



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

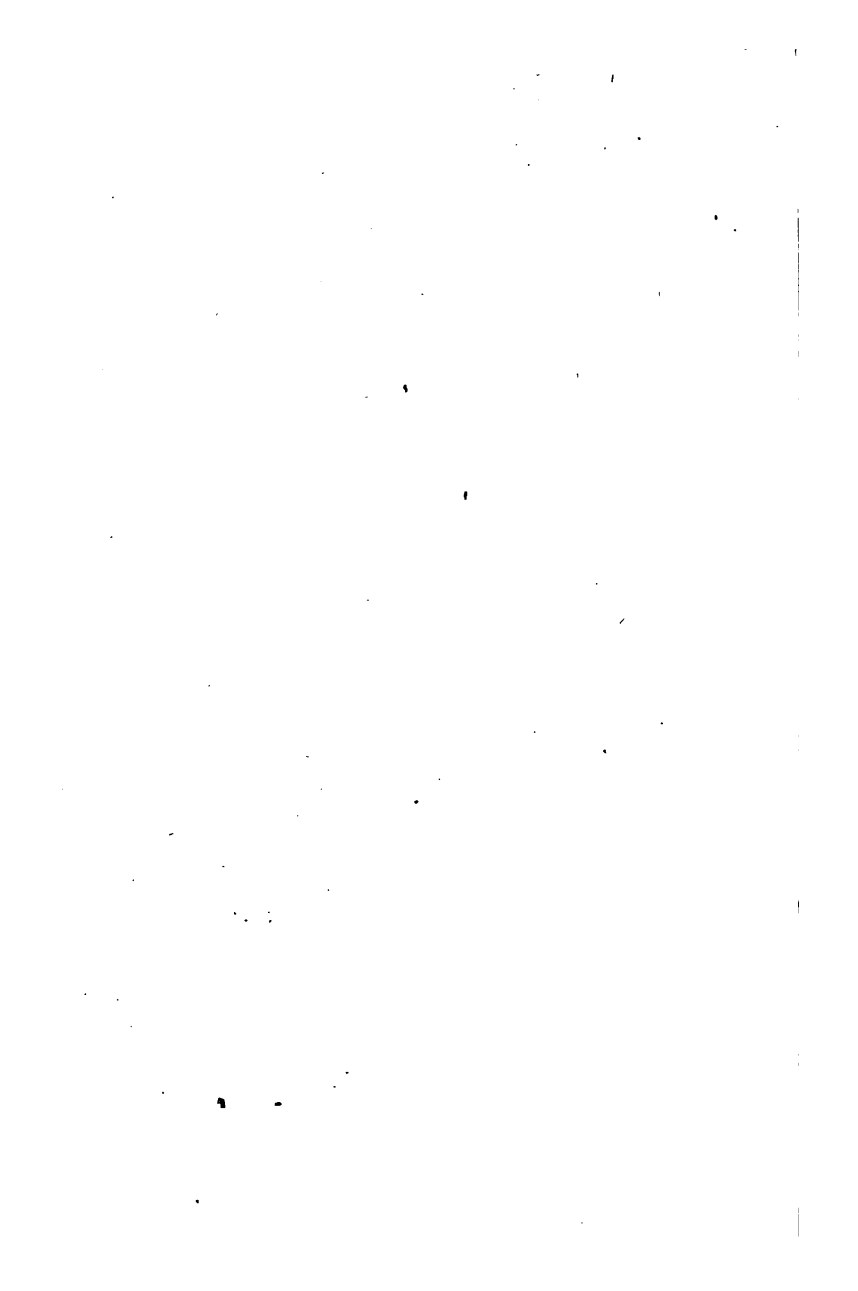
Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

189. c.

120.







PRACTICAL EXPERIENCE
IN
BREEDING, REARING, AND FATTENING
THE COMMON KINDS OF
DOMESTIC POULTRY,
WITH AN
INTERESTING ACCOUNT
OF
EXPERIMENTS
IN
ARTIFICIAL INCUBATION.

BY
JOSEPH NEWTON.



IN TWO PARTS.

IOKWEEL:
PUBLISHED BY THE AUTHOR.
LONDON:
E. REYNOLDS, HIGH STREET, BLOOMSBURY,
AND MAY BE HAD OF ALL BOOKSELLERS.
1852.

189. c. 120.

ERRATA.

In page 3, line 23, for *to* read *too*.

„ 15, „ 14, for *fourteen shillings each* read *fourteen pounds*.

„ 18, „ 8, for *barn* read *corn*.

• „ 19, „ 1, for *Puitada* read *Pintada*.

„ 23, „ 2, for *in haste* read *of hazel*.

„ 41, „ 7, for 22 read 28.

Dedication.

TO THE
LANDOWNERS, FARMERS AND GARDENERS
OF
GREAT BRITAIN,
AND THOSE UNDER THEIR DIRECTION IN CHARGE OF
DOMESTIC POULTRY.

To none can we present our remarks with more propriety, than to you.

Having experienced much pleasure in cultivating a love and knowledge of nature, by keeping poultry for the benefit of our employers, we found a great want of practical works at the commencement of our engagements, and now with a desire to benefit others under like disadvantages, have undertaken this little work, with the hope that it may be found worthy of your patronage.

1

2

3

4

Preface.

Our aim in preparing this little work, is to furnish those in the charge of poultry, either for gentlemen, the farmer, or for the cottager, with a few simply practical observations.

We do not presume to teach, but merely give the results of our practice; which in itself has been successful in providing employment for my partner in life, and repaying our employer; having had abundance of eggs and poultry for the supply of the mansion; and some to dispose of to marketable customers.

The pronoun *we* so frequently used in the following pages, merely intimates the combined attention of my wife and self, I being employed as horticulturalist on the same estate, was frequently otherwise engaged.

Vertical line on the right side of the page.

General Remarks and Observations,

FROM THE

COMMENCEMENT OF OUR ENGAGEMENTS.

ATTENTION, with practice duly carried out, will soon show the amount of success to be realized in rearing poultry; and whatever disadvantages we may be placed under, with due care and attention they may be overcome.

Our stock at commencement was as under :

	£.	s.	d.
Twenty-three hens, valued at	1	15	0
Three cocks, valued at	0	3	0
We bought three Turkey hens and one cock.	1	15	0
Two guinea fowls, (hens)	0	4	0
	<hr/>		
	£3	17	0

We took charge of this stock on the 9th of May, 1847. The fowls were of the barn-door breed, and excepting six very old hens, were very good fowls. With those

hens and white Dorking cocks (our object being to cross the barn-door fowl with the Dorking) we commenced.

The house we had to rear the young poultry in could scarcely be worse for the purpose than it was. The distance from our dwelling-house being nearly five hundred yards. The walls were twelve feet by twelve feet, and sixteen feet high, ventilated with lattice-work window and door, so that to admit light we were obliged to let in the air at all seasons; very little sun could shine into the interior, as from the form of the place it was necessarily excluded. The floor was paved with brick; the most expensive, cold, and damp, that could have been thought of. While standing in this place, we even shuddered at the idea of trying to bring up poultry to make it pay, before we could have a better place built.

This rearing house opened into an inclosed yard, twenty yards by twenty yards, and we were to keep the poultry within these bounds, at the express wish of our employer. The chitte-prat breed are certainly a good sort, and we have some very beautiful birds, but they are not profitable with us under these restrictions; and a friend of mine cannot make the same sort profitable without a good range.

From having to keep these fowls in so small a space, they were subject to many diseases, being prevented from amusing themselves at large, and obtaining that food in nature, with a proper amount of exercise, conducive to their health. There were also other drawbacks

to this system of things. The hens stole the food provided for the chickens, and spread disease.

But in trying to make this plan pay, we were induced to adopt various inventions. True, we had the best time of the year to commence our operations in, so cared but little about the badly contrived house for the first season, but in the next we had another foe to contend with, the rats had got a strong hold in the sewers under the enclosed yard, consequently we had to supply the fowls with more food than we otherwise should, had our habitation been nearer to prevent such incursions.

Thus from May, 1847 till April, 1850, did we endeavour to make the poultry pay; recollecting that we were to have a better house for our purpose, if successful in our experiments, and, by this time therefore we expected it, and being unwilling to throw so much labour unnecessarily away by extraneous attention, solicited our employer for its erection.

After looking in various directions, we resolved to have our rearing house, &c. as near to our dwelling-house as possible, that our charge might have immediate care and attention; also, to assist with warmth and light, by warmth when the external air was too cold for young chickens; and so light that in rainy weather we could keep them comfortable in the house, building the coops as fixtures round the place, and economizing the room.

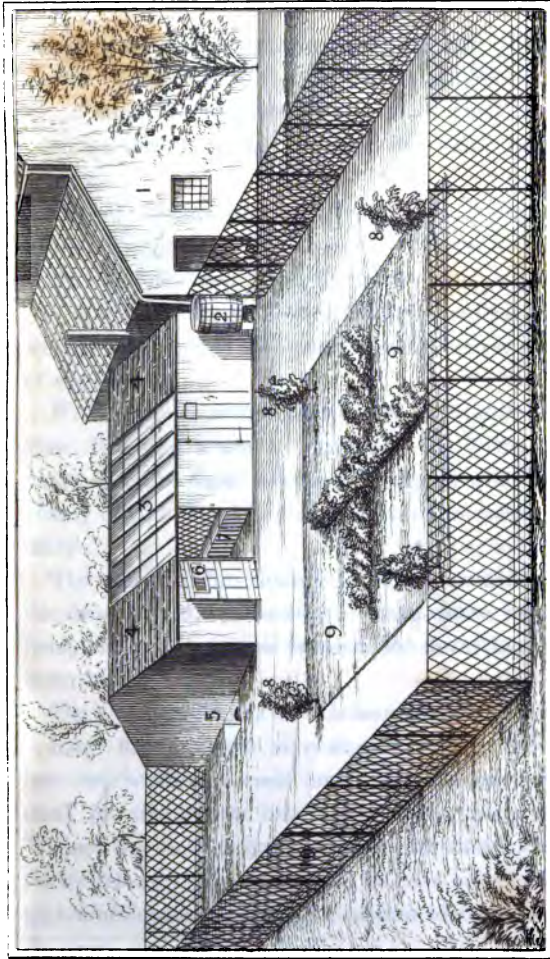
The soil we dug out a foot below the surface, and laid large tunnel tiles along the bottom to form a flue,

then filled up the space to the ground level, with coarse stones or brick-bats, the floor then was formed with a layer of concrete; thus the heat from the flue being under the floor could circulate through the rough stones, and both dry and warm the floor.

We got this house up, twenty-four feet long, by twelve feet wide, and five feet six inches high from the ground; a plate of timber rests upon the brick-work all round; the door posts are morticed into the plate; three tie beams run across, upon which, in winter, we lay planks as shelves for plants. We ran up a dwarf wall, three feet high, to divide it into two houses, one for turkeys, &c., the other for chickens; a joist with wire fencing carried higher up, divides these compartments, without changing the light or temperature.

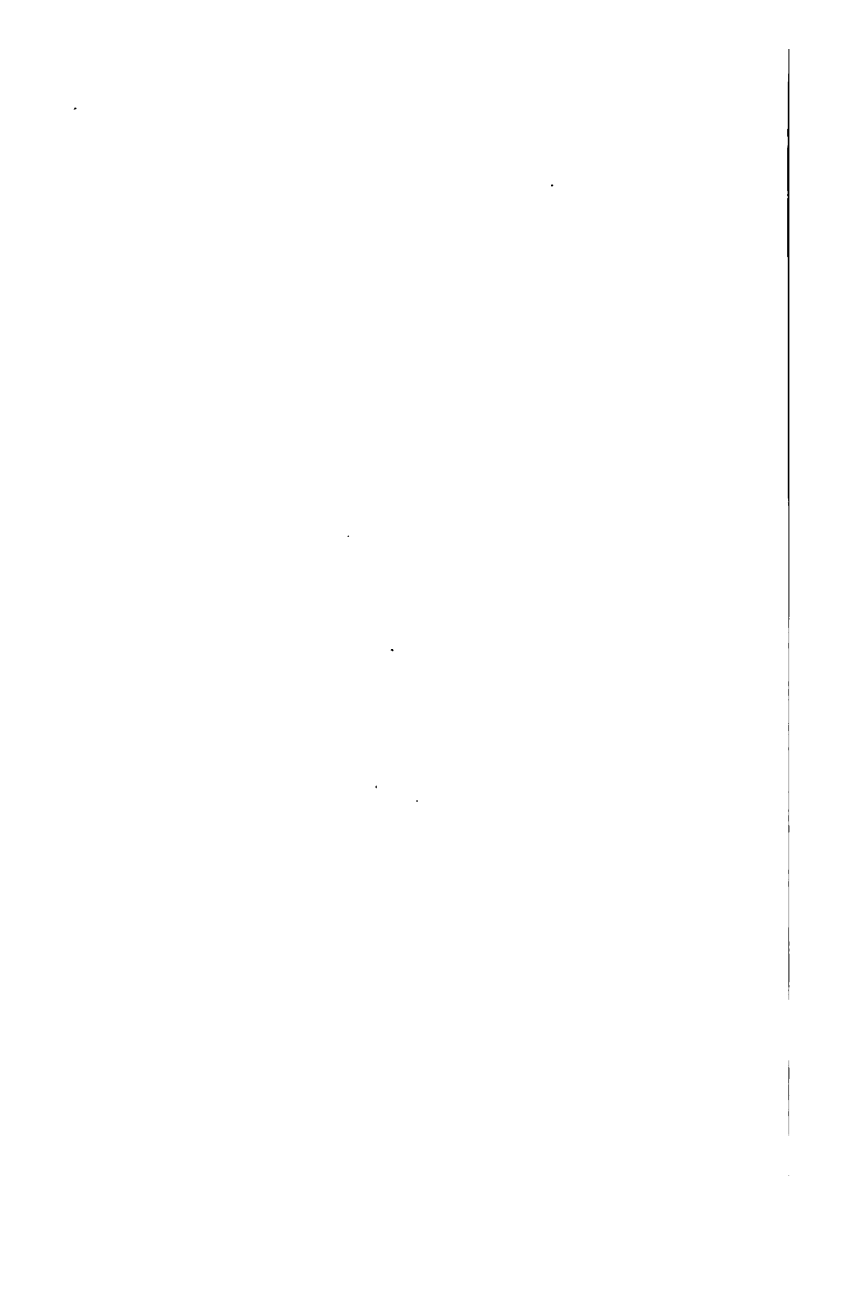
The roof is partly of glass, viz: eighty-eight feet, in panes a foot square, laid in grooves in the rafters; the remainder is of slate. We wished to have the whole of the roof covered with glass, which would have been the best and cheapest. The eaves are left open under the roof for admission of air.

The doors open into a yard, to permit the young poultry to run out or in at their pleasure. They are made of half-inch deal, with sliding ventilators. This yard we enclosed with wire netting, of two-inch mesh, six feet high, fastened to studs, six feet apart. The wire netting we procured at Richardson's, Tonbridge Place, London, at one shilling per yard, but being of two-inch mesh, requires another wire to run along,



PLAN OF REARING HOUSE &c

- 1. Attendants House. 2. Water Cask. 3. Glass. 4. Slate part of Roof. 5. Furnace.
- 6. Slide Ventilator. 7. Coop. 8. Laurel. 9. Grass Plat. 10. Wire Gates. See Page 4.



about a foot high from the ground, crossing each mesh in the middle, to keep the smaller chickens within the fence. We have two light framed doors, covered with the same material, to allow us a way or passage through.

Outside of this yard we planted laurels and hollyhocks; inside of it, we have a beaten path of land, eight feet wide, leaving a square grass plat in the centre; and at each corner we planted a laurel; nearly besecting the plat with a cross of laurel, in order to give a shade of eight sides.

We have seven coops for turkeys, each four feet by three feet, the fronts of half-inch lath, three inches apart, to admit light, the sides being of thin boards, closely fitted to keep the old turkeys from seeing each other.

The coops in the chicken house are constructed in the same manner, but smaller; having eleven coops for hens, in the same space as seven for the turkeys; but lower in proportion.

The young poultry in these houses we feed, by putting a board in the centre of each, for which purpose we have two boards for each house, that the one may be aired for twenty-four hours previous to using again. We have had one hundred chickens in our chicken-house, twelve feet by twelve feet, which we have not allowed to go out of doors for a fortnight, because of the cold and damp air, and we did not lose five out of the hundred, throughout the year, 1851.

We had sixty young turkeys, and six turkey hens in the house allotted to them, twelve feet by twelve feet, and the young turkeys were not out of doors for three weeks together.



The Common Fowl.

As to which is the best kind or breed to propagate, must depend much upon situation, and other circumstances; as one kind will be found to be more profitable in one county than in another, even under similar treatment. The kind we find to be the most profitable, is the half-bred Dorking, which is the barn-door fowl, and white Dorking cock; by which we get a fowl thick in body, and plump on the breast, short legged; which we can get well fleshed at the age of sixteen weeks; as chickens, this we consider better for our purpose than a long-legged, and coarse sort of fowl. While we admire our fowls for the symmetry of their shape, &c., we take the form of the green linnet for a model.

We have had the true game, the true Dorking, Hamburgh, and Spanish fowls; but cannot say they have been so profitable with us, as the kind we now have. Their colours are white, brown, speckled, and buff; we find the white hens lay the best in summer, the brown ones in winter, the buff ones sit the best, and are the kindest mothers, the speckled lay the largest eggs; we had one egg this year, from a grey pullet, six and a half inches round and seven inches longitudinally,

but as we have more hens die egg bound, of this colour than any other, we do not keep so many as we should wish. We do not keep our hens, when more than three years old, unless they are very fine ones; as by bringing in young fowls, we can spare the others before they are too old to sell for the table; by this means we keep our stock of equal value.

When we had the game cock, he was too fond of fighting, and disabled many of the other sorts, and even killed some. We have a few cocks of the true Dorking breed, which we keep as a comparison with the others, which are crossed.

The chitte-prats, or silver pencilled Hamburgh, we have true to the breed. We have some beautiful birds, but we consider them chiefly as ornamental; we have not been enabled to render them profitable; but as we keep them confined, our place does not seem to suit them, nor have we yet heard of any poultry having been reared profitably for the table, without a range of ground.

When a hen wants to sit, we bring her home; for should she sit where many other hens lay and roost, they will want to lay in her nest, when she comes off for food, and in the confusion occasioned by such interlopers, much injury is done, but by having all the sitting hens at the rearing-house, they can be immediately attended to, when they come off to feed, and also prevented from going upon another sitting fowl's nest, when more are off than one at the same time, for the purpose of feeding, &c.

In spring, for our sitting hens, we place the nest and eggs in wicker baskets; but in summer on the cool damp floor. We find little difficulty in getting a hen to set on a different nest from that she has layed in; but if very unwilling, place her in the nest with a board over her, perforated with auger holes for air, she will thus soon be accustomed to her situation. Another reason why all sitting fowls should be under and near the attendants care, is, that immediately they come off the nest, they should be fed, and care taken that each returns to its appropriate nest, for should any take the wrong one, a quarrel will ensue, which will not terminate until both nests of eggs are spoiled.

Since we had our breeding and rearing house built close to us, when we hear any quarrel amongst the fowls, we go and see which is in fault, determinedly pull off the hen who has got on the wrong nest, and put her on the floor; when the proper owner of the nest will appear to thank us, and go on her own eggs, while the other that was wrong will mutter at our treatment; but with an appearance of shame will betake herself to her own nest. Sometimes the quarrel will be repeated, but with two or three interferences on our part, the strife will end.

When the chickens are hatched, we leave them in the nest with the hen for twenty-four hours, as they do not require any food in that interim, but merely the warmth of the hen's body. It is decidedly wrong to remove the nest during twenty-four hours on any pretext; as any

other that you may substitute cannot be so warm or congenial.

When the chickens come from under the hen, and run about in a lively manner, we take them all to the coops in the rearing-house, and place a board ten inches high, to keep the chickens, while so young, from getting to the older ones, or other hens, who from having other chickens would kill them. We first feed them with boiled eggs, chopped up with the shell, which we think gives them bone. Then for the first week, we give them boiled eggs and bread crumbs, tail wheat and groats, and bricks finely powdered or broken, and a little brimstone; this food we lay on a board in the coop.

For the first month we give the chickens their food as dry as possible, and allow no water to be spilt about.

We find earthenware fountains the best to supply them with water, as in the course of a few days the chickens all run in the body of the house together; we put their food there to eat as they require, which is a hard rolled ball of barley paste, about three inches in diameter; these we put in small garden pans to keep the food clean, in which we are very particular, and keep it fresh; this plan tends to lessen the necessity for any medicinal treatment, and if kept dry, with light and well ventilated, very few of the chickens will die; this sort of food we prepare for them every two or three hours if required. But should any of our chickens take cold, or be otherwise sick, we look for any feathers under the wings or tail, and if the quills seem full of

black blood, we call them sick feathers, and pull them out, and give them agremonia and rue tea to drink, without any other suction for twenty-four hours. When we do not give them this tea, we give them a pill or two of arum maculatum, or what children call lords and ladies, at night; when all the chickens have gone into the coops, we remove all the left food, and sweep the place out clean, then with a watering pot with a small rose, we slightly sprinkle the floor with water, shortly after, we dredge the same with quick lime, which decomposes all affluvia; we then take either cut wheat straw, or wheat chaff, and cover the floor, which amuses the chickens to scratch and pick about, providing sufficient exercise to keep them in health; this should be done every night, as the chickens begin to feed early in the morning, when they find a fresh and invigorating meal ready for them.

We have not a sufficiently large grass plat in our yard for green food for them, but provide mown grass, lettuce leaves, or any waste greens we may have instead; and every three or four days, give them some sweet raw meat, cut in shreds, as by keeping them up, we prevent their obtaining worms and insects. Their natural mode of life should be our guide in all these provisions.

To support our recommendations of warmth and light for chickens, when in February, we were about to carry on our experiments in artificial incubation, we had a hen with a brood of eight chickens in a coop, by the side of our stove; we soon saw that what the chickens cared

for, was heat; for if they were sufficiently warm they would not go under the hen. In six weeks the hen would take no more notice of them, but wanted to lay again. The chickens did not seem at any loss without her, they had not been out of doors, nor did they want to go as the air was cold, and in fourteen weeks from the hatch, viz. six with the hen, and eight with artificial warmth, by our stove, the chickens weighed upon an average, a pound and a half each, and were at that time worth six shillings a couple. Thus these chickens were as good in the cold months as they could be brought up in any of the finer seasons of the year. In six weeks after, this hen left her chickens, she had another brood of ten chickens; in August she sat again, and by rearing the chickens by the artificial means, she now, on the 13th October, wants to sit again.

Perhaps we do not gather so many eggs as others, with the same number of fowls; but it must be taken into consideration, that our hens have hatched and brought up a great number of guinea fowls, and wild ducks, and the eggs we give our young turkeys and chickens are not enumerated in our list as accounted for.

We feed all our fowls twice a day, first when we let them out in the morning, then about three o'clock in the afternoon.

To fatten poultry for the table, especially the young ones, we have had most praise for those that have been well fed while allowed to run about. If we put them

up to fatten, we find the best plan, is to put up from six to twelve in a place, about the size of a common pig sty, with little light, made with wooden pales, sufficiently open to admit of a free current of air in each pen, we feed them with barley paste, giving them plenty of clean water and fine gravel for digestion; we feed them for about a fortnight, and if they do not gain flesh in that space of time, we do not consider them healthy; but we prefer those, as already stated, who are with plenty of barley allowed their liberty, until they are fit for the table.

We find our eggs best for hatching chickens from, when allowing ten hens to one cock. But we always object to sitting hens on eggs layed by a moulting hen, or if attended by a cock when in the same condition.



The Turkey.

WHICH is now perfectly naturalized among us, was unknown before the discovery of America, to which quarter of the world it is indigenous. It was first imported into France, in the reign of Francis the First, and into England, under Henry the Eighth. The young of the turkey in this country, are among the tenderest of birds, although in their natural forests they are capable of enduring a Canadian winter of six months duration, in which state they are larger and more beautiful than in their state of domestic captivity.

We have had the Norfolk, the Cambridge, the American and the white breeds, but we find the black Norfolk the best. The Cambridge we class second, the American third, and the white turkey the worst. We principally keep the black Norfolk now, and the white merely as an ornamental bird.

In rearing our young turkeys we were very unsuccessful, until we had our rearing-house built, but since then, have found it comparatively easy; when the air is cold, they will sit and cry, rejecting food, but when a proper temperature is provided, they soon become contented and eat their food with a zest; we give them the same food as the young chickens, keeping them a little

warmer, and give them as many onion tops, or young onions as we can spare; milk curds they are also fond of; they are very tender if exposed to damp or cold, until they acquire that red colour natural to the head. After that all they require is plenty of food.

They are fond of ranging in the park for bents, grass, clover, or acorns, we also take them to the stubble fields, and give them barley when they come home. We find the best time to hatch them, is in May, and with good feeding till Christmas, have cock birds weighing seventeen pounds each, and hen birds ten pounds each and upwards. We do not take our turkeys up to cram them to fatten them. We sold thirty-five turkeys last December for fourteen shillings each, they were fed with barley paste, and were allowed to range in the park till we wanted to kill them. We do not find second broods pay, having been unsuccessful in six cases to one, the successful ones were in July, 1849, one turkey hatched fourteen birds. If we cannot get a second brood by this time, (July) it will pay better if the turkey sits on guinea fowl's or hen's eggs. We have six hens and one cock.

We do not confine the hens while laying their eggs, but allow them to choose the situation, generally under a shrub or tree; we watch them and take out the eggs, which, although done, they will not forsake to make another. When they want to sit, we give them their eggs at our home, on the ground, with a little loose hay under a coop to make their nest with. They do

better making their own nest upon the ground, with plenty of room, than with any nest we could provide. Turn up the coop sufficiently every morning to allow each to come off to feed, without any danger of breaking the eggs, then return the coop to its place, leaving the slide open for each to return; which if they fail in good time to do, which is about fifteen minutes, we send them on. We take them off to feed if they will not come off without.

We give each from thirteen to fifteen eggs to sit upon, which require a month to hatch. When first hatched, we allow them to remain with the mother for twenty-four hours before we move them, unless they hatch very slowly; in which case we take some away and wrap them in flannel, placing them before a fire for warmth, to prevent the mother from squeezing them while sitting on the remaining unhatched eggs, but take them back to her as soon as we think it safe. We take away all the empty egg-shells, that the sharp edges might not hurt the birds in their nest.

We have stated that the young ones are very susceptible of cold while under the age of five months, and should they take cold during that time are liable to disease in the head, which will swell to an unusual size, and acquires an appearance of a solution of gum water, which in time changes to a thick curd of a yellow colour; at this stage of the disease, the eyes are closed, and the nostrils stopped, and rejecting all food, mope in a corner to die.

In 1849, our flock of young turkeys were in a heavy shower of rain, when three months old, which brought on this disease, and in a month's time, one was in the extreme state described; and seeing all the birds were getting worse, notwithstanding having applied all the usual remedies recommended as well as my own, I took as a last resource, a sharp pointed pen-knife, and cut through the skin close to the top of the bird's beak, I then gently pressed out all the secreted matter, washing the head well with warm water. As soon as this operation was performed, I put the bird on the ground, with some food, which it immediately began to pick up, and seemed to get relief, yet it ultimately died. I had twenty diseased in a similar manner, but applied the same remedy before they were so far gone, and every one recovered and did well. But this needs caution, as by opening the skin before the virulence is sufficiently ripe, the head will become festered a second time and be longer in getting well; while by allowing it to come to too great a head, you cut off any chance of saving them. I have cut more than one hundred afflicted with this disease, and have only lost one, whereas formerly, we suffered considerable loss from the same disease.

The turkey is fond of roosting upon trees, and require care in bringing home for safety, which should be attended to early in the afternoon.

We have brought up a cat with our poultry, which we find very useful in keeping sparrows and other small birds from eating the chicken's food. She will kill any

small birds that come within her reach, but have never known her to destroy one head of poultry. She will even allow the chickens to pick her victuals while she is eating; and once this year, when we had put eight young turkeys on the hearth before the fire for warmth, she gathered them in a brood for three quarters of an hour, and she generally sleeps in the rearing-house at night, to keep mice from the barn, &c.



The Guinea Fowl.

THE Puitada or Guinea Fowl is partially known in a domestic state, all over Europe; but is most common on the Mediterranean coasts. Africa appears to be its native country, and it was probably introduced into this country from Guinea.

We find this fowl very profitable to rear, and at our commencement had two hens and a cock, but the latter was strange to our place and did us very little good. One of our guinea hens laid one hundred and eighty eggs, from April to October, 1851.

We never allow them to sit on their own eggs, but prefer giving them to a turkey, which will bring them up as cautiously as any hen, in fact we would recommend turkeys, who lose their first brood to be set on the guinea fowl's eggs. A turkey can sit on from twenty to twenty-four eggs, whilst a common hen only upon fifteen eggs.

They do not like confinement, and if near a good park, where they can range, will find more than half the food they require. The best way we find to render them tame is to feed them in one particular place, and at one specific time, when they will not fail to come to the accustomed spot. They are very fond of roosting in

trees, if you are not particular in getting them to roost early; but as we are careful of ours in this respect, we can drive them home at an early hour as easily as a flock of sheep. They cannot be put up to fatten, but must be allowed a good range, with plenty of food.

We can generally sell them in February for five shillings a couple.

To rear guinea fowls, we allow a good sitting hen fifteen eggs, as soon as they are hatched, they will run about and be very wild. We place the hen and brood under a coop, with a lift, similar to that used by keepers in rearing young pheasants, and are careful that there are no apertures through which they can get out, for in that case they would get to a stack of wood, or something of that sort, from which it would be very awkward to get them out again. Keep them very close within this coop for ten days, and give them plenty of ant's eggs in the left compartment of the coop, and if you can procure sufficient, they will require no other food; indeed they will not do well without them. Any one who can rear pheasants or partridges may rear guinea fowls.



The Wild Duck.

THIS fowl we rear for shooting, for the table, and for ornament. Before we commenced rearing it, the game-keeper had it under his charge, and it had no more care than the other game intrusted to him; it was left to find all its own food, which it had often to seek for at a distance from home, and consequently so much exposed to the sportsman's aim, that with us it was becoming scarce. We had not sufficient for ornament, and of course none for either shooting or the table. We have a fine piece of water for them, but had considerable trouble before we found out the best way to manage them.

Our best success has been found in allowing them to lay their eggs where they choose, but we take them away till the three first weeks in April. From the last week in April, till the end of May, we take their eggs to be hatched by our hens. This we do for the following reasons,—we do not leave the early eggs with the duck, to prevent her from sitting; and we do not set any hens before May, because when they are hatched earlier the water is too cold, subjecting the young broods to cramp, which kills them. The best time we have found for them to take the water is at the end of June.

When first hatched, we put them in a coop with a lift, and covered at the top with wire. They are very wild, and require different treatment from the tame duck; but if you feed them with plenty of worms, cut up, they will be as easily reared. With a sufficient quantity of worms, they will require no other food for the first month. We then give them stiff barley paste in a small garden pan, with a little water to dabble in, which nutriment we find suits them best.

It is remarkable, that within a month, these little creatures seem quite to undergo a change, at first they will run anywhere to avoid observation; but afterwards, when they hear your footstep, they will run out of the coop, with one eye turned up and outstretched neck, while on tiptoe they look out with eagerness for their accustomed meal of chopped worms.

After they are about a month old, we take the hen and brood of ducks under a coop, boarded at the back, with open spars in front, to within fifty yards of the water, placing it with the back, or boarded side towards the water, that the hen may not see the young ducks take to the water, and lifting the openings for the young brood to get to their element, which they generally do in a day or two. From this period we give them nothing but the barley paste, as they find worms in a sufficient quantity themselves. While here we give the hen barley, and as soon as they can eat the same, and do without the hen, we allow her to go; entering the young ducks in our book as worth a shilling each. When they are about

three months old, we make a place for them close to the water to resort to in haste, like a crate; covering the top with straw as a thatch, and in this we drive them home every night, feeding them with barley. We pull the three first quill feathers from under one wing to prevent them from flying into the corn fields, where they might be shot; whereas, by confining them to our own water, they may be shot if required while whirring over it on the wing, as the wing will have new feathers by the month of October. Sometimes we have 130 together for ornament and sport. We feed them regularly, otherwise they will not remain on the premises.

They will not breed like the tame duck, having one drake to several ducks. We once shot too many mallards, and few of the ducks during the next season bred. Some of our ducks hatch and bring up their broods of their own accord, but they generally drag their brood about the ditches, until from want of food or proper care, many of them are lost, unless indeed, when she hatches very late in the season. The rat is fonder of the young wild duck than any other of our poultry. The pike will take them; and we lost 30 in one day by these fish when they were a month old. As to the colour, we consider the darkest the best; the plumage of the drake gets very like the duck, at the close of the season, (*ie*)—summer. We do not keep the tame duck, so have given no remarks upon it; but those who rear other poultry than we have described, will require but little more instruction.

Conclusion.

FROM the result of our observations, we would advise poultry to be well kept, if you expect to receive remuneration for your trouble ; give them as much food as they require—that is as much as they will eat up at a time when given them. You must not merely allow them standard measure per head ; for some will lay more freely than others, so require more food. They cannot produce good eggs from a mere measured allowance ; and in addition to this, they require a comfortable domicile ; and we, from experience, advocate the adoption of glass houses in preference to the usual method generally adopted.

Damp kills poultry in a variety of ways, therefore, we advise its prevention as much as possible. The specimens now in our possession will give a decided proof, that a due care of them will not fail to produce profitable results. Warmth, light, and cleanliness at all times are essential to their productiveness ; cold air, and dirty food, generate innumerable diseases with them as with the human race ; and if by these remarks, we can induce a greater care, doubt not but you will experience accompanying results.

ABSTRACT OF ACCOUNTS, FROM MAY 9th, TO
DECEMBER 31st, 1847.

	£.	s.	d.	£.	s.	d.
May 9th, 1847.						
Value of Stock				3	17	0
Dec. 31, 1847.						
60 Fowls	6	0	0			
20 Chickens	1	10	0			
8 Turkeys	3	10	0			
12 Guinea Fowls	1	10	0			
<hr/>						
100	£12	10	0			
Increase in value of Stock				8	13	0
1131 Eggs sold or used				3	16	4
<hr/>						
17 Chickens killed				1	4	6
12 Turkeys killed				2	11	0
12 Fowls killed				1	7	6
<hr/>						
41				17	12	4
Produce						
Loss in 1847 ..				1	10	0
<hr/>						
EXPENSES.						
29 Bushels of Barley	7	10	0			
6 Bushels of Barley Meal	1	8	0			
14 lbs. of Rice	0	4	8			
Wages for the year	10	0	0			
<hr/>						
	£19	2	8	£19	2	8
<hr/>						

ABSTRACT OF ACCOUNTS, FROM JANUARY 1st, TO
DECEMBER 31st, 1848.

	£.	s.	d.	£.	s.	d.
Jan. 1st, 1848.						
Value of Stock				12	10	0
Dec. 31st, 1848.						
80 Fowls	6	0	0			
20 Chickens.....	1	10	0			
14 Guinea Fowls	1	15	0			
9 Turkeys	3	16	0			
123	£13	1	0			
Increase in value of Stock				1	9	0
3590 Eggs sold, &c.				12	16	6
18 Fowls sold						
95 Chickens sold						
23 Turkeys sold				22	0	3 $\frac{1}{2}$
6 Guinea Fowls sold						
24 Wild Ducks sold						
166				36	5	9 $\frac{1}{2}$
Produce						
EXPENSES.						
41 Bushels of Barley	9	4	11			
19 Bushels of Barley Meal.....	3	15	9			
6 Bushels of Tail Wheat	1	3	6			
Wages for year	10	0	0			
Wages for Boy to assist	1	18	3			
				26	2	5
Gain in 1848	10	3	4 $\frac{1}{2}$			
	£36	5	9 $\frac{1}{2}$	£36	5	9 $\frac{1}{2}$

ABSTRACT OF ACCOUNTS, FROM JANUARY 1st TO
DECEMBER 31st, 1849.

	£.	s.	d.	£.	s.	d.
Jan. 1st, 1849.						
Value of Stock				13	1	0
Dec. 31st, 1849.						
12 Turkeys,	4	4	0			
16 Guinea Fowls,	2	0	0			
80 Fowls,	8	0	0			
20 Chickens,	1	10	0			

128	£15	14	0			
Increase in value of Stock,				2	13	0
4100 Eggs sold, &c.				12	5	3

22 Turkeys sold						
55 Fowls sold						
44 Chickens sold						
15 Guinea Fowls sold						
41 Wild Ducks sold						
				21	18	0½

177				36	18	3½
Produce						
EXPENSES.						
51 Bushels of Barley						
18 Bushels of Barley Meal						
10 Bushels of Tail Wheat						
Rice and Groats						
	15	8	2			
Wages and Boy to assist	11	17	3½			
				27	5	5½
Gain in 1849	9	12	10			
	£36	18	3½	£36	18	3½

ABSTRACT OF ACCOUNTS, FROM JANUARY 1st TO
DECEMBER 31st, 1850.

	£.	s.	d.	£.	s.	d.
Jan. 1st, 1850.						
Value of Stock				15	14	0
Dec. 31st, 1850.						
14 Turkeys	4	16	0			
100 Fowls	10	0	0			
15 Chickens	0	15	0			
62 Guinea Fowls	7	15	0			
	<hr/>					
191	£23	6	0			
	<hr/>					
Increase in value of Stock				7	12	0
4500 Eggs sold, &c.				12	10	5½
	<hr/>					
40 Turkeys sold						
67 Fowls sold						
24 Chickens sold						
73 Ducks sold						
12 Guinea Fowls sold						
				28	16	5
	<hr/>					
216	Produce			48	18	10½
	<hr/>					
EXPENSES.						
80 Bushels of Barley						
42 Bushels of Barley Meal						
11 Bushels of Tail Wheat						
7 Bushels of Pollard						
Rice and Groats						
Boy's Wages and Salary						
				37	15	9
Gain in 1850	11	3	1½			
	<hr/>					
	£48	18	10½	£48	18	10½
	<hr/>					
	<hr/>					

ABSTRACT OF ACCOUNTS, FROM JANUARY 1st, TO
DECEMBER 31st, 1851

	£.	s.	d.	£.	s.	d.
Jan. 1st, 1851.						
Value of Stock				23	6	0
Dec. 31st, 1851.						
14 Turkeys	4	13	9			
16 Chickens	0	16	0			
100 Fowls	10	0	0			
65 Guinea Fowls	8	2	6			
<hr/>						
195	£23	12	3			
Increase in value of Stock				0	6	3
4500 Eggs sold, &c.				12	10	0
<hr/>						
44 Turkeys						
136 Fowls						
58 Wild Ducks						
56 Guinea Fowls						
				38	7	9
<hr/>						
294				51	4	0
EXPENSES.						
87 Bushels of Barley						
52 Bushels of Barley Meal						
13 Bushels of Pollard						
5 Bushels of Tail Wheat .						
5 Bushels of Beans						
Rice, Groats, and sundries ..						
Wages, Boy, &c.						
Gain in 1851	8	5	8½			
	£51	4	0	£51	4	0

PART II.



AN

INTERESTING ACCOUNT

OF

EXPERIMENTS

IN

ARTIFICIAL INCUBATION,

CARRIED ON WITH A VIEW OF COMBINING THE SAME
WITH HORTICULTURE, SHOWING ITS ADVANTAGES
AND ECONOMY.

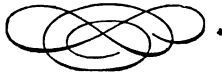
BY

JOSEPH NEWTON.

Introduction.

IN bringing before the public my plan and experiments in hatching and rearing poultry by means of warm air, every idea herein expressed and followed out, has sprung from the study of nature in the practice of horticulture, closely observed in the production of plants of different kinds, according to the proper temperature applied.

As for instance, the melon requires the skill and attention of the gardener, with a temperature more adapted to the growth of the plants than our atmosphere affords, if success is expected in the fruiting season. So a good horticulturalist who is successful in forcing on the tank system of heating, would not require a greater outlay than two or three pounds, to combine the hatching and rearing of poultry with horticulture. And feeling qualified to give rules and plans with a certainty of success, I shall feel happy in assisting any persons who feel inclined to apply to me for instructions.



General Remarks.

HAVING conceived in my own mind, that the elements of a seed, and the egg of a fowl, were essentially the same; and knowing by practice, I had frequently succeeded in generating seeds from a diverse temperature, I considered something might be done with the egg, if subjected to similar treatment; accordingly, I put thermometers several times under the sitting poultry, turkeys as well as fowls, and found the heat to vary from 100 degrees to 108 degrees; now arose the question, what can I make to keep the heat at from 104 degrees to 106 degrees, allowing two degrees to move or change, knowing the difficulty of obtaining a fixed heat, as warm air is continually moving, and subject to change. While standing in the chicken-house, I perceived a spare place about four feet long and two feet six inches wide—a chimney being there; I immediately said this is the place, and went to mark out my plan on paper and build it as here shown.

DESCRIPTION OF INCUBATING STOVE.

1, Chimney—2, damper—3, a tin, three feet six inches long, one foot six inches wide, and three deep—the top lifts off; and the boiler part is eight inches square by nine deep, all soldered in one

34 EXPERIMENTS IN ARTIFICIAL INCUBATION.

piece. The dark mark on the top of door 4, is a piece of stout sheet iron, to secure the boiler from the action of the fire. No. 5 is the drawer in which the eggs are laid, the bottom of which is perforated zinc. I lay a thin plate of zinc on the top of the eggs; there is a space between the edge of the drawer and the top of the zinc plate which lays on the eggs and the warm tin; the heat of the warm tin is radiated on the zinc plate; the cold air acting on the top and bottom of the zinc plate, brings the plate to 104 degrees of heat; this resting on the eggs, and the bulb of the thermometer, gives me the proper temperature, of which I take notes as hereinafter shown by tables, during the process of given incubation. No. 6 is one side, and a bottom of an old glass-box put in the space between the wall and the stove, to answer the purpose of an air box, to act as a mother for the chickens, to bring into during the first stages of life. No. 7 is a board with a pane of glass puttied in, to keep the chickens in, and give them light under the temperature for the regulation of that for the eggs.

The thermometer must be of metal—a wooden scale will crack and break. The tin boiler cost me seventeen shillings, and the thermometer one shilling and sixpence. But for an outlay of from thirty to forty shillings, one may be constructed of iron to hatch 100 eggs at once.

My first apparatus would burn the waste cinders of the house, and require attention to regulate the heat every four hours; but the larger one I have now fixed of iron will require less attention. I hatched some chickens with it on November 25th, 1851, and did not attend to it from between ten o'clock at night till seven in the morning; during the day, it was under the care of a boy under fourteen years of age, and during this time, it was cold and frosty for a fortnight together. I have not shown



INCUBATING STOVE.

See Page 24.



this plan of my new apparatus that I have recently carried on my experiments with, as one for a model, but merely as that by which I have established my principles, and that too, with more ease and success than I anticipated. But having now the poultry to show in return for my trouble—and having had the most respectable witnesses on various occasions to view my work, have no hesitation in submitting it to public notice.

In the Birmingham and the Midland Counties Exhibition of Poultry in 1851, I exhibited, as per catalogue, class 26, No. 552, six silver-pencilled Hamburgh fowls. These chickens were hatched on the 24th of May, and reared by artificial heat without the assistance of the hen, and the plan combines horticulture with artificial incubation; also in class 40, No. 695 in the same exhibition, (Dorking and barn-door fowls), one cock and three hens, hatched 1st of May, 1851, and reared by artificial heat. One of these hens layed on the 25th of November, and all three by the 22nd of December. Also, No. 696, same class, six chickens, hatched 18th of August, 1851. Class 46, No. 1019, two Guinea fowls, hatched 30th of May; and extra class, No. 1053, wild ducks, hatched 30th of May. All these I presented for public inspection at the above exhibition for 1851.

My first practice as shown by my note sheets, was to see to what height I could go before I killed the chicks. When they were fifteen days old I put twenty eggs to this experiment, and broke an egg each day to observe the process of incubation going on in every egg. I found

a live chick at 110 degrees—one day at 117 degrees ; but this at 117 degrees I tried for a short time only ; on the fifteenth day I had only five eggs left. This day I observed the thermometer at 120 degrees for ten minutes, this I observed twice ; the next day, on breaking the remainder of the eggs, I found the chicks dead. There were three rotten eggs in the twenty,—and have found by observation, if the heat is kept as high as 116 degrees, they will die from excess of heat—and at 80 degrees for eight hours at a time, from the want of heat. When the birds have got so near the hatching as to absorb nearly all the yolk in their body, they die of cold at 90 degrees. I have observed them at the different states from one day to another ; and in taking them out of the shell while alive, have found the colour of the blood change from excess of heat or cold.

On the 12th of April, 1851, I put fourteen eggs in my drawer, and broke three at different times to see the process, all of which contained live embryo. On the first of May, 1851, my first experiments were developed. I saw at three o'clock P.M., on that day, that one chick was coming out ; and by five o'clock, four more, from the fourteen eggs, I had eight fine chickens ; three I had killed by examinations, and three were rotten eggs. I hatched, likewise, three Guinea chicks out of four eggs ; also eight wild ducks, and two turkeys about the same time. I had two eggs of the tame duck for the first fifteen days, I kept one in my incubating drawer, and the other the hen sat on ; I then exchanged them, and

both were duly brought out with fine chicks at the proper period of time. I brought up these eight wild ducks, and six others without any mother in a cucumber house ; they did not require so much warmth as my other chickens, and my place was already crowded with the stock I then had. In August, I tried another twenty eggs in my apparatus, and in this hatch I had only three bad eggs ; but I must remark, the difficulty is not quite overcome when the chickens are hatched ; they must also be provided with warmth, or they will soon die ; and this will be well provided for in the plan I will give to those who may apply to me for instructions. I have taken a brood of chickens from the hen as soon they were hatched, and brought them up in my small box ; when the air is warm enough, they will be still, and quiet, but if the air is too cold, they will cry and reject their food ; and if they are long exposed to a colder air than they require, would soon be attacked with the disease called the gapes.

In this climate, and in an unfavourable place, chickens are subjected to this and other diseases, which would be obviated by rearing them under glass-houses, and kept sufficiently warm. One of my plans to combine this with horticulture, and carry on a large economy, is to have two vineries, a propagating, and a green-house, heated on the tank, polmaze, and flue system—all can be heated with one fire, one house, or all, to be worked at the same time, and be so fitted with my apparatus, as to hatch and rear as many chickens as the size of the tank will allow.

38 EXPERIMENTS IN ARTIFICIAL INCUBATION.

By such an arrangement, you may bring up the chickens for fourteen weeks without interfering at all with the horticultural work; and this plan is so arranged, that should the proprietor decline to continue the poultry part, the apparatus might be taken out at a trifling expense, and the houses might be heated on a principle of equal economy.

The success I have met with in heating houses generally, warrants me in stating the principle to be successful; without glass, and some plan based on what horticulturalists consider proper for half-hardy plants, no plan for artificial incubation will recompense the labour. Glass now is cheap, and with it we can have any temperature our plants require; why not extend the same advantages to our poultry? We might then contrast the comforts they enjoy in warmth, to the sneezing little chickens we see out in a cold rainy day.

Consider this plan of having two vinerias, divided in the centre by propagating or incubating house, with greenhouse, with moveable partitions to each house, so that all might be of the same temperature if required.

The four houses would form the accompanying diagram.—Each house to be fitted with moveable lattice-stages for plants to stand on.



To commence propagating, the 1st of February and put eggs for incubation, the 7th of February, to hatch on the 28th. Gently begin to force one vinery 1st of March; when the vines have well broken, move the

chickens from propagating or incubating house, by removing the partition ; let the chickens have the bottom of the vinery to run and live in ; do not pave the floor, but let the soil remain as before its erection ; lay a moveable lattice on the floor to walk on, the flue, or hot water pits will do for the chickens to lean against, and keep themselves warm. By about the 21st of March, the chickens will be about three weeks old ; and if your plants are for bedding, they will require potting out. This done, start the other vinery, and move the plants to get root. The chickens will not be able to fly up to hurt the grapes before they are six weeks old ; give them then the green-house, if this house is divided by a moveable partition, you can give up as much room to the chickens as they require, the other part of the house can be used for plants. The three dotted lines as marked round the cut, forms the yard opening from the green-house, by this plan, the chickens cannot get into the other houses. They should be here two months, that is until they are fourteen weeks old. By the last week in May, they will require no further protection, whether they are kept to lay, or for fowls. I should then send them away, and only use the houses for horticulture, till the following February.

This then is the same as we bring up our half-hardy plants for ornamenting our flower-gardens, and my experience in rearing both plants and fowls, has often given me an opportunity of seeing how closely the success of the one is shown in the treatment of the other. But as

chickens are considered enemies to the gardener, it may appear singular that I should advocate the combination of poultry with horticulture; but my object in recommending this to the attention of gardeners is, knowing that a knowledge of the regulation of a healthy artificial temperature is of great use in such constructions as applicable to both purposes, while the agriculturalist has this to learn to make him successful. I would advise the adoption of a plan similar to that of our poultry-house, extended in length more or less according to the number of poultry, and different kinds intended to be kept. The roof to be all of glass, and the interior to be divided by moveable glazed partitions.

The table, or sheet I used for noting down the different degrees of heat, was similar to the following, but extending to twenty-four hours, with lines across for as many days as are required for incubation.

I had two thermometers, one to give the heat at the top of the eggs, the other for that under them; every observation being noted down when taken, the paper was filled up on the day of hatching.

DATE.	A.M.	A.M.	P.M.	P.M.	P.M.	A.M.	REMARKS, &c.
	5	9	1	5	9	1	
AUGUST, 13TH	104 96	106 99	105 91	100 91	102 95	104 96	
„ 14TH	„	„	„	„	„	„	

In order to have strong birds, there ought to be a difference in the temperature of the heat applied to the top

and bottom of the egg, of from eight degrees to ten degrees.

PROPER TIME FOR INCUBATION.

- For Turkeys from - - - - 30 to 31 days,
 ,, Guinea Fowls from - . 28 to 29 ditto,
 ,, Fowls from - - - - - 20 to 21 ditto,
 ,, Ducks from - - - - : - 22 to 29 ditto.

Keep the temperature from 104 degrees to 108 degrees on the top of the eggs; we find this with the sitting poultry. From the time the bird chips the shell, to coming out from three to twenty-four hours; but we generally find the best come out first.

The eggs I turn over every day, and move them once in eight hours, by putting my hand on the top of the eggs; moving them backwards, and once forwards.

I take the drawer out for a quarter of an hour each day for the eggs to cool, to be the same as if the hen went off to feed; indeed I take the habits of the hen in all I observe of her as my guide.





