqualify a pen of Game.

In courage and “bottom” Game Bantams are not behind their larger relatives. In constitution they are the hardiest of all Bantam breeds. Black-reds, Duckwings, Brown-reds, and Piles are all shown. At one time the Black-reds were far the best, but the others are now fully equal to them; and in all the colours, the long legs and stylish carriage are now attained as fully as in the larger Game, there being no shortcoming in any respect.

VARIETY BANTAMS.—During late years, owing chiefly to the skill of the late Mr. W. F. Entwisle, by crossing with existing Bantams and breeding size down, almost all the larger breeds of poultry have been reproduced in Bantam form. The proper standard of size, Mr. Entwisle considered, was one-fifth the weight of the original breed. We can only give a list of the breeds and varieties which have been thus produced. In addition to the foregoing,

there have been exhibited Malays in several colours, Aseels, Andalusians, Leghorns in several colours, Hamburgs both pencilled and spangled, Polish, Spanish, Dark and Light Brahmas, Houdans, Silver-grey Dorkings, Silkies, and Sultans. We confess that some of them do not appear to us worth the trouble of production, especially considering their little practical value.

Bantam chickens require, for a week or two, a little more animal food than other fowls, and, rather extra care to keep them dry. After that they are reared as easily as other birds, and should indeed be rather *scantily* fed to keep down the size. Rice is often largely employed in their diet for the same purpose, and so is late hatching; but this tends to shorten the tails and other furnishing of the cocks. It is better to rely upon an avoidance of such grains and meals as are rich in nitrogen—thus dispensing in particular with grits, oats, oatmeal, and middlings—and feeding scantily at longer intervals. This does not imply starvation, but on the very contrary the highest health and condition; the ample and frequent feeding with which other poultry is often pushed on, by no means always producing the greatest degree of bodily vigour and activity. In the Bantam we desire simply to produce the light and nimble grace of nature, rather than the heavy flesh which is the breeder's object in many other cases. Most of the hens are good mothers, and are often employed to rear small game; and are not bad layers if the eggs were only larger. We believe them, however, to produce quite as much for their food as ordinary breeds. But their chief use is in the garden, where they eat many slugs and insects, with very little damage. On this account they may be usefully kept where a separate poultry-yard is found impracticable. We should prefer the Game variety, as being hardiest; and, being good foragers, five or six of these may be kept in a

garden for almost nothing, requiring only a house two feet square to roost and lay in.

Bantam eggs are just nicely cooked by pouring boiling water over them in a breakfast cup, on the table.

CHAPTER XXIII.

TURKEYS. GUINEA-FOWL. PEA-FOWL.

THE most opposite opinions have been expressed by different breeders as to whether or not the rearing of turkeys in England is profitable. The mortality in turkey chicks is very often tremendous, and quite sufficient to eat up any possible amount of profit; but there are persons who for years have reared almost every chick; and, under these circumstances, they will yield a very fair return. For about the first six weeks or two months turkey chicks, as usually reared in England, are *excessively* delicate as regards wet. The very slightest shower, even in warm weather, will often carry off half of a large brood. When about two months old, however, the red naked protuberances about the neck and throat begin to appear, and as soon as these are fairly developed, or the birds "shoot the red," as it is called, the *chicks* become *poults*, and are hardier than most other fowls.

The large importation recently of the American bronze turkey, and consequent increase of information about American methods, have lately shown that the causes of this early delicacy have not been altogether understood. It has not been sufficiently taken into account that the turkey, like the pheasant, still retains in large degree its character and constitution as a *wild* bird; and accordingly,

like the pheasant, is poisoned by, or extraordinarily sensitive to, both tainted ground, and complaints caused by inactivity and over-feeding. Mr. Tegetmeier has done much to make this matter clear, and has published from time to time convincing evidence that when reared really *at liberty* on very wide range over fresh, high, dry ground, healthy turkey chicks are hardy and brave the weather. He quotes especially the State experiments at Rhode Island, where it was found that such housing as is usual in England led to heavy mortality ; that restricted liberty put them out of condition from want of exercise, and full feeding also caused disease ; whereas wide range on clean ground, scanty feeding, and sleeping out of doors, gave health, and ultimately even greater weight.

We may also quote* the experience of Mr. George Tucker, one of the largest American raisers, who rears hundreds every year in Prudence Island. After only average success by old methods, he now makes his nests out of old barrels turned on one side and placed in out-of-the-way corners. Early eggs may or not be given to hens, but when the turkey stays on the nest two days, seventeen are given to herself, choosing the same age as nearly as possible. When the chicks are two days old they are removed with the hen to a remote part of the farm, where each brood is placed in a triangular open pen formed of merely three boards twelve feet long, care being taken that there is no hollow in the ground to hold rain. Only four or five such broods or pens are placed in a twenty-acre field, which they are to occupy, and the pens are moved frequently for five or six days, after which they are let out and allowed free range. They are fed on corn meal mixed with sour milk, and given drinks of sour milk, but no water.

* From *Farming* (Canada).

After four weeks cracked maize is mixed, and this gradually displaces the meal, but is still moistened with the milk ; feeding being at first thrice and later on twice a day. The young woman who attends to the feeding has about three miles to walk upon her round. Mr. Tegetmeier has collected similar evidence from others, who do best by removing the broods very early to the highest and driest pastures, farthest from the homestead, and leaving them in the open, any which stay about the house always suffering most from disease.

These facts are most valuable and suggestive, but do not give us all the truth. It is not the fact, as Mr. Tegetmeier represents, that the climate of America "is more severe than our own," except as to the winters ; on the contrary, during the rearing season it is far more uniformly warm and dry. Neither is it the fact that birds reared by "English methods" die, to any such extent as represented, under the management of experienced rearers. If this were indeed so, turkeys could not have been reared commercially at all, as they have been for many years, nor could the hundreds of tons have been sent over from Normandy, where similar methods are pursued. Where such a system as above described has succeeded in the far damper climate of England it has been mostly in woodland country, which is at the command of very few, or on large farms where a comparatively few are reared. Americans, again, have not to take fox-preserving into account.

But there is a further matter to be considered ; for there are in fact two kinds of hardiness and two kinds of delicacy involved, and there are in this respect very great differences in *breeds*. The American bronze is often half-bred wild, and seldom far removed from wild, hence it does best under wild conditions. It is hardier to mere exposure ; and more sensitive to tainted ground, confined air, or other effects of

confinement, like wild races of men.* On the other hand, our long-domesticated races, like the Norfolk or Cambridge, have been profoundly modified (as shown by increased number of eggs, like the fowl), and have become more tolerant of restriction, while more delicate as regards wet or other exposure. This, and the immense difference between England and America in extent and rental of land, all have to be taken into account, if the best is to be done with a given strain under given circumstances.

To be practical. Turkey rearing should not be attempted except on dry soil, preferably pretty high and where the grass is poor, and not tainted by any heavy head of other poultry, especially by ducks or geese. The greatest care should be taken to avoid *any* in-breeding, by regular introductions of fresh unrelated blood; and the breeding stock never be allowed to get over-fat, as presently noted. Too many hens to one gobbler should also be avoided. One union is sufficient to fertilise all of the eggs in one laying of the turkey-hen, and hence it has been said that the number of hens to one turkey-cock may be unlimited. The best breeders, however, find that as the number of hens allowed to one bird approaches a dozen, the chicks show falling off in constitution; and the number ought therefore to be limited to about this.

The turkey-cock may be used for breeding at two years old, and the hen at twelve months, but are not in their prime till a year older. They will be first-class breeding stock, as a rule, for at least two years later, and many cocks in particular will breed splendid chickens for considerably longer. Here a very common mistake is made, even by the Norfolk breeders, who are apt to sell their larger and older birds, and breed from young stock, in order to save the

* We have noted a somewhat similar instance of special delicacy to confinement in the splashed Ancona amongst fowls.

keep of large birds through the winter and get a better price. Now repeated experiments have been made on this point, of which we will only quote one, recorded in America, where turkeys are reared far more systematically than in England. A raiser bred from an unusually large and strong gobbler, bred the preceding season, but weighing 25 lb., and very fine yearling hens. All were from a large strain, and gave a fine flock, several pairs weighing 35 lb. at seven months old. The birds were kept over, and next year the cock weighed over 30 lb., and the hens 18 lb. : there were that season more pairs *weighing* 40 lb. than there had been 35 lb. the year before ; and they were hardier and reared with less trouble.

This rule is universal. The only thing to be said against it is, that a very heavy gobbler is sometimes too much for the hens. This, however, is avoided in America by shutting up the gobblers a while before breeding, and feeding sparingly, but on good food, so as to reduce their weight. Both gobblers and hens, in fact, should be as large in frame as possible, but not in the least fat and heavy. The best chicks, with a very large father, come from hens 14 lb. to 17 lb. each, and chicks from plump, heavy parents, are far less hardy. Special care should be exercised to weed out birds which have a *short keel* or breast-bone, which is a great fault, and will reduce the price, affecting carving most seriously.

In regard to the housing of breeding stock, an important lesson is to be drawn from the experience above cited. If even a large and high roosting-house be enclosed, it will be noticed how the birds *hurry out* in the morning—they want fresh air. A turkey-house should not face towards cold aspects ; but having seen to that point, it should be *entirely open in front*, and, if possible, the front of the shed higher than the back. Then if the *perch* be as near the back wall

as will allow room, they will have all the shelter they require.

The best time to hatch the chicks out is in the months of May and June, or even July ; and all eggs set should be marked, as the turkey often lays several after commencing incubation. A very good plan is to give a turkey's first eggs to a common hen. In a state of nature, the turkey-cock is constantly seeking to destroy both the eggs and chickens, which the female as sedulously endeavours to conceal from him. There is generally more or less of the same disposition when domesticated, but the behaviour of many cocks is quite unexceptionable ; and as such a quiet disposition saves a great deal of trouble, it is always worth while to ascertain the character of the cock of the year in this respect.

Domestication has also, in England, profoundly affected the fecundity of the turkey. Early in the nineteenth century the hen often laid only a dozen eggs, rarely more than eighteen at one laying, and her second batch was rarely in time to hatch with profit. Very recently we heard of a hen (hatched in June, 1896) which laid her first egg on December 22nd of the same year. The second batch is very often now in time to hatch and rear if desired, and the number has considerably increased. A batch of 20 eggs is now not at all uncommon, and we have heard of occasional hens laying as many as 50 eggs in one year. One was recorded as laying 70 eggs, but we do not know on what evidence.

The turkey-hen is very prudish, but gives scarcely any trouble while sitting. She sits so constantly, that in confinement it is needful to remove her daily from her nest to feed, or she would absolutely starve, unless she has made her own nest in a shrubbery or plantation, when she may be trusted. Nevertheless, when absent she is apt to be forgetful, and, therefore, if allowed to range at liberty, care should

be taken that she returns in time—twenty minutes. A better plan, however, is to let her have her liberty, only in a confined run of grass. Besides her daily feed, a water vessel and some soft food should be always within her reach. No one must visit the hatching-house but the regular attendant, or the hens will get startled, and probably break many eggs, which easily happens from the great weight of the birds.

The chicks break the shell from the twenty-sixth to the twenty-ninth day, scarcely ever later. The day but one before the hatching is expected, the hen should be plentifully fed, the nest cleaned of any dung or feathers during her absence, and an ample supply of food and water placed where she can reach it, as she *must not again be disturbed* till the chicks are out. There will rarely fail to be a good hatch. The egg-shells may be cleared away after hatching has proceeded some hours, but the chicks should never be taken away from the hen, and never be forced to eat. Water or milk may be given, however, by dipping the tip of the finger or a camel-hair pencil in the fluid, and applying it to the end of their beaks.

And now for the chicks. These are often fed on oatmeal, etc., like the young of other poultry ; and it does not answer. Nearly all the young birds which die otherwise than from wet, do so from a strong tendency under our artificial feeding to diarrhœa, or other inflammatory irritation of the intestines, which has always to be watched against. The constant maintenance of eager appetite, with plenty of exercise, is one great means towards this. Experienced rearers feed for the first few days on *hard-boiled egg*, mixed with some stale bread-crumbs and a little of some kind of salad, and sometimes after the first day with milk-curd, which must, however, be squeezed very dry. The best green food right through for young turkeys is *dandelion leaves*, chopped fine at first ; and where they are

regularly reared, it is well worth while to see there is a supply, which is but too easy. When they have a choice, they prefer this to all others, and its known tonic and biliary properties explain the reason. At all events, nothing more helps turkey chicks to thrive ; but it must not be overdone. After a week or so, barley-meal and bread-crumbs may be gradually added, till, at the end of three weeks, the egg is as gradually left off altogether. By degrees, also, a little hard grain and boiled potato may be given, but avoiding too soft or new grain carefully. "Little and often" at first, but gradually coming down to four and three times a day, and feeding rather sparingly than otherwise.

The following tonic, often used in France, is sometimes useful.

Powdered cassia bark	...	...	...	3 oz.
„ ginger	...	...	...	10 „
„ gentian	...	...	...	1 „
„ aniseed	..	...	...	1 „
Iron carbonate	...	...	...	5 „

Or in like proportions. This may be mixed with the meal food occasionally at the rate of a small to large teaspoonful for a fair brood, especially at five to ten weeks old, choosing the worst days, or if they seem to flag ; on signs of diarrhœa it is also a useful corrective.

In our damp climate it is very desirable to have ample but open shedding or roofed coops, under which the chicks can be cooped for at least a week. With Norfolk or Cambridge birds, such shelter should be always at hand, and the hen, at least, kept out of wet grass. But we may learn from our American cousins that the more liberty they can have almost from the first, on short dry grass, or on dry soil, the better ; and with the semi-wild American bronze strains now so widely distributed this is even more important, and such may have freer range and exposure, if that range is

wide and dry enough to keep the ground pure. In that case these fine strains will do better kept away from the house and yard, provided foxes are not preserved in the neighbourhood (another point which Mr. Tegetmeier seems to have forgotten). But our more domesticated breeds will do best, on the whole, kept carefully *out of the wet* till nine or ten weeks old, when they begin to "put out the red." When this growth of the red on the neck is complete they will be pretty fully fledged, and as regards the weather, may be considered hardy: even in America, under the "wild" system, most deaths are found to occur just before this crisis in their growth.

To finish or fatten for market different systems are adopted. All agree that on very wide range little food is needed during August and September, as they find a great deal. In America they are usually fattened by giving them after that what Indian corn they will eat, the white grain being preferred, and care taken not to give much *new* corn of the year, which causes diarrhœa. In Normandy, whence several thousand tons are sometimes sent over to England for Christmas, it is customary during the last three weeks to cram them morning and evening with dough composed of barley-meal, boiled potatoes, and some bran and minced grass, which is made into boluses, each dipped in milk as given; but the birds are still driven out to pasture all day. The best English birds are also left at liberty, but fed freely for some weeks, mainly on soft food. But in parts of Norfolk and other places they are often put up to fatten, in stables or sheds, or pens made of wattles and furze, well littered down with peat moss, raked over every other day, and with a dust-bath in one corner, and perches about a yard from the ground. They are mainly fed on oatmeal, Indian meal, and barley-meal mixed equally, with the house scraps and some boiled potatoes, and made up with skimmed

milk if obtainable. A little grain is generally given after the evening feed, and many feeders give an occasional whole meal of grain as a treat. For the last fortnight some rough suet is often mixed with the meal. Most of the time between meals most feeders keep the shed in semi-darkness; but many let them out for half an hour before feeding, getting them quietly in again for the meal, and then darkening as before. They should have grit also, and a little cut grass. Insect vermin must be sedulously guarded against from the first to the final stage. We have already said that those meant for breeding should never be fattened up in any way.

The ordinary English turkey is of two kinds—the Norfolk (black all over) and the Cambridge. The latter is of all colours—the best, to our fancy, being a dark copper-bronze; but fawn colour and pure white are often seen, as are also variegated birds, which occasionally present a very magnificent appearance. In early editions of this work we expressed the hope that English stock might be improved by crossing with the much larger American *bronze turkey*, containing chiefly wild blood. Long ere this, repeated importations have been made of this noble strain, and the advantages have been even greater than we had expected. The average size of the Birmingham prize birds has not only been greatly increased, but the hardiness has been even more benefited; and there are now probably no prize English strains which are not at least half American blood. The magnificent plumage of the American breed is another point in its favour. The heaviest recorded American weight is 45 lb. The new blood is, however, while hardier regarding exposure, specially sensitive to tainted ground, as above noted.

The magnificent Honduras, or ocellated turkey, has unfortunately never been successfully domesticated. It

breeds freely in confinement, but appears to require a tropical climate.

GUINEA-FOWL.—This bird, called also the *Gallina* and *Pintado*, mates in pairs, and an equal number of males and females must therefore be provided to prevent disappointment. A single male should not in any case have more than two hens. There appear to be ten or twelve wild varieties, but only one has been domesticated in this country.

To commence breeding Guinea-fowls, it is needful to procure some eggs and set them under a common hen ; for if old birds be purchased they will wander off for miles as soon as they are set at liberty, and never return. If hatched in the poultry-yard, however, and regularly fed, they will remain ; but must always have one meal regularly at night, or they will scarcely ever roost at home. Nothing, however, will persuade them to sleep in the fowl-house, unless it is large and lofty, and they usually roost in the lower branches of a tree.

The hen lays pretty freely from May or June to about August, often 90 or 100 eggs in a season. She is a very shy bird, and if eggs are taken from her nest with her knowledge, will forsake it altogether, and seek another, which she conceals with the most sedulous care. It is best to give the earliest eggs to a common hen, as the Guinea-fowl herself frequently sits too late to rear a brood. If "broody" in due season, however, she rarely fails to hatch nearly all. Incubation is from twenty-six to twenty-nine or thirty days.

The chicks require food almost immediately—within, at most, ten hours after hatching—and should be fed and cared for in the same manner as young turkeys. It should be observed, however, that they require while very young

more *constant* feeding than other chickens, a few hours' abstinence being fatal to them ; and they need also rather more animal food to rear them successfully and keep them in good condition, especially in the winter. The chicks are very strong on their legs, and in fine weather may be allowed to wander with the hen when very young.

The male birds are quarrelsome, and very apt to beat other fowls. They may be known from the females by the wattles being nearly double the size ; also the hen alone utters the peculiar cry so well known as "Come back !"

The flesh of the Guinea-fowl is of exquisite flavour, much like that of the pheasant. The body is very plump and well-proportioned. Like all other finely-flavoured birds, it should never be over-fed or crammed, as is sometimes done. Who would think of cramming a pheasant to make it more "fit for table" ?

PEA-FOWL.—The distinguishing characteristics of this well-known bird are the crest or aigrette on the top of the head, and the peculiar structure of the tail covert feathers. The true tail of the peacock is short and hidden, and what we call the "tail" is, strictly speaking, an excessive development of the tail coverts, or side feathers, which occasionally have been known to extend more than a yard and a half from their insertions.

The colour of the ordinary peacock is too well known to need description. White and pied varieties are also bred, but are, in our judgment, far less ornamental. This species, called by naturalists *Pavo cristatus*, has a crest consisting of about two dozen feathers, only webbed at the very tips.

There is another variety known as the Javan Pea-fowl, or *Pavo muticus*. This bird is larger than the common Pea-fowl, the male sometimes measuring more than seven

feet from the bill to the end of the "tail." The naked space round the eye is also of a livid blue colour, and the feathers of the neck are laminated, or resembling scales. The most characteristic difference, however, is in the crest, which is much higher, and the feathers of which are webbed, though rather scantily, from the base, instead of being bare till near the tips. The bird also differs in only possessing his long and splendid ocellated train during the breeding season, at other times appearing with feathers not so long, and destitute of the well-known "eyes," but of a rich green with gold reflections, beautifully and regularly "barred," or "pencilled," on a very large scale, with whity-brown. This splendid bird is not very common.

A third variety has recently been described, called the "black-winged" Pea-fowl, in which the shoulders and most of the wing in the male bird are black. The hen is much lighter than the common breed, being generally of a cream colour, with a dark back.

Pea-fowl are of a very wild disposition, and generally roost either on trees or on the very top ridge of a roof, to which they fly with ease. The hen lays in the greatest seclusion, and must be allowed to select her own nest, usually deep in a shrubbery. She lays generally from five to nine eggs, but sometimes considerably more. The time of incubation is about twenty-eight to thirty days. One cock should not have more than three or four hens.

It is no use setting Pea-fowl eggs under common hens, which forsake their chickens long before the young Pea-chicks can endure the night air. The Pea-hen goes with her brood nearly six months, and the chicks *need* this. They have, however, been reared in an artificial brooder. They are fed and cared for as turkeys, but must be let out on the grass always in dry weather, or they will not thrive. The food is also similar in general; but some worms or

other insect food should be provided in addition, in default of which some raw meat cut fine is the best substitute.

Pea-fowl are tolerably familiar, and if regularly well fed will get very tame, and tap at the window when neglected. They are, however, ill-natured, and frequently beat and even kill other fowls, sometimes even attacking children. From this cause they are ill adapted to keep in a general poultry-yard, apart from their natural impatience of restraint. Young chickens in particular the cocks will often kill, and we believe *eat* them afterwards. Their only place is on the lawn or in the park, where the splendid hues of the cocks show to great advantage, and their peculiar shrill scream is not too near to be disagreeable, and where they can nest in their own wild way. They do not reach maturity until three years old.

CHAPTER XXIV.

DUCKS.

THESE waterfowl cannot be kept successfully unless the breeding and exhibition stock has access to water sufficient to swim in. Without this the eggs are always more or less unfertile, and constitution fails. If there be pretty good range over garden, or farm, or roadside, however, an iron cistern a few feet across, sunk in the ground, may be made to suffice for this, and the birds will still be healthy and fertile, wandering over the soil for slugs and insects. A pen of ducks is most useful in a garden, doing little damage and eating all the slugs they can find: strawberries, however, must be carefully protected from them. The wild duck is monogamous, but in domestication the eggs from three or four ducks to one drake are generally fertile.

It is very different with ducklings for market, which are

reared in thousands without swimming at all, in very small space. Hence duck-rearing has been found a lucrative industry in many parts of the world.

The house for a pen of ducks need only be a few feet square, but must be well ventilated above. The floor must be dry, preferably of flags or concrete, sloping down a little from the bed-place. On this dry straw is laid, renewed clean every two or three days. If they have good range they will only need a little meal and grain twice a day ; if not much range they need more, and *must* have some animal food, considerably more than fowls. They also need ample lime rubbish and sharp grit, the latter of which should also be freely put in a trough of water. They are best shut up in the house till nine or ten in the morning, by which time they have generally laid, otherwise many eggs will be lost.

For exhibition (of the larger breeds) only a few of the very best of the young ones should be put by themselves, and pushed on with grain and meal, but in a hardy way. Both these and ducklings meant to be kept for stock, however, are better not let into the water till three or four weeks old. In nature the mother duck pushes them in at once, and this seems to harden the skin so that no harm results. But with hens or incubators they cannot be thus early hardened, and catch cold, as they will also do in a shower of rain. Hot sun will also kill many; and it needs to be remembered, therefore, that young ducklings must be kept out of both hot sun and rain.

Ducklings for market are reared upon quite a different system, which varies a little, however, amongst rearers both in England and America. As is well known, thousands of tons are reared yearly in Aylesbury for the London market. The supply has so increased that the very high prices once realised for early ones have somewhat declined, but fine

couples in January even yet sometimes realise a sovereign, gradually decreasing to June. And yet it is curious that early ones are easier and more quickly prepared than for the latter month. Eggs, however, are scarce, which limits early production.

Round Aylesbury the rearers collect eggs as soon after Michaelmas as possible. These are still largely set under hens, though incubators are also used ; in the latter a little lower temperature is necessary than for chickens, and generally rather more moisture. The eggs hatch in twenty-eight days, and the ducklings are left for twenty-four hours. After that, some rearers put about fifty with one hen, to brood them a little in turn ; others put them in warm boxes by the fire. For a few days they are fed chiefly on a mixture of hard-boiled egg, boiled rice, and bread-crumbs ; later on chiefly on barley-meal mixed with boiled greaves chopped up, and mixed with the liquor the greaves were boiled in, grit being freely supplied, the feeds coming down from five or six per day to four. Chopped green food is also given. As to accommodation, all rearers do not manage alike, except that while very young they are crowded pretty thickly, all indoors ; later on they have a little more room. Some will put, say, 150 ducklings in a room twelve feet square, with an outer yard, and allow them to dabble for an hour in a small tank of water. Others keep them always under cover, in a warm place. They are always kept in with little light after meals, and fresh straw or peat-moss should be given daily. By eight or ten weeks they should be ready for market, weighing about 4 to 5 lb. each, and if kept beyond that begin to moult and lose in flesh and value. The general breed is the Aylesbury.

Of late years the vale of Aylesbury has been losing much of its pre-eminence as a duck-raising centre, large numbers being bred and fattened in Norfolk, Surrey, and other

localities, and largely by the use of incubators, whilst the Aylesbury rearers adhere too much to old-fashioned methods. A very usual method is to push them on well for about seven weeks on a proper mixture of meals, granulated meat, and green food, keeping them out of the water, and at about that age to put them up for sixteen or twenty days of fattening, during which time locust-bean meal, fat, and the intestines of animals minced up are added to the food. They should then be ready for killing, and if kept on much beyond this point generally begin to moult and lose weight. They have to be kept carefully out of both rain and sun, generally in sheds about 12 feet square, with an outer yard, which may accommodate about 150 birds. The greatest profit is of course realised in those got to market along with green peas.

In America duck-marketing is carried on chiefly by very large establishments or duck-farms, provided with large "brooder houses," mostly long gable buildings with a passage up centre, and rows of pens about ten feet square on each side, which are heated by hot-water pipes. The favourite breed is the Pekin, which in America appears to compare better in size with our own large breeds. Mr. Hallock's celebrated Atlantic Farm on Long Island* has carried on duck-raising for forty years, lately averaging 15,000 birds marketed per annum; and one couple of Pekins weighed every week in 1897 weighed at ten weeks 8 *lb.* each, which far surpasses any English result. At a certain age the birds are taken from warmed brooder-pens which have no outer yards, to cold pens which have outer yards but no pond. Their meal is constantly mixed with a portion of sand, cut green food, and chopped meat, the meal portion consisting of maize meal, bran, and coarse

* We gather these particulars from *The Feather* (U.S.)

flour, the maize and meat being somewhat increased and the bran decreased with age. There are, however, establishments which market as many as 30,000 ducklings annually.

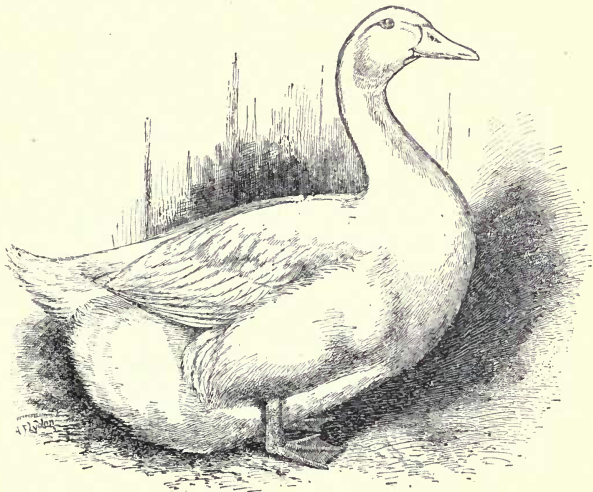
On other large duck-farms, as we are informed by Mr. A. F. Hunter (the editor of *Farm Poultry*, U.S.), ducklings are reared out of doors, a hundred or more in a pen of about a quarter of an acre. Several lots are reared in succession, so that 2,000 per acre are reared on these plots up to August; then the partitions are removed and the ground ploughed up and sown with winter rye, not to be used again till April. Early ones are reared in-doors in pens, more or less as above. Where there is water it is often fenced up into small portions, each belonging to one of the pens; these small ponds become filthy, but the ducklings seem to take no harm. On other farms the pens may be roughly 100 feet square.

The splendid appetites of young ducks, their hardiness if kept out of rain, sun, and damp for a few weeks, and their early maturity, make duck rearing a steady business when properly managed. But like other branches, it must be gradually grown into, directed by experience acquired in actual practice, and the market and machinery gradually worked up to or created by the rearer.

It should be remembered that the first dozen eggs or so which a duck lays are generally (or at least very often) unfertile.

AYLESBURY DUCKS.—In plumage these should be of the purest snow-white all over. The head should be full, and the bill well set on to the skull, so that the beak should seem to be almost *in a line* from the top of the head to the tip. The bill should be long, and when viewed in front appear much like a woodcock's: it should be in prize birds of a delicate flesh colour without spot or blemish, and

with a slight fleshy excrescence where the feathers commence. Eye full, bright, and *quite black*. The legs should be strong, with the claws well webbed, and in colour of a rich dark yellow or orange. Body rather long, but broad across the shoulders, and the neck rather long and slender. The drake should have one, and sometimes has two, sharp



Aylesbury Duck.

curls in his tail. The keel or breast-bone ought to be long, deep, and straight.

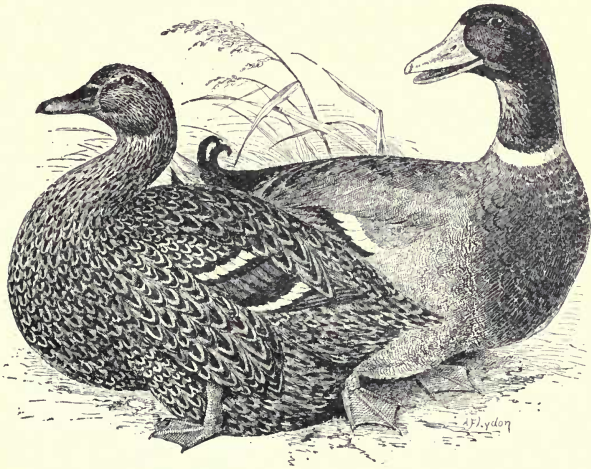
The delicate flesh-colour of the bill is of the greatest importance for exhibition, though of course not for market only. Besides being of good breed in this respect, plenty of sharp grit or gravel must always be kept in large water troughs, in which their grain is given; they must be kept out of much sun, and not kept on ferruginous soil, either of which stains the bird, as will yellow maize;

and they must not be allowed to grub about in filthy water. On old birds, however, a coarse horny substance often forms, upon the bills of ducks which have their liberty especially, and for exhibition this is carefully pared away, taking care not to touch the inner skin or make it bleed. After this the bill is carefully smoothed with fine sand-paper, and the duck kept in semi-darkness for two or three weeks, feeding chiefly on wheat put in gravel and water.

An Aylesbury duck lays on an average about 60 eggs in a year; but individuals have laid double that number, and doubtless eggs could be bred for as in fowls. The eggs may be either white or green, and the same duck may lay both.

ROUEN DUCKS.—The best general description of the Rouens in plumage is to be precisely like the wild mallard, but larger. The drake should have a commanding appearance with a rich green and purple head, and a fine long bill, formed and set on the head as described for the Aylesburys. The bill should look *clean*, of a yellow ground, with a very pale wash of green over it, and the "bean" at the end of it jet black. His neck should have a sharp, cleanly-marked white ring round it, not quite meeting at the back. Breast a deep rich claret-brown to well below the water-line, then passing into the under body-colour, which is a beautiful French grey, shading into white near the tail. The back ought to be a rich greenish-black quite up to the tail feathers, the curls in which are a rich dark green. Wings a greyish-brown, with distinct purple and white ribbon-mark well developed. The flight-feathers must be grey and brown—any approach to white in them is a fatal disqualification, not to be compensated by any other beauty or merit. Legs a rich orange. Nothing can exceed the beauty of a drake possessing the above colours in perfection.

The bill of the duck should not be so long as in the drake, and orange-brown as a ground colour, shading off at the edges to yellow, and on the top a distinct splash or mark of a dark colour approaching black, two-thirds down from the top ; it should there be rounded off, and on no account reach the sides. Any approach to slate-colour in the bills of



Rouen Ducks.

either sex is a fatal blemish for exhibition. The head is dark brown, with two distinct light brown lines running along each side of the face, and shading away to the upper part of the neck. Breast a pale brown, delicately pencilled with dark brown ; the back is exquisitely pencilled with black upon a moderately dark brown ground. The shoulder of the wing is also beautifully pencilled with black and grey ; flight-feathers dark grey, any approach to white being instant disqualification ; and ribbon-mark as in the drake.

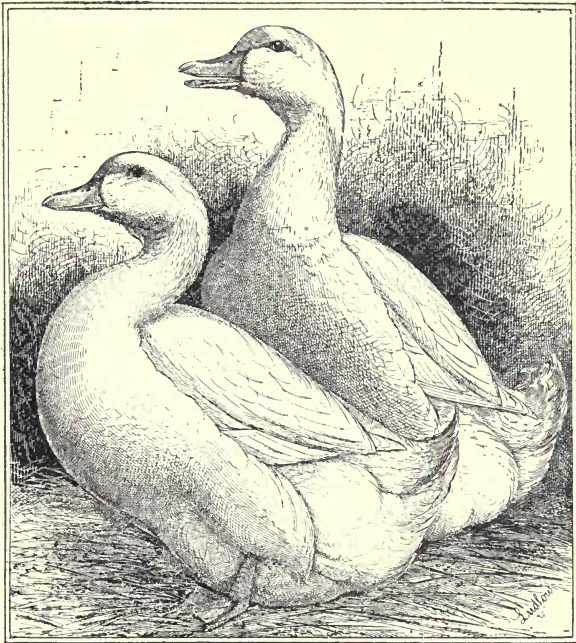
Belly, up to the tail, light brown, with every feather delicately pencilled to the tip. Legs orange, often, however, with a brown tinge. Both sexes should be well "keeled," as described for Aylesburys. The Rouen is not so good a layer as the latter, but quite as heavy and good for the table.

PEKIN DUCKS.—This breed was imported from Pekin into both England and the United States, in the year 1873, and has most marked characteristics. One of these is the strong yellow blood. Both legs and bill are deep orange colour, and the plumage a kind of ferret-white, with a strong canary tinge, which becomes stronger still in the under-feather. The legs are set on rather far behind, which gives an upright or Penguin carriage. Another feature is the boat-shape of the long and deep keel, which, with a fulness of rump and peculiar turn-up at the tail, irresistibly suggests the shape of an Indian birch canoe. Yet another peculiarity lies in the fact that the duck is, as a rule (though there are exceptions), a non-sitter and prolific layer. At one time birds were shown with white plumage and pale bills, but which, no doubt, were crossed with Aylesbury; and the canary tinge is now fully recognised.

This is a most valuable duck, but does not seem to be bred to nearly as high a standard in England as in America, where it is the breed universally used now by the duck-farmers. In England a large-looking bird often weighs no more than 8 lb., though large specimens are exhibited of greater weight, and some breeders average the eggs at 90 per annum, others less. On the American duck-farms birds of 11 lb. and more are quite common, in adults, and the average in eggs from many hundred ducks is reported from three of the largest farms as 135, 140, and 145 per duck. But these are the results of breeding and

selecting the bird, on a large scale, as the Aylesbury is bred with us.

The Pekin grows fast and early, and in America is expected to weigh 5 lb. at eight weeks. It is a little wild

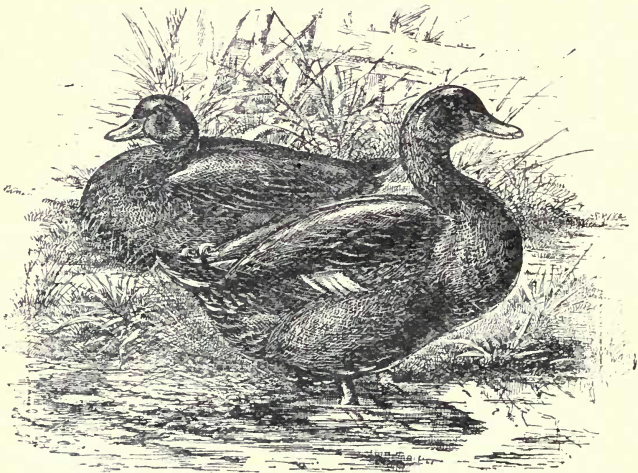


Pekin Ducks.

or free in habit, and does not fatten well in small pens; hence the larger American yards or pens mentioned in the above remarks. The flesh is particularly free from grossness. We are inclined to believe that the greater weight and growth in America as compared with England, is partly

owing to the recognition of its freer habits ; but still more largely to the use of green food and bran along with Indian meal, which probably keeps the digestive organs in more active exercise.

The CAYUGA is a large black duck, originating in North America. The original wild stock is no doubt descended



Cayuga Ducks.

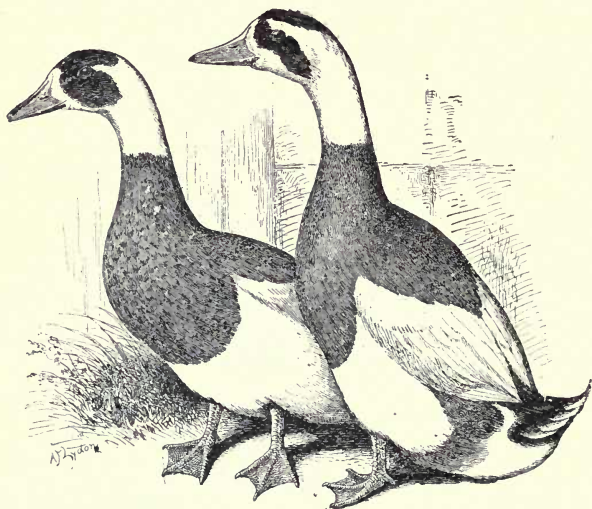
from the mallard, and was of a brownish black, with an irregular white collar round the drake's neck. Breeding to get out these faults of colour at first reduced the size ; but this was recovered, and the breed now is a good size, and black all over, with as much green lustre as possible—in fact, as nearly as possible a large edition of the Black East India Duck. The shape, however, is not nearly so short as that of the East India Duck, but more resembles that of

the Aylesbury. This duck has been bred to weigh 19 lb. per pair. It is hardy and matures early ; is quiet in habit, and a very good layer. The flesh has a gamey flavour which most people like. It is very apt to moult out white feathers after the first year or two. This fault should be avoided, and the legs chosen as dark as possible.

BLUE DUCKS, resembling Andalusians in colour, were known in Lancashire many years ago, and no doubt originated (as in fowls) by crossing white ducks with some dark breed. They have no special merit, and their colour is not particularly attractive, but some attempt has lately been made to revive them. They often occur by pure accident, and are easily perpetuated.

The MUSCOVY, or MUSK DUCK, appears to be a totally distinct species ; the cross between it and other ducks being, at least usually, infertile. The drake is very large, often weighing 10 lb., and looking far more on account of the loose feathering : but the female is less than the Aylesbury, not exceeding about 6 lb. The plumage of this variety varies greatly, from all white to a deep blue-black, but usually contains both. The face is naked, and the base of the bill is greatly carunculated. The drake is very quarrelsome, and we well remember the injuries inflicted by an old villain of this breed belonging to a relative, upon a fine Dorking cock in the same yard. When excited, the bird alternately depresses and raises its head, uttering most harsh and guttural sounds, and with the red skin round the face, presenting an appearance which has been justly described as "infernal." The flesh of the Musk Duck is very good eating ; but it is far inferior as a layer to either of the preceding, and cannot be considered a very useful variety.

INDIAN RUNNER DUCKS.—These ducks have existed round Cumberland nearly half a century, under the former name of Penguin Ducks, from their very upright carriage; of late years their unusually active habits have given them the above name, and their prolific laying has brought them into notice and popularity. Instead of waddling, they



Indian Runner Ducks.

literally do “run” along the ground, and on any range will get their own living. Their size is small, averaging about 4 lb. each; their plumage very tight and close, and in pure birds a sort of buff-fawn and white; the bill, tapering from a broad base, and straight on the top, not dished as in other breeds. The neck is very long and fine. The head is yellow when hatched, but gradually becomes green.

These ducks are non-sitters, lay early, and often constantly till moulting-time. They are hardy and easily reared,

and the flesh is fine in quality ; but they do not fatten, and are not profitable for table. Their value is as layers and foragers, and they are certainly the most prolific of any breed in this country, though they do not much, if at all, surpass the standard to which American breeders have brought the Pekin.

CALL DUCKS are principally kept as ornamental fowl. The voice of the drake is peculiar, resembling a low whistle. They vary in colour, one variety precisely resembling the Aylesbury in plumage, but with a yellow bill, and the other the Rouen ; but in both cases bearing the same relation to them as Game Bantams do to the Game fowl. The flesh is good ; but there is too little to repay breeding them for the table, and their only proper place is on the lake.

The EAST INDIAN, or BUENOS AYRES BLACK DUCK, is a most beautiful bird. The plumage is black, with a rich green lustre, and any white, grey, or brown feathers are fatal. They should be bred for exhibition as small as possible, never exceeding 5 and 4 lb. As they usually pair, equal numbers should be kept of both sexes.

Many most beautiful varieties of small foreign ducks are often shown, the most common being the Mandarin and Carolina ; but it is needless to give detailed descriptions here.

CHAPTER XXV.

GEESE AND SWANS.

IN a small way, a pen or two of geese are most profitable to the farmer or cottager who has access to waste land, common, or roadside, with water-range of some kind. In

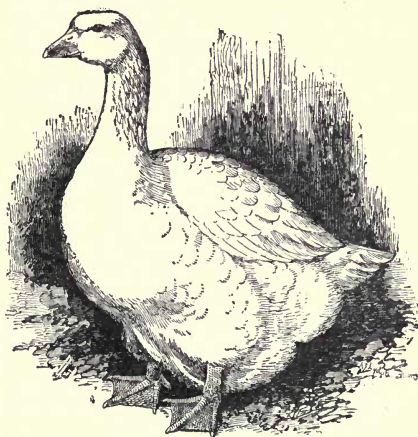
such circumstances the stock birds, and the young ones during great part of their growth, cost scarcely anything, as they graze and forage about, especially on wheat stubbles. They differ from ducks in being vegetable feeders, and will not touch such garbage as ducks delight in ; and they keep better together, so that a number can be herded. It is unprofitable to turn them into really good pasture, however, as they consume so much grass, which they bite even closer than sheep.

The house for a pen of geese need only be two or three yards square. The floor must be dry and hard, littered down with straw, or ferns, or leaves, renewed frequently, and the soiled bedding used for manure.

The wild goose is monogamous ; in domestication, the number given to one gander varies from two to four, but they are seldom so prolific in the latter case. Prolificacy also depends to a certain extent upon their having rather deep water to mate in. They seldom lay till after a year old, and purchased goslings often do not lay their first year. A nest for each goose in a pen is required, as every bird lays where her first egg is laid. The nests should be 2 feet 6 inches square. The time of incubation is thirty days.

Geese generally commence laying in February, and lay about fifteen eggs each, sometimes rather less or more. The bird "feathers her nest" for sitting, and when she has stayed on a day or two she is sometimes set upon thirteen—the first four or five are often set under a hen. She sits very steadily as regards the Embden or White, but the Toulouse is not a good sitter, and her eggs are often set under large heavy hens, or even turkeys. Of late, incubators have been largely used in the chief goose centres. Goose eggs particularly require sprinkling. The goose gives no trouble, neither does the gander, who will often come and squat by his favourite wife—for he usually has

one. Neither parent will brook much interference, nor do they require it, but they will allow the feeder to approach. On hatching, the goslings should be left for a day in the nest to get strong, and may have a meal or two of hard-boiled chopped egg and breadcrumb, mixed with some chopped weed or greens—some green food they require from the first; after that, barley-meal makes a good staple till they can eat



Emden Goose.

grain. Any vegetables—even boiled turnips, and potatoes, and carrots—may be mixed with their food. When stronger, they should be cooped out on grass, the best coop being one of the open crates used for packing earthenware; and when quite strong and vigorous it is as well to let them run with their parents over the range. They need little food after that, until put up for fattening, but are generally rather poor till after harvest, when they are turned out on the stubbles, getting there both as much grain as they can eat and miscellaneous weeds and other green food, of which

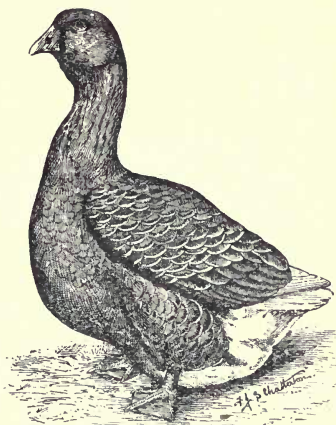
they are equally fond. After being out a few weeks on the stubble fields they will have added from 2 lb. to 4 lb. each to their weight, and are in very good condition for killing. If not then killed or fattened, however, it is bad economy to put them back to mere grazing diet, as they lose weight and become poor again.

At Michaelmas these farm or country-reared geese are often killed just as they are, as "green" geese. But more are fattened, upon systems which vary considerably. Some pen them up in a rather dark shed and feed on barley-meal, with some whole barley also in troughs of water. Others fatten on barley-meal mixed with brewers' grains. Some prefer bruised oats in water.

Among the large goose fatteners of Norfolk and other districts matters are more systematised. Some are hatched in incubators, and reared under brooders, somewhat heated for a little while; but many are bought up from farmers and other rearers round, or from Ireland. Some turn them for a while into turnip fields, where they are fed in large numbers of pens, or sheds kept rather dark. It is found better, where it can be done, not to pen them up suddenly after free range, but to break the change in some such way as this. When penned, some use grain boiled or steeped in hot water, till the last fortnight, finishing with barley-meal mixed with skim milk and a little fat. Others prefer heavy oats, either whole or ground, soaked and given in troughs of water; this is said to make heavier flesh and less fat. Of the tons of geese now sent over from France, the best are fed in batches of about twenty in a pen, the food being buckwheat given in long troughs of water, the meals being three per day. These are only penned about four weeks, and the flesh is remarkably white. Some green food should always be given if possible, but it is often dispensed with, in our opinion to the detriment of the flesh.

The heaviest goslings are produced by a cross between Embden and Toulouse.

For exhibition, geese are shut up in the dark, and fed liberally on whole barley, or wheat, or heavy oats in troughs of water. To obtain great weight they must be kept quiet. They should have some fresh turf, and be let out for a swim half an hour or more every day. Without such a swim they lose health and spirit.



Toulouse Goose.

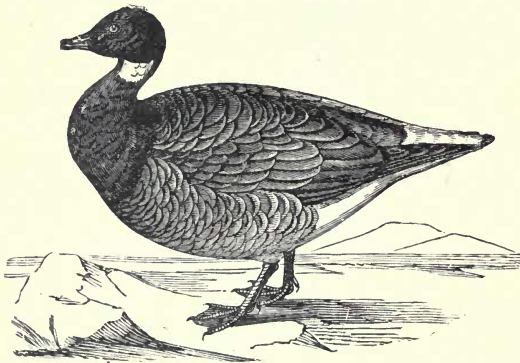
The EMBDEN GOOSE is pure white in every feather, the iris showing a curious blue colour.

The TOULOUSE GOOSE is larger and heavier, the plumage a rich brown, passing into white at the under parts and tail coverts. The forehead should be flat, and the bill a rich orange-red. The cross is generally saddle-backed in marking.

The CANADA GOOSE appears to stand zoologically between geese and swans. It is not a good grazer, but does extremely well wherever there are marshy ponds, as it is very fond of

all pond-weeds and plants. It is quite easily domesticated, and is said to be more delicate in flesh than the common goose. It calls for no peculiar management; and as it is quite as hardy, as well as very ornamental, it is to be regretted that it is not more kept as farm stock. It also does well when left to itself on ornamental waters.

THE CHINESE GOOSE also occupies a position rather between geese and swans; it is also called the Knobbed



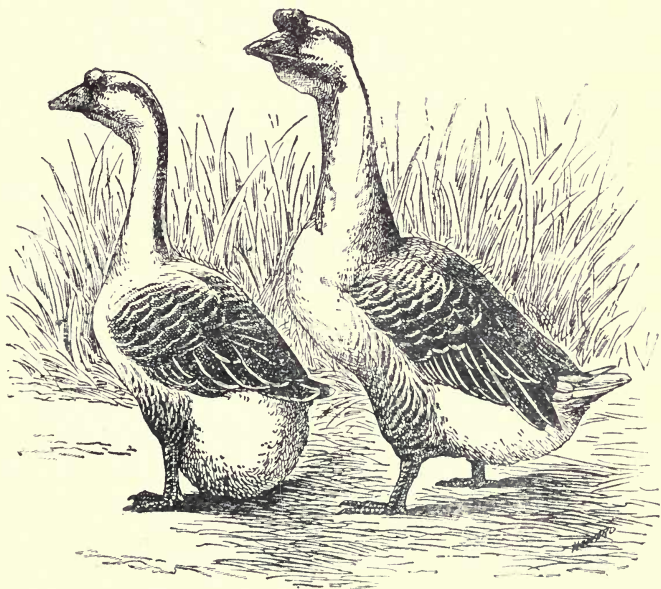
Canada Goose.

goose, having a protuberance at the base of the bill. It too is domestic, and quite easily reared, and is remarkable as the only *prolific layer* of the family. A Chinese goose will generally lay about 30 eggs in a batch, and from three to four batches in one season; hence it is worth keeping on that ground. It is also very fine in flesh, and very ornamental on the pond.

The appearance of the Chinese Goose will be seen from the excellent illustration.* It varies in colour, the most

* From *The Feather*, U.S.

usual being a grey-brown on the upper parts, with front part of neck and breast a yellowish grey; a very dark brown stripe runs all down the nape of the neck from head to back. Others are white, but in these also a stripe of quite *different* character—the feathers being closer and denser



Brown Chinese Geese.

looking, though still white—can be clearly seen. The neck is very slender, and there is a sort of dewlap at the throat. The cry is rather harsh, and the bird is said to be fond of swimming at night, but this is easily remedied by shutting up after a feed of grain. There is really no reason why this prolific and beautiful breed should not be more generally kept as useful stock.

SWANS.—There are six or seven varieties of swans known to naturalists, but only three are at present, or likely to be, domesticated in this country—viz. the English White or Mute Swan; the Australian or Black Swan; and the Chili or Peruvian Swan. The plumage of the two first needs no description; but that of the Chilian Swan differs from either in being white on the body, with a black head and neck, making rather a pleasing contrast of colour. In size the White Swan is largest of all. All three varieties are long-lived, and individual birds are reported to have reached the age of one hundred years.

The female swan lays in February, every other day until seven to nine eggs are laid. More than five cygnets, however, are seldom hatched. The nest is made somewhere amongst the flags and weeds at the water's edge, and it is dangerous to approach either the male or female during incubation, as they are very irascible, and a blow from their strong pinions will even break a man's arm.

On ornamental waters, unless there is very heavy shrubbery or flags at the edge, a house must be provided in the most secluded place possible at the edge, with a slatted ladder leading up to the entrance from the water. In this an ample nest or two should be provided. The birds must then be left alone. They will want some grain in these more limited circumstances, especially in winter; and are the better if grass be thrown to them, unless they can get it themselves, as, of course, is often the case. The parents are too jealous of the cygnets to permit interference, and will bring them out themselves when ready, but some meal in shallow troughs may be provided near the entrance. The cygnets are afterwards best fed by throwing coarse meal on the water, and later on will partake of pieces of bread, and grain, with their parents.

CHAPTER XXVI.

DISEASES, VICES, AND VERMIN.

WHEN a fowl becomes ill, the best cure in very many cases is *to kill it*. Some such deaths are both necessary and beneficial; for Nature has picked out the very birds which you ought, if you knew their real state and constitution, to discard; and if you manage to save them and continue to breed from them, you may probably perpetuate their weakness. This consideration is never to be forgotten. Only in trivial ailments, or in the case of valuable birds probably infected from outside, do we recommend much attempt at a cure, and even then only when the disease is so defined that the treatment is fairly certain. As this work is intended to be strictly practical, it is only for such well-defined complaints we shall prescribe.

Besides actual diseases, there are certain *natural* ailments, as they may be called, to which all fowls may be subject, and which demand treatment. And it is convenient also to collect into this chapter certain other adverse agents which the poultry-keeper may have to contend with.

For actual diseases, it is well in all large establishments to have a weather-tight and well-ventilated house kept as a hospital, in which healthy fowls should *never be placed*. Roup, in particular, is so contagious that even a recovered bird should be kept by itself for a few days before being restored to its companions.

Apoplexy occurs from over-feeding, and can seldom be treated in time to be of service. If the fowl, however, although insensible, does not appear actually dead, the wing may be lifted, and a large vein which will be seen underneath freely opened, after which hold the bird's head under

a cold water tap for a few minutes. It is just possible that it may recover ; if so, feed sparingly on soft food only for a few days. In over-fed hens death often occurs during the exertion of laying ; if, therefore, a laying hen be found dead upon the nest, let the owner at once examine the remainder, and should they appear in too high condition, reduce their allowance of food accordingly.

Bad Moulting.—Old fowls sometimes suffer much at this season, especially if the precautions recommended in Chapter II. have been overlooked. Give stimulating food, warm, every morning, and well peppered, with meat and ale every day, and keep under cover in wet weather. Add also iron, in the form of "Douglas Mixture," to the drinking water, and give small doses of sulphur as advised in chapter above. The birds, if not sunk too low, will then usually pull through. Fowls should not, however, be kept until old, except in the case of pets or valuable stock birds.

Bronchitis.—This is often shown in a quite mild and chronic form by frequent coughing and sneezing, with little or no discharge, and that from nostrils only and not eyes. Put enough nitric acid (it is less dangerous, as nitric acid is violently corrosive, to ask at a chemist's for B.P. dilute nitric acid) in the water to taste slightly sour, with two teaspoonfuls of glycerine and one of gum arabic to a pint. It will do the rest no harm, and usually stops the cough in a few days. If not, see other remedies under *Cold*.

Cold.—This is usually shown by discharge from nostrils, and perhaps also from the eyes. There is very often also some watery diarrhœa. Much mischief may often be prevented if such symptoms are treated *at once*, by removing to shelter, and giving to drink a quarter-pint of water containing ten drops B.P. tincture of aconite. If the chemist makes difficulty about this under the Poisons Act, get

some aconite "tabloids," which contain one drop each, giving one at once, three or four more (singly) every half-hour, and then every two hours. Aconite is no use unless given very early, and then only in the early stages. The nostrils may be syringed gently with hazeline tincture, diluted with equal parts water; and a drop or two of essence of camphor with the aconite often helps at this stage. It is, of course, necessary to keep the patient from draught, wet, and cold.

If these measures fail and the cold develops into a confirmed catarrh, after, say, twenty-four hours aconite must be superseded by other medicines. The nostrils and eyes should be cleansed frequently with hydrogen dioxide and water in equal parts (this admirable wash is well known to all good chemists now), and the nostrils may then be greased with vaseline, mixed while melted with one teaspoonful in ten of eucalyptus oil. A few drops of eucalyptus and also of pure terebene should be put in the fountain, the soft food be slightly peppered, and 10 grains of Epsom salts may be given daily with advantage. It is also of the greatest service in many cases to fumigate the fowls well, whilst on their perches, by sulphur on a fairly red-hot shovel held underneath, or a little eucalyptus oil on a shovel not quite so hot. The birds will sneeze or cough, but this will do them good, and no notice need be taken of it. Should all these measures fail to arrest the catarrh, and especially if the discharge appears to assume a more sticky character, treatment for *roup* had better be adopted, and will be equally proper even if true *roup* be not present.

Consumption is denoted by cough combined with gradual wasting and ill-health, though sometimes the appetite is good. Cure is out of the question.

Crop-bound.—Fowls sometimes so distend their crops that nothing can pass out to the gizzard, and death ensues

unless relieved. Careless feeding after hunger is the usual cause. In most cases persistent and gentle kneading about of the crop with the fingers, occasionally pouring a teaspoonful of warm water down the throat, and after leaving the bird a couple of hours, repeating the process, will be effectual. If not, there is no remedy but to make a perpendicular cut rather more than an inch long in the upper part of the crop, remove all the contents with a teaspoon, wash it out thoroughly, and then join *each skin separately* with three or four horsehair single stitches or ties, making the outer set come between the inner ones, not over them. Feed in small quantities on biscuit-meal for a few days, giving no water for twenty-four hours. There is no danger about the operation, and apparently not much pain.

Crop Dropsy, Soft Crop, Crop-sick, are all names used to denote a distension of the crop by foul watery fluid, with general ill-health. There is little doubt that profuse drinking is often a cause of this. The crop must be evacuated, holding the bird head downward, twice a day: feeding rather scantily an hour afterwards with biscuit-meal in which grains of wheat are mixed, moistened with brandy and water. In the water should be placed some quassia chips and a little tincture of perchloride of iron. First of all give 30 grains of Epsom salts; afterwards, twice a day, should be given half the bulk of a hazel-nut of Walton's Tonic Paste mashed up with a little water. In some cases, about three grains iodide of potassium daily seems of marked benefit, but in others we were unable to trace any effect to it.

Diarrhœa may in mild cases be checked by a diet of rather dry barley-meal, or a few meals of well-boiled rice sprinkled with chalk; it is well, however, to give also six drops of camphorated spirit thrice daily on a pill of soft food, giving no green food beyond finely-cut grass. If this

fails, give a bolus made of five grains chalk, five grains rhubarb, three grains cayenne pepper, and half a grain of opium, one in the morning, and another in the evening; or three to twelve drops (according to size) of chlorodyne every four hours will almost always stop it.

Diphtheria.—It is uncertain whether or not this malignant disease, marked by white or yellowish growths about the throat, is a modification of the ordinary roup virus or not. Very often it is combined with roup, the birds being attacked with ulcers about the eyes, nostrils, comb, or face, or in the inside of the mouth or throat, besides the usual roup symptoms. On the other hand, in some cases the latter are not present, while the diseased formation may be plentiful. This complaint broke out with such virulence in 1876 as to be called "the new disease," and has never since been absent from England. The form in which white or yellowish membrane forms in the throat, or on the tongue, or anywhere inside the mouth, is properly "diphtheria" or "diphtheritic roup," and is often accompanied by roup symptoms. So deadly is it that many advise wholesale slaughter and disinfection; but many cases have, beyond doubt, yielded to treatment. This is most hopeful where one or two birds only are attacked, obviously from outside infection, in a clean and generally healthy yard. If such cases be *at once* isolated from the rest, it may be well to treat them; but if that cannot be done, instant execution is cheapest in the end. Also if the disease appears when fowls have access to pig-troughs, or manure-heaps, or drainage, or in some farmyards, the case is almost hopeless, as the germs find such ample breeding-ground.

The fowls attacked should at once be placed apart in a hospital, free from draught, and a slight aperient given of from one-third to half a tea-spoonful of Epsom salts.

Meantime obtain at once from the nearest chemist a bottle of ordinary chlorate of potass and perchloride of iron mixture—every chemist makes it up, and any will do—and also a bottle of the following dressing :—

Carbolic Acid...	...	...	...	...	1 drachm.
Sulphurous Acid	...	...	...	...	3 "
Tinct. Perchloride of Iron	...	...	...	...	4 "
Glycerine	...	...	...	...	4 "

With a camel-hair or sable pencil touch all the parts which show growths, morning and evening, with this latter dressing; and six hours after the salts begin to give one-quarter ordinary adult doses* of the chlorate and iron mixture, feeding meantime on the *best* soft food, unpeppered, but mixed with warm brandy-and-water: an occasional egg-and-brandy between two fowls is also of much service. Great care must be taken in anointing the throat; and occasionally a bird may be so irritated by a drop "going the wrong way" as to choke and die. These cases cannot be helped, some such dressing being absolutely necessary; but for bantams and chickens the lotion may be diluted with one-third water. If the mouth and throat appear healing, while there are sores outside which make no progress, these may be treated with lunar caustic as an alternative. When the worst symptoms are alleviated, after treatment must be guided by circumstances, according as there may be diarrhœa or the reverse; or roup may remain and have to be prescribed for.

A treatment occasionally successful has been the *immediate* application to every spot attacked of lunar caustic; but, on the whole, cures have been rare with this. More

* These and other quantities refer to fowls of good size and vigour. Smaller fowls and bantams may have from two-thirds down to one-third of the quantity.

success has been reported from the application of an American coal-tar preparation called Cresolene,* ten drops to a pint, applied as a lotion, especially to the inside of the mouth and throat; but, as this is difficult to procure, experience is not sufficient to pronounce positively. Finckler's tincture of Papaine, so far as it has been tried, also appears to exert a most marked effect upon the diseased secretion. Any outbreak in the yard may too probably give ample opportunity for the trial of each and all of these remedies.

There are symptoms, not to be confounded with the above, of an obvious catarrhal cold or roup with apparently sore places or ulcers inside the mouth, not, however, forming a skin or membrane. This appears to be more of the nature of quinsy or thrush, and may be often dealt with satisfactorily by isolation and warmth, with slight aperients of Epsom salts (say 20 grain doses), and application frequently to the sore places of borax and honey. But such cases should be very carefully watched for fear of mistake, and lest, after all, they be instances of true diphtheria.

The more serious disease appears to be more or less communicable both to cats and human beings; and a grave responsibility, therefore, attaches to keeping cases about where there are children. Bodies of all fowls which die of it should be either burnt or buried in quicklime.

Gapes is a fatal disease of chickens, due to the presence in the windpipe of a number of small worms, which finally kill by either wasting or actual suffocation. A solitary case may sometimes be cured by camphor in the water and a small pellet twice a day, removing the actual worms by introducing a feather stripped nearly to the top, or a loop of horsehair, into the trachea, and turning it round during

* Not to be confounded with an English preparation termed Kresyline.

withdrawal, which usually brings one or more worms with it; or fumigation over the fumes of carbolic acid poured on a hot brick, till the chicken is nearly dead, will also kill the worms. It has been discovered that in some mysterious way the disease is frequently connected with a large insect often found on the heads of newly-hatched chickens. These are destroyed by anointing the heads of the chickens while only a day or two old with the following ointment:—Mercurial ointment * 1 oz., lard 1 oz., powdered sulphur $\frac{1}{2}$ oz., crude petroleum $\frac{1}{2}$ oz. The ointment is to be warmed to semi-fluidity, and in that state gently rubbed in. If the chicks even of a yard previously infested are thus treated, it has been proved over and over again that there will be no gapes amongst them. Infusing garlic in the water, and adding it (chopped up) to the food, are also beneficial; and M. Megnin's cure for pheasants consists in dosing each bird with $7\frac{1}{2}$ grains of yellow gentian and $7\frac{1}{2}$ grains of assafœtida. Several gape "cures" are also advertised, and are pretty effectual.

Leg Weakness.—Highly-fed chickens which grow fast, bred from prize stock, are most subject to this, which simply arises from outgrowing their strength, and must be met accordingly by mineral tonics. Parrish's chemical food, which combines phosphates and iron, will be the best medicine.

The above affection must not be confounded with *cramp* or rheumatism from cold and wet, which also makes the birds unable to walk, or even stand. In this case the treatment is warmth, feeding meanwhile on meal mixed with ale, and always given warm; rubbing the limbs daily with a liniment composed of two parts linseed oil to one of turpentine. Sometimes bathing the feet and flexing them

* The mild kind. There are two ointments so known to many druggists.

in hottish water is of service. Under this regimen the bird will soon recover, unless the attack has been long unperceived and neglected. Cramp in very young chickens has been dealt with in Chapter IV.

Liver Disease presents many and various symptoms. The chronic form much resembles consumption, being also due to tuberculosis; but there is seldom any cough, and the failure of the appetite is the first and most marked symptom, with moping and listlessness, and often shrunk and dark comb. This is practically incurable; but when cases occur the owner should consider whether his stock is tainted, or if his yard does not present such unsanitary conditions—particularly *damp ground*—as need prompt treatment; or if he is using potatoes or maize.

Without this constitutional taint, the liver may become congested, or even inflamed. The symptoms are not very defined, consisting mainly of evident distress and depression, quick respiration, loss of appetite and weight, and often bilious evacuations or dysentery. If there be a yellow look about the face and lameness in one leg, the case is nearly certain, but these symptoms are not at all universal. Acidulate the water with nitric acid, and give at once half a grain of calomel and half a grain of opium, with a second dose of same next morning or evening. The bird should be kept quiet and in darkness in a pen on some hay, and fed very sparingly on bread and milk. If there should be improvement soon after the second dose of calomel and opium, follow with 10 grains tartrate of potash, morning and evening for a few days, and recovery is probable. If not, the case is probably hopeless.

Nervous Debility is not uncommon in fowls much exhibited. Many are barbarously overshadowed; but far short of this there may be much suffering, which is manifested without any actual disease, much as in human beings.

Perfect quiet at home, with a daily raw egg, and half a teaspoonful twice daily after meals of Parrish's food and pancreatic emulsion, have marvellous effect if the fowls are not too far gone.

Pip.—For a long time we did not believe in any real disease of this nature, but we have had many specimens sent to us of scale or skin at the tip of the tongue, as hard, large, and sharp as the nib of a quill pen, the birds being unable to eat—from soreness, as we believe. And we are quite satisfied now that, though not common, such a complaint is sometimes endemic, or “about,” as people say. The treatment is simple. If a fowl is seen to peck at and drop corn, it should be examined. If the hard scale is found, it must be removed by the thumb-nail, and the spot dressed once or twice with borax and honey. Give also fifteen grains Epsom salts, and soft food for a day or two, and the bird will speedily be well.

Pneumonia.—The name for inflammation of the lungs. Besides the cough of bronchitis, there will be quick and distressed breathing like gasping, with evident distress, and matter may be coughed up. Remove at once to a warm pen, and give one drop aconite tincture, or one tabloid (aconite should *always* be at hand in a large yard) every half-hour for six or eight hours. Rub in between the shoulders, among the roots of the feathers, as a counter-irritant, some turpentine, or Homocœa (strong) embrocation, or paint on the skin some iodine liniment. After the aconite give two drops ipecacuanha wine in water every hour. Brandy and egg will do much to keep up strength; the food had better be bread and milk. When better, give the wine half as often; when distress ceases, discontinue it.

Rheumatism is shown by lameness and weakness of the legs, in cold or wet weather; if the weather be warm, it can hardly be rheumatism. Take the bird in from exposure,

give a five-grain tabloid of salicylate of soda twice a day, and rub well into the joints any stimulating embrocation; any one of those so commonly advertised is more or less effective, or turpentine will do. Chaulmoogra oil is said to be specially good. Rheumatism can generally be apparently cured, the first time or two; at the same time, a rheumatic fowl is a weakly fowl, and to such our remarks at the commencement specially apply.

Roup is caused by wet or very cold winds, if it ever does arise spontaneously; many think it purely contagious. It is certainly quite distinct from mere catarrh, though the symptoms resemble these to a certain extent. The leading features are a high state of fever, with an *offensive-smelling* discharge from nostrils or eyes, or both, or sometimes hanging about in froth, but more often tending, after a few days, to become thick. Any fowl attacked should be at once secluded, and everything it has used be disinfected with carbolic acid for the sake of the rest. The fowl must be kept in a moderately warm and dry place, and given at first half a teaspoonful of Epsom salts, washing the head and organs affected with Labarraque's solution of chlorinated soda, diluted with twice its bulk of water, or dioxide of hydrogen diluted in the same way, twice or thrice a day all through the attack. The food should be slightly seasoned with cayenne. A few hours after the oil give a copaiba capsule, and continue these every twelve hours till the discharge yields, giving a second dose of salts on the third day. After recovery the fowl should be quarantined for a few days, and be given a last wash with the chlorinated soda before being returned to its companions. If copaiba capsules cannot be readily procured, nearly all the advertised "roup pills" are more or less beneficial, or the following is a good prescription:—Cayenne pepper, 20 grains; copper sulphate, 10 grains; copaiba, 1 fluid drachm. To be made

into twenty pills, one to be given morning and evening. It is to be noted that most cases of true roup first begin with the symptoms of mere *catarrh* or cold. These should have been treated *at once*, as there described; if they have not been, hopes of recovery are much lessened. The directions here are for the further symptoms above described, or, if diarrhœa has first appeared, that will have been treated.

Scaly Legs.—This unsightly incrustation of the shanks is chiefly confined to feather-legged breeds, and is due to a small insect. It can be cured by scrubbing every morning with strong carbolie soap, and anointing at night with sulphur ointment, or ointment sold for the purpose.

Soft Eggs are generally caused by over-feeding the hens, and the remedy is then self-evident. It may, however, occur from want of lime, which must of course be supplied, the best form being calcined and pounded oyster-shells. Sometimes it is occasioned by fright, from being driven about, but in that case will right itself in a day or two with quiet and rest. If *perfect* eggs are habitually dropped on the ground, the proprietor should see whether the nests do not need purifying.

White Comb is shown by an appearance like white flour on the comb and parts of the face, often traceable also over the head, with or without loss of feathers there. It is essentially a disease of *low tone*, and usually due to overcrowding, or want of cleanliness, or insufficient green food. Any such omission should be supplied, and quinine and iron tonic given in the water if it seems needed. To the places apply carbolised vaseline. About 30 grains of Epsom salts, followed by half a teaspoonful of powdered sulphur every other day for ten days, will help towards a cure.

There is often confounded with this comparatively mild

affection, a much more severe form of eruption which is terribly contagious, and appears to be caused by a parasite of the *Sarcoptes* order. This, also, usually begins round or near the head, sometimes also the feet, before the body itself is reached. Actual pimples are observable in this malady, and as the heads of these break, scales form, and the feathers fall off. Rigid isolation is necessary if the victim is not at once destroyed, and the best treatment will be the rubbing in of an ointment composed of 1 ounce mercurial ointment, 1 ounce sulphur ointment, and $\frac{1}{2}$ ounce kerosene or paraffin oil.

Worms.—These are not unfrequently observable in the droppings of fowls. The most efficacious remedies (on the authority of Prof. Woodroffe Hill) appear to be, 10 grains of fresh areca-nut powder (fasting) in a spoonful of milk; or 1 grain of santonin with 7 grains of the nut; or 3 or 4 drops of the oil of male fern in a teaspoonful of salad oil. No food should be given for several hours after, and then warm soft food only for a few days. The dose may need to be repeated in about a week. Turpentine capsules have been also found useful in some cases. Contaminated animal food is the usual cause of worms. All worms expelled or evacuated should be carefully destroyed by burning.

It will be seen that by far the greater proportion of poultry diseases arise either from cold or wet, or neglect in preserving cleanliness—often both combined. It should be noted also that a first general symptom of many such diseases is diarrhœa, which we have observed often manifests itself even in roup, before any discharge from the nostrils is perceptible. At this stage much evil may be warded off. Whenever a fowl hangs its wings, and looks drooping, let it be seen at once whether it appears purged, and if so, give immediately, in a tablespoonful of warm water, 10 to 15 drops of essence of camphor. This will be

as beneficial for cold or chill as for the diarrhœa itself. Repeat this next morning, and in many cases the disease, whatever it is, will be checked ; care being of course taken to give the invalid warmth and good shelter.

VICES.

Egg-eating is generally acquired from the breakage of soft eggs, which creates an appetite for the delicate food ; we do not believe it ever due to a craving for lime. Some think that eating broken-up egg-shells leads to the habit, and possibly whole or half shells might do so. Whatever the cause, the vice is most inveterate when once acquired. The only possibility of real cure depends upon *isolating* the criminal, which is also necessary to prevent her contaminating the others. She should be provided with a regular supply of egg-shells carefully emptied and refilled with nauseous materials, if possible of a yellow colour. Sometimes fresh-made mustard is rejected, but we have seen hens eat it unconcernedly ; carbolated vaseline, however, is always, we think, turned from with loathing. There should always be such an egg near the nest ; and on the other hand, the nest itself should be so constructed that the egg rolls down out of reach as soon as laid. An easy way of managing this is to make a false bottom to it of a rather slack or hollowed piece of carpet, in the back region of which a cross cut is made through which the egg disappears on to a cushion of hay below. Half a nest-egg should be cemented to the carpet by the flat side. Thus deprived of the real delicacy, and every trial resulting in the nauseous carbolate, experience proves that many hens can be cured ; but the necessity of having only one bird to deal with, and the patience and perseverance needed even then, are obvious.

Feather-eating is a far more common vice, especially

prone to occur in confinement, when fowls are close together with little to do. Certain breeds are thought by some to be especially prone to it under these circumstances; Houdans and Andalusians have that reputation, but others have found them exemplary. It is probable that insect vermin start the habit in some cases, and certain authorities attribute all to this cause; but we have been consulted in one where close scrutiny could find no such reason. We believe a craving for animal food not supplied may occasionally be a reason; also a feverish state of body from want of green food; or a sore place about the head of any bird. For in the same category must be placed the habit of pecking at the comb and face, until the fowl attacked becomes a pitiable object. In this latter case it is generally the cock which is attacked; and the way in which he stands perfectly still, apparently content and even happy to have his comb and wattles torn to pieces, is a proof of how little sensation there can be in these parts, and how little truth in the charges of cruelty so recklessly brought against those who dub their birds.

This habit also is in some cases inveterate, when it has been any time unchecked. Whatever the cause, these things are not diseases, but real *vices*, or acquired vicious and artificial appetites; and we have no moral sense to appeal to. Many cases, however, have been and can be cured. Any bird specially attacked must be isolated, as it tempts the others; on the other hand, if only one or two are culprits, let them be removed ere they corrupt the others. Vermin, if found, must be dealt with; so also with want of cleanliness, and above all, any deficiency in regular and ample green food. Animal food must also be given in proper but not excessive quantity, and small cooling and tonic doses of Epsom salts—say, ten grains each, which is not a laxative after the first dose, will tend to allay

feverishness. The attacked plumage should be drenched every two or three days with Jeyes' Fluid diluted by two parts water, whose taste will probably prevent feathers being swallowed, and carbolated vaseline applied *freely* to all bare places. The beaks of all offenders should be carefully filed away from time to time, at the edges of the tips of both mandibles, so that for an eighth of an inch the bill cannot quite close; corn can still be picked up, but the beak will not be able to close upon and draw out a feather. But, finally, care must be taken to reduce the numbers to a proper proportion for the space, and, while feeding adequately, to do so in a way to provide *occupation* for the fowls. For it is the old enemy celebrated by Dr. Watts who is chiefly to be combated. The grain may be scattered sparingly and worked *under* the loose earth, or straw scattered over it, to promote constant scratching; or green food may be supplied by half a cabbage cut open and hung by a string; or the animal food by a piece of cooked liver or a large bone suspended in the same way. By such means, and never forgetting the withdrawal of either the special culprit (if any) or the special victim, or both, can this horrible propensity be very frequently overcome.

VERMIN.

Under this heading we include all living enemies of the poultry-yard, both in the insect world and amongst mammalia.

Insect vermin in general seldom become very troublesome if the dust-bath be properly attended to, the houses and sheds whitewashed at proper intervals, and occasionally sprayed with dilute carbolic acid. But there are exceptions, sometimes what may be almost called an epidemic, perhaps from some less careful neighbour's premises, and special

precautions are therefore advisable, as special measures may be necessary.

Fleas or *Lice* are most common in the nests and in the sitting hen, from which they may infest a brood of chickens. When either abound, nest material should be frequently changed, and wild fern or bracken, if it can be obtained, will be found much less infested by them than straw. The birds themselves should be treated individually, a mixture of two parts Dalmatian (or that bearing any other name, all are the same) insect powder and one part powdered sulphur, being well rubbed into the plumage. The heads should be touched with carbolised oil, or oil with a little kerosene in it, which can also be slightly applied under the wings. A French paper states that these pests may be kept away from nests by blowing out an egg through holes in the two ends, and placing therein some eucalyptus oil. This is done by cutting a few long narrow strips of sponge, moistening them with water, and then rolling them tightly and closely round with twine from end to end. When dry, the twine is unwound, the sponge retains its shape, and can be passed endways through the hole into the shell. Eucalyptus oil is then dropped in to saturate the sponge, the holes are sealed up with wax, and the oil exhales through the shell. Perforated eggs of enamelled metal can now be obtained, in which disinfectants or insecticide can be introduced. One of these will permeate a nest and do much to keep away insect vermin.

Mites are the worst of insect vermin, and are often unsuspected because nocturnal. When they have got a footing, they come out in myriads and attack the fowls or chickens all night, the blood giving them the red colour so familiar. Their haunts are cracks, and intervals between two pieces of wood. Perches must be made movable where they are found, and taken out weekly in summer for the ends in

contact with the house, and the sockets, and all fissures and cracks to be painted with kerosene. And besides the regular lime-wash, the inside of the house should be sprayed, or the cracks painted over, with dilute carbolic acid, or even corrosive sublimate solution. Poisons are, however, better avoided.

Rats may often be kept out by laying small mesh netting under the floor and a foot high all round. A terrier, trained not to hurt the birds, will often keep them away. Pouring gas-tar down every hole that is found is sometimes efficacious; but a more effectual plan is to stop up every hole but one, and to pour down this some bisulphide of carbon. This should, however, never be done at night, and no light should be taken near as long as any smell remains, the vapour being about the most inflammable of any known. It penetrates through their runs and kills them by suffocation.

Foxes can be to a considerable extent guarded against in several ways, so far as a limited stock is concerned: it is very large establishments which are so helpless. A small roll of netting near each door, or a semicircle in front, generally frightens them away, as they suspect a trap; so will often a piece of red rag tied to a stick. Any such scares should, however, be changed about or varied every few days, that the animals may not get used to them. Another usually successful way to guard a fowl-house which must be left open is to make the exit right at one end of the side, and to give access to it by a wooden tunnel all along the side, only large enough for the fowls to walk along, and turn at the end. Here, again, the fox suspects a trap, and will rarely enter, especially if the open end be further furnished with a variable scarecrow such as the above.

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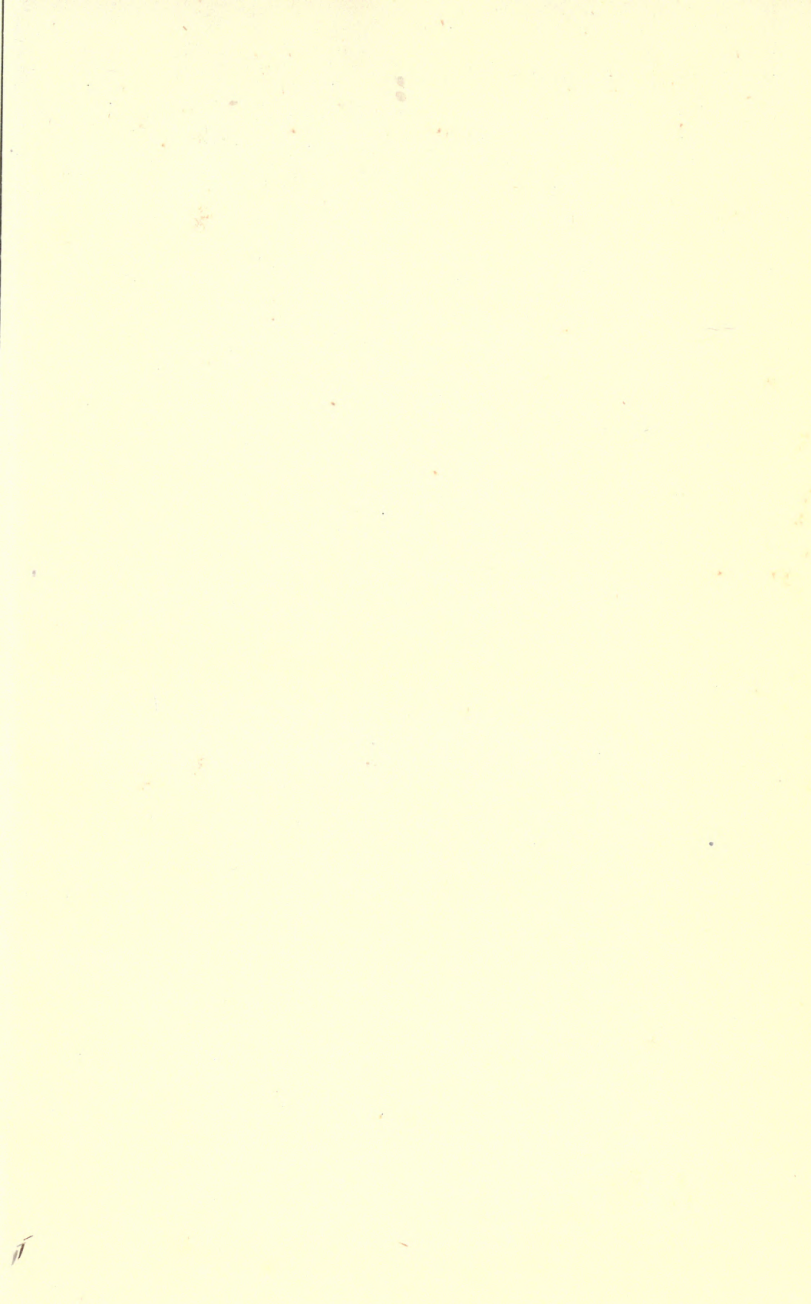
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