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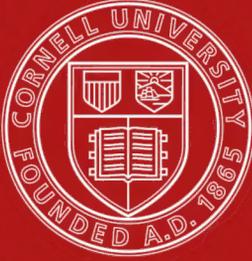
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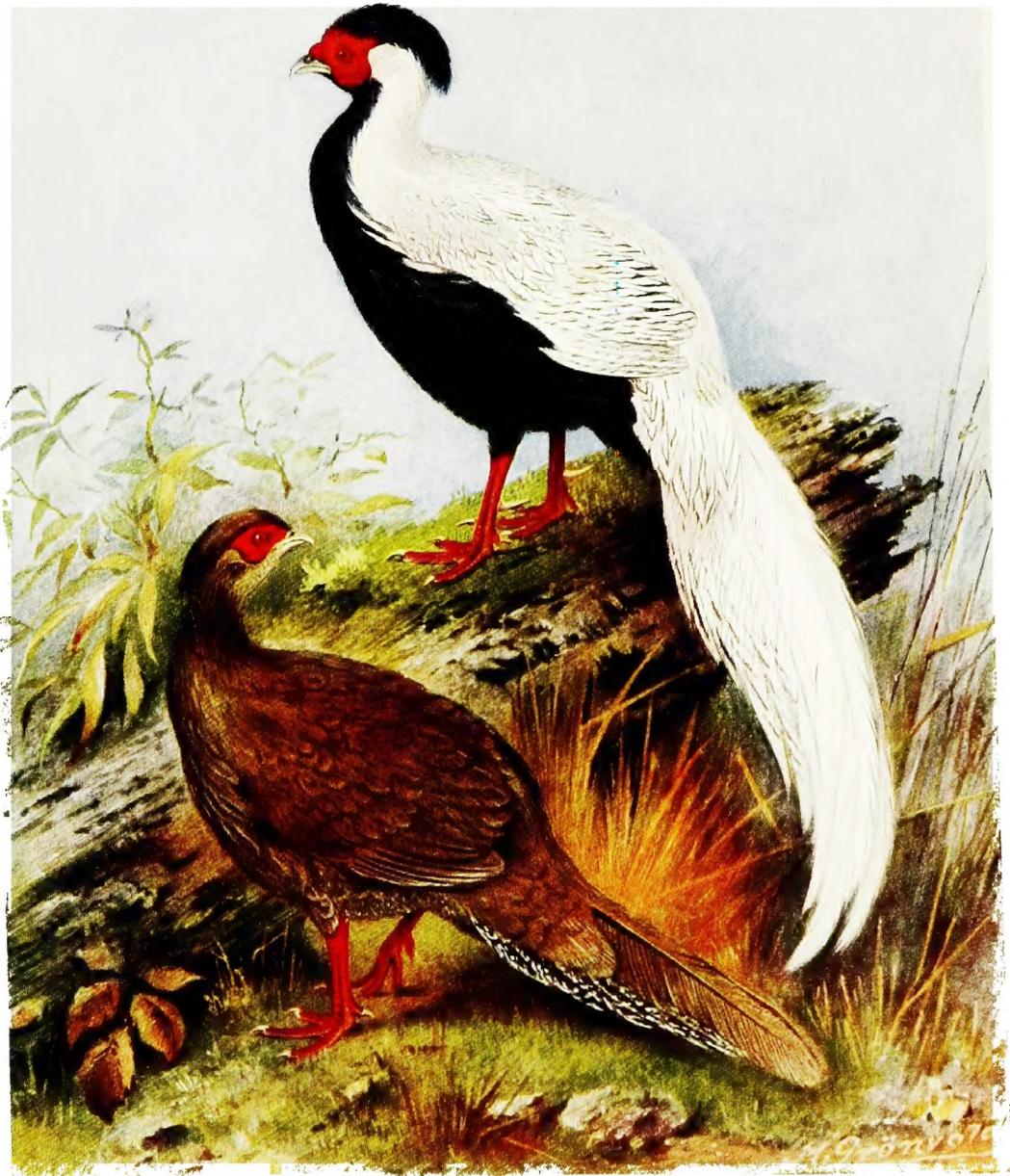
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SILVER PHEASANTS (MALE AND FEMALE)
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PHEASANTS

In Covert and Aviary

By

Frank Townend Barton, M.R.C.V.S.

Author of

“Terriers: Their Points and Management,” “Ponies, and All About Them,”
“Hounds,” “Gun Dogs”

WITH FOUR COLOURED PLATES FROM LIFE BY H. GRÖNVOLD,
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PREFACE

It will, I think, be admitted by all readers of this work, that very little excuse need be offered for its introduction to the public, or rather to those interested in matters appertaining to Pheasants, either for the Covert or for the Aviary, a title to which the present publication answers. It is somewhat surprising to note the small amount of literature that has appeared in volume form concerning Pheasants and their general management. As far as the writer is aware, there are only one or two manuals published relating to a description of the Phasianidæ and their management, the most notable book being Elliot's valuable Monograph on the Phasianidæ, a work that now approaches three figures to purchase it. Be this as it may, the Author is confident in believing that the task he has undertaken will find adequate reward by giving such information as may be useful to those engaged in preservation of Pheasants—in fact, to all sporting men interested in this the Prince of Birds. In conclusion, the Author desires to express his thanks to the proprietors of the *Gamekeeper*, and also to Mr Lazenby for the use of photographs.

F. T. B.

PHEASANTS

CHAPTER I

PHEASANT COVERTS AND THEIR CONSTRUCTION

WHEREVER the preservation of Pheasants constitutes an essential part of game-rearing, it is indispensable to provide the birds with coverts best adapted to protect them against not only their natural enemies, but above all, against that lawless sportsman, the poacher, though many will, I have no doubt, take exception and objection to the use of the title "Sportsman" in connection with a man whose nocturnal depredations are performed in every manner contrary to the rules of sportsmanship, to say nothing as to his total disregard for what may be termed the "Ethics of Sport." The single-handed poacher is, as a rule, a less formidable foe to deal with than a covey of poachers, the desperate actions of which frequently lead to the most serious consequences. The "prevention" of poaching is certainly better than its "cure" by either fine or imprisonment, and had those engaged in the planting of coverts during antecedent years only considered this matter, both lawlessness and night-watching would have played very little part in connection with game preservation.

Existing coverts, as a rule, are rather favourable to the poachers' operations, more especially when the leaves begin to

PHEASANTS IN COVERT AND AVIARY

fall, and the nights are sufficiently light to render the birds conspicuous objects on the branches of the trees. It is an indisputable fact that branches radiating horizontally afford the best foothold for Pheasants, consequently such are the most likely to be used as roosting-places; hence the reason why the Larch-tree is so often used for this purpose. Nevertheless, Larch-trees in a covert do more towards the encouragement of poaching than any other British trees. One of the prime factors in covert formation is density of growth above and below, and this is the reason why many young coverts of Scotch Firs will afford much better protection and safety than an old-established and extensive covert formed principally of Larch-trees. Moreover, Pheasants, during severe weather, like to seek the seclusion of sheltered positions, which is well afforded by such trees as the Scotch Fir, the Silver Fir, the Spruce, the Yew, the Beech, all of which, excepting the Beech, have persistent or green leaves throughout the winter, whilst the dead leaves of the Beech remain attached to the parent plant for a variable period during the latter season, thus affording both protection and shelter. This persistency of the withered leaves only exists up to about fifteen years. The Beech hedge, likewise that of the Yew and the Holly, constitutes one of the best natural protections it is possible to have around a covert, and birds are not slow to take advantage of this fact, especially where there is a dense undergrowth of other vegetation.

The oldest species of Beech indigenous to England, which has also been introduced into Scotland and Ireland, is the common Beech (*Fagus Sylvatica*). This is a tall tree, with a smooth trunk and dense foliage, the latter throwing an intense shade on the soil beneath, thus destroying all other growth under its shade. When grown thickly together, the Beeches develop long straight trunks, and a thick mass of

PHEASANT COVERTS

foliage above. In the formation of hedges, the Beech must be close clipped. It is especially suitable for planting in coverts where the soil is of a chalky nature, and this is the reason why the Beech is one of the chief woodland trees of the Chalk Hills on the South Coast of England.

The density of the coriaceous and persistent foliage of the Holly (*Ilex Aquifolium*), combined with the protective influence of its spines, renders it particularly suitable for planting in and around coverts, and many also recommend the Yew (*Taxus Baccata*), which, like the Holly, bears crimson berries, though of slightly different hue. The toxicological properties of the Yew are rather against its use about coverts, and no explanation has been given why thrifty and well-fed Pheasants should *occasionally* resort to the consumption of its foliage, possibly with fatal results. Well-developed Yew-trees have a closely arranged branch system with horizontal deviation of the branches, which, together with the closeness of the foliage, makes a very good shelter for the birds, though as far as the establishment of a covert is concerned, Yew-trees are never very likely to play a significant part.

The value of planting three varieties of trees, namely, Oaks, Beeches and Sycamores, in and around every covert, can hardly be over-estimated, as each of these supplies food—natural food, which all Pheasants will readily consume. Acorns, beech-mast, and the achenes or seeds of the Sycamore (after the succulent part has dried away) are valuable food for Pheasants. Their economical advantages are at once obvious, to say nothing as to the provision of such natural aliment being one of the best preventives against straying or wandering in search of food. In support of the truth of this statement, it is advisable to refer to the letter of a correspondent, which appeared in the *Gamekeeper* for

PHEASANTS IN COVERT AND AVIARY

November 1909, under the title of "Acorns and Straying Pheasants":—

"There is no denying the fondness of Pheasants for acorns, and those among us who wish to bear as large a head as possible, and still keep the autumn food bill within certain limits, are glad to see a plentiful crop. Other keepers who are allowed to use what corn they like may not care to see a big crop of acorns, because they state Pheasants stray in search of them, and thus cause a good deal of trouble.

"I have paid some little attention to this matter, and have arrived at the conclusion that the birds do not really stray after the acorns, but owing to the speedy way in which they are able to fill their crop when such fare is abundant, have a lot of spare time on hand to spend in getting into mischief. A Pheasant on arriving on a tree, the ground beneath which is thickly littered with acorns, can, in a few minutes, swallow as many as will cram its crop and take half a day to digest, while it would have to search for hours to secure enough of other fare. Thus the birds are unemployed the greater part of the time, and unemployed Pheasants have only one recourse, and that is to wander. If the acorn supply could be spread over a longer period, it would be far better, but we have to face a glut and consequent straying.

"There would be less straying in the time of acorns, I feel convinced, were keepers to observe two points, these being to provide good supplies of grit and water. Acorns are hard shelled and their mastication must be a great strain on the gizzard, so more grit than usual is needed to enable that organ to fulfil its functions, and if the necessary quantity is not to be found at home, Pheasants feeding on acorns will resort to where it is. Water is also needed in larger quantities than

PHEASANT COVERTS

usual because of the dry, heating nature of acorns, and few coverts contain a too plentiful supply of water. If these two necessities are provided for the birds there will be far less wandering, and for that reason I commend these remarks to all brother keepers who reside where the Oak flourishes.”

The only objection to the planting of Oaks for covert purposes is their slow growth. The seeds of the Sycamore are ready for consumption in the spring, and where these trees are abundant, it is stated that eggs are obtained earlier than in coverts without such. The leaves of the Oak and the Beech decay very slowly when on the ground, and heaps of such leaves are most favourable to the production of insect life, in search of which Pheasants are not slow to take advantage of, especially during hard weather. Pheasants are very much more likely to stray during cold weather than warm, especially if the snow on the ground is soft ; therefore, in feeding the birds under such conditions, it is better to scatter the food freely about, otherwise if they are able to fill their crops at once they are liable to begin to wander.

In the formation of a covert, it is indispensable to attend to what may be termed the “fundamental” principles of its construction, which may be summarised as follows :—

- (a) Select a sight in which the sun will shine the greater part of the day, and if possible having a south or south-west aspect.
- (b) Never plant a covert on a boundary, but in the centre of the manor, with the smaller plantations surrounding the main one.
- (c) Select, if possible, a sight where there is a free supply of water, such as a stream or a pond, as the absence of water favours the straying of birds.
- (d) Avoid the formation of coverts too large, a number of smaller ones being preferable to a single large one.
- (e) Plant a sufficiency of low-growing shrubs, such as the Barberry, the

PHEASANTS IN COVERT AND AVIARY

Broom, Bramble, the Rhododendron as well as the Hazel, Laurel and Privet, as Pheasants delight in the dense cover afforded by low-growing and trailing perennials, besides most of the shrubs last named, as well as the seeds of the Dog Rose. All afford capital food for Pheasants. In some coverts the Gorse or Whin is used, but this is not as useful as the Broom (*Cysticus*), and the latter should always predominate.

Most game-keepers and others interested in the construction of a covert will, I think, agree with the author, that the best of all trees to plant are: Spruce Firs, Silver Firs and Scotch Firs. These should be planted moderately close, which prevents excessive branch formation. For Spruce Firs, a distance of 4 yards, but not more than 5 yards apart, is the most desirable. The seedlings of the Silver Fir require protection against early frosts and also against drought in summer.

Morris, in his work on *British Game Birds and Wild Fowl*, has the following paragraph, concerning the favourite resorts of the Pheasant, and which has a direct bearing upon the formation of a covert. The author referred to says:

“The most favourite resort of the Pheasant is the thick, brushy underwood, composed of small shrubs, Bramble bushes, long coarse grass, and other wild plants, which is often met with through the whole of small woods and coppices, and in the outskirts of larger woods, or where woods have been cut down, and the brushwood allowed to grow as it would.

“In such situations as the above the Pheasant remains quiet and concealed during the daytime, but at sunset and sunrise it leaves this seclusion for the more open feeding ground; it is singular that on these occasions it never

PHEASANT COVERTS

walks, but, we believe, invariably runs from the cover to the place where it is accustomed to feed. It habitually frequents the same cover and feeding ground, leads to the formation of narrow runs or paths which, to the practised eye, tell with certainty the number and kind of game to be expected. It is mentioned in Thomson's *Natural History of Ireland*, that in that country, Pheasants are frequently found during the summer and autumn months in the potato fields. During the autumn, winter and early spring months the Pheasant perches in trees when it roosts, but from the beginning of April till the middle or end of September, its roosting-place is among the long and coarse grass and sedge of its favourite cover. On withdrawing from the trees as roosting-places in the spring, the hen bird is the first to set the example; but the cock Pheasant does not abandon his tree for several weeks later. When, however, they have taken to the ground, they do not again use the trees at night, unless something has occurred to disturb them. During the winter single individuals will frequently leave the coverts and, if not molested, will remain for a considerable time at a distance from their natural haunt, and during this period, they usually roost in hedges, or thick grass or stubble, seldom resorting to trees as roosting-places. These stragglers are the exceptions; as a common rule, Pheasants will be found in winter roosting in trees, and generally somewhat in company—where one is found, others may be expected at no great distance. The tree preferred by the Pheasant for its nocturnal resting-place is the Larch Fir, when attainable, and this probably arises from the peculiar growth of the tree, in which the branches are nearly at right angles to the trunk. Their preference for these trees, which are denuded of their leaves in the winter, gives additional facilities for the poacher in their destruction,

PHEASANTS IN COVERT AND AVIARY

as so large a bird is very readily seen on the almost naked branches, and offers an easy mark to his gun."

The foregoing account is clearly illustrative of the fact that it is, in virtue of the habits of the Pheasant, indispensable to make provision in every covert for dense undergrowth, and the more brushwood left lying about the better, as this materially aids the growth of various climbing and twining plants, such as the Honeysuckle, Bryony, Bindweed, etc., all of which are of contributory service.

Existing coverts can be improved by planting some of the low growing shrubs previously alluded to, and if decayed and fallen timber, along with the brushwood, is allowed to accumulate, it materially adds to the low ground cover, so much desired by Pheasants, but which, in and around the hedges, is usually removed by hedge-trimmers. There is a wonderful difference in existing coverts throughout the British Isles, not only in their formation, but also as to the different varieties of trees entering into the formation of the coverts. Take, for instance, the counties of Norfolk and Suffolk, in which the preservation of game has attained a high level of excellence; in fact, it would be a difficult matter to find counties better attended to in this respect. The bulk of the trees forming the coverts in the counties alluded to, consist of some species of Firs or Pines, such as the Scotch Pine (*Pinus Sylvestris*), the Spruce Fir (*Abies Excelsa*), and the Silver Fir (*Abies Pectinata*). Amongst the two-leaved pines, there are about twenty species to which the Scotch Pine, Stone Pine, Mountain Pine, etc., belong, whereas, in the five-leaved forms, there are about thirty-five species, included in which are the Silver Fir, the Spruce Fir and the Larch.

Again, in Gloucestershire, some of the younger coverts



KEEPERS SEARCHING FOR PHEASANT NESTS IN THE WOODS OF THE
NORTH YORKSHIRE HILLS

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PHEASANT COVERTS

are mainly formed of Oaks, there being no hard and fast rule as to the trees selected for this purpose, one of the main deductions being to avoid planting Larches, which, though liked by Pheasants for roosting in, prove disastrous in localities where poaching exists in its chronic form.

Scotch Firs for covert planting, about five-year-old plants, can be bought for thirty shillings a thousand, whilst Spruce Firs, at the same age, usually cost about twenty shillings per thousand; the principal matter being to secure plants that have been twice transplanted and grown on exposed ground. The Spruce Fir is a fine timber producer, and as such, is in great demand. Game-covert plants can usually be bought for about thirty shillings per thousand, though, of course, they vary according to the kind of plant and the size of the same. The following is a list of plants suitable for coverts, and from which a selection can be made :—

Broom	Holly	Hazel
Mountain Pine	Willow	Elder
Yew	Laurel	Guelder Rose
Barberry	Snowberry	Privet
Quick-Thorn	Rhododendron	Sea-Buckthorne
Wild Raspberry	Briar	Box

The best heights for these plants for transplanting ranges from 2 to 4 feet on an average, though some may be more, others less.

CHAPTER II

THE COMMON PHEASANT

THE "original" type of common Pheasant (*Phasianus Colchicus*) is generally regarded as having come from the River Phasis, or Colchis, in Asia Minor; hence the application of the generic (*Phasianus*) and specific (*Colchicus*) names applied to these birds, though it is quite possible that the species of Pheasant had a much wider distribution in Asia.

The word placed in italics at the commencement of this chapter is used for the specific purpose of indicating or emphasising the fact that a distinction must be drawn between that of the generality of Pheasants met with in the coverts, and the species of such as belong to the true type of "Common Pheasant," often spoken of under the more popular titles of "Black-necked" or "Old English" Pheasants, in contradistinction to the "Ring-necked" either as hybrids, or pure bred specimens of the Chinese Pheasants, now so universally distributed in game preserves.

It would be incorrect to regard the Old English Pheasants as even uncommon, as such birds are plentiful in some localities, though scarce or unknown in others.

Concerning the scarcity of Black-necked Pheasants, a leader among British Ornithologists, Lord Lilford (Thomas Littleton Powys, fourth lord), in the *Birds of Northamptonshire and Neighbourhood*, says:

"Although it is most difficult to find pure bred specimens of the species *P. Colchicus*, on account of the frequent cross-

THE COMMON PHEASANT

ings with the Chinese Ring-necked Pheasant (*P. Torquatus*) and other species, we do occasionally meet it, especially in the large woodland of the Northern Division of Northamptonshire, which by their small size, the absence of any trace of the white collar, so conspicuous in the Chinese bird, and the intense blackness of the plumage of the lower belly, present the characteristics of the true unadulterated species."

It may be accepted as an indisputable fact that what is now called the common Pheasant is a mixed variety—a manufactured article—consisting of a blend of Chinese, Japanese and the Old English Pheasants, and in some instances other varieties in addition.

The introduction of alien blood into that of *P. Colchicus* has rendered the plumage more attractive, and increased the size and weight of the birds, without interfering with their prolificacy.

B. R. Morris, in his work on *British Game Birds and Wildfowl* (1855), says :

"There is a variety of the Pheasant having a white ring round the neck, which is not uncommon, and which used to be considered a distinct species from the ordinary one, but is now found to be only a variety, as it will feed with the common Pheasant, and the presence of ring-necked birds with young brood seems to be quite accidental.

"In some districts, however, they prevail to a great extent, and Mr Selby says that in his neighbourhood they have nearly superseded the common kind."

From the foregoing account it would appear that the

PHEASANTS IN COVERT AND AVIARY

introduction of the Chinese Ring-necked Pheasant or the hybrid of *P. Torquatus* existed prior to 1855.

In continuing, the same author says :

“Pure white Pheasants and individuals pied with white in every variety, are common enough, and some of the latter exhibit great beauty of markings. The pure white plumage is said to be assumed most frequently by the female bird, and those which have come under our notice have certainly borne out the remark.”

Both pure white and pied Pheasants are occasionally met with in both sexes, but as such can only be regarded as variations of the common Pheasant, neither can the former be relied upon to produce birds, either white or pied, though some of the broods do, as a rule, develop the same plumage. Experimental breeding amongst both animals and birds has proved that it is extremely difficult to establish a race of pure white animals or birds from coloured ancestors. There is always a strong tendency towards a reversion of the “fixed” type, from which the white or pied bird has been derived.

Many sub-species of the common Pheasant have been alluded to by various writers, but as such are not of much practical importance, it is not desirable to enter into a consideration of the same. The male birds, until after the first moult, are very similar to the females, which in this, as in other species, are non-attractive in their plumage, whereas the converse nearly always applies to the males, and few birds of the Gallinaceous kind exhibit more attraction than the male Pheasants. The average weight of an adult cock Pheasant may be set down at $2\frac{1}{2}$ to 3 lbs., some being heavier, others lighter. The hens are smaller and lighter in weight. The length of the male, as measured from



BLACK-NECKED PHEASANT (MALE)
(*Phasianus Colchicus*)

THE COMMON PHEASANT

the beak to the tip of the central tail feathers, is about 36 inches, occasionally less, but not as a rule more.

The extent of the wings is about 31 inches, and the girth of each wing (measured midway) $8\frac{3}{4}$ inches. Girth around the body about 14 inches, and that around the thighs, $4\frac{1}{2}$ inches. Length of the back, 7 inches; ditto of the neck, $6\frac{1}{2}$ inches. The girth of the skull about 5 inches. The length of the pair of central tail feathers ranges from 18 to 24 inches in a full-grown male bird. The bill is a light horn colour, about 1 inch in length, strong-hooked, with light-brown or flesh-coloured nasal membranes. The papillar or cheek patches are either crimson or bright scarlet according to the season, being of the colour last named during the breeding season. The upper half of the papillar patch has the form of an irregular crescent, broadest in front, extending from the base of the bill to a level of the ears. The lower papillar patch resembles in shape the flap of a spaniel's ear, but is continuous with the upper crescentic portion, with an islet of beetle-green feathers below the eyelids, which latter are flesh coloured, almost circular, but their margin, on close inspection, reveals rudimentary eyelashes, or at any rate dark structures representing such. Each papillar patch is composed of a multitude of conical papillæ, regularly interspersed with minute black tufts, arranged in lines.

The bright scarlet colour is due to the rich blood supply of the papillæ, which attain a maximum degree of perfection after the first moult, in young and vigorous birds, during the spring-time. The feathers on the top of the head, excepting a small area above the nasal membranes, are bronze-green, forming a tuft which surrounds the openings of the ears. There is another tuft of fine dark-coloured feathers which,

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when non-erect, completely hides the aural openings, though the tuft is usually erect during the pairing season. The bases of the feathers are in touch with an erector muscle in front of the ears. The aural openings are large and circular. The feathers clothing one-half, or a little more than one-half of the neck, are beetle-green in colour, but under different illuminations may appear electric blue, or other allied shades. Viewed in strong sunlight, the colour is that of intense emerald.

The feathers on the lower portion of the neck, when seen singly, have their margins tipped with green, below which is a reddish-orange, and still lower down the feather is greyish-brown. The neck feathers are smallest above, but at the base of the neck and junction of the breast, they are about 2 inches in length and very abundant, being densely crowded. On either side of the breast, partly under cover of the wing, the feathers are tipped with the same deep green or purple, but the major portion of each is reddish-orange. The bulk of the breast feathers are of a brownish-black colour, with dark-green margins; the front portion of the back exhibits a remarkable variety of colouring. On the lower portion of the shaft of each feather, there is a downy covering, the exposed portion being alone attractive. In the outer zone, the colour is reddish-yellow, slightly green at the tip. Inside the reddish-brown colour, there is another zone of green, and within this again a buff-colour, succeeded by a central zone of blackish-brown feathering. The remaining feathers of the back are very abundant, and each is about 3 inches in length. They are a deep foxy colour, and reflect from their tips a bluish-green coloration.

The lower portions of the breast and the thighs are heavily clothed with feathers of a deep reddish-brown. The quills

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are dark grey, with transverse mottled cream-coloured markings, there being twenty-four quills in each wing, whereas the secondaries are a mixture of brown, buff and grey, but when viewed collectively in the wing, the yellowish-brown coloration predominates.

The under surface of the wing is light grey, but yellow or buff at its base of attachment.

The tail feathers are remarkable for their length, and arranged in pairs. The two central ones are the longest, there being eight on either side of the pair of centrals. The margins of the tail feathers are tinted with green, and reflect this colour from their upper surfaces, the under surface being much darker. They are of a buff-brown colour, with dark transverse markings, the latter being either opposite or alternative arranged, but the markings vary in their width, being broadest towards the tip of the feathers, and opposite to each other. At the base of the tail, on the upper surface, there are a number of smaller feathers, similarly marked, which materially add to the beauty of the caudal appendage.

The hen Pheasant, as stated elsewhere, is smaller than the cock bird, and the tail shorter. The bulk of her plumage is a greyish-yellow, marked with black or yellowish-brown, but that growing on the top of the head, and lower part of the neck, are tinged with red. Tail, yellowish-grey, with black mottlings and spots, but the transverse bars, so striking in the male, are absent, whilst the under portions of the body are lighter.

The length of a hen Pheasant is about 2 feet, or a trifle over. The spur on the shank or back of the tarsus is absent in the hen. In both male and female, the first or inner toe is the shortest, the third one being the longest, and the fourth one a trifle longer than the second one.

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Pheasants, like other birds, are liable to exhibit variations in their plumage, but only as a rule slightly so, excepting in the case of those well-marked deviations alluded to earlier on in this chapter. It is mostly in game preserves where several different species have been introduced, that one is most likely to come across the most marked difference in plumage, as variability of type is only likely to be assumed, where such a condition of affairs is, or has been, operative.

Distinctiveness of species can only be maintained where due regard is paid to the introduction of the birds coming from pure stock (known to exist in a state of purity), although the latter does not necessarily imply that such birds will provide any better Pheasants for powder and shot. In fact, the hybrid birds, as stated earlier on, are in the greatest demand for sporting purposes, and precisely the same remark applies to the cross-bred Mongolian Pheasants—birds that are highly esteemed by sportsmen.

R. Morris, in his *British Game Birds and Wild Fowl*, gives the following description :—

“The adult cock Pheasant has the bill of a light horn-colour; darker at the base. Irides, yellow hazel. The eyes are surrounded by a naked papillose skin, of a very bright scarlet colour, minutely dotted over with black specks; under each eye is a small patch of feathers of a dark spotted glossy purple. Crown of head, bronze-green, the feathers somewhat elongated; on each side of occiput is a tuft of dark golden-green feathers, erectable at pleasure; very conspicuous in the pairing season. The rest of the head and the upper part of the neck, deep purple, brown, green or blue, as seen in different lights; lower part of the neck and breast, reddish chestnut, each feather with a black margin; lower part of breast and

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sides the same, each feather largely tipped with black, reflecting glossy purple. Feathers of upper part of back, orange-red tipped with black; feathers of black and scapulars have the centre black, or spotted with black, outside which is a yellowish band, and the outer margin red-orange. Lower part of back and tail coverts, purplish red, tinged with green, purple and other reflections—the feathers long and pendant; quill feathers, dull greyish-brown, varied with pale wood brown; wing coverts, of two shades of red; centre of belly, thighs, vent and undertail coverts, brownish-black. Tail feathers very long, the two middle ones the longest, occasionally measuring 2 feet; the outside ones, which are the shortest, are less than 6 inches long. All are of a reddish-brown, with transverse lines of black, about 1 inch apart. Legs, toes and claws, dusky; on each leg is a spur, which becomes sharp after the first year.

“The female is less than the male; the whole plumage more sober; general colour, light brown, varied with darker brown and black; the upper part of the neck in some lights shows iridescent reflections; space round the eye is feathered; breast and belly, dotted with small black spots on a light ground. Tail short, but barred similarly to that of the male.”

Elliot, in speaking of *P. Colchicus*, has some very interesting remarks concerning this bird, and as the monograph containing it is a remarkably scarce work, the author considers it will be of interest to reproduce Mr Elliot's remarks:—

“No member of the *Phasianidæ* has been longer or more generally known than the above-mentioned species of

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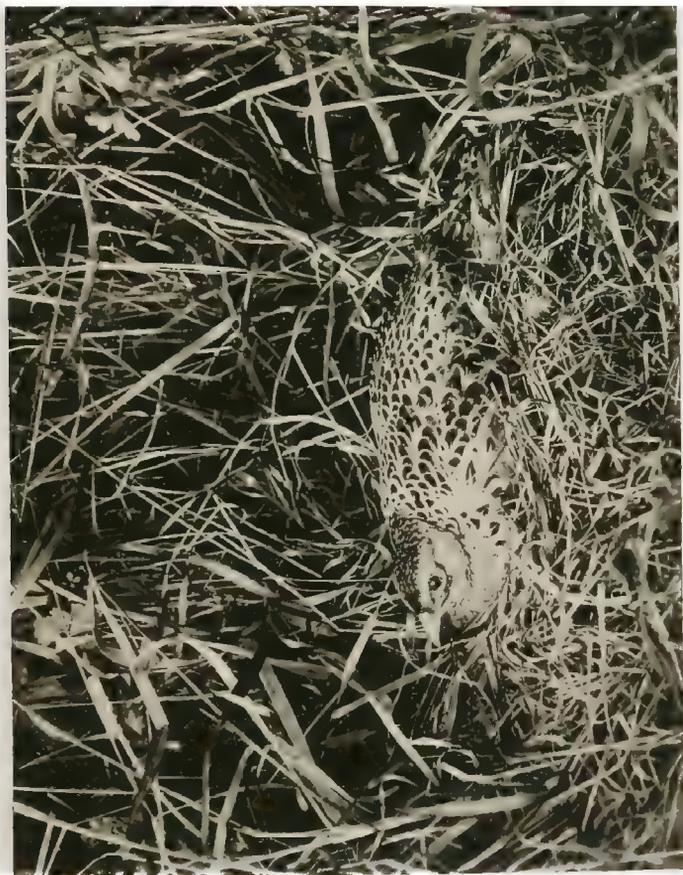
Pheasant. Every preserve in England and on the Continent, inhabited at all by Pheasants, contains this bird. But it is difficult to meet with one that has not at some time or other received an infusion of foreign blood, and consequently presents evidences in its plumage, of its ancestors having lived in the vicinity of *P. Torquatus* or *P. Versicolor*, which species have also been largely introduced into Europe. It is a matter of regret that this hybridism should be permitted, for it in no way improves any of the species, and gives to us a race of mongrels, which at least to the ornithologist's eye, is anything but agreeable.*

I have said that no species of Pheasant has been longer known than the present, and that I am not wrong in this assertion, is shown by the discovery of a curious fact which tells us that it has been an inhabitant of England for over eight hundred years. Mr W. Boyd Dawkins, in a letter to the editor of *The Ibis*, dated 20th April 1859, says :

“It may be of interest to your readers to know that the most ancient record of the occurrence of the Pheasants in Great Britain is to be found in the tract *De inventione Sanctæ Crucis nostre en Monte Acuto et de ductione ejusdem apud Waltham*, edited from manuscript in the British Museum, and published in 1864.”

Now the point of this passage is that it shows that *P. Colchicus* had become naturalised in England before the Norman invasion, and as the English were not introducers of strange animals in any well authenticated case, it offers

* Elliot's views in relation to hybridism are certainly not correct, there being abundant evidence, as strikingly manifested by crossing *P. Mongolicus* with *P. Colchicus*, that a hybrid may excel in every way, that of either of the individual species.



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fair presumptive evidence that it was introduced by the Romans.

The original habitat of these Pheasants was said to be near the River Phasis in Colchis, where the Argonaut when returning to Greece from their expedition in search of the Golden Fleece, found it in large numbers. Hence it has derived the name that it bears.

The Hon. T. S. Powys, in his article on *The Birds Observed in the Ionian Islands*, says of the common Pheasant:—

“That the only localities in which I have myself seen Pheasants in these parts, were once on the Luro River, near Preveso, in March 1857, on which occasion I only saw one, the bird having never previously been met with in that part of the country; and again in December of the same year, in the forests near the mouth of the River Drin in Albania, where it is apparently common, and where several fell to our guns. In this latter locality, the Pheasants’ habitat seems to be confined to the radius of from 20 to 30 miles to the north, east and south, to the town of Alessio, a district for the most part densely-wooded and well-watered, with occasional tracts of cultivated ground, Indian corn being apparently the principal produce, and forming with the Berries of the Privet which abounds throughout Albania, the chief food of the present species. We heard many more pheasants than we saw, as the woods were thick, our dogs wild, and we lost a great deal of time in making circuits to cross or avoid the numerous deep streams which intersect the country in every direction.”

This species is particularly abundant on the shores of the Gulf of Salonica, about the mouth of the River Vardar, and I have been informed, on good authority, that Pheasants

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are also found in the woods of Vhrakori in Etolia, about midway between the Gulfs of Lepanto and Arta.

The following account of the habits of this species is taken from Naumann's *Birds of Europe*, translated by H. E. Dresser, Esq :—

“ It is found thoroughly wild and in abundance in several parts of Bohemia, on the Danube, and on the Rhine, and the wooded islands in this river, on the pasture lands of the Elbe, and in many fertile and beautiful parts of Germany, still less in the northern than in the southern part.

“ It is necessary to spread them in our part of the world by human assistance, as this bird is without desire to migrate, and flies so heavily as to be unable to make long journeys. In their own country they are said to leave their places of abode in autumn, but soon return when the weather is favourable, and are therefore truly migrants. The Pheasant is certainly a forest bird, but still not so in the truest sense of the term, for neither does it inhabit the dense tree forest, nor the depths of the mixed forest, unless driven to do so. Small pieces of green, where deep underbush and high grass grows between the trees, thorn hedges, berry growing bushes and water overgrown with weeds, are their chosen places of abode. Nor must well cultivated and grain growing fields be wanting where the bird is to do well. It neither likes the raw mountain country, nor dry sandy places, nor does it frequent the open woods, unless for protection against its enemies or during bad weather, or at night.

“ It lives on the ground, skulking about the high grass and dense underbush, and runs long distances without once rising on the wing. Only when surprised by a beast of prey, does it take refuge in a tree, which it leaves soon after, and returns to the ground. It roosts on a branch of a tree, from 10 to

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30 feet high, and it is an exception if one roosts on the ground, when perhaps it has wandered too far in the fields from the trees.

“It is an impetuous wild bird, though not really shy, unless one calls its nervous carefulness and boundless flight by that name. Even when used to the keeper, and half tame, it comes to the usual feeding-place at the call with fear and trembling, and seeks to satisfy itself quickly in order to run back to its hiding-place in the thicket at the least noise. Its fear knows no bounds ; a passing mouse will scare it severely, and even a snail creeping past will frighten the hen from off her nest, and on the approach of real and great danger, she remains on it like dead.

“In spring and in pairing time, the male is restless and wild. He then often comes out of his hiding-place, to an open place on the edge of the thicket in an erect position, claps his wings several times, and shoves himself forward in a peculiar position a few feet, and emits a harsh note, which one cannot well express except by calling it a crow of one syllable. It has some resemblance to the crow of the barn-door cock, but it is shorter. It is a note with which he calls the female and is seldom heard except in spring. Only young males sometimes crow in autumn.

“His food consists of grain, sweet fruits and berries, green herbage, insects and worms, accordingly as the time of the year for them. Ants and their larvæ are a particularly favoured food of his, and these form the chief food of the young.

“*Male*.—Upper part of the head green, brownish on the occiput, divided by greenish feathers on each side of the head behind the ears. Throat, sides of face, spotted, under the eye and neck, green with ridged bluish reflections. Upper part of the back, golden yellow, with a dark blue V-shaped

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mark at the tip. Feathers of the rest of the back, black, with their margins deep chestnut, and a white line running parallel to the shaft for two-thirds of the length, and meeting near the tip. Rump, red, with greenish reflections, becoming deep red over the tail where the feathers are very much separated and hide the upper tail coverts. Outer tail coverts, olive-brown mottled with brownish-black. Upper part of the breast, rich brown red, glossing from orange to purple and blue. Flanks, rich golden orange, broadly tipped with deep blue. Abdomen, black. Central tail feathers, yellowish-brown in the middle, with a red longitudinal line, and the edges green; narrow black bars across the centre, and are continued on the rest of the feathers with red ones. Lateral feathers, similar, but mottled with black on the inner webs, the extreme outer feathers mottled on both webs. Under tail coverts, deep red. Bill, horn colour; feet and legs green, bare skin of thighs, scarlet, finely dotted with green feathers.

“*Female*.—Head and neck, reddish-brown, pointed with black. Upper part of back, rufous, with broad V-shaped lines, and tips of feathers black. The rest of the back, yellowish-brown, with black centres and black tips. Secondaries, chestnut, barred with black and buff, the latter dividing the former, and tipped with white. Primaries, brownish-black, barred on outer webs with yellowish-white, and mottled on inner with same. Rump, yellowish-brown, centre of feathers black. Upper part of the breast, rufous, with irregular black lines crossing the feathers. Flanks, yellowish, barred with brownish-black. Middle of breast and abdomen, yellowish-brown, finely vermiculated with dark brown. Tail feathers, chestnut in the centre, barred with black, a narrow irregular yellowish line going from the black bar, the outer edges of brown, mottled with black. Tail, blackish-brown, and feet and legs, grey.”

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Dixon, in his *Game Birds of the British Islands* (1893), has the following paragraph concerning the pairing of the Pheasant :—

“ Semi-domestication appears to have so far affected the morals of the Pheasant that it has caused it to depart from its usual monogamous instincts and to adopt the looser ethics of polygamy, just as the domesticated descendants of the wild duck have done. In its native wilds the Pheasant appears to be strictly monogamous, but in this country the male bird almost invariably associates itself with several females (as many as his prowess or his charms can keep or attract), and upon them devolves all care of the eggs and young. Instances, however, are on record where cock Pheasants in our islands have been known to assist, not only in the duties of incubation, but in attending to the brood. The Pheasant does not appear to have been polygamous long enough to have certain recognised pairing stations or ‘laking’ places, but towards the end of March the cock birds begin to crow and fight for the females, each collecting and maintaining a harem varying in size with his prowess. The hens go to nest in April and May. The inherent timidity or shyness of this species causes it to breed in seclusion, and the great nesting grounds are well in the cover of the plantations and woods, although many odd birds nest wide amongst growing crops, or in the hedge bottoms. Sometimes the nest is placed by strange caprice in an old squirrel’s drey or on the top of a stack, and I have known it in the centre of a tuft of rushes within a couple of yards of a much-frequented footpath. Each female makes a scanty nest under the arched shelter of brambles or dead bracken, or very often beneath heaps of cut brushwood which has been left upon the ground all winter. It is little more than a hollow, in which a few bits of dry bracken or dead

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leaves and scraps of grass are collected. The eggs are usually from eight to twelve in number; sometimes as many as twenty are found, and I have known of an instance in which a single hen has brought off twenty-six chicks from as many eggs. They vary from brown through olive-brown to bluish-green in colour, and are unspotted. The late Mr Seebohm, Jun., and myself took a clutch some years ago in Northumberland of the normal colour, amongst which was one of a delicate greenish-blue. They measure on an average 1.8 inch in length by 1.4 inch in breadth. Incubation lasts, on an average, twenty-four days. The Pheasant only rears one brood in the year; but if the first clutch is unfortunate, other eggs are laid, as hens have been known to sit as late as September. When leaving her nest for a short time to feed, the hen carefully covers her eggs with leaves, and invariably flies from her home when she quits it voluntarily, returning in the same manner. The young are seldom fully grown before the end of July."

CHAPTER III

THE MONGOLIAN PHEASANT (*Phasianus Mongolicus*)

THE introduction of the Mongolian Pheasant into the British Isles has most certainly done more towards the improvement of Pheasants in the coverts than any other variety. For strength of flight, for size, for soundness of constitution, fertility, and early maturity, the Mongolian Pheasant, both in its pure and hybrid forms, stands second to none, and the author believes that most shooting men, game-rearers and others interested in Pheasant preservation will concur in the truth of this statement.

It is impossible for Mongolian Pheasants to be kept in the wrong place, as they will thrive under conditions that would be totally inadequate for the rearing of other birds belonging to the same genus. It is a species that not only succeeds as a first, second and third cross, but in subsequent ones, in fact, it can be crossed and recrossed without apparently showing any signs of degeneracy, as happens in the case of most other species. Take, for instance, the Japanese Pheasant. The first cross is generally a very successful one, but subsequent ones have proved to be failures in the majority of instances.

As the name implies, this Pheasant comes from Mongolia, from the cold parts of China, and the Valley of the Black Irtish.

Mongolia is one of the deserts of the world, the vegetation being scanty, and very little rain falls, whilst cold blasts come from the north, and the winters are intensely cold. In the centre and eastern portions are mountain ranges, and between these fertile valleys. As the vegetation is scanty, and there

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are many sandy dunes, it follows that the Mongolian Pheasants have to be good foragers. Extreme heat frequently prevails in Mongolia, consequently the birds are accustomed to a climate in which opposite conditions prevail, therefore this may account for their particular suitability to British game preserves.

In some respects the Mongolian Pheasant resembles *P. Torquatus*, but of the two it is the more massive bird, and possesses certain other features that is at once distinctive from the Chinese species.

It has a white ring round the neck, though the ring is incomplete in front, the intervening area being the same colour as that of the breast, orange-red, with green or purplish reflections. The wing coverts are white, which serves to distinguish it from the other species. The rump is dark maroon, with green reflections, merging into that of purple. The tail feathers are barred with either brown or brownish-red markings. In general appearance the feathering of the bird is not unlike that of *Phasianus Colchicus*, though a much more massively built bird throughout.

The total length of the adult male is about 36 inches, and the female 10 inches less. The Mongolian hen crossed with a Japanese cock (*P. Versicolor*) produces good hybrids, which are prolific, strong on the wing, and early to reach maturity, but the best cross of all is the half-bred Mongolian, *i.e.*, half *P. Mongolicus* and half *P. Colchicus*, the product being the most magnificent bird it is possible to breed for sporting purposes, and such a hybrid is a distinct advance upon any *pure* or *mixed* variety of Pheasant hitherto known.

Hardihood, size, soundness of constitution, great strength of flight, early maturity, fertility, adaptability to circumstances, and quality of the flesh, are the characteristics possessed by these birds.

Three-quarter bred Mongolians are in great demand, in



PINE MONGOLIAN (MALE) PHEASANT
(*Phasianus Mongolicus*)

THE MONGOLIAN PHEASANT

fact more so than half-bred, as the more the Mongolian predominates in the hybrid the more vigorous the bird. The Mongolian crosses well with the Chinese, with the Japanese, the first cross being the best one. There is no reason why the Mongolian should not hybridise with other species, such as the Amherst, Reeves, Prince of Wales, etc. Many game-preservers procure pure Mongolian cocks, and introduce these amongst the common Pheasants of the woodlands, which, as stated elsewhere, is a hybrid, between the Chinese and black-necked Pheasant, but it is better to cross *P. Mongolicus* with *P. Colchicus* (the old English Pheasant), introducing fresh stock from time to time.

Adult Male.—Is easily distinguished from all the maroon and red-rumped species previously described, by having a broad white ring (interrupted in front) around the neck. Otherwise it most resembles *P. Persicus*, but the mantle and chest and breast are bronzy orange red, glossed with purple carmine in one light and green in the other. The rump is a dark maroon, strongly glossed with green, shooting into purple; the throat is purplish bronzy red to the breast, and the flank feathers are tipped with very dark green, and in the middle of the breast and the sides of the belly are dark green. It is, moreover, rather a large bird. Total length, 36.5 inches; wing, 9.6; tail, 22; tarsus, 2.8.

Adult Female.—Like the female of the *P. Chrysomelus*, but there is a black spot near the extremity of each feather of the upper mantle and a black bar across the middle, instead of a broad black sub-marginal border. Total length, 26 inches; wing, 8.5; tail, 12.3; tarsus, 2.5.

Range.—From the valley of the Syr-Darya, across the basin of Lake Balkash, as far east as Lake Saisan and the Valley of the Black Irtish, and southwards to the Valley of the Ile and Issik Kul.

CHAPTER IV

PRINCE OF WALES PHEASANT (*Phasianus Principalis*)

THIS is a distinct species of Pheasant, resembling in many of its features the Mongolian, but has certain characteristics which sharply define it from the last-named species. Judging from the locality to which it is indigenous, it ought to prove of the greatest service in game preserves where the geographical conditions are inclined to be of a swampy nature, and it is rather surprising that it has not been more freely introduced into British coverts than it has been; in fact, up to the present time, this species has been kept more in the hands of breeders of fancy Pheasants than in those engaged in the preservation of game in our woodlands. Its strong flight, vigorous constitution, beauty of plumage, prolificacy, and fertility of the eggs, renders it particularly suitable to the British game-preservers. Its nomenclature, *Phasianus Principalis*, has been derived from the fact that a pair of skins of this species belonging to the late King Edward VII., then Prince of Wales, were exhibited before the Zoological Society during 1885, and brought over from Afghanistan. The Prince of Wales Pheasant inhabits the banks of the Bala Murghab, in the swampy districts of which it has been very abundant. Its environment is vastly different to that of most other species of Pheasant, in which the desire for seclusion in coverts and hedge-rows is so distinctly manifest.

In length this species is similar to that of *P. Colchicus*,

PRINCE OF WALES PHEASANT

viz., about 36 inches, and the tail feathers have dark transverse markings. It has white wing coverts, similar to that in *P. Mongolicus*, but it is distinguished from the latter bird by the complete absence of the white ring round the neck. The plumage of the chest and breast is tipped with dark purple, giving a purple-green reflection. The ground colour is golden-red, spangled with a deep bright purple.

There seems to be no reason why the Prince of Wales Pheasant should not hybridise well with the Mongolian, although the writer is not aware of anyone having tried the production of hybrids from the two species named. The first discovery of the bird by the British appears to have been by the members of the Afghan Delimitation Commission in 1884, and it was during that year that a considerable number of birds were shot.

Ogilvie Grant, in his *Handbook on British Game Birds*, refers to *Phasianus Principalis* in the following terms:—

“*Adult Male*.—This may be easily distinguished by having white wing coverts of *P. Persicus*, but unlike that species the rump is bronze-red, and practically there is no purple lake gloss on the lower back, rump and upper tail coverts. The feathers of the chest and the breast are broadly tipped with dark purplish-green. Total length, 35.5 inches; wing, 9.4; tail, 21.5; tarsus, 2.7.

“*Adult Female*.—Much paler than the female of *P. Colchicus* and *P. Persicus*, the brown colour of the feathers of the mantle being pale rufous, and the general colour of the rest of the plumage, pale sandy buff. It is extremely similar to the female of the *P. Chrysomelus* from the Amu-Darya, having the black spots on the middle line of the chest feathers more strongly marked than any other allied species.

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“*Range*.—North-western Afghanistan and North Persia.

“*Habits*.—This extremely handsome species was first discovered in 1884 by the members of the Afghan Delimitation Commission, and the Naturalist attached to the Expedition prepared some beautiful skins. Dr Aitchison informs us that the specimens of this Pheasant were all got on the banks of the Bala Murghab, where it occurs in considerable numbers in the tamarisk, and grass jungle growing in the bed of the river. He stated that more than four hundred were killed on the march of 30 miles up the river, and that the bird not only wades through the water to make from one point of advantage to another, but it also swims, and is apparently quite at home in the thickets where there is always water to the depth of 2 or 3 feet. These swampy thickets afford good shelter, and in the morning and evening the Pheasants leave it for more dry and open country, where they pick up their food.”



PRINCE OF WALES PHEASANT (MALE AND FEMALE)
(*Phasianus Principalis*)

CHAPTER V

THE CHINESE PHEASANT (*Phasianus Torquatus*)

THE Chinese Pheasant (*Phasianus Torquatus*) is a distinct species, originally introduced into Great Britain from China, to which the bird is indigenous. According to authoritative accounts, it belongs to the North of China, and large quantities of frozen birds are sent down the market to Peking.

In many respects the Chinese Pheasant resembles the common Pheasant (*P. Colchicus*), but it has the distinctive white ring around its neck, from which the specific name *Torquatus* has been derived. In pure-bred specimens this ring is complete, whereas, in the Pheasants found in British game preserves, there may be only traces of this ring, as these birds are hybrids, derived from the Chinese and the common Pheasant, with a certain amount of Japanese Pheasant intermingled. Therefore, in spite of the fact that the Chinese Pheasant as a progenitor, stamps its distinctive features on the hybrid, the latter has a tendency to revert to the black-necked Pheasant, its prepotency being more strongly marked than that of *P. Torquatus*.

Considered in the light of improvement, the alliance of Chinese Pheasants with those of Great Britain, has exercised a most salutary influence, and such may be summarised as follows :—

First of all, the constitution of the birds has become more vigorous ; secondly, there has been a distinct increase in size

PHEASANTS IN COVERT AND AVIARY

and weight ; thirdly, the brilliancy of the plumage has been enhanced ; fourthly, increase in size instead of diminution has resulted, and been maintained ; fifthly, hardihood and prolificacy, combined with great strength of flight, fertility and maturity, have all been maintained, which, in all probability, would not have been so had British game-preservers had to rely upon the black-necked breed as opposed to the ring-necked variety, or hybrids therefrom.

Some game-preservers—principally those of the older school—seem to be opposed to the introduction of alien blood into their stock, apparently taking a pride in maintaining purity of what are known to some as “Old English Pheasants,” maintaining that the flesh of these birds is more delicate in its texture, and that they are of stronger flight. Whether or not this is the correct view to take, opinions will be divided, but it is as well to understand that in the breeding and perpetuation of individual species, it is essential for the maintenance of the constitutional vigour, to infuse fresh blood, either of the same, or an allied species, the latter for preference, provided that other conditions are favourable.

It is stated that it is rather a difficult matter to maintain the Chinese Pheasant in a state of purity, and many birds sold as such are, doubtless, not pure bred. This is more applicable to the Chinese Pheasant than to most other varieties, in which the slightest adulteration may render itself evident in the plumage, though it is not so readily discernible in the Chinese Pheasant.

These remarks are more especially applicable to the first cross of *P. Torquatus* with that of *P. Colchicus*, less so in the second, third and fourth generations. There is a first-class description of the Chinese Pheasant given in Mr Gould's *Birds of Asia*, from which the author has taken the liberty of reproducing it. Mr Gould says :

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“The male has the forehead deep green, crown of the head, fawn coloured, glossed with green; over each eye, a conspicuous streak of buffy white; the naked papillated skin of the orbits and sides of the face, deep scarlet or blood red, interspersed beneath the eye with a series of very minute black feathers; horn-like tufts on each side of the head, throat and neck, rich deep, shining green, with violet reflections; near the base of the neck, a conspicuous collar of shining white feathers, narrow before and behind, and broadly dilated at the sides; the feathers at the back of the neck, black, with a narrow mark of white down the centre of the back portion, and a large lengthened mark of ochreous yellow, within the edge of each web near the tip, the feathers at the back and capillaries black at the base, with a streak of white at the middle, then buff surrounded with a distinct narrow band of black, to which succeeds an outer fringe of chestnut; feathers at the back, black, with numerous zig-zag and crescentic marks of buffy white; lower part of the back, rump and upper tail coverts, light green of various shades, passing into bluish-grey at the sides, below which is a mark of rufous; breast feathers indented at the tip, of a rich, reddish-chestnut, with purple reflections, and each bordered with black; flanks, fine buff, with a large angular spot of beautiful violet at the tip; centre of the abdomen, black, with violet reflections; under tail coverts, reddish-chestnut; wing coverts, silver grey; wings, brown, the primaries, with light shafts, and crossed with narrow bars of light buff; the secondaries, similar, but not so irregularly marked as the primaries; tail feathers, olive, fringed with different shades of violet, and crossed at regular intervals, with broad, conspicuous, black bands, passing into a reddish-brown on the sides of the basal portion of the six central feathers; bill, yellowish-horn colour; irides, yellow; feet, greyish-white. The female has the whole of the upper

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surface brownish-black, with a margin of buff with every feather, the throat whitish, and the central portion of the under surface, fawn colour ; flanks, mottled brown ; tail, buff, barred with dark brown, between which are other interrupted bars of the same hue. These marks are broader on the two central feathers than on the others, and, moreover, do not reveal the edge on either side."

Regarding the confinement of the Chinese Pheasant to the aviary, little need be said, as the extremely hardy nature of these birds, befits them to environment under all ordinary conditions. It is a variety which does well in covert and aviary.

The colouring on the lower portion of the back serves to distinguish the Chinese Pheasant from other species. The rump and the upper tail coverts have a greenish-grey lustre, and on either side, a coloured patch, whilst around the neck, there is a distinct clearly defined white ring. The flank feathers, also those of the mantle, are buffy orange, whereas, in *Phasianus Formosanus*, the feathers in these regions are pale yellow. The breast, chest feathers, have very narrow purple margins, but the general colour of the breast feathering has a purple lake sheen upon it. The bars on the tail feathers are broader than in some other species.

CHAPTER VI

SHAW'S PHEASANT (*Phasianus Shawii*)

THIS species of Pheasant belongs to the genus *Phasianus*, and in many of its features it is closely allied to *P. Colchicus*. It is regarded by some authorities as the parent stock from which all the Chinese Pheasants have been derived. In connection with this matter Elliot makes the following statement:—

“This species *P. Shawii* is one of the most interesting discoveries yet made among gallinaceous birds, apparently presenting to us the original stock, looking at the subject from a Darwinian point of view, from which all the species of the Chinese Pheasants have descended.”

It is a resident of the valleys of Yarkand and Kashgar, extending as far eastwards as the Rivers Aksu and Khotan. The total length of the male is about 36 inches, and that of the female 24 inches.

The former is distinguished from *Colchicus* by the wing coverts which are white, whilst the back, rump and upper tail coverts, are of a yellowish-red bronze, emitting green and purple reflections. The breast and belly are dark green. The hen bird is very plain, and has a ground colour of a pale reddish-buff.

Shaw's Pheasant is regarded as a very untamable bird, and its wild nature prevents it from occupying a position

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of any value in game preserves. Mr Shaw in shooting in Eastern Turkestan shot many of this species, which he mistook for *P. Colchicus*. He brought two male birds back to England, thinking that they would be a valuable addition to the species already existing in this country, and it is due to this fact that the species has been so named.

CHAPTER VII

REEVES', OR THE BAR-TAILED PHEASANT (*Phasianus Reevesii*)

THIS is a magnificent species of Pheasant, and one that has been introduced into many coverts for improving the beauty of the plumage in the production of hybrids. Although known for centuries, the Reeves' Pheasant was not introduced into Europe until 1831, a male bird having been imported by one Mr Reeves, but what may be termed its first successful introduction into the British Isles was due to the efforts of Messrs Stone & Medhurst. It is a native of the mountains of Northern and Western China, and there is no doubt that the country to which it is indigenous renders it particularly suitable for flourishing upon British soil, but especially so for mountainous districts, such as Scotland and Wales, where it has plenty of range to indulge in its natural roving habits. During flight the Reeves' Pheasant is remarkably vigorous, and owing to the enormous length of its tail, it is a difficult bird to shoot until the sportsman becomes an adept in the art of shooting these Pheasants, as allowance has to be made for the great length of the tail.

For pace and strength of flight the Reeves' Pheasant has no equal amongst the genus to which it belongs.

The total length of the tail is about 5 feet, and owing to the transverse markings or bars, the term "Barred" Pheasant is sometimes applied to this species. The total length of the bird is about $6\frac{1}{2}$ feet, and it looks all this when

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in flight. During repose the tail feathers do, to a considerable extent, cover one another, but when in flight they are spread out in a lateral manner.

The head is covered by a white cap of feathers, and beneath this there is a black band extending from the base of the beak to the back of the skull where it unites with the corresponding band on the other side of the face, and encircling the eyes. Below this is a broad white collar, which is again followed by a dark-coloured band, but not so broad as the collar. This alternate arrangement of light and dark markings stands out in strong contrast with what may be termed the "general body colour."

The feathers along the back to the wing coverts and towards the black band on the neck, are of an intense yellow, the margin of each feather being black. The wing coverts are white, and their margins also black, whilst the feathers on the breast and below the wing coverts are white, with cinnamon-coloured margins. There is a peculiarity in the arrangement of the feathers, and the only term that the author knows which will express this arrangement is that of "imbricated," *i.e.*, overlapping at their margins.

The number of feathers comprising the tail is usually eighteen, and these, as previously stated, are barred, the ground colour being of a creamy white or faint grey.

Many game-preservers have tried crossing Reeves' Pheasant with other species, and some of these experiments have been a success and others not so, but there is a consensus of opinion that the Reeves' Pheasant will hybridise well with the common Pheasant, and also with the Chinese, the Golden Pheasant, and the Silver Pheasant, and that the product of such mating is generally very satisfactory, more especially with the common Pheasant.

Reeves' Pheasant crosses particularly well with *P. Colchicus*,

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but opinions differ as to whether the hybrids thus produced prove fertile or otherwise, there being insufficient evidence to give any dogmatic statements in relationship to this matter, but the author sees no reason why Reeves' hybrids—the product of the Reeves' cock and the common hen Pheasant of the coverts, should not produce fertile birds. As aviary birds, Reeves' Pheasant crossed with the Golden, produces hybrids unsurpassed in beauty, and birds that thrive remarkably well in confinement.

In coverts where the trees are tall, the introduction of several birds of this species would be a distinct advantage, and lead to the production of towering Pheasants, provided that circumstances are favourable.

Adult Male.—The crown, white, surrounded by a wide black band; chin, throat and nape, white, margined below by a black ring which surrounds the neck. The upper parts, mostly cinnamon, each feather bordered with black presenting a scale-like appearance. Wing coverts, white, broadly margined and centred with black; chest, sides of breast and flank feathers, somewhat similar, the two former with chestnut margins, the latter with buff extremities; rest of under parts, black. Middle pair of tail feathers, enormously elongated, white down the middle, barred with black and chestnut and brownish-black on the sides; outermost pair, buff, tipped with black. Total length, 6 feet 6 inches; wing, 10.3 inches; tail, 5 feet; tarsus, 3.1 inches.

Adult Female.—Crown, reddish-brown; rest of head and neck, buff, except ear coverts, and a band across the nape, which are mostly a bluish-brown. Feathers of the upper mantle, rufous, tipped with brownish-grey, mottled with black, and each with a somewhat heart-shaped spot. Rest of the upper parts mottled with rufous buff and grey. The wing coverts and scapulars with buff and the lower back

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with black shaft stripes; chest, breasts and sides, somewhat like the mantle, but the white spots much less conspicuous; rest of the under parts, pale buff. The middle tail feathers, mottled with sandy buff and black; outer pairs, chestnut, mixed with black and barred and tipped with white. Total length, 32 inches; wing, 9; tail, 16.6; tarsus, 2.5.

Range.—Mountains of Northern and Western China extending as far east as Kiu-kiang (Ogilvie Grant).

Hybrids between Reeves' and the Golden Pheasant have been bred in confinement, and the males are remarkably handsome birds, having a general plumage of reddish-brown.

Mr E. F. Creagh, writing in the *Field*, of 13th May 1886, has some very interesting notes relating to the Reeves' Pheasants, and as this description gives in a concise manner facts of general interest, the author has taken the liberty of reproducing Mr Creagh's notes, which are as follows:—

“It was from Ichang, the post at the head waters of the Tangtse, the great river of China, or rather where that river reaches its gorges, that I started with the stream to a large valley where I knew Reeves' Pheasant had been seen. It is useless to ask any questions of the country folk, who will always answer ‘Yes.’ I therefore landed and walked along the wide valley, with high perpendicular mountains on either side, and beetling over small woods Cypress. The birds live on the berry of this tree, and fly from one wood to another. They will never show themselves if they can avoid it, and through their great flights when running, steal away from the dogs. Sometimes, however, when taken by surprise they rise, and then only by great caution can a single sportsman hope to get them. Surrounding the woods with several guns is the best way to take them. I think they drive away the *P. Torquatus*, for I have never seen the two species together.

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This may perhaps be due to the fact of their living on different food. I had with me at the time a Spaniel and a Red Irish Setter, and as the day was fine and clear, walked on quietly, until I came to what appeared to be good country. The hills here were lower, and the wood fairly dense but without undergrowth. A wood-cutter told me he had seen several Pheasants a few days ago but could give no further information, so tying up my Spaniel, I determined to work quietly along with the setter. Although it was January, the day was hot, and I was obliged to dispense with my coat as I struggled up the hill. I worked along the lower part without coming on any scent. Suddenly the setter got very busy, and moved along showing me that he had some large game. I followed as well as I could over the broken ground. False scent! back again. Then the dog took a turn up the almost perpendicular rock. I thought, 'How could the birds get up there and leave no scent.' They had evidently helped themselves with their wings. I was determined to follow, and brought the setter back to a place where we succeeded in getting on to the upper ledge after a little scrambling. Having arrived at the top, as I had anticipated, we soon came to the scent again, and away went the dog very cautiously setting every now and again. Just ahead of us now was a stone wall. I was very much afraid that they might come to the rise just as I was getting over, so I made preparations for a surprise. I knew there were several birds or some larger game by the general activity and caution shown by the dog. I was soon over the wall ready for anything. Below me was some long grass. On the edge I had left some high trees on my right, the hill also with long grass, but no wood. I was very badly placed, for I could not see where the game could be. Up got six Reeves' Pheasants, splendid birds. I felt certain of two,

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but I only succeeded in bagging one, which went rolling down the hill in its last struggles. The bird I bagged was a cock, measuring 5 feet 4 inches from the bill to the end of the tail feathers."

The Reeves' has at various times been turned down on some of the sporting properties of Great Britain, but it cannot be considered a success, for the males drive away the common and ring-necked Pheasants, and do not interbreed freely with either species.

A fight between two old cocks is a beautiful exhibition of activity and spirit. They spring up 5 or 6 feet in the air before striking, and such is their agility, that the bird assailed hardly ever allows himself to be struck. So much the better for him, for it will be observed that the legs are garnished with spurs as long and sharp as those of the game-cock.

The last peculiarity of this species worth naming, is that when they set out on a jaunt, they make for the highest point within range, whereas the common Pheasant is accustomed to travel downwards, along the course of the valleys.

CHAPTER VIII

SÆMMERRING'S PHEASANT (*Phasianus Sæmmerringii*)

THIS species of Pheasant is indigenous to the southern portions of Japan, existing in localities similar to those occupied by the Japanese Pheasant (*P. Versicolor*). The ornithologist Temminck, appears to have been one of the first European Naturalists to describe the bird with any degree of accuracy, though sportsmen had given descriptions of it prior to the observations of the ornithologist referred to. It is an uncommon species in British game preserves, mainly because of its pugnacious habits. In other respects it is suitable for crossing with the common Pheasant.

Confinement in aviaries has possibly something to do with exciting the vicious habits of this species, as such confinement does unquestionably tend towards the production of irritability of temperament. Sæmmerring's Pheasant breeds readily in the aviaries, and specialists in fancy Pheasants can usually supply birds of this species; if not the birds, eggs for hatching.

The plumage of this Pheasant is extremely handsome, and two very characteristic features presented by the male and the female are the broad, widely separated, transverse markings on the tail of the former, and the short tail of the latter.

The breast and under parts of the tail feathers are chestnut; the upper surface of the throat and back of the bird is also chestnut or coppery brown, but when the feathers are examined

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separately, they are grey below, brown in the middle, with a broad stripe down the centre, and on either side, chestnut-brown. Both primaries and secondaries are dark brown. The tail feathers are chestnut, and have dark or black transverse stripes about a couple of inches apart. The intervening areas between the bands are of a somewhat lighter tint than the general chestnut colour of the body.

The female has the feathers on the head and upper surface mottled with chestnut. The rump and the tail coverts are of a dull chestnut, barred with brown, whilst the wing coverts are tipped with black and white. Throat, buff, and the feathers on the under surface of the body, brown, tipped with light buff, inclined, on either side, to be tawny.

Sœmmerring's Pheasant, although suitable for aviaries, cannot be regarded as a species that is ever very likely to become popular amongst British game-preservers, there being many other Pheasants vastly superior for such purposes.

Considering the importance of the Sœmmerring Pheasant, the author thinks that it is advisable to supplement his remarks by the following notes, which are extracted from Grant's *Hand-Book of Game Birds*:—

“*Adult Male*.—The general colour above chestnut or brownish-chestnut, the margins of the feathers of the upper parts and chest glossed with purplish-carmine, changing to fiery gold. The basal part of the feathers, black, most conspicuous on the wing coverts. The breast and rest of the under parts and tail feathers, chestnut, the long middle pair with white narrow black bars, dividing the lighter from the darker chestnut, and the outer pairs widely tipped with black. Total length, 50 inches; wing, 8.8; tail, 37.

“*Adult Female*.—Crown of the head, blackish, each feather

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margined with rufous, the general colour of the upper parts, black, mottled with sandy buff and rufous. The feathers on the mantle with the ground colour mostly rufous, those of the back and scapulars mostly black with buff showing stripes. Chin, throat and fore-part of the neck, pale buff, most of the feathers, except those down the middle being tipped with black; chest, pale greyish rufous, spotted with black. Rest of the under parts are mostly buff. Tail feathers, chestnut, the middle pairs indistinctly mottled with black and buff, the outer pairs tipped with black and white. Total length, 21.0 inches; wing, 8.1; tail, 7.5; tarsus, 2.1."

Range.—Japanese Islands of Hondo and Kiu-siu.

Habits.—Very little has been written about the habits of Scemmerring's Copper Pheasant, and the only public notices are not very important. Since the year 1865, several birds have been bred in the Zoological Gardens, but the young birds have not survived for more than a few days.

Dr Joseph Wilson gives the following notice on this species :—

“ During the first part of our stay at Simoda, the cultivated fields afforded no food for the Pheasants. The natives told us they were plentiful in the hills, but no one was willing to undertake to show them, and several rambles through the bushes where these birds were supposed to feed, ended in disappointment. Once only I had a glimpse of a brood of young ones near the mountains, but they immediately disappeared by running very rapidly. The note of one or other of this species of Pheasant was heard frequently. On the top of the precipitous hill about a mile from Simoda, covered by small trees and very thick undergrowth of shrubbery, the

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Pheasant (or so we were assured by the Japanese) passed the weary hours while his mate was on her nest, and very sensibly solaced himself and her with such music as he was capable of making. It was, however, anything but melodious, and may be represented as a sort of compound of the filing of a saw and the screech of the peacock. There are two notes only uttered in quick succession, and represented by the Japanese name of Ki-ji, but the second note is much longer, louder and more discordant, in fact has more of the saw-filing character, Kee Jææ. These two notes are uttered, and if the bird is not disturbed, they are repeated in about five minutes. A good many times, perhaps twenty, to become better acquainted with these individuals failed; it seemed impossible to make him fly if his covert was by any means extensive."

Mr A. D. Bartlett, the superintendent of the Zoological Gardens, in London, writing of this species, says :

"Among the *Phasianidæ*, some species are remarkable for their pugnacious and fierce dispositions, not only the males, but frequently the females destroy each other. The want of sufficient space and means of escape among bushes and shrubs or trees is no doubt the cause of a good many females being killed when kept in confinement, and this serious misfortune is not a rare occurrence. After the cost and trouble in obtaining the birds, and when they have recovered from their long confinement on the voyage, their owner desires to reap a reward by obtaining an abundance of eggs, as the birds approach the breeding season. Alas! he finds that some disturbance has occurred. The place is filled with feathers, and the female bird, from whom he has expected so much, is found dead, or dying, her head scalped, or her eyes picked out, or some equally serious injury inflicted. I

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have found some species more inclined to this cruelty than others, the worst according to my experience being the *P. Sæmmerringii*.

“Eggs—pale greenish white, rather long ovals; shell smooth and fine. Average measurement, 1.8 inches by 1.35 inches.”

CHAPTER IX

THE JAPANESE PHEASANT (*Phasianus Versicolor*)

THE Japanese Pheasant is an extremely handsome species, and one that will readily hybridise with various other birds of the genera, such as *Colchicus*, *Torquatus*, *Mongolicus*, etc., and the offspring be perfectly fertile, but it cannot be regarded as a successful bird for introduction into coverts, as the succeeding generations after the first one, at any rate when mated with the common ring-necked Pheasant, have proved more or less a failure.

The author cannot say that these remarks are applicable when mated with *Mongolicus*, as the vigorous constitution of these birds seems to not only assert itself, but reassert itself, from one generation to another. The influence exercised by *P. Versicolor* is not sufficiently stable ; therefore, the beautiful plumage characteristic of these birds is soon abolished, unless re-established from generation to generation.

With reference to the cross between a Japanese and the common Pheasant, Tegetmeier has the following remarks, on page 171, in his work on Pheasants :—

“The cross between the Japanese and the common Pheasant is a bird of brilliant plumage, easy to rear, of greater size than the average of English birds, and the flesh is very tender and well flavoured. In Norfolk this very beautiful cross was introduced some few years back by Mr J. H. Gurney, who bred most successfully, both at Euston and Northrepps, and from the birds he obtained at Knowsley sale,

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and the common Pheasant, though chiefly with the ring-necked cross, and produced magnificent specimens ; and from the eggs being greatly sought after by other game-keepers in his district, the race soon spread throughout the county."

From personal observation and inquiry, however, writes Mr Stevenson :—

" During the last two or three years, it appears, evidences of this cross, even in the coverts where these hybrids were most plentiful, are now scarcely perceptible, the strong characteristics of the Chinese birds apparently absorbing all the less marked though darker tints of the Japanese. One of these birds, killed in 1853, weighed upwards of 4 lbs., and many examples, which were stuffed for the beauty of their plumage, will be found in the collections of our country gentlemen."

Tegetmeier seems to think that with the fresh introduction of new blood and care in the preservation of the cross-bred birds, that a permanent race would be established, precisely in the same manner as the ring-necked hybrid, as the two birds, *P. Versicolor* and *P. Torquatus*, would practically stand in the same degree of relationship. As the author has previously stated, *Phasianus Mongolicus* is a much more suitable bird to mate with the Japanese Pheasant, although there is no real necessity, and practically no advantage, excepting that of enhancing beauty of plumage, for the introduction of *P. Versicolor* into British game preserves. In the aviary, the Japanese is a great ornament, more especially when seen side by side with the Golden Pheasant, and hybrids can be produced from these two birds in spite of the fact that they belong to different genera.

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P. Versicolor was first introduced into Great Britain during 1840, and it is rather singular to relate how the breed was established into British game preserves. A male [and female were imported, but the hen died, and the male bird had to be utilised for crossing with *P. Colchicus*. The birds of the first generation were half and half, those of the second generation, three-quarter bred, whilst the succeeding generations were mated with the parent bird, until a pure stock of *P. Versicolor* was finally established. (See Chapter on Hybrids.) It was fortunate that it was the hen bird that died, otherwise the difficulty of restoring the breed would have been much greater.

The Japanese Pheasant is regarded as having little disposition to stray, which is a recommendation, and also that they are good flyers; the male hybrids, *i.e.*, *P. Versicolor* plus *P. Colchicus*, resemble Stone's Pheasant (*Phasianus Elegans*), which is a native of South-western China. *Phasianus Versicolor* has a most distinctive plumage, and there is no difficulty in recognising birds of this species. The whole of the neck and under parts of the body are a magnificent deep green, bluish-green in reality, whilst the back of the neck, breast and under surface, are a brighter green. The scapularies are a distinct chestnut, with buffy markings. Tail coverts a slaty green. The tail is barred and has a total length of 17 inches, whilst the length of the bird is about 30 inches. In the female the length of the tail is 10 inches, and her total length 24 inches. The best description concerning the plumage of these birds that the author has come across, is that given in Mr Gould's *Birds of Asia*, from which the following extract is made:—

“The male has the forehead, crown, and occiput, purplish oiled green; ear tufts, glossy green; chin, throat and sides and back of the neck, glossy changeable bluish-green; back

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of the neck, breast, and under surface deep shining, grass-green, with shades of purple on the back of the neck and upper part of the breast; feathers of the back and scapularies, chestnut, with buffy shafts, and two narrow lines of buff, running round each, about equidistant from each other and the margin; lower part of the back and upper tail coverts, light glaucous grey; shoulders and wing coverts, light greenish-grey, washed with purple; primaries, brown on the internal web, toothed with dull white at the base; outer web, greyer, and irregularly banded with dull white; tertiaries, brown, speckled with grey, and margined first with greenish-grey and then with chestnut; centre of abdomen and thighs, blackish-brown; tail, glaucous grey, slightly fringed with purplish, and with a series of black marks down the centre, opposite to the base of the feathers, where they assume a band-like form. As they advance towards the tip they gradually become more and more irregular, until they are arranged alternately, and in the like manner gradually increase in size. On the lateral feathers these marks are much smaller, and on the outer ones they are entirely wanting, those feathers being covered with freckles of brown; orbits, crimson red, interspersed with minute tufts of black feathers; eyes, yellowish-hazel; bill and feet, horn colour.

“Compared with the female of the common Pheasant, the hen of the present bird has all the markings much stronger, and is altogether of a darker colour. She has the whole of the upper surface very dark or blackish-brown, each feather broadly edged with buff, passing in some of the feathers to a chestnut hue; those of the head, and particularly those of the back, with a small oval deep spot, of deep glossy green close to the tip; primaries and secondaries, light brown, irregularly barred with buff, and with buffy shafts; tertiaries, dark brown, broadly edged with buff on their inner webs, and

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mottled with dull pale chestnut on their outer web, the edge of which is buff; tail, dark brown, mottled with buff, and black on the edges, and crossed by narrow irregular bands of buff, bordered on either side with blotches of dark brown; on the lateral feathers the lighter edges nearly disappear, and the bands assume a more irregular form; throat, buff; all the remainder of the under surface, buff, with a large irregular arrow head-shaped mark near the top of each feather; thighs, similar, but with dark mark nearly obsolete."

In the description given by Mr Gould, a reader will, I think, admit that this eminent Naturalist has described the plumage of the bird, not only with great accuracy, but in all minutiae.

P. Versicolor is found throughout the whole of the Japanese Islands, with one or two exceptions.

Elliot's description is embodied in the following words:—

"The male has the tip of the head, green; ear-tufts, shining-green; throat and back, blue, with greenish reflections; under parts green, with purple reflections upon the neck and breast feathers, and the back and scapulars have their centres black with two buff lines equidistant from each other; the margins, chestnut; shoulders, bluish-grey; primaries, brown on the inner web, outer greyish, and irregularly barred with whitish; secondaries, chestnut, with broad mark of buff in the centre, this mark mottled with black on the outer web; rump and upper tail coverts, bluish-grey; abdomen in centre and thighs, dark brown; tail, greenish-grey, the central feathers barred with black, regular at base but becoming alternate towards the tip; edges of the feathers, purplish; the black bars are similar on the lateral feathers, and absent from the outer ones;

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naked portions of face, crimson, dotted with minute black feathers ; bill and feet, greenish.

“The female has the upper part of the head, blackish-brown margined with light brown. Face, ears and chin, white ; ear coverts, reddish-brown ; neck, light rufous, tipped with blackish-brown ; mantle, black, each feather margined with light brown, and with green metallic spot near the tip ; margin of rump feathers, reddish-brown ; wings, brownish-black in the centres of the feathers, with broad margins of yellowish-brown ; secondaries, rufous, the outer webs mottled with black ; primaries, reddish-brown crossed with irregular bars of light red ; breast and under parts, light rufous brown, with a greenish shade in certain lights, with blackish bars crossing the feathers at intervals ; tail, rufous brown, crossed with bars of blackish-brown, the edges greyish-brown, finely dotted with dark brown ; bill, horn colour ; feet and legs, flesh colour.”

CHAPTER X

HAGENBECK'S PHEASANT (*Phasianus Hagenbecki*)

HAGENBECK'S Pheasant is an extremely handsome species, resembling in many respects the Chinese Pheasant (*P. Torquatus*), and is a native of the Kobdo Valley in North-west Mongolia. There is every reason to believe that if these birds were introduced into British game preserves, they would cross with *P. Colchicus* and produce hybrids precisely allied to the ring-necked birds.

The length of the bird, as measured from beak to tip of tail, is a little over a yard, and the average weight, $3\frac{1}{2}$ lbs. At the base of the neck there is a white collar, rather broader than that in *P. Torquatus*. The crown is green, but not the same olive-green as in the Chinese Pheasant. The feathers on the back and rump have a creamy tint, with transverse bands, similar to that in *P. Torquatus*, though, perhaps, of a more mottled character.

The lower wing coverts are a light grey, inclined to blue. In addition to these distinctions, there are others of minor importance most strikingly manifest when the two birds are side by side. As the name implies, Hagenbeck's Pheasant is called after Carl Hagenbeck, though it is rather singular that such a useful species as this should not have been freely imported into Great Britain, as it certainly is eminently suited for introduction into British game preserves.

It should make a good cross with *Mongolicus*, yet the introduction of so many different species into a covert is not a

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system that can be advantageously employed. If Hagenbeck's Pheasant were introduced into a covert, it would be advisable to liberate paired birds, as there is always a desire for birds of the same species to associate, better than with those of an "allied" species.

CHAPTER XI

HYBRIDS AND HYBRIDISATION

Mongolian Hybrids

(See also *Phasianus Mongolicus*)

IT is only during this last few years that the Mongolian Pheasant has come so much to the front in the estimation of British game-preservers. Previous to the introduction of the Mongolian, the author believes that the ring-necked Pheasant was the predominating bird in the coverts, and for the introduction of fresh stock, pure bred specimens of the Chinese Pheasant (*P. Torquatus*) were relied upon, just as the pure Mongolian (*P. Mongolicus*) is used at the present time.

The Mongolian Pheasant possesses distinct advantages over both the Chinese and the Japanese for the production of hybrids, either half or three-quarter bred. The Chinese Pheasant has certainly proved its value so much, that it is mainly responsible for the ring-necked Pheasants now widely distributed throughout game preserves. When the Japanese Pheasant was first of all used for crossing with the common Pheasant, either as *P. Colchicus* or hybrids derived from the latter and the Chinese, great expectations were anticipated, and it certainly was a decided success, so far as the first generation was concerned. Subsequent experiments, however, have conclusively proved that the perpetuation of *P. Versicolor* in *succeeding* generations has exercised a detrimental influence,

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and the author does not believe that anyone engaged in raising Pheasants for the covert are any longer desirous of using the Japanese Pheasant for such purposes. The beauty of its plumage was, in a measure, responsible for the limited popularity it enjoyed. Proof has been established, beyond all question of doubt, that the vigorous nature of the Mongolian Pheasant renders it unrivalled for establishing a hardy and prolific sort of Pheasant for sport, and the more widely its utility becomes known, the more eagerly it will be sought after. Mongolian hybrids are as fertile, in fact more so, than the common ring-necked birds, and it will be a difficult matter to mention any material facts adverse to the laudatory terms applicable to Mongolian Pheasants, either in their pure or mixed states.

The production of hybrids is not, as a rule, a matter of much difficulty, but two factors of paramount importance have to be considered, and not only must they be considered *theoretically*, but established by practical demonstration. It is upon the demonstration of such facts that the true value of *hybridisation* depends.

Fertility of the hybrid is an indispensable feature, it being well known, in fact, part of the general law that sterility frequently accompanies the production of the hybrid, either of the first or succeeding generations, therefore it is useless to utilise a cross that establishes this condition of affairs, and it would be a difficult matter to find an instance where such prejudicial effects could be more pronounced than in the preservation of game.

None the less important is prolificacy and early maturity. The production of eggs, either in or out of covert, or for that matter in the aviary, constitutes one of the most valuable assets in game-farming operations. There are many other factors that have to be considered by the Pheasant-rearer,

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which may be briefly summarised as follows :—(a) To maintain a vigorous constitutional stamina ; (b) to produce birds that are not only strong flyers, but possessed of a high degree of flight ; and (c) to increase the beauty of the plumage as well as the weight and size of the bird.

The edible qualities have also to be considered, fineness in the grain of the flesh being to the epicure a most desirable feature. As the male parent usually predominates in the production of soundness of constitution, hardihood and physical development in other respects, it is advisable to mate pure-bred Mongolian cocks with black-necked hens (*P. Colchicus*), and the product of this generation will be, if pure-bred birds have been used, a brood consisting of half Mongolians and half *Colchicus*. If the hens of this generation are then mated with a pure Mongolian again, three-quarter bred Mongolian generation is established, and finally if this latter generation are again mated with a pure Mongolian, the product should be birds of the true Mongolian type, the black-necked element having been finally bred out. Theoretically the converse applies, when a Mongolian hen is used, but the exclusion of type is less clearly defined in the case of a female, therefore it is advisable to insure “fixity of breed” by commencing on the male side. Individuality is more lasting under these circumstances.

Although the Pheasant is a polygamous bird, it is not advisable to allow him, either in the pheasantry or in a covert, more than from five to eight wives, a proportion that should be borne in mind when the cock birds are killed off at the end of the shooting season, but it is not expedient to deplete the male stock too much. On the other hand, the old cock bird will be a nuisance to the young ones in the spring, as well as destroy the chances of successful later broods, by harassing the hens. Moreover the old male birds often lead

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the young ones astray, so that what with amorous overtures towards the hens, and the not infrequent damage to the chicks, as well as establishing precedent towards straying, it becomes the solemn duty of the keeper to see that his work is not outwitted by the presence of too many male birds in the coverts. Some keepers make a practice of catching up the young cock birds in sufficient number, and keeping these in pens until satisfied that they have made a clean sweep of surplus male birds. When this has been done the penned cock birds are released, and in doing so, it is necessary to let the birds go into the same coverts from which they were *originally* taken, otherwise the object in view will probably be defeated.

It is customary now on many game preserves to turn down a few Reeves' cocks and hens in order to improve the plumage of the birds in the coverts as well as the strength and speed of flight, the Reeves' Pheasant being one of the most remarkable birds when on the wing.

A good deal of discussion has taken place concerning the fertility or otherwise of Reeves' hybrids, and the matter must still be considered as *sub judice*. The Reeves are certainly beautiful birds, and they will hybridise not only with other members of the same genus (*Phasianus*), but with those belonging to other genera, such as that of *Thaumalea*, *Euplocamus*, etc. It is not advisable, in the author's opinion, in view of the uncertain fertility of the hybrid, to introduce many Reeves' into the coverts, excepting in game preserves in mountainous localities, where the trees are tall, and the birds have practically an unlimited range of flight—ideal conditions for Reeves' Pheasants to exist in.

In the aviary, the production of hybrids having magnificent plumage, though sterile, has not the significance attachable to the covert bird, or at anyrate, such as are expressly

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bred for sport. A cross not uncommonly resorted to is that between *P. Mongolicus* and *P. Versicolor*, in other words the Mongolian and the Japanese Pheasants are mated, the product being hybrids both fertile and vigorous, though not equal to that of the Mongolian and *Colchic* species.

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The Ring-Necked Pheasant

At the present time this hybrid is the commonest in the British game preserves, and has been produced by a combination of the Chinese Pheasant (*P. Torquatus*) and the black-necked Pheasant (*P. Colchicus*). It is a very prolific hybrid, and breeds true to type. On many preserves it has been crossed with the pure Mongolian (*P. Mongolicus*), and this has had a salutary effect. The result of this will be in the majority of preserves, Pheasants one third *P. Colchicus*, another third *P. Torquatus*, and the remainder *P. Mongolicus*, a regular triple hybrid, nevertheless by no means despicable birds.

Macgillivray in vol. i. of *British Birds*, in speaking of the ring-necked Pheasant, says :

“ The proportions of the parts are precisely the same as in the common Pheasant. The Tarsi have about seventeen scales in each of their anterior series. The first toe has five, the second nine, the third twenty, the fourth seventeen scutella. The spur is conical, blunt, and four-twelfths of an inch long.

“ The feathers of the upper part of the head are oblong and blended ; of the rest of the head and the upper part of the neck, imbricated and rounded ; of the fore-neck and breasts,

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broad, slightly emarginate or abruptly rounded ; of the back, broad and rounded ; of the rump, elongate with loose filaments ; of the sides, very long ; of the abdomen, downy ; of the legs, soft and rather short. There is the same tuft of small feathers over the ear. The wings and tail are precisely similar, even to the concavity of the extremities of the longer feathers of the latter.

“The bill is horn colour, or greyish-yellow, tinged with green ; the nasal operculum, flesh colour. The iris is yellow, and the bare papillar space about the eye, crimson.

“The upper part of the head is brownish-green, the forehead, sides and tuft, deep green. The upper part of the neck is deep blue, glossed with purple and green, the latter predominating behind. At the lower edge of this dark-coloured part is a white band, extending along two-thirds of the circumference of the neck, narrow behind, broader at the two anterior extremities. This band is composed of white tips only. The rest of the fore-part of the neck is of a rich coppery tint, glossed with purple in some lights, fading below into brownish-yellow, of which colour also are the sides. On the neck and breast each feather has a terminal margin of purplish-blue, which in some lights is black. This margin is distinctly indented, but the emargination gradually disappears on the lower feathers. The middle and lower part of the breast is blackish-brown, glossed with green. The fore-part of the back is yellowish-red, each feather slightly margined with black, and having a central oblong spot of the same. The scapulars are redder, with a slight black tip, the central part dull yellow mottled with dusky, and margined with a black band. The hind part of the back is confusedly variegated with yellowish-red and green. The feathers of the rump are of a deep red at the ends, variegated with green tints. The tail feathers have the shaft dusky, the central

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part dull greenish-yellow, with transverse black bars, exterior to which is a broad longitudinal band of dull red, then the broad loose margin, glossed with green and purple. The lateral feathers are gradually more mottled with black. The upper wing coverts are dull yellow, the inner edged with dull red; the quills, wood-brown tinged with grey, barred with greyish-yellow; their coverts similar.

“The esophagus is 9 inches long. The crop commences at 4 inches from the top. The stomach is $2\frac{1}{4}$ inches long. The intestine 6 feet 6 inches; of which the duodenal portion is 11, the rectum 6. The cæca are $16\frac{1}{2}$ inches long, their greatest diameter $\frac{19}{2}$, their extremity obtuse.

“Length to end of tail, 35 inches; extent of wings, 32; bill along the back, $1\frac{1}{4}$; along the edge of the lower mandible, $1\frac{5}{2}$; tarsus, 3; first toe, $\frac{7}{2}$, its claw, $3\frac{1}{2}$ twelfths; second toe, $1\frac{1}{4}$, its claw, $5\frac{1}{2}$ twelfths; third toe, 2, its claw, $\frac{7}{2}$; fourth toe, 2, its claw, $\frac{5}{2}$.

“Length of another individual, 35 inches; wing from flexure, $10\frac{1}{2}$; tail, $20\frac{1}{2}$; bill along the back, $1\frac{2}{2}$; along the edge of the lower mandible, $1\frac{4}{2}$; tarsus, $2\frac{3}{4}$; first toe, $\frac{7}{2}$, its claw, $\frac{4}{2}$; second toe, $1\frac{4}{2}$, its claw, $5\frac{1}{2}$ twelfths; third toe, $2\frac{1}{4}$, its claw, $\frac{7}{2}$; fourth toe, $1\frac{5}{2}$, its claw, $\frac{5}{2}$; spur, $\frac{1}{4}$.

“The female of this variety I am unable to distinguish from that of the other or common kind.

“There is before me at present an individual in all respects similar to that above described, only that the ring is reduced to a slight spot on each side of the neck, four or five feathers there having a white tip. Were these five feathers pulled out, there would be no difference between it and the common bird.

“In general the common ringless Pheasant has the colours somewhat deeper than the ringed variety; but in both kinds there are slight variations in the colouring. Individuals

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speckled or patched with white are not uncommon ; others entirely white are sometimes seen. A more beautiful variety is that which has been named the Bohemian Pheasant, which, like the ring-necked, may be considered as a distinct race. All the races and varieties breed together, and the produce is equally prolific, a fact which of itself is sufficient to prove their specific identity."

Phasianus Principalis Hybrids

The Prince of Wales Pheasant has been crossed with the black-necked, and the birds resulting from this cross are very beautiful in their plumage, and particularly sharp on the wing, but as *P. Principali* is undersized when compared with *P. Mongolicus*, it follows that the hybrids are smaller, and this loss of size is an important item to the Pheasant-raiser, to the sportsman, but above all to the game-dealer and the public.

Principalis hybrids are very prolific layers, but their eggs are rather small, as might be expected. It is a hardy hybrid, but the author believes that all game-rearers will agree with him that it is distinctly inferior, in nearly every respect, to the *Mongolicus* hybrids. *P. Principalis* would be better crossed with pure Mongolian hens, or perhaps what would be more advantageous, would be to mate a pure Mongolian cock with a Prince of Wales hen. This would, to a certain extent, diminish the tendency towards the reduction in size of the birds, as physical development is more likely to be perpetuated on the male side. The pure black-necked Pheasant rather favours reduction in size, and this is augmented by using *P. Principalis* on the male side.

The Prince of Wales Pheasant is by no means an unsatisfactory bird in the covert, whilst it has certain qualities

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which recommend its introduction. For instance, it will correct any tendency towards sluggishness of the birds on the wing, being, as previously stated, a particularly sharp bird in this respect. It possesses no objectionable qualities, and when a species of Pheasant is free from such, there can be nothing against its introduction into a covert.

Versicolor Hybrids

It is not necessary to say very much concerning Japanese Pheasant hybrids, as the matter has already been considered when speaking of *P. Versicolor* in the chapter devoted to this bird. This species of Pheasant as a hybrid with *Colchicus*, or even for the production of hybrids from the common ring-necked birds, is by the majority of Pheasant-raisers regarded as a failure.

As stated elsewhere, it is not wanted in the coverts, and any qualities that it does confer are of too evanescent a character to justify one to encourage its usage. Whatever can be done with it must be in association with a strong stock of Mongolians.

Albino and Pied Pheasants

In the coverts it is not at all uncommon to shoot birds with white feathers freely interspersed amongst the rest of the plumage, but the degree of such albinism varies considerably from a mere sprinkling to one of complete transformation, though pure white birds are certainly uncommon in the coverts, unless introduced from without. Importers of game birds supply Albino Pheasants, and many gentlemen purchase several pairs of these birds for turning down in the

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game preserves, in order to introduce a pied variety into their preserves. Considering the number of Albino Pheasants that are supplied by dealers in live game birds, the inference is that a permanent white race has been established, but for what reason it is difficult to estimate. White Pheasants are poor layers, not particularly hardy, and their eggs frequently infertile. Pied cock birds are more liable to perpetuate the pied plumage than the hens, and there is no doubt that the common ring-necked Pheasant, when mated with a white bird, or with a pied one for that matter, has a better chance of producing pied offspring than in the case of a pure bird such as *P. Colchicus*.

Reversions to original plumage are of common occurrence, and it is impossible to lay down any established law that will guide one in the production of pied birds, or even of albinos.

The assumption of what may be regarded as strictly winter plumage, either in a partial or complete manner, is common to many species of both winged and ground game, likewise to some vermin, being obviously developed for protection, by harmonising with the snow.

Typical examples are afforded by the Mountain Hare, the Ptarmigan, the Ermin, and certain other members of the Mustelidæ. Albinism is the converse of melanism, in which the plumage assumes an intense blackness. In animals, deafness is frequently associated with albinism.

CHAPTER XII

THE FORMOSAN RING-NECKED PHEASANT (*Phasianus Formosanus*)

THIS species inhabits the Island of Formosa, where the birds are numerous. In many of its features it strongly resembles *P. Torquatus*, but differs from this in the paleness of its ground colour; moreover the margins of the feathers have a deep border of a purplish green.

STONE'S PHEASANT (*Phasianus Elegans*)

Mr Stone sent two specimens of this species to the Zoological Society's Gardens, which he obtained in the Yun-ling Mountains. The male bears a resemblance to the hybrids produced from *Colchicus* and *Versicolor*, whilst the female has the upper part of the throat and neck white, the under parts of the body in front having irregular black bars. The chest, breast and sides of the belly are a very dark green, and the medium wing-coverts, greenish-grey.

THE CHINESE RINGLESS PHEASANT (*Phasianus Decollatus*)

As the name of this species implies, it is destitute of the white ring, so characteristic of the allied species *P. Torquatus*, and the crown of the head is a very dark green, and not bronze-green, as in the true ring-necked Pheasant. In some

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instances traces of a white ring are found, thus bringing the two species now under consideration into very close touch with one another.

The ringless Pheasant is found in Western China from Western Yunnan to Southern Shensi, eastwards to the Shinling Mountains and westward to Quei-Choo, where it inhabits the grassy slopes on the sides of the mountains.

CHAPTER XIII

BARRED-BACKED PHEASANT

THE Pheasants belonging to this class are closely allied to those of the genus *Phasianus*, the essential difference being the black-and-white "bars" on the lower portion of the back and the rump, and there are only sixteen feathers in the tail instead of eighteen, as in *P. Colchicus*.

Only two species are recognised, viz., Elliot's and Hume's.

ELLIOT'S PHEASANT (*Phasianus Ellioti*)

It is to the credit of Consul Swinhoe that this species of Pheasant was first discovered, he having found these birds inhabiting the mountainous locality of the Province of Che-Kiang.

The nomadical nature of Elliot's Pheasants is against the introduction of this variety into British game preserves, though it has been introduced.

The length of the male bird is about 33 inches, and the feathers of wings, shoulders and breast, are bronze-red. Extending across each wing are two white bands. The feathers of the belly are white, and those of the rump black. Tail feathers barred with grey and black.

The female is a light drab, with mottling and bars of black.

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HUME'S PHEASANT (*Calophasis Humei*)

Hume's Pheasant inhabits the mountainous portions of Manipur (especially about the streams), Lushai and the Chin Hills, extending through the Kamhow Territory into Eastern Lushai.

The feathers of the chest and neck are steel blue, with purple reflections, and belly and flanks chestnut, and the breast feathers same colour with reddish margins. Tail barred with chestnut and black.

This species of Pheasant was first described by Mr Hume, who obtained both a living and dead specimen during his travels in the East.

CHAPTER XIV

THE GOLDEN PHEASANT (*Thaumalea Picta*)

THE Golden Pheasant, belonging to the genus *Thaumalea*, species *Picta*, is a most beautiful variety, and one that is highly esteemed for the aviary, being hardy and thriving well in confinement.

These Pheasants are natives of the Western Central Districts of China, and were well known during the time of Linnæus (1766); in fact, this eminent Naturalist gave a description of these birds, though evidently unaware that they were indigenous to Eastern Europe. Goldsmith, in his *History of the Earth and Animated Nature*, refers to the Golden Pheasant under the name of *Phasianus Pictus*, to which genus neither the Golden or the Amherst Pheasants belong, but exclusively to that of *Thaumalea*, characterised by the presence of a "Crest" or "Circlet" of feathers, proceeding from the top of the head, and pointing backwards, and also by a "Tippet" encircling the neck along the upper border and sides.

Being a hardy variety, the Golden Pheasant does very well reared in outdoor aviaries, or for that matter, it thrives well under the same conditions as the *Phasianus Colchicus* (Common Pheasant), and the young birds are as able to forage for themselves quite as freely as any other species of gallinaceous birds.

Although the male birds have such gorgeous plumage, the hens are exceedingly plain in appearance, a rule that invariably exists throughout bird life.

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The plumage of the male consists, as previously mentioned, of a "Crown" or crest of orange-coloured feathers, and a tippet of bright orange red, arranged like a frill, and what corresponds to the margin of each frill, is encircled by bluish markings, almost bordering on black. To arrest the attention of the female bird, this collar expands, being displayed laterally as circumstances necessitate.

The development of the complemental plumage and its conspicuous display, constitutes a feature of particular interest amongst birds, both domesticated and otherwise.

At the base of the neck, following the feathers composing the tippet, the feathers have a ground substance of green coloration, with a deeper colour around the margins, forming a marked contrast with the brilliant yellow feathers of the back, and crimson ones covering the scapular, or shoulder bones. Beneath the body and covering the breast, the feathers are a combination of scarlet and orange, but on the throat, light brown. The tail is exceedingly graceful, and consists of long feathers, some of which are spotted, others barred, the upper tail coverts being an admixture of orange and crimson. It is impossible to conceive anything handsomer than a cock Golden Pheasant in full plumage, so that one need hardly wonder why these birds are held in such high esteem by fanciers.

When Golden Pheasants are kept in outdoor runs they should be pinioned, which is preferably done when the birds are about a month or six weeks old. To do this, take each bird in the hand, spread out the wing, and remove a portion, preferably to include the first joint, and a little above it, which prevents flight to any height beyond several feet. Any slight bleeding that occurs is of no practical importance, but to heal the wound touch it with a little compound Tincture of Benzoin.

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The Golden Pheasant is naturally a shy bird, easily frightened, and has a disposition to revert to its wild instinct, which, once acquired, is very difficult to wean it from, in fact almost impossible; therefore birds intended for the aviary must, as previously stated, be pinioned.

The aviary should be provided with nests for the hens, which produce a variable number of eggs, according whether young or old birds. A young hen usually lays about one dozen eggs in a single season, whereas an older one will produce from twenty-five to thirty-five or forty eggs, and the incubative period is three weeks and three days (domestic fowl, twenty-one days). Although Golden Pheasants do very well when hatched by artificial means, the birds are stronger when brought forth under the care of a broody hen, or a combination of the natural and artificial methods may be employed. The eggs can be placed in the incubator for the first twenty-one days, and the incubative period then completed under a hen, or perhaps what is still better, the eggs may be placed under a hen for twenty-one days and the hatching process then completed in an incubator. All eggs should be removed from the aviary as soon as laid, otherwise the birds will probably acquire vicious habits. Regarding the number of hens to be allowed for each male bird, most authorities are agreed that from four to six is quite sufficient. It is a mistake to breed stock from one-year-old hens, the second season being the best for the production of vigorous birds; moreover, early mating is not necessary in the case of fancy Pheasants.

The cock birds do not assume their attractive plumage until they have moulted in the second summer, which is the best evidence one can have, as afforded by nature, as to the physical fitness of the birds for mating purposes. The best food for the broods consists of either ants' eggs, or maggots, in conjunction with maize-meal, barley, or wheat-meal

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(previously scalded with boiling water), and hard-boiled eggs, chopped up very fine. Such vegetables as lettuce, spinach, turnip-tops, cress, or other green food given in the same manner, are invaluable adjuncts as food for young Pheasants. A question that naturally presents itself to the mind of a thoughtful reader is, "What shall the first meal be composed of?" Some advocate soft food only, others advocate dry feeding. If the former plan be followed, the eggs must be boiled until they are quite hard, and as soon as cold, the shell removed, the contents broken up into a finely divided state, and subsequently mixed with double the quantity of scalded meal, such as biscuit meal, stale bread, barley, maize or wheat, the chief secret being to prepare the food freshly each time, as there is nothing more pernicious than fermenting or sour food.

The addition of a little sweet milk will be found advantageous. Whatever meals are used, they must be well scalded, so as to swell the particles of meal. Pheasant chicks do not require any food for the first twenty-four hours, there being sufficient nourishment absorbed by the chick, immediately before it breaks through the shell, to last it for the time specified; in fact some Pheasant-rearers don't give the birds any food until the youngsters are at least twenty-four hours old, and the young birds generally do quite as well, if not better, than those supplied with food earlier do.

The birds must be protected against their many foes, and the best plan of doing so is to keep each coop enclosed in a wire run, various portable forms of which are on the market, and can be obtained for a comparatively small sum of money.

As in the case of all other young birds, the advisability of placing the coops on ground where there is plenty of insect life is a matter of the utmost importance, and must

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never be lost sight of. Adult male birds agree very well, and will live in perfect harmony when kept apart from the hens; therefore anyone contemplating keeping Golden Pheasants for the beauty of their plumage, can safely purchase a number of cock birds to live in the same aviary, and the most suitable food for both those and the hens is maize (bruised), barley, oats, wheat, etc., and the birds should be fed three or four times daily, with a little warm food in winter.

It is better not to provide perches for the young birds until they are at least three months old, but adult birds, likewise young ones, after the period specified, must have suitable perches placed well apart, so that they will not damage the plumage of one another, which they are very apt to do, if allowed to roost too close together.†

Hybrids have been produced from Golden and common Pheasants, but it would appear that the product of the cross has nothing to recommend it, whilst it has the reputation of drawing other birds from the covert, a feature of the most objectionable kind, nevertheless one that is of paramount importance to the practical Pheasant-raiser.

Typical specimens of Golden Pheasants, in perfect plumage, can be obtained for about fifty shillings per pair, others in a less perfect state for forty shillings per pair, but a good deal will depend on circumstances, as the author has had magnificent birds offered to him for very much less than the prices quoted.

To preserve the beauty of the plumage, it is necessary to adopt measures, in the aviary, to prevent the birds from sudden fright, especially at night-time. This can be done by arranging blinds of thick green holland, so that the whole of the interior of the aviary will be in complete darkness, even during the brightest nights. The screens can be fixed

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to hooks, above and below, which will prevent the sheets from flopping about during a windy night.

Elliot, in his valuable Monograph on the Pheasant, describes *Thaumalea Picta* as follows ; and it will be noted that the description given is a very accurate one, coinciding with what one finds actually exists in typical specimens of the species :—

“ One of the longest known species of Pheasant, but it still retains its position as one of the most beautiful. Early introduced into Europe from China, its native country, it is familiar to everyone, and no bird is more suited, both as regards its gentle disposition, and strong contrasting colours of plumage, to become an inhabitant of the aviary. It breeds readily in confinement, and the chicks are not difficult to rear, but grow rapidly. Nothing is more beautiful than to see a number of these birds scattered about upon a lawn, their active movements executed with much grace, while their scarlet breasts appear to great advantage against the bright green grass. The ruff of the male is capable of considerable extension, and when paying his addresses to the female, he is accustomed to draw it entirely over the side of his face which is nearest to her.”

Mr Swinhoe has furnished the following facts regarding this species :—

“ *T. Picta* is found in the provinces of Hoonan, Kweichou, Yunnan, S.W. Hooper and S.E. Szechuna. It is very common about the mountains near Ichang, and is brought from thence to the Hankow market. Europeans have shot it near the banks of the Yangtse, 100 miles north of Hankow. It is taken to Canton and exposed in the bird shops for sale. Those offered are nearly always males, and

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wild captures. The Chinese do not offer to hunt them in captivity. A different species of cross is met with in Japan, wanting the spots on the tail, and with darker ruff and blackened chin and throat. I could not ascertain whether this was wild in Japan. It may have been introduced there from China in former years, and altered in the course of time. The Japanese breed Pheasants and produce strange crosses. I saw a bird of very curious appearance at Yokohama, which looked to me like a hybrid between Silver and Gold Pheasants. I also saw in the shops *P. Torquatus*, but I believe the examples of these were lately brought from China."

The black-throated bird referred to above by Mr Swinhoe has been described as distinct, which it appears to be, as it presents many differences from the present species in all stages of plumage. When at Antwerp lately, I saw a male, *T. Amherstia*, which was mated with a female, *T. Picta*, and six eggs were the result. Whether they will prove fertile or not remains to be seen, but a cross between these species could not be otherwise than beautiful.

Of the habits of this species we know absolutely nothing, collectors appearing satisfied with obtaining so charming a bird, without paying any particular attention to its mode of living.

Pere David writes in the *Zoological Proceedings* for 1868:—

"That the *T. Picta* is unknown in the North of China, and that without doubt it is an error to state that the bird is found in Dauria. It is more probably an inhabitant of the mountains in the centre of China and further westwards in the same latitude."

The male of this beautiful species has the tip of the head and the occiput covered with a long silky amber-coloured

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crest, and extensive ruff, springing from the back of the head hiding the neck. The feathers of this ornamental appendage are deep orange red, with a dark blue bar at the tip, and can be stretched out and brought over the face at will; mantle, deep green, tipped with velvety black; scapulars, dark crimson; primaries, brown, with a line of buff on the outer web; terminal portions of shaft, buff; secondaries, deep brown, mottled with chestnut; tertiaries, rich blue; back and rump, golden yellow; throat, bright rufous brown, rest of the under parts scarlet; upper tail coverts (very long and narrow), crimson; tail, very long, the two centre feathers, rich rufous brown, covered with irregular circles of blackish-brown, giving to them the appearance of being spotted with buffy brown. The rest of the tail feathers diagonally crossed with dark brown. All the tail feathers are buff at their tips; below, greenish-yellow; feet and tarsi, pale green.

Female.—Head and back of neck, blackish-brown, barred near the tips with yellowish-brown; upper part of back, blackish-brown, barred with rufous and tipped with greyish-brown; wings, black crossed with bars of light yellowish-brown, and dotted with black; primaries, blackish crossed on inner webs with chestnut, on outer with yellowish; under parts, buff, barred on chin, breasts, and thighs with blackish; middle tail feathers, black, barred irregularly with yellowish-brown; outer tail feathers, chestnut, crossed with fine black lines, at intervals of half an inch, the outer edges mottled with black; bill, horn colour; feet and legs, flesh colour.

CHAPTER XV

THE AMHERST PHEASANT (*Thaumalea Amherstiae*)

(The Flower Pheasant)

THIS is a very beautiful species, in many of its features closely allied to that of the Golden Pheasant, with which it forms an admirable hybrid, excelling in beauty of plumage that of either the Amherst or the Golden; and anyone interested in the breeding of Pheasants cannot do better than mate these two species together, and hybrids thus produced are perfectly fertile, which is exactly what one would expect, when two birds belonging to the same genus, though of a different species, are mated together.

The Amherst Pheasant is, however, a most useful addition to the coverts, improving as it does the brilliancy of the plumage of the common Pheasant. The first pair of birds of this species introduced into Great Britain were brought over from India by Lady Amherst, to whom they were given by Sir Archibald Campbell. This was about 1828, but it was not until 1869 that these birds were imported into the Zoological Society's Gardens, at Regent's Park, where they bred freely in the aviaries. Subsequently other birds were imported by Mr Stone, and the result has been that Amherst Pheasants are not at all uncommon in the aviaries of Pheasant farms; likewise in many coverts.

In its native haunts the Amherst Pheasant is said to be most abundant about the rocks of desolate mountains, and that it prefers to inhabit these localities, in preference to forests. It is a slightly larger bird than the Golden Pheasant,

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and one of its chief characteristics is a white tippet, the feathers of which have a marginal dark-greenish band, with a secondary band narrower than the first one. The skin of the face is light blue, and the feathers of the forehead green, whilst those which form the crest are a brilliant combination of orange and scarlet. The wing coverts, the back, breast, shoulders, front of the neck are metallic green, whereas the lower portions of the breast and belly are white. Tail coverts have green and white stripes down the middle with scarlet tips and brown bases. The two upper middle tail feathers are laced. The legs and feet blue. The hen is a deep chestnut brown, barred with a darker brown, and in many respects similar to that of the Golden Pheasant.

A peculiarity about the Amherst Pheasants when living in coverts is that the birds of this species keep together, and quite apart from the other Pheasants; yet in spite of this fact, the Amherst will, as previously stated, breed with the common Pheasant.

Although the account given by Gould in vol. vii. of his *Birds of Asia* is to some extent obsolete, the fundamental facts nevertheless remain true; therefore the author thinks it advisable to quote what Mr Gould says in the volume alluded to:—

“This very remarkable member of the *Phasianus* was brought into notice first time in 1828 by the late Mr Benjamin Leadbeater, who in a paper read by him at a meeting of the Linnæan Society of London, on the 2nd December of that year, stated that the return of His Excellency, the Right Honourable Earl Amherst, from India, has made us acquainted with one of the most splendid examples of the genus *Phasianus* that has been submitted to the notice of ornithologists for many years past.

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“Two males of this species came originally from the mountains of Cochin China, and were presented by the King of Ava to Sir Archibald Campbell, who gave them to the Countess Amherst. Her Ladyship retained them in her possession about two years, and ultimately succeeded in bringing them to England alive, but they only survived the voyage a few weeks.

“The general character of this bird and the arrangement of its plumage are similar to those of the Golden Pheasant. When Lady Amherst brought home the two specimens from which Mr Leadbeater's characters were taken, nothing certain was known of their history, of the locality where they came from, or of the country of which they were natives, and the time that has elapsed has not enabled us to acquire this very desirable information. It is now, however, believed that the bird is an inhabitant of the Chinese province of Yunnan, and the adjoining regions of Thibet. It is seen how Lady Amherst became possessed of her two specimens. One which was presented to Mr Leadbeater by Lady Amherst passed into the possession of the late Earl of Derby, and now forms part of the vast collection bequeathed by his Lordship to the town of Liverpool.

“Mr B. H. Hodgson, formerly a British resident in Nepal, who was well known for his devotion to natural history, obtained two specimens, which had been brought into Napalese territory from some distant country. They are now in the British Museum, and two more have, I believe, been sent to Paris. The six specimens enumerated, all of which are males, are probably all that have yet been collected. It would be my great pleasure to see a female of this fine bird, and every ornithologist would be truly grateful by the arrival of any information respecting the part of the Celestial Empire in which it dwells, and as to its habits. The bird

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would doubtless be as easily kept in our aviaries as its known ally the Golden Pheasant, and it is my urgent wish to see it thus located before I leave this lower world for the higher and brighter one that is the end of all our hopes and desires.

“Irides, white; naked skin surrounding the eyes, light verditer blue; feathers of the crown, green, crossed with crimson; pendant tippet, white, each feather tipped with a narrow crescentic dark green tone, with an edging of a lighter tint, and a straight point of the same kind about $\frac{3}{4}$ of an inch from the tip; neck, back, shoulders, chest and wing coverts, beautiful metallic green, each feather tipped with a broad zone of velvety black; primaries, dark brown, with lighter shafts and white edgings; greater wing coverts and secondaries, bluish-black; breast and tail, white; thighs and under-tail coverts, mottled brown and white; legs, light blue; feathers of the rump, brown at the base, green in the middle, and the exposed portion, bright saffron yellow; tail coverts, brown at base, barred with green and white in the middle, and ending in scarlet; two broad middle tail feathers, olive grey, crossed with bars of green, about $\frac{3}{4}$ of an inch apart, between which are a series of oblique wavy lines of a blackish-brown. Remaining feathers have the inner web narrow and mottled with black and white; the outer web, with curved brownish-green bars, about $\frac{3}{4}$ of an inch apart, on a ground the inner portion of which is greyish-white, the outer chestnut brown.”

CHAPTER XVI

THE SILVER PHEASANT (*Euplocamus Nycthemerus*)

THE Silver Pheasant belongs to the genus *Nycthemerus*, and like that of the Golden, Amherst and certain other birds, does not belong to the Pheasants proper, although it is customary to regard it as a species of Pheasant. Its handsome appearance renders it a desirable acquisition to the aviary, provided it can be kept apart from the other inmates, because its pugnacious proclivities prevent it from being suitable to associate with other members of the aviary.

It is sometimes spoken of as the Silver Kalage Pheasant, the White Chinese Pheasant, the White Fowl, Silver Fowl, etc. This bird was referred to by Albin in 1738, and by Edwards in 1751, being spoken of by Linnæus under the technical term of *Phasianus Nycthemerus*. It is indigenous to the mountain ranges of Southern China, Fo-kien and Che-kang, but being a very hardy species, there is not the slightest trouble experienced in rearing the Silver Pheasant in confinement; consequently it is very common in British aviaries. It is only in exceptional instances that these birds are found in British coverts, into which it is a most undesirable acquisition, as it not only drives the other birds out of the preserves, but its manner of flight is so low that it is practically useless for sporting purposes.

The Silver Pheasant is easily tamed, but during the mating season it develops vicious qualities not only towards other birds but also towards human beings, which it is liable

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to attack in a most determined manner, and may do serious harm unless its spurs have been removed. The huge development of the spurs renders it particularly dangerous in this respect, so that if it is necessary to keep it amongst fowls, etc., it is better to remove the spurs.

As previously stated, the male bird is particularly handsome, whilst the female is a much bigger and finer bird than those belonging to either of the genera *Thaumalea* or *Phasianus*.

The leading characteristics of the Kalage Pheasants are the presence of a long hairy crest, laterally compressed tail feathers, and the long spurs. In the male bird the crest is composed of numerous long, fine purple feathers, covering the crown of the head, and projecting backwards about half-way down the neck. The beak is a light horn colour, the upper mandible being very strong, hooked, and projecting about $\frac{1}{8}$ of an inch below the lower one. The skin of the face and wattles is crimson, and most brilliant during the pairing season. The feathering on the back and upper part of the neck, as well as that immediately behind the cheeks, is almost pure white, excepting in front of the throat, where it is purplish-black, and continuous with that of the breast and under parts of the body.

The feathers on the back of the neck are very finely pencilled, the lines radiating obliquely, the colour of the markings being brownish-black. It is the beauty of these dark markings on a white ground-work that confers the silvery aspect so characteristic of these Pheasants. The markings of the feathers on the back are broader.

A peculiarity is the presence of some white-shafted feathers on the sides of the breast. The wing coverts have longitudinal, sinuous, dark markings, extending from base to apex, whilst the markings on the quill feathers are

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arranged obliquely, each one being fairly broad, but less distinct on the surface of the under wing.

There are a pair of central, laterally compressed, very long tail feathers, pure white, and on either side of these, seven other tail feathers, each with pencilling corresponding to that of the feathers on the back.

The feathers of the breast, sides, thighs and under part of the body are blackish-purple, emitting a purple reflection. Legs and feet, red, with a sharply pointed spur, about an inch in length.

Length of the shank (*Tibio-Tarsus*) is a trifle over 3 inches, thickness $1\frac{1}{4}$ inches. The total length of the bird about 36 inches; length of tail about 20 inches; girth, 15 inches, as measured beneath wings, but outside wings, 18 inches.

In general build the female is distinctly massive and altogether bigger than *Colchicus*. There are sixteen tail feathers, there being four central dark-brown ones of about equal length, and on either side six feathers, with blackish-brown markings, the brown colour predominating.

The quills are chocolate brown, with the primaries and secondaries a light buffy brown, corresponding to that of the general body colour, which is much lighter on the breast, sides and thighs, but each feather is studded over with minute brownish-black spots, corresponding to those of the male, though the markings are disguised by the prevailing brown colour.

The throat is of a lighter brown. The legs are red, and the spurs very rudimentary. Length from tip of tail to point of beak, 26 inches; girth outside the wings, $16\frac{1}{2}$ inches; girth inside wings, 13 inches; girth round thighs, $4\frac{1}{2}$ inches; length of central tail feathers, 10 inches.

The crest is of a much deeper brown, and only about half the length of that of the male bird.

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In concluding the description of the Silver Pheasant it is necessary to add that these birds vary somewhat in size, especially the hen, but as a rule the average measurements are those given by the author.

Concerning prices, a cock and hen can usually be bought for about a guinea, whilst the average number of eggs produced by the hen is from ten to fourteen, and the hens are good sitters and good mothers. The *Tibio-Tarsal* bones are much finer in the female than in the male, and the leg scales smaller. Under surface of the feet, white.

CHAPTER XVII

THE ARGUS PHEASANT

THE Argus Pheasant is an extremely handsome variety and one that constitutes an adornment to any aviary, as the plumage of the birds is of a most gorgeous character when displayed. Specimens can be seen in the Zoological Society's Gardens, Regent's Park, where the birds have bred in confinement. It is a native of North-west Borneo, likewise of Siam and Malacca.

There are really two species of Argus Pheasants, a large one (*Argus Giganteus*) and a small one (*Argus Grayi*), the prefix "Argus" being derived from the ocelli or eye-like spots on the secondary feathers of the wings, which are not visible when the wing is closed.

According to accounts given by the late Mr William Davison and others, these birds, in their native haunts, are extremely shy, it being almost impossible to shoot them, though they can be captured by snares. When in captivity they become very tame, readily adapting themselves to their new conditions, though they have a tendency, on being released from confinement, to revert to their old desire for seclusion.

The total length of the Great Argus Pheasant is nearly 6 feet, this being mainly due to the extraordinary length of the tail, which is almost 4 feet. The skin covering the face and neck, or rather a portion of the latter, is quite destitute of feathers, but of an intense blue colour. Although

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the plumage has a variety of shades upon it, the bulk of it is either brown or yellowish-red, over which are distributed a number of small spots, darker or lighter than the ground colour. The large spots are arranged in regular rows on the secondary feathers, close to the front border of the shaft of the feathers, so that when the bird is displaying its plumage the beauty of these spots becomes most obvious.

The ocelli or eye spots are mainly contributory in enhancing the beauty of the plumage, and are displayed to the best advantage during courtship. Each ocellus is about 1 inch in diameter, and stands out like a ball lying within a socket, looking as though the wing were possessed of so many eyes. In each secondary feather there is about a score of these eye spots which are confined to the male bird, the plumage of the hen being very plain and darker, whilst she is altogether smaller than the cock-bird.

The central pair of feathers of the tail, as previously stated, are very long, and during display the apex of each is turned outwards, the pair forming, as it were, a triangle.

The primary wing feathers are brown and covered with black dots, more especially towards their apices and along their front borders, but they are destitute of the ocelli. The beautiful plumage of the male is unquestionably developed for the purpose of attracting the female, as such is chiefly displayed during courtship, and the harmonious blending of the colours only becomes so strikingly manifest at this particular period. When kept in the aviary the Argus Pheasant must be protected from cold, so that it is necessary, in the case of an outdoor aviary, to have canvas screens, capable of being adjusted to suit the variable conditions of the weather.

The author is not aware of any attempts having been

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made to cross the Argus Pheasant with other varieties of the *Phasianidæ*, but it is quite possible that hybrids from the Argus Pheasant could be produced, yet no advantage would be likely to result from the production of such hybrids.

Concerning the Great Argus Pheasant, Bowdler Sharpe, in his *Wonders of the Bird World*, has the following interesting account:—

“The Argus Pheasant of the Malay countries is one of the most splendid birds in existence, and like its namesake has indeed a ‘hundred eyes.’ The whole of the outer web of the secondaries, which are, moreover, of enormous size, is decorated with circular spots of white, yellow and rufous, surrounded by a ring of black, and it is from these eye-like spots that the bird gets its name. In captivity the Argus often displays his wonderful plumage, much as the Peacock exhibits his train for the admiration of the female, by throwing up his wing and bringing it forward to the ground, so as to display all the series of spots on the secondaries. The late Mr William Davison, who explored Tenasserim for years in pursuit of natural history specimens for the great Hume Collection, has given the best and indeed the only account of the habits of the Argus Pheasant with which I am acquainted. One peculiarity about the bird’s life is that the males and females live apart, and the latter appear to have no fixed residence, but wander about the forest, only occasionally visiting the male bird in his ‘drawing-room,’ as Mr Davison calls the playing-ground. The hen bird, he was told, builds a rude nest in some dense cane-brake, and lays seven or eight eggs like those of a domestic Turkey, hatching them out and bringing up the nestlings without any assistance from the male bird. The latter, in fact, appears

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to be almost wholly devoted to the keeping of the drawing-room in order, and is by no means of a quarrelsome disposition. In some parts of Tenasserim the Argus Pheasant is quite a common bird, and many males are found inhabiting the same forest district. If a gun be fired, everyone of the birds within hearing begins to call, and on any alarm or excitement, such as a troop of monkeys passing overhead, they immediately give vent to their note, which sounds like 'how-how!' repeated ten or a dozen times. This note is given out at short intervals when the male is in its clearing, and is answered by every other male in the vicinity. Mr Davison says that the female has quite a different note, which sounds like 'how-owoo, how-owoo!' the last syllable much prolonged, repeated ten or a dozen times, but getting more and more rapid, until it ends in a series of 'owoos' run together. The call-notes of both the male and female Argus travel to an immense distance, that of the former especially being heard at a distance of a mile or more.

"The 'drawing-room' consists of some open level spot, sometimes chosen down in a dark, gloomy ravine, entirely surrounded and shut in by dense cane-brakes and rank vegetation; sometimes on the top of a hill where the jungle is comparatively open, from which the male bird clears everything in the shape of dead leaves or weeds for the space of 6 or 8 yards square, until nothing but the bare earth remains, and thereafter he keeps this place scrupulously clean, carefully removing every dead leaf or twig that may happen to fall on it from the trees above. The food of the Argus consists chiefly of fallen fruit, as well as of ants, slugs and insects. The birds feed in the early morning, and all come down to the water to drink about ten or eleven a.m., and the males then retire to look after their drawing-room for the rest of the day.

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“Mr Davison says that in his opinion these cleared spaces are undoubtedly dancing-grounds, but he was never able to catch one of the birds actually dancing in them. The proprietor was always either seated quietly in the clearing or was moving slowly backwards and forwards, calling at short intervals. Except in the hours of feeding or drinking in the morning and evening, the male Argus Pheasants were always to be found at home, and they roost in the trees close to their clearing. They are remarkably shy birds, inhabiting the depths of the dense evergreen forests, and are most difficult of approach, as they dive into the impenetrable thickets on the first suspicion of danger, and never fly if they can escape by running, even when pursued by a dog. Even if the hunter manages to approach the playing-ground so stealthily that only a few yards separate him from the calling bird, the latter has always disappeared when at last he is able to see into the clearing through the dense intervening foliage. It is therefore impossible to shoot the birds, but they are somewhat easily trapped when once their playing-ground is discovered.

“Thus Mr Davison himself used to catch them by building a hedge of cut scrub round the playing-ground, and leaving four openings for the bird to enter by, each furnished with a running noose attached to a bent sapling, but the Malays take advantage of the idiosyncrasy of the Argus to keep its clearing scrupulously clean, and act accordingly. A bit of bamboo, about 18 or 20 inches long and a $\frac{1}{4}$ of an inch wide, is shaved down till it is of the thickness of writing-paper, the edges being as sharp as a razor. This narrow pliant piece ends in a stout sort of handle at one end, 6 or 8 inches long, which is driven firmly into the ground in the middle of the cleared space. The bird in trying to remove it, scratches and pecks at it,

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endeavouring to dig it up, but finding all its efforts vain, it twists the narrow pliant portion several times round its neck and takes hold of the bamboo near the ground with its bill, then giving a sudden spring backwards to try and pull it up. The consequence is that its head is nearly severed from its body by the razor-like edges of the bamboo.

“Another method is to erect two small posts, about 4 feet high and 3 feet apart, in the clearings, across the top of which a bar is firmly fastened. Over this bar a string is run, by one end of which a heavy block of wood is suspended just under the bar, while the other end is suspended to a peg lightly driven into the ground immediately beneath the block. The bird commencing as usual to clear away these obstructions, soon manages to pull up the peg and thus release the heavy block of wood which falls and crushes it.”

Elliot, in his valuable monograph on the *Phasianidæ*, gives the following description of the *Argus Giganteus* and the *Argus Grayi*:—

Argus Giganteus

“Although known to naturalists for a century, up to the present time nothing whatever has been recorded of the habits and economy of the Great Argus. No European has ever shot it that I am aware of, and its habits of living in the depths of the forests and amid the recesses of dark thickets, renders it very difficult to observe in its haunts. The Great Argus is not capable of very extended flight, the length of the secondary feathers interfering materially with its efforts at progressing through the air.

“Five individuals of this species have at different periods been brought alive to Europe. The first was a male and

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lived for some time in the Zoological Gardens, Regent's Park, where he was the object of great attraction to all who saw him. The other four are now living. One of these is a female, at present in the Gardens of Amsterdam, where I lately saw it. Another male is in the private collection of *Phasianidæ*, belonging to His Majesty, the King of Italy. A pair was originally shipped, but the female unfortunately died on the voyage. The male, as I have lately heard, is in fine condition and very tame. It is to be hoped that the female now at Amsterdam will also become His Majesty's property, and that the race may be continued in Europe. The remaining pair are the property of Baron Rothschild and are now living in the Gardens of the Zoological Society, Regent's Park, and walk about their enclosure with a proud and upright carriage. Unfortunately, the male is shorn of his chief ornaments, as it was necessary to cut the tail and secondary feathers to allow of his introduction into the box which served as his home during the voyage to England. It is apparently not a difficult bird to preserve in confinement, and we may confidently trust that it will, before long, be a familiar object in pheasantries of Europe.

“The Great Argus is accustomed to strut somewhat after the manner of the Peacock, but he has no length of train to display, though he makes up for this by elevating and opening his wings, so that the long secondaries are shown in a semicircle over his back, the spread tail completing the circle and filling up the space between the wings in the centre. This exhibition has an exceedingly beautiful effect, the hundreds of eyes or spots scattered over the feathers giving the bird a very novel appearance.

“The top of the head and occipital crest, black; bare skin of head and neck, rich deep blue; breasts and under parts, deep red with black and buff lines running along the

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feathers; back and wings, black, covered all over with buff spots; rump and upper tail coverts, buff with brown spots; primaries, light grey on outer webs, covered with regular lines of rufous brown spots; inner webs, very light rufous, covered with black spots with rufous centres, a line next the shaft, olive-brown, crossed with fine dark brown lines, then a broad red band spotted minutely with white, running about two-thirds the length of the feather; shaft, orange at base and deep blue for the remainder of the length; secondaries, exceedingly long, dark brown, thickly covered on the outer webs next the shaft with ocellated spots, yellow in the centre then olive with an outer rim of black. From these eyes to the margin of the feather, run narrow blackish-brown diagonal lines. Inner webs covered with round blackish-brown spots, surrounded with very light brown rings; tips of secondaries, dark reddish-brown spotted with white; the shafts white; middle tail feathers very long, greyish on inner web, spotted with white, these spots surrounded with black; outer web, black next the shaft, chestnut on the remaining, spotted with white with black margins. Rest of feathers chestnut, covered with white spots having black outer rims; bill, horn colour.

“Female, similar to male, but without the lengthened secondaries and middle tail feathers; her secondaries, blackish, irregularly marked with buff lines; tail feathers, brown mottled with black.

“Malayan Peninsula, Sumatra (Blyth), Siam (Mouhot), Sumatra, in deep forests (Raffles), Tenasserim River (Blyth).”

SMALL ARGUS PHEASANT (*Argus Grayi*)

“Nothing whatever has been discovered concerning this bird since I described it in the *Ibis* in 1865, and I believe

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that the two specimens in the British Museum are the only representatives known of this species. Considerably smaller than the Great Argus, it also presents various differences in the markings of its feathers which would seem to entitle it to be separated from its longer-known ally. Unfortunately, its habitat is not known with any degree of certainty, as it is doubtful if the two specimens we have come from Borneo, but it is pretty certain that he has come from the localities where *Argus Giganteus* is found, else we should have found more examples of the species before this time. The principal differences between this bird and the larger species consists in the deep red breast and under parts, bright chestnut of the lower part of the neck, the black tail, the small size of the ocellated spots, and also of the dots on the wing and tail, together with the prevalence of white on the back. The other specimen, which appears to be a young male, has the lower part of the breast a yellowish-brown, finely barred with black, the upper portion a light chestnut-red like the more adult bird. The tail is mottled with brown, two of the feathers presenting the white spots.

“ The species may be described as follows :—

“ Bill, horn colour ; base of the upper mandible, black. A narrow line of black hair-like feathers commences at the bill and continues over the top of the head and down the back of the neck, elongated on the occiput, so as to form a crest. The rest of the head and upper part of the neck, bare ; lower portion of the neck and upper part of the breast, bright chestnut-red ; under parts, entirely chestnut, darker on the flanks, each feather irregularly marked with white, bordered on each side with black ; upper portion of the back and wings, blackish, confusedly marked with white ; rest of the back and upper part of the coverts, dark buff, covered with round black spots. The wings resemble those

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of the *Argus Giganteus*, but are much darker, inclined to be black, and have ocellated spots much smaller; tail, black, outer webs dotted with very small and inner webs with larger white spots. The inner webs of the third and fourth feathers near their tips have white marks very much enlarged, giving to this portion a light appearance, but there is none of the rufous colouring so conspicuous on the outer webs of the tail feathers of *Argus Giganteus*. The long middle feathers of the tail are black on their outer webs for about half their width; the rest, chestnut, dotted with small white spots; inner webs, grey, also spotted with white and growing lighter towards the edge."

CHAPTER XVIII

THE EARED PHEASANT

THIS is a hardy variety of aviary Pheasant and forms a remarkable exception to the rule with regard to the plumage of the male and female, the cock and hen birds of this species being identically alike in plumage, the only distinction of importance being the presence of spurs in the former. The name "Eared" Pheasant has been derived from the tuft of white feathers which project upwards and slightly backwards above the head, forming a tuft on either side.

The Eared Pheasants belong to a genus known as the "*Crossoptilon*," of which there are five species, though European Naturalists are only familiar with two of these species, namely, the Manchurian Eared Pheasant (*Crossoptilon Mantchuricum*), and the White Tibet Species (*Crossoptilon Tibetanum*).

The Manchurian Eared Pheasant inhabits the mountains to the North of Peking, and the white species is found in Tibet.

In many of their habits the Eared Pheasants resemble those of the domestic fowl, being quite as hardy, prolific, and sociable as the birds last alluded to. The beak is white and the skin of the face bright red. The tail coverts are white, abundant, and form, as it were, part of the tail, in this respect differing from other species of Pheasant. The legs and feet are reddish, thick in the shanks, and the toes very strong. The feathers clothing the body are brown, whilst

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the whole build of the bird is of a very masculine type, its physical development being of a much more massive character than that of other species. Specimens do fairly well in aviaries, and have been reared in the Zoological Gardens as well as by various private owners. The only use of the Eared Pheasant in Great Britain is as an ornamental bird, but there are other species much more suitable for this purpose.

CHAPTER XIX

THE BLOOD PHEASANTS

THE Blood Pheasants belong to the genus *Ithagenes*, and there are several species which resemble in certain respects the Silver Pheasant. The birds of this genus are so named because they have blood-coloured patches of plumage beneath the throat, on the breast, and under the tail, etc. They are characterised by a tail consisting of fourteen feathers, the presence of a crest in the male, naked patches beneath the eyes, red legs and toes, and by the crimson patches previously alluded to.

The Blood Pheasants are indigenous to the mountainous regions of Eastern Tibet, and to the western and northern mountains of China. They all nest on the ground, laying about a dozen eggs, although the precise nesting habits of the various species of Blood Pheasants are not very clearly understood. The three species are as follows:—*Ithagenes Geoffroyi*, *Ithagenes Sinensis*, *Ithagenes Cruentus*.

GEOFFROY'S BLOOD PHEASANT (*Ithagenes Geoffroyi*)

The birds of this species inhabit the higher regions of Eastern Tibet and Western Szechuen in China, and the total length of the bird is about 17 inches. It has a crest of grey feathers and a patch of green on the wing coverts larger than that in the other species. The under tail coverts

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are crimson tipped with grey, whilst the chin, throat and chest are grey.

Geoffry's Blood Pheasants are gregarious, and particularly fond of inhabiting the bamboo jungles.

THE NORTHERN BLOOD PHEASANT (*Ithagenes Sinensis*)

This species inhabits the Sinling Mountains, and also the higher regions north of Nanshan and Kansu. It is said to differ from the last species in having a patch of brown on the wing coverts, and the sides of the crest a sooty brown. It is about the same size as Geoffry's Blood Pheasant.

Concerning the habits of these birds, that eminent naturalist Przevalsky says :

“We observed this scarce species called by the native Sermun, only in the Kansu Mountains, where it principally inhabits the wooded districts and also ascends to the Alpine regions. We did not obtain a single specimen ourselves, but bought a skin from the Tanguts, who told us that these birds in spring keep mostly to the edges of the forests, and about the Alpine bushes, and then feed on a particular kind of grass. In winter they descend to the middle and low mountain ranges, where they form small companies, and pass the night on trees like *Crossoptilon Auritum*.”

THE BLOOD PHEASANT (*Ithagenes Cruentus*)

Ithagenes Cruentus is said to be very common in Nepal, where the birds congregate in flocks and feed in the bamboo

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plantations, scratching about just as the common fowl does for its food. The principal food comprises berries in the autumn and winter, and the young shoots of various species of Fir-trees in the spring. A peculiarity of these birds is that in connection with the spurs; as many as five spurs have been found on one leg, and it is said that the bird develops an additional spur each year, but not beyond the number already named. The feathers on the breast and chest are splashed with crimson; the chin, the throat, and the cheeks, crimson; the upper tail coverts are crimson; and the medium wing coverts, green. Then the hen bird is very much plainer, a reddish-brown predominating in her plumage. Sportsmen who have shot these birds are slightly at variance concerning their edible qualities, but there is no reason why the flesh of well-nourished young birds of Blood Pheasants should not be as good as that of any other species.

As to whether the Blood Pheasants will breed in confinement and their suitability for aviary purposes the author has no reliable information, but sees no reason why they should not thrive in the aviary.

CHAPTER XX

THE ASSUMPTION OF MALE PLUMAGE BY FEMALE PHEASANTS

THAT hen Pheasants occasionally assume the male plumage is a fact well known to anyone having an extensive acquaintance with Pheasants, either in covert or in aviary, but this assumption of the male characteristics is by no means confined to Pheasants, as innumerable instances have been recorded in various other members of the feathered tribe. The transformation of plumage is gradual, and is usually regarded as evidence of sterility, but it has been proved, not only in Pheasants, but in other birds, that it must not be accepted as positive of such evidence. In other words, it is the outward expression of degenerative changes in connection with the reproductive organs within, though, as stated above, not a rule free from exceptions.

The transition begins at the extremities of the feathers, and proceeds with a tolerable degree of uniformity, until the bird is invested with a mantle of plumage almost identical with that of the male. In certain instances doubt has arisen as to the identity of the sex, but it is not difficult to establish this by after-death examination. The presence of the oviduct, or the existence of the degenerative stage of the ovary, will afford positive proof as to the sex. The mere presence of spurs is not sufficient to satisfy the exacting mind, because some hens, as is well known, develop spurs, though in a modified form. An acute observer can detect the feminine element in the physiognomy of the bird, so

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obviously portrayed in the accompanying illustration, which, through the kindness of Mr R. E. Horsfall, of Stody Lodge, Melton Constable, the author has been enabled to reproduce. This illustration was depicted in the field, but at the time a certain amount of ambiguity was expressed concerning the identity of the sex, though Mr Horsfall had not the least doubt about it himself, and in order to support his theory as to the bird being a hen, he has favoured me with a copy of the taxidermist's letter, which runs as follows :—

“ On dissection the Pheasant was a female without doubt. The ovary was in a degenerate condition, but the oviduct was there, which leaves no room for doubt.

“(Signed) N. H. PASHLEY.”

The production of barren hens may arise from two causes : first, from disease of the ovary or oviduct ; secondly, from senility, in other words, from old hens, which should not be allowed to exist in the coverts, as their presence materially diminishes the perpetuation of the species. The assumption of the male plumage is not necessarily a permanent one, either in the Pheasant or in any other birds, and this has been proved on several occasions, but in no instance can one have a better proof than that afforded by the Mallard, and the Rouen Drakes, which for three months in the year undergo a periodical change of plumage, assuming the feminine garb, which is the converse of the foregoing. It is, in a relative sense, equally applicable.

Hen Pheasants in male plumage have been known to revert to their normal state of plumage, and the cock Pheasant has likewise been found to take on the plumage of the hen, as reported in the *Ibis* for 1897, page 438. Whether the bird was sterile or not does not appear to have been proved,



ASSUMPTION OF MALE PLUMAGE BY THE FEMALE SEX, PROVED BY THE
TAXIDERMIST IN THE POSSESSION OF MR. F. F. HORSFALL, STODDY LODGE,
MILLON CONSTABLE

[*T. J. J. J.*, page 114

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but it must be borne in mind that sterility in a male, through degenerative changes in the generative organs, is just as liable to occur as in the case of the female. Again, spurless cock Pheasants are not unknown, therefore the absence of these weapons of defence—sometimes offence—is not proof as to the identity of sex.

Two facts of practical importance to the game-presenter are associated with this change of plumage in birds, and should not be lost sight of. The first one is not to leave a lot of old hens in the coverts, but to replenish the stock every second or third year ; and secondly, to allow only young and vigorous male birds to remain for the perpetuation of the stock.

CHAPTER XXI

PHEASANTRY EGGS *VERSUS* WILD ONES

THIS is a subject of considerable importance to game-rearers, and one that has been, and still is, a constant source of argument, there being no end of contributions in the various journals devoted to the preservation of game. Some game-keepers are strongly in favour of pheasantry eggs, whereas others prefer eggs gathered from birds under natural conditions.

Although the Pheasant readily adapts itself to environment, it must be borne in mind that the nearer such approaches are to the original state the more complete the ultimate results. Virility is strengthened by natural conditions, and it must stand as an incontrovertible fact that the chicks produced from wild Pheasants' eggs, and reared naturally, are stronger than those raised in an artificial manner. Eggs derived from wild birds and then hatched by hens and subsequently reared under artificial conditions are, most certainly in the writer's opinion, superior to those produced in the pens from penned birds. Every game-preservee knows perfectly well that any misfortune arising during the hatching process of such eggs—*i.e.*, the wild ones—is accidental and has no connection whatever with the manner in which the eggs have been produced. If plenty of hen Pheasants are left in the coverts, which there ought to be in every well-regulated game preserve, eggs will be produced under natural conditions, and when

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the keeper can obtain a supply of eggs from such a source, he ought with good management to have vastly superior birds to the man who rears exclusively from aviary produced eggs.

To encourage egg-laying in the coverts is one of the first duties the gamekeeper has to perform, and if he makes artificial nests in suitable places in the coverts, as well as in the hedgerows where the Pheasants are likely to stray, and deposits an artificial egg in each, there ought to be no difficulty in persuading the hens to lay their eggs. What may be termed the "natural concealment" of eggs is owing to their colour corresponding closely to that of their surroundings, and a hen Pheasant will, as a rule, select a site for its nest that is well concealed. In some instances she will lay in the nest of a partridge, likewise that of the domestic fowl, but there is one matter that she desires, namely, seclusion for her nest, or to be away from the interruption of the male bird, which, by the way, it may not be out of place to mention, sometimes takes on maternal duties, and will not only sit on and hatch the eggs, but also rear the brood, though such instances are exceptional.

In relation to this matter the editors of the *Gamekeeper* were anxious for the benefit of their readers to have the views of gamekeepers upon the subject, and offered a prize for the best essay, the selected one being as follows; and it is written by W. D. Fairweather, head-keeper to Sir A. Wilson, Dunning, Perthshire:—

"Personally, I have not the least doubt that the eggs from penned Pheasants are superior to the eggs from wild ones. If there was a question about it, I would not have penned birds, neither would many outside game-farmers. I am perfectly well aware that many keepers, particularly

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of the older school, hold an opposite opinion, and what is more they can bring forward some very good arguments to substantiate that opinion. Many old keepers base their arguments against penned or pheasantry eggs, on the result obtained from what I may term the primitive system of penning Pheasants; pens about the size of a good pigsty immovable as the hills, and generally as near the kennels as possible, being a few of the obvious characteristics of that system. Perhaps for one year or two the results were extremely good, next year only fair, and after that failure and the consequent condemnation of all penned eggs. Now, the great arguments for wild eggs are that the birds are stronger and healthier because they are living in a natural state, that they are not coddled or pampered up in any way whatever, and as a result, the chicks from eggs laid by wild birds have much more stamina than the others and so are much less bother to rear. If these arguments are sound, why do Pheasants not increase appreciably even when there is no rearing? If they do, it is generally the result of years of very careful nursing, with the addition of the warning 'cocks only' on the shooting days. The truth is that our climate, more especially our northern Scottish climate, is just a shade severe for Pheasants during the winter and spring seasons; they need special attention and feeding at all times, and even with all this in some years the young wild birds reared are few and far between. And so I say that when my birds are penned I have them directly under my observation. I can feed them and be certain that they get what I want them to get; I can shelter them as I wish, and if I get a change of blood I can be sure that I am getting the very utmost out of the change. Simple enough things these, but difficult to make certainties when dealing with wild birds. Then I can reject



HEN PHEASANT WITH NEST AMONGST HEATHER

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a hen that I think is unhealthy, or weakly or old; this I consider very important too, as I could not possibly know her eggs if they were picked up outside. And by gathering my eggs late and early, I can be sure that they are never damaged by frost; by no means a slight advantage in almost every year as far north as this. Then I can store the eggs away from rats and wet, and turn them as I think fit; there is no worry as to their safety. One reads that a hen Pheasant will turn her eggs every time she visits her nest, but she does not; and when one considers that a nest with fourteen eggs may take three weeks to fill, one wonders if there is much in the turning theory if that nest hatches out all right. I know also that there is a greater chance of all my penned eggs being fertile. Several times I have taken in a wild nest and not one fertile egg in it, because the hen was too far away from her kind. I have been contradicted and laughed at before for saying that, yet it is none the less a fact. My birds also pay me better because I get twenty eggs from a hen that may only lay fourteen outside, and I also save to the extent of my own time and the time of my men, when they would be looking for wild eggs. Some would say 'picking up wild eggs,' but I say 'looking for,' advisedly. There is such a lot of looking for and so-very little of the picking up, especially when one has the hen waiting on the eggs. Over and above all these advantages I have comparative peace in my mind about vermin. If one takes a reasonable amount of care the eggs are secure from winged vermin, even in an open pen; foxes cannot get near the birds without a lot of trouble; hedgehogs and rats can be looked after, and little is left to luck or chance. With wild eggs a very great deal always must be left to both. Nor do I believe that the young chicks from wild eggs are one little bit the easier to rear

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once they are hatched. I have always noticed that wild Pheasant chicks are a shade wilder and quicker than those hatched from penned eggs, and I am quite sure that besides being the only difference this wilder trait is a distinct disadvantage. It is nothing as long as the fronts are on, but if one has to rear on a bare field and has both kinds of chicks, he will soon know which he prefers when they are let away. It is a dreary job counting a row of wild Pheasants at feeding-time and as dreary a job getting them shut up at nights after they are any size. There is no real proof that the wild chicks grow better or quicker than the others; many a rearer imagines they do so because he wishes them to be so, though that is not quite the same thing. I know also that the wild birds die just like the others when any of the real troubles come to the rearing-field; it is no argument to say that they do not die from like causes outside, as the conditions are very widely different. Finally, no one can say the wild birds fly a bit better or higher than the others on shooting days, if they are fed the same, and somehow I have a conviction that they retain their wandering propensities till the day of their death. To my mind there is no comparison possible between the two kinds of eggs; if time, trouble, and the certainty of getting the best results from outlay and work are all taken into proper consideration, the penned eggs have it easily. And what can there really be in the question of Stamina? We all know that even our breeds of domestic fowls give of their best only when they are specially fed and sheltered; more especially is this true from the point of view of either quantity or fertility, and why the identically same treatment should be wrong for the less hardy Pheasant beats me to understand. I know that there are men who invite disease even in their Pheasant pens, through the



HEN PHEASANT SITTING ON NEST SURROUNDED BY GRASS AND NETTLES

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old causes of dirt, overcrowding and laziness; when that happens it is the fault of the man and not of the system."

Mr H. Phuler also offered his views in the following essay :—

"It must not be overlooked that the Pheasant is not a native of the British Isles; neither must we forget that in most cases it is living a life that is altogether foreign to the real wild Pheasant. Therefore in speaking of wild Pheasants we do not (or should not) think of it as a bird following its natural, I might say, virgin wildness. When the shooting season is over, and all the birds required for the pens are caught up, we can usually find a few left in the home coverts. Everything is done to induce these birds to stay in those coverts and also to draw all outsiders as near the centre of the beat as possible. There are many reasons for this; they are more under a watchful eye, can be fed regularly, and helped in many ways; also their nests, when the time comes, can usually be located with little trouble, and this is a great advantage to the keeper, as he can then make use of the eggs if he wishes. In many cases these birds have been hatched from pheasantry eggs the year previous and become quite used to the feeding methods, and are quite familiar with their daily contact with their keep-feeder. As this has gone on yearly they have lost a great deal of their wild instinct, and seem quite content to make a gluttonous feed once or twice daily, and then settle down to the prescribed life marked out for them. Their daily rambles are confined to a very small radius, and their inclinations in that respect have quite left them. In many cases they are fed and attended to much the same as penned birds, and become very indolent, and do not leave—at least not willingly—their

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every-day haunts. They become very much like tame pigeons ; they have their liberty but they do not leave home. In many cases they are almost as much under control as the birds in the pens, and the treatment being the same in both cases, the results are often much the same. A bird in a large open pen is almost in the same position as the one outside under these circumstances. In an open pen fresh blood can be introduced more successfully than outside, and the hens still have the benefit of the outside cocks. Also there are many things that can be done with advantage in the pens, which are not practicable outside, which help the birds to produce the best results. Of course the outside birds have advantages over the others, but results show that the eggs from penned birds are usually as good in every way as from (so-called) wild birds in the home coverts. There are times and seasons when these outside eggs prove to be the best, but, on an average, if the pens are well and successfully managed the eggs from them are far more regular and reliable.

“ But there is another class of Pheasant in the British Isles known to most keepers. This one has never been seen on any of the usual feeding-places. In fact, it has always avoided them, and all that appertains to such places, as much as possible. It has never known what it was to fill its crop in a few minutes from a quantity of food thrown down for it, but has had to pick and constantly feed in a perfectly natural way, the whole of its time. It has become so quiet and cunning that it has quite escaped notice, and its presence is quite overlooked. It usually has, or appears to have, a mate all to itself, and this is a very fitting mate in all respects. So cute is he that notwithstanding his bright plumage he keeps himself quite invisible, and even when he crows, by a provision of nature, he does it in such a manner that his

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exact whereabouts is quite a mystery. This is a pair of Pheasants as nearly approaching their wild state as they possibly can in our country. When the nest is found it is often quite unexpectedly, and generally in or near the boundary fence, or in some remote part of the estate. There are often seventeen eggs or even more in the nest, and what eggs they are! The keeper has no fear of carrying them a matter of 3 miles in his pockets; the shells are almost as hard as guinea-fowls' eggs. They then prove 100 per cent. fertile, and 95 per cent. hatch off in many cases. As for the chicks, look round the coops in a few days' time and see their wild nature; even at so young an age they are fully developed, and when confined to the guards they would, if startled, kill themselves in an endeavour to rush quickly to cover. True offspring of their parents, days after, take a walk round the rearing-field with the keeper, and he may point out to you certain very smart skulking birds amongst the rest, which you would quite have failed to see, with the remark, 'That is a wild bird. . . .' 'There is another, I can tell 'em by their legs.' What a pity they are so scarce! Of course, from a rearing point of view, it is quite impossible to have these eggs to take the place of pheasantry eggs, as there are so many points to be considered, and at present we are only dealing with the merits of the eggs. Modern egg-producing, under the most scientific system, has failed as yet to give an egg equal to these. But this is the kind of egg aimed at, and wanted."

From the foregoing essays it will be gleaned that the two writers are diametrically opposed in their views, the former advocating penned Pheasant eggs as being the best, and he clearly states his reasons to substantiate his dictum; on the other hand Phuler argues that wild eggs give the most

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satisfactory results, but he admits that there are many advantages to be gained in connection with the penned birds unobtainable in the wild condition. Again Phuler seems to make a distinction between the ordinary Pheasants of coverts and what may for convenience be designated "outlaw" Pheasants. It would, however, be quite impossible in the preservation of game, as it stands to-day, to place much reliance upon the rearing of birds of the lawless type last referred to.

With few exceptions the hen Pheasant makes her nest on the ground, and as these are very often cleverly concealed, it is impossible for keepers to discover them, though in searching for eggs it is surprising how skilful the observant keeper becomes in the detection of Pheasants' nests. Sometimes several hens will nest in close proximity, and when they do so, a considerable number of eggs may be collected in this manner. Those eggs which are first laid in the nest will, if removed, be replaced by a second lot, and many keepers allow the second batch of eggs to be hatched by the hen Pheasant. This is not at all a bad practice, as it combines what may be termed natural with artificial game-raising, the advantages of which in certain localities are at once obvious; whereas where vermin are troublesome, or the eggs are likely to be detected by labourers and others, it is disadvantageous.

In searching for Pheasants' eggs it is necessary to be very cautious not to disturb the hen but allow her to vacate her nest at her own free will. Nests can often be located by watching for the birds feeding in the morning and evening, and their subsequent movements. A practice adopted by many keepers is to find the nests with a pointer or setter. No matter how carefully nests may be searched for there is bound to be a certain number that remain undiscovered, and it is just as well that it should be so, as this materially helps



THE MATERNAL DUTIES WERE SO STRONGLY DEVELOPED IN THIS HEN PHEASANT THAT SHE REGULARLY SUBMITTED TO BE STROKED WITHOUT LEAVING THE NEST

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to strengthen the constitutional stamina of the birds raised from penned Pheasants.

Some gamekeepers, when they remove the eggs from the nest, carry them home in the shirt bosom, pocket, etc., but an ingenious invention known as the "Foster-mother Egg Belt" has recently been patented to act as a safe carrier for eggs. The latter can be kept warm for about thirty-six hours. This belt is worn underneath the keeper's waistcoat, and has a number of cotton-wool compartments into each of which a Pheasant's egg can be fitted. There is another advantage in using this belt, and that is the eggs or a portion of them can be removed from one nest and exchanged for that of another, so that a system of cross-breeding can be followed.*

If the season is a particularly wet one, it is not economical to allow much natural hatching, it being better under these circumstances to gather in most of the eggs and rear the birds under hens.

A word of caution is necessary with regard to the purchase of wild eggs from labourers and others, as the writer has known a gamekeeper purchase eggs that have been obtained from the estate over which he had charge in the preservation of game; but Pheasant egg stealing is, unfortunately, in spite of stringent legislation, far too common.

The rewarding of labourers for the discovery of nests is a commendable practice, so far as it goes, but this may develop into a vice, and it does so through two channels, namely, by training them to make specific excursions with a view to discovering them, and secondly, for the pecuniary gain attached to it. The honorarium should only be given when it is absolutely certain that the chicks have been hatched from the eggs, as proved by the evidence afforded

* The belts referred to can be obtained in three sizes from Messrs Gilbertson & Page, Hertford.

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by the empty shells in the nest. A peculiarity in connection with sitting Pheasants is, that when a nest containing eggs becomes known to several hens, they will all probably sit on it at once. The human egg-stealer, crows, jays, magpies, rats, together with various other vermin, both winged and ground, as well as late frosts, are accountable for the destruction of a large proportion of wild Pheasants' eggs, some of which enemies can, to a large extent, be controlled by the keeper and his men. Frost, wet, and other adverse climatic conditions are quite beyond the control of the keeper.

In the accompanying illustration there is depicted two keepers in search of eggs, and it will be observed what close scrutiny is necessary for the detection of the nests. When nests are discovered in exposed situations, a keeper can by art very often assist in the concealment of such a nest, thus affording it the necessary degree of protection.

LABOURERS AND GAME EGGS

On many estates it is necessary to guard against not only the stealing of eggs by those whose purpose is to sell them, but also the thieves whose only object for securing the eggs of game is to eat them. The last-mentioned marauders are usually of the labouring class, for whom the keepers keep a constant watch, very often reverting to the offer of a pecuniary reward, in order to induce the labourers to refrain from pillaging the nests of the game; but there is the risk in this precaution of the labourers searching for nests, in which case much harm may be the result, and a man caught at this practice should be dealt with by the law. A nest is sometimes discovered when grass is being mown, or disturbed by a flock of sheep grazing



TO ILLUSTRATE CONCEALMENT OF SITTING HEN PHEASANT

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near ; it is then that a labourer can justly claim his reward by saving the eggs from destruction. To do this the nest should not be disturbed, but the keeper made acquainted of the vicinity in which it lies, so that he can judge for himself if there is any danger.

Should it be discovered that the hen from off the nest has met with some accident preventing her from sitting again on the eggs, the labourer should at once gather them, and hand them over to the keeper, taking care to see that they are kept as warm as possible while off the nest. There is an instance known of a partridge returning to her nest, after it had been exposed by the cutting of the crop in the middle of which it was situated, and remaining there to hatch the eggs for four days, even with mowing operations going on the whole time.

When a keeper has been told that a nest is in danger, the finder should be questioned as to how he became acquainted with the fact. If it is thought that the nest is really in danger, and should be removed at once, then the labourer is entitled to receive his reward there and then ; but when the nest is left as it is, on the chance that with due precautions the brood may be hatched, then the question of reward should be left in abeyance until after that event has come to pass, and all danger is over. Otherwise the labourer may steal the eggs, leaving the keeper to believe that the eggs have disappeared by other means. If the reward is left over, the finder may do his best to earn it by protecting the nest as far as possible within his power.

With all his care, however, the keeper is sometimes outwitted by the labourer, as in the following instance :— Having found a Pheasant's nest in his garden fence, a man was promised the usual reward on its hatching, by the keeper. Some time afterwards the finder received the

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amount promised, the nest having been discovered full of shells. Later, however, the keeper discovered that after giving the information concerning the nest, the informant had returned and removed the eggs, sold them to a keeper on an adjacent estate, and received from the latter the empty shells which he had placed in the nest, and it was on the discovery of these shells that he received his reward.

Another method adopted by a gentleman who owned a large shooting, and who believed that for one egg stolen for game, a dozen were taken for eating, was found to be particularly applicable. He realised that a hen's egg would be appreciated more than that of a Partridge or Pheasant, and so offered one of the former for each one of the latter found. Although long since dead, this practice is still carried out on the estates in the districts where he lived.

The relationship between the gamekeeper and labourers has much to do with the saving of eggs, as naturally if on friendly terms with a keeper, a labourer will not go out of his way to annoy him by tampering with the nests, and thus the loss in this way will be very small.



CLUTCH OF PHEASANT EGGS FOUND AMONGST THE HEATHER

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CHAPTER XXII

MANAGEMENT OF PHEASANTS IN AVIARIES AND PENNING THE BIRDS

THE number of hen birds allotted to each cock ranges from five to eight, and many keepers believe that five hens to each cock is the orthodox number, but it may be accepted that the number first named is about right. Although a monogamous bird, the Pheasant has, by semi-domestication, become polygamous, but he is not capable of keeping more than six or eight wives busy throughout the season, in other words, of rendering the loves of his harem prolific.

The catching up of the birds, prior to their confinement in the aviary, is always a matter of considerable concern to the keeper who has a real interest in the well-being of his birds. Various devices are employed for such purposes, some of a rude and simple construction, others more elaborate in design.

It does not make much difference what sort of trap is employed, provided that it can be relied upon to do its duty efficaciously, with a minimum amount of injury to the birds entrapped. If birds are allowed to knock themselves about in the traps, it will be a long time before they will settle down properly, and this is one reason why a proportion, though in the minority, take their aviary Pheasants directly from the rearing-field. The question is, is this a commendable practice or is it not, and the author has not the slightest hesitation in condemning the custom, as it is the

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surest method of perpetuating a stock of Pheasants constitutionally weak, more than semi-domesticated, and very liable to fall an easy prey to disease. Such a practice cannot be too strongly discouraged, and if its detrimental influences are not apparent in the first, second or third generation of birds, it is bound to show itself sooner or later.

The gamekeeper wants birds that can fly, and the sportsman wants birds that he can shoot, which neither will have, if such artificialities are indulged in.

A common form of hand-made willow trap is depicted in the illustration, and it is one a good deal used by keepers. Another form of catcher is shown in the woodcut. It is always set, and the best plan is to scatter food about it. For a few days the doors must be left open, and the birds will go inside to feed through the doors. Afterwards the doors should be closed, and the food put at the mouth of the tunnel, through which the birds will pass, but they cannot find their way out again. These traps are 2 feet 9 inches long, 2 feet wide, and 15 inches high. Their cost, ten shillings each.* It is seldom that the birds find the outlet to these cages. It is advantageous to have the traps much larger than the bird, otherwise it will damage itself.

A very simple form of trap is a hole in the ground, with a board to drop over, so that the captive is kept not only in the dark, but also perfectly quiet.

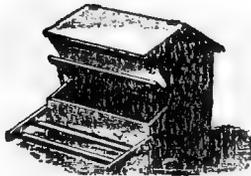
Never place cock birds with the hens in the laying pens until the hens have had a few days to settle down. Some male birds seem to take a dislike to the female, and continue to annoy her, plucking feathers out of her, and this is soon followed by the rest of his wives maltreating her in a similar

* Messrs Gilbertson & Page, Hertford, supply these traps.

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fashion. No doubt there is a reason why a male bird should take a dislike to one member of the harem and not the rest, but it seems to be a case of "the more I see of you the more detestable your presence becomes," and so the persecution continues.

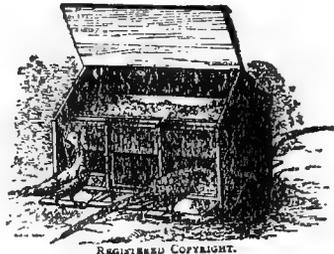
In the handling of birds, for their removal to the pheasantry, a good deal of tact is requisite, though some keepers catch hold of birds so roughly that half their plumage is destroyed.



REGISTERED COPYRIGHT.
* FEEDING TROUGH

The author believes in handling the birds by their legs, thus avoiding damage to plumage.

The best time for putting the Pheasants in the pens is at night, and the easiest time to catch the birds in the traps for the pens is during a snow-storm. If the pit-traps are used, some maize should be thrown into the holes as a decoy previous to the setting of the trap. All aviaries require perches. Regarding the question of age for stock birds, two-year-old cock birds are the best, and these should be mated with one-year-old hens. Make it a point to always keep a supply of two-year-old cocks and one-year-old hens.



REGISTERED COPYRIGHT.
* PATENT FEEDING TROUGH

Pheasants in aviaries require to be fed night and morning, one meal consisting of soft food and the other of hard. A free supply of pure water and plenty of grit are indispensable. Oats, barley, kibble beans, peas, lentils, and greaves, or a

* The feeding troughs depicted are the registered designs of Messrs Boulton & Paul.

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supply of green bones, together with barley meal and biscuit meal, should form the stable diet. In addition to this, vegetables are distinctly beneficial.

In feeding penned Pheasants, it is necessary to guard against one thing, and that is, never give them too much maize. It is a food that lays fat on quicker than any other cereal, more especially the internal deposition of fat, and once this takes place, it is a barrier to egg-laying; moreover, it is conducive to indolence, and this in its turn predisposes to vice, such as feather-eating, etc.

Nitrogenous foods, such as greaves, green bone, beans, peas, lentils, are all favourable to egg-production by stimulating the ovarian apparatus. Give the birds plenty to do whilst they are in the pens, scatter their food broadcast, and let them have a dust bath, as the more they are kept in amusement the less liability to disease, vice, etc.

Quietude is advisable, as Pheasants like solitude. Eggs usually appear about the first week in April, but commonly during the third week. Make a practice of moving the eggs from the nests three times per day, always, of course, leaving a pot egg in. Store them carefully in the egg cabinets. Egg-eating has been alluded to in another chapter, and if the offender cannot be cured by the means recommended, that is by giving her a rotten egg or two to eat, the best plan is to wring her neck. When birds lay soft-shelled eggs it is a sign that they want a supply of lime, and the best way to give this is in the form of ground oyster shells, ground bones, etc.

Keep the egg cabinet in a cool place, neither allow it to be exposed to frost or sun. The eggs must not be shaken upon any account. It is customary in many pheasantries to pinion the birds by cutting the Pheasant's wings, but there is no necessity for this, because the same object can be attained by a strap or chain, such pinioning appliances being



HOME-MADE WILLOW TRAP FOR THE CAPTURE OF PHEASANTS FOR THE PENS

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sold by dealers in pheasantry requisites. If the wings have been cut and then the birds are turned again into covert, they are very liable to fall victims to foxes, etc.

Protection from vermin is an important part in the management of the pheasantry, and doubtless there are many other matters that will suggest themselves to the thoughtful reader in connection with the management of penned Pheasants, and which the author may have overlooked ; nevertheless he has endeavoured to describe what may be termed the essential outlines of Pheasant management when the birds are confined to pens.

PENED PHEASANTS

In connection with this subject the following contribution appeared in the *Gamekeeper*, and being a very practical article, the author has taken the liberty of reproducing it. It is as follows :—

“ Directly eggs are expected from penned Pheasants, the birds become doubly interesting to those engaged in looking after them, and the pens are closely scanned several times a day in search of the first egg. Perhaps this is seen in a week, or at least several days before others appear, and then the quantity laid gradually increases till two-thirds of the birds produce an egg each daily.

“ For a time this continues, granted that no cold weather sets in to affect the birds and cause them to cease rapid production, and then a pause occurs, and eggs come but slowly. The experienced rearer is fully aware that this partial cessation of egg-production is perfectly natural, because it marks the period when the birds if they had been leading a natural life would have laid their nest of eggs, and commenced to sit.

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In the pens they may not begin to sit thus early, because their systems have been fed up to withstand a greater strain of laying, and if this feeding is judiciously continued they go on laying with renewed vigour after a short pause.

“Late eggs are of little value to anyone except he has had the ill-luck with the hatching of the first, so it is advisable to begin to check the birds directly the required number is being approached. What I do is as follows: If I consider that by the end of the week I shall have in hand as many eggs as I need, all stimulating food is stopped, and the birds are fed on little else than dry corn and green food; in about ten days they have nearly ceased egg-production and are released, in all likelihood to lay the last few in a nest and hatch out the chicks.

“As the laying period advances some of the birds are certain to show signs of broodiness, and great care should be observed to collect the eggs frequently at this time; especially those which lie together, as the sight of a number of eggs, I am sure, often induces broodiness. I have proved this with reference to ordinary fowls, for when I want them to become broody for placing on Pheasants' eggs the simple device of not removing their own eggs from the nests generally exercises good effect, and they come on to sit much more rapidly than they otherwise would.

“The broodiness of hen Pheasants confined in aviaries seldom continues long, for the birds cannot get away from the rest, and the cock has a decided objection to a broody hen in his presence. He generally worries the bird till she resumes her ordinary condition, and then the good food soon starts the bird on to lay once more. When broody birds are noticed in a pen very close attention must be paid to collecting the eggs, in case they do get sat upon and started on the way towards hatching.

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“ It always pays to shut up one-third more Pheasants than are generally supposed to be necessary to produce a required number of eggs ; early eggs are what the rearer needs, and it sometimes occurs that owing to a spell of cold weather early eggs are scarce. However, the man with plenty of birds shut up is nearly certain to be in a safe position. Even if laying continues satisfactory from start to finish he is better off, for he is able to release the Pheasants and clear his hens all the sooner. This is advantageous in the interests of keeping the ground clean.

“ Late eggs are never satisfactory, and I rarely keep birds in pens after they have laid an average of about eighteen or twenty each. Eggs produced after this never hatch out the strongest chicks, and this is the reason late birds are difficult to rear. The chicks are weakly from the first, and never seem to gain full strength except under exceptional conditions, which rarely prevail when they are placed on the rearing-field.

“ If readers only thoroughly understood the importance of most rigidly selecting their stock birds they would pay the greatest possible attention to it, and I am afraid it is an undertaking they carry out without due care. However great the attention paid to birds on the rearing-field, it is at the best an artificial process, very different from that intended by Nature. It is a big step towards success to have the strongest and healthiest of chicks to deal with, and these can only be got from stock birds which are full of health and vigour.”

CHAPTER XXIII

ARTIFICIAL INCUBATION

IN the rearing of poultry the incubation of eggs by means of artificial heat has been in existence for a great number of years, though in a somewhat crude form, as all sorts of devices were originally, but not very successfully, employed for such purposes. When we are told that the manure heap could be utilised for the hatching of the eggs of the domestic fowl, one can easily understand that such crude methods could not be of a very reliable order.

It is only during this last thirty-five years or so that artificial incubation has been carried out with any approach towards success, but it is now, especially in the rearing of poultry, one of recognised value, and its universal employment is sufficient evidence of its utility. The remarkable improvements that have taken place, even during this last few years, in the manufacture of incubators, foster-mothers, and other rearing appliances, is truly wonderful, and these remarks not only apply to Great Britain and the Colonies, but also to the Continent, and above all to the United States, where the poultry industry is carried out on a large scale, and in a distinctly progressive manner.

The artificial rearing of Pheasants constitutes an integral part of most of the principal game shoots within the British Isles, and owing to the enormous number of birds that are annually reared on some estates, it is distinctly advantageous to utilise any appliances that will economise labour, provided such usage is compatible with successful results.

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The author feels justified in saying that the incubator is one of the most useful appliances that the Pheasant-rearer can possess, and anyone having a considerable number of birds to rear is most certainly seriously handicapped without it. It is common knowledge that chicks or Pheasants incubated by artificial means from start to finish are not as vigorous as broods hatched under natural conditions.

It is not, however, intended that the incubator can be advantageously employed for cold eggs, because as such it is certainly not equal to broody hens, but its chief merits, as an artificial aid, come into play during the final phases of natural incubation, as directly the eggs begin to chip, they should be removed to the incubator, and the hatching process completed therein.

As a rule in a sitting of eggs all the chicks do not come out on the same day, and the more weakly members are very liable to be trampled to death, which can be obviated by placing the remainder of the eggs in the machine. Another advantage in the use of the incubator is that for drying the birds as soon as they are hatched, and they can be kept in the drawer until a sufficient length of time has elapsed for feeding them.

As there are many incubators on the market, the selection of the machine must be left for individual choice, but never purchase a cheap incubator, because it is impossible to put the best adjustments into a machine and sell it at a low price.

Probably two of the best incubators on the market are those of Messrs Haersons (Spratt's Patent), and those manufactured by Messrs Gilbertson & Page, Hertford. Whatever make be selected there are certain general principles in the management of an incubator which are of primary importance, and unless these are attended to, failure, either partial or complete,

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is almost certain to be the result. It is in the attention to details upon which success mainly depends. First of all the incubator must be kept in a room where the surrounding medium—*i.e.*, the air—is warm, and the temperature uniform. A drafty out-house, or a damp place of any kind, is not the right situation for an incubator ; on the other hand, the apartment must not be too warm. If a keeper has room in his own cottage—though he is not as a rule overburdened with apartments—the best plan is to place the incubator in such, but not in a kitchen that is liable to be overheated.

Previous to putting any eggs in the machine, it is a wise procedure to regulate and adjust the temperature of the machine for a few days, so as to become acquainted with the regulation of the heat. The best temperature is 103°, with a minimum range of 102° and a maximum of 105° Fahr.

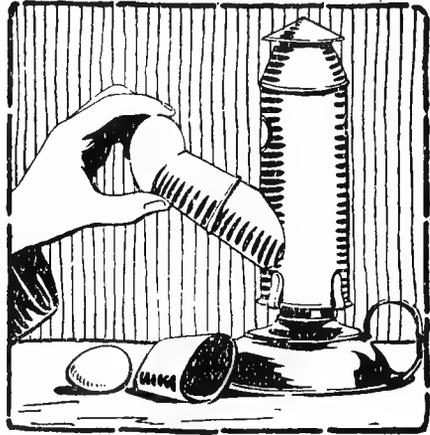
The eggs should be turned night and morning, but before putting them into the incubator it is advisable to mark each egg with a cross on one side, and some other distinguishing stroke on the other, so that in turning the eggs there will be one mark displayed in the morning and the other in the evening. During the turning process shift the position of the eggs, so that those in the corners and around the sides of the drawer will be replaced by the eggs in the middle, by which means the whole of the eggs will be uniform in the incubative stage. Neglect of this precaution frequently leads to many of the eggs being spoiled. Whilst turning the eggs the drawer ought to be left open for ten minutes every day after the end of the first week, and each subsequent day this time should be increased about one minute, in order that there will be about twenty minutes' exposure given to the eggs at the full period of incubation. This exposure of the eggs to the air is a very necessary part in the management of an incubator, though a good deal will depend on the temperature

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of the room ; if it is a cold room, ten minutes is enough. If the eggs are put in the incubator in rows and the finger wetted, it can be run over them and turned over in this manner, though some incubators have special devices for turning the eggs.

Test the eggs on the seventh day, and any unfertile ones should be removed and replaced with other eggs, but never put cold eggs into an incubator, only using those taken from hens at the same period of incubation. An extremely useful egg-testing lamp is shown in the accompanying illustration. It consists of a lens and reflector, and in order to test the egg, the lamp is lighted and the egg placed against the focus as shown. When the eggs begin to chip, the chipped side must be turned upwards, and as soon as the chick is out transfer it to the drying box, where it will remain if necessary for twenty-four hours.

Late hatching may arise through the temperature being too low, and too early hatching through the converse of this. Another very important matter, in fact, one of the most important items in the management of an incubator, is to have a sufficient degree of moisture present, but like that of the temperature, too much moisture is equally pernicious. There is a happy medium, and in order to strike this correctly, that good schoolmaster, experience, is indispensable. If the chamber is too dry, there is too much loss of moisture from



EGG-TESTING LAMP
(Gilbertson & Page.)

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within the shell, whereas excess of moisture in the chamber diminishes evaporation inside the shell, and the embryo dies through a modified form of suffocation.

The condition of the surrounding atmosphere in relationship to the ventilation must be taken into consideration; for instance, if the air in the room is too dry, more moisture must be allowed, whereas if inclined to be damp, the opposite is applicable. The water-tank should be replenished with water at a temperature of 120°, though some incubators are what are known as "non-moisture machines," but even these are usually sold with a water-tray. Either gas or oil are the usual heating media, the latter being as a rule the most convenient and the one in most general use. The best paraffin only to be used, and the trimming of the lamp, its replenishment with oil, etc., are all details of importance.

In order to judge accurately of the temperature, the bulb of the thermometer must be kept just above the eggs, and not touch them, otherwise there will be a difference in the temperature between that of the eggs and the air above them. It, the bulb, should be about half an inch above the level of the eggs within the drawer.

As previously stated, all unfertile eggs should be removed after testing them, either with the appliance depicted in the illustration, or by means of a piece of cardboard, blackened on one side, and with a hole cut in the middle, slightly smaller than the egg.

The egg is held between the fingers lengthwise over the aperture, and the dark side of the cardboard facing the observer, and the lighted lamp on the other side, so that all unfertile eggs, when viewed in this manner, are seen to be "clear," whereas those containing chicks will be quite dark, excepting at the air space.

There are many other inventions on the market for the

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same purpose, but they are all practically based upon the same principle.

It is necessary to issue one word of caution in connection with the transference of Pheasant chicks from the incubator, and that is to substitute the chickens gradually for the eggs under the broody hens, one half of the dummy eggs being removed and then the other half, the substitution being concurrent. See that the broody hens are free from lice, otherwise the chicks will be infected, and this will materially check their growth.

Concerning artificial incubation of Pheasant eggs, it may be of interest to refer to the opinions of several head-keepers which are given in the *Gamekeeper* of January 1909, the editors of that paper offering a prize for the best essay upon the subject, the winner being Mr Stewart Smith, but as two other letters are also meritorious, the author has taken the liberty of reproducing them in the order named.

The following is Stewart Smith's essay :—

“The perfecting of the incubator to its present state of efficiency has quite revolutionised the art of rearing Pheasants. One is nothing (no pun intended) nowadays if not up to date, and no keeper who proposes to be in the forefront at his occupation can afford to be without one or more of these useful machines, according to the number of birds he is supposed to rear.

“I have experimented with incubators in various ways, and I may just as well say it now, personally I do not approve of putting Pheasant eggs in them for the whole period of incubation. The plan I have found invariably to be the most successful is to set the eggs under the ordinary broody hens until they are chipped, then remove all except two or three that are left with each hen, and place them carefully in the

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drawer of the incubator. It is a good plan to set the machine going at the same time the hens were set, or even a day or two beforehand; then if any accidents occur, such as a hen ceasing to be broody or an egg getting cracked, these can be placed in the drawer and kept until another hen can be procured. Or you can allow the incubator to finish the process. In the case of a cracked egg or one that a hen has put her claw into, the egg will not hatch unless a small piece of paper is gummed over the fracture. No one who has ever used one of these appliances would care to attempt rearing a large number of Pheasants without one, and no one who has not tried them can possibly have any idea of the amount of lives that are saved through their agency. So that the best advice I can give to intending rearers, who do not already possess an incubator, is to get one without delay, and have it in readiness before the rearing season.

“If you keep your incubator only for hatching off chipped eggs, as I prefer to do, you will require to see that the thermometer in the drawer does not register more than 100° Fahr. Otherwise you will find that when you have filled the drawer with ‘live’ eggs, you will have great difficulty in keeping the heat at regulation point, viz., 103° to 104°. If the drawer becomes too hot, a speedy way to cool it is to draw it out altogether for a few minutes and keep it out until the damper has fallen. Then screw down the lamp a little. In practice I find that this is both better and quicker than tampering with the regulator. I am, of course, presuming that you have previously got your machine going perfectly steady, and that the heat only rises above the normal with the introduction of the ‘live’ eggs. Fresh eggs have exactly the opposite tendency, so that one would require to have the heat regulated to at least 103° before introducing eggs to the drawer. I take it for granted that the user will not

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forget to keep water in the tray, nor yet to change it frequently, and that he will not forget to turn the eggs every day. In the case of chipped eggs, the chip wants to be placed uppermost, otherwise you may find a few dead in the shell, through the little one's bill protruding through to the mat, and so being unable to turn round. Fresh eggs I find are best turned by taking several handfuls of eggs from the centre of the drawer, and allowing the others to gently roll to the centre. I then place the ones I have removed round the outer edges. Incubators are all, or nearly all, fitted with a so-called drying chamber. In practice I find it is much better to let the whole hatch dry off in the drawer, and as soon as ever the little ones are quite dry and able to stand up I have them removed and placed under previously prepared hens, who are sitting on a bird or two each in close proximity to the hatching house. Anything in the way of a chill is fatal to birds at this stage. In about forty-eight hours they can be safely removed, in a hot water-box, to the rearing-field. Even after hatching is quite finished it is a very wise plan still to keep one incubator going, for there is no remedy ever I have discovered for reviving birds that have wandered and got a chill like the drawer of an incubator."

Mr Richard Hayes advocates his method as below :—

"The following is the method I have followed for a considerable time with great and unwavering success. I take it for granted at the usual time in the spring you will have a sufficiency of eggs. Set under hens acquired for the purpose, taking care to set them in batches about once a week, to insure a certain quantity hatching simultaneously. In the meantime you will make ready your incubator, placing

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it perfectly level, in a room free from draughts, and in as quiet a place as possible. Two or three days before eggs are expected to chip you will start your incubator, bringing up the temperature to 104°. We will now suppose the eggs to be chipped. You will remove the bulk of them from under the hens, only leaving a few with each hen to hatch herself and keep her quiet. Place them in an incubator, taking care not to disturb them until ready for the rearing-field. You will know this by the eggs you have left under the mothers. The only attention required by the incubators is to attend to the lamp, and to keep the heat regularly up to the 104°. By doing so you will insure strong chicks; as a rule with me they turn out stronger than those left with the hen. Your hens will have now brought the ones left under them. Count them up (you will already know what you have in the incubator) and transfer them along with their mothers to the coops in the rearing-field. As soon as the hens have settled down, empty the incubator, take chicks to coops and make batches up. The hens will be perfectly quiet and make no demur. A lot of attention is now required by these, as the chicks are apt to get from under the hens and consequently chilled; in such cases place them again in the incubator until recovered. I have saved many by these means. I prefer this method of hatching to bringing out altogether under hens, as I consider immediately after the eggs are chipped to be the most critical time in the life of the chicks, many being trampled to death in the sitting-boxes by excitable hens, before they have fairly left the shells. You will now wash out your incubator and make ready for the next batch of eggs which will be at the point of chipping. Repeat the process and so on through the season. You will frequently find hens refusing to sit, after doing so for some time; or



SITTING OF PHEASANT EGGS

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again in hay-time, the mowing-machines play sad havoc with both Pheasant and partridge nests. Here again the incubator becomes invaluable, as you can place the eggs in it until you get the required broody hen. One thing I have omitted to mention, and that is to cover the slippery floor of the egg box or drawer with a piece of wrapper or other similar substance. This is a great help to the young chicks in getting on to their feet. The egg shells should also be left in, as they serve a similar purpose. These may seem very trifling things to mention, but it is this attention to minor details that leads to ultimate success."

Mr John Wills' essay was as follows :—

"When speaking of incubators a few years ago in the presence of an old labourer who had not seen one he seemed to be greatly interested, and after some time he exclaimed, 'What be they things?' 'Oh!' I said, 'they are machines for hatching chickens.' 'What!' he said, 'do you mean to tell me you put eggs in a machine and turn a handle and hatch out chickens?' When I tried to explain that there was not any handle to turn, he said, 'Wall, tain't a machine then.' And there are plenty of keepers who, although not as bad as this man was, do not know what a valuable aid an incubator is at hatching-time. We will suppose we have a one hundred egg incubator which will hold one hundred and eighty Pheasant eggs. The incubator room should be situated, if possible, where the direct rays of the sun will not shine into the room. Have a solid floor so that the machine can be fixed firm and level, then start the machine and regulate the heat in the drawer to 103° steady heat. Now if we have not had any experience I think it a good plan to try with a few hens' eggs. Even if

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we do not want to rear the chickens we shall get into the way of regulating the machine. Supposing we have two thousand eggs to put down by the 20th of May. Our incubator will only hold one hundred and eighty at one time, so we must set our eggs in the following way. On 26th April we will set twelve hens on fifteen eggs each. Next day put seventy eggs in the incubator with date marked on them. The eggs under the hens will chip a few hours before those in the machine, and when a sufficient number has chipped they must be drawn out and put in the incubator, and those in the incubator must be put under the hens till those chipped are transferred to the drying box. You must be careful to let each hen hatch one or more birds, or you will find on taking them to the rearing-field that they will not take them and will most likely brain the lot. After the first two lots are set, we must follow with lots of two hundred, as our incubator will be full enough. The remaining space can be used if any hot eggs are brought in and we have not a spare hen to take them. The birds an incubator will save with careful management during the hatching season will pay for itself, so I advise every keeper to get one. I have stated two thousand as a guide, but anyone can adapt the plan to their own particular circumstances. I think an incubator is just as valuable on a wild shoot where wild birds only are expected. Make up a good number of nests with two or three pot eggs to induce the bird to lay in safe and convenient places. Do not interfere with them until they become broody. Watch them off, and replace their own eggs with the same number of pot ones. The number of each nest and the date should be recorded so as to know when each hen began to sit. Some will lay a few eggs and then forsake. These eggs with those found in dangerous places should be put in the

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incubator to hatch at the same time as some of the nests. When the eggs begin to chip, put them in a warm water-box wrapped in flannel. Go about an hour before sunset, and from behind lift off the hen with a stick, and give her fourteen or fifteen, according to the eggs you have, and in about an hour's time have a look to see if she is still on all right. If this is done quietly, the hen generally soon comes back, and having all night to sit, goes off with a full brood. I do not advise anyone to interfere with partridges, they generally do better if left quietly alone. Finally I would add, if you should have the misfortune, on going round to feed your birds some cold or wet morning, to find that they have squeezed out from under the coop (which sometimes happens if it is a rough bottom) and are nearly dead, that the best place to bring them round is in the drawer of an incubator."

Mr. William Sewell advocates the following method:—

"An incubator is one of the most useful things a game-keeper can have during catching and hatching time, and unfortunate is the man who does not possess one, especially when there is a large percentage of weakly chicks hatching out. If only one incubator is in use, I think it should be used solely for drying the birds which are not strong enough to be taken to the field, and for finishing off the chipped eggs which are in danger of being crushed by the sitting hen. Often when nesting the keeper will accidentally flush a sitting hen from her nest, and perhaps has no spare hen under which to put the eggs. Then the first thing he thinks of is the incubator, in which he places them until such time as there is a hen to take them. It often happens that several sitting nests are found. Then care should be taken not to

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get them mixed, and when put in the incubator they should be marked, so that each separate lot will be known, and no complications result. When hens are hatching off it is very seldom that all the chicks come out together, and some may be strong and fit for the rearing-field, while others are only struggling out of the shell. It would never do to let them stay under the hen till all were fit, or in nine cases out of ten serious results would happen by the hens trampling them. Probably the best birds would be crushed. There the drying box comes in useful, and all backward birds should be placed therein, care being taken to keep them warm while moving. In a few hours the majority of these birds will be as strong as the others and ready to join them under the old biddy on the field. While in the drying box the lid should not be shut down close but be kept slightly opened, just sufficient to give the chicks a little air. The incubator should be kept as near as possible at one heat, about 104° or 105°. This is rather difficult at times, as it is often opened for the purpose of putting in or taking out the chicks, and naturally it loses a certain amount of heat each time it is opened. This, however, does not affect the young birds as much as the eggs, which are nearly sure to be in the drawer underneath, but the less an incubator is opened the better. In a wet season the hens will sometimes turn restless and take no notice of their young brood, with the result that the little things get wet and draggled, and, failing another good hen, would die but for the useful incubator, in which they soon come round, and in a short time are as lively as ever. Of course they need a mother then, but there are sure to be other hens hatching off which will take them, and occasionally I have known their former mother to settle down quietly and take them again. If a man has more incubators than he requires for drying off

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chicks, etc., he will naturally want to try his luck with cold eggs, and in that case a little more attention is required.

“The incubator should stand perfectly true. This is best accomplished by using a spirit level and placing thin pieces of wood or cardboard under the bottom if necessary. Then the lamp needs carefully looking to, and should be filled and trimmed every morning, and when a steady heat of 105° is attained the drawer may be filled with eggs. These should be turned over every day. I find the best way to do this is to put a cross or other mark on one side of the egg. Then it is easily seen if it has been missed. The best way to turn them is with the finger tips. Incubation should be started at the same time when a large batch of eggs are placed under hens, then when hatched the chicks will come in useful for distributing among the hens which have brought off a poor lot, and thus you will insure good broods being placed on the rearing-field. Care should be taken to keep the heat of the incubator always at 105° or eggs may be spoiled. Once a day is quite sufficient to interfere, and eggs will get the necessary airing while the turning and lamp-trimming process is going on. To make most use of an incubator would be to fill it with eggs when the first lot of hens are set; it would then come in useful for the weakly chicks after, but for some reason a good many do not do this. Perhaps they would expect more to hatch off than there would be mothers for. That would depend, however, on the fertility of the eggs and the number of hens set.”

CHAPTER XXIV

THE SELECTION OF BROODY HENS

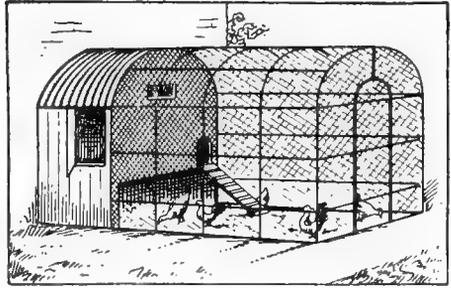
THE practical game-rearer knows perfectly well that upon the judicious selection of suitable hens for egg-hatching purposes and the subsequent rearing of the chicks, his success mainly depends. The artificial incubator and the artificial rearer have, to a large extent in poultry rearing, supplanted the hen, but game-rearers take a more conservative view of the matter, relying principally upon the domestic fowl for the successful raising of the Pheasant broods.

It is well that the majority of game-rearers are somewhat conservative in their views, as it has yet to be shown in an incontrovertible manner that the artificial foster-mother can be utilised as a satisfactory substitute for rearing Pheasants. A good deal of care must be exercised in purchasing broody hens, otherwise subsequent events will in all probability show any indiscretion that has been committed.

On some estates a sufficiency of fowls are kept for sitting purposes, from which the keeper draws his supplies, as the occasion demands ; whereas other keepers are entirely dependent upon birds they purchase from cottages and farmers in the locality. Or again some keepers merely hire the birds, paying 1s. 6d. or 2s. for the hire during the rearing season. Where a large head of Pheasants has to be reared, it necessitates a good deal of resourcefulness on the part of the keeper to obtain a sufficiency of broody hens to meet the demands imposed upon him, though some hens will rear

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three broods in a single season, but commonly two. A matter that has often given rise to a considerable amount of discussion in connection with broody hens for sitting purposes is that respecting the different variety of fowls for sitting purposes, and every man is entitled to his own opinion, some keepers preferring one, others another variety, but there is a consensus of opinion that the cross-bred or barn-door fowl is one of the best for such uses, provided that the bird contains a proportion of the Brahma cross. Wyandottes, Orpingtons, Indian Game and Plymouth Rocks are all good sitters as well as good mothers, whilst Brahmas, Cochins and Langshans are early brooders, and sit well, but they are inclined to be clumsy, consequently liable to injure the young birds.



PORTABLE PHEASANT AND POULTRY HOUSE

A variety of fowl that can with every confidence be recommended is the Silkie, a native of the Far East, and it would be profitable for Pheasant-rearers to cultivate more of these birds. A Silkie will become broody when it has laid about a dozen eggs, and will sit anywhere during this time in a most patient manner.

A Silkie hen will cover about a dozen Pheasants' eggs, and do the work of incubation as well as subsequently tending their young better than any other variety of fowls. They never trample on the chickens, and rarely damage an egg, and they have more warmth in them in point of size than most other fowls. Another advantage claimed for this variety of fowl as brooders is that they will take to Pheasant

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chicks belonging to another hen just as well as they do to their own.

The hens weigh about 2 lbs., are pure white in colour, whilst the skins are of a deep violet. The comb, the face and the wattles are a reddish-purple, and the legs blue.

Although any poultry may become infested with lice, likewise with scaly-leg, the author believes that Silkies are freer from these troubles than any other species of domestic fowl; therefore, this alone is a strong recommendation for the adoption of these birds whenever possible. In order to have a good supply of Silkies, the head-keeper should encourage cottagers to raise as many as they can, and this can be done by supplying them with a sitting of eggs on equitable terms. The Silkie is hardy, good-tempered, and will flourish in the smallest of spaces, but it is a variety that does not do well if exposed to too much wet, cold or excessive heat.

The exigencies of circumstances may compel the game-rearer to select broody hens of all sorts, shapes and sizes, some of which will prove good, bad or indifferent sitters and mothers, though there is one golden rule which cannot be too strongly emphasised, and that is, select healthy, or apparently healthy, brooders only.

Infestation with lice, scaly-leg, tuberculosis, roup, as well as enteric, are the principal troubles that the game-rearer must guard against. All these complaints have been referred to under their several headings, in the chapters relating to diseases, but it is necessary to recapitulate the salient features indicative of such undesirable affections.

Scaly-leg is easily recognised by the disorganised condition of the scales upon one or both of the legs. Roup will be recognised by a discharge from the nose and a snuffling sound in the breathing. Lice require to be carefully looked

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for, especially on the under parts of the body, and the feathers should be parted to see that the birds are free from this infestation. A lousy broody hen will soon infect the brood, and they will never thrive like they ought to do, as the poultry louse causes a lot of irritation.

Tuberculosis is a wasting disease, and when fowls are affected with it, they are generally very poor, feel light when handled, and are lacking in vigour, their wings droop, and they seem to hang about in an aimless sort of manner.

With reference to enteric, the game-rearer will almost have to take his chance, as there is no method that can assure him against the introduction of this deadly trouble, which is, as every Pheasant-rearer knows, the most dreaded scourge, or at any rate, this, and another trouble—gapes.

If fowls are selected where they have unlimited grass runs, the risk of introducing enteric is greatly minimised; therefore, avoid selecting fowls where they are kept in a dirty condition, with little freedom.

It is sometimes a difficult matter to ascertain whether a hen really is broody, but the best means of doing so is to go into the poultry house after the birds have gone to roost and had time to settle down. A hen that is sitting on her nest, at what may not inaptly be termed a late sitting, will usually be found broody, but the author advises that all selected hens should be carefully examined in a strong light during the day-time, in order to see that they are perfectly healthy.

Do not have anything to do with birds that are moulting, as they are totally unsuitable for hatching purposes. In the introduction of the broody hen to the nest, she should be put in the hatching-house, where she can see the eggs, along with some food and water, and she will soon accommodate by sitting on the eggs. The best place for the nest-boxes is

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one that is very quiet, warm, well-ventilated, free from draughts, and rather dark. Each nest-box should be 18 inches high and 15 inches square, without a bottom, with the top, back and sides of solid wood, so that in a row of nest-boxes one hen will not disturb another. The sides should have three holes drilled in them towards the roof, and the front ought to be hinged so as to let down; but there must be a small board at the lower part of the front to keep the eggs in position.

Some hatching-boxes have wire bottoms to them, others have a wire pen attached, but whatever form of hatching-box be used, it must be kept scrupulously clean, periodical lime whitening being a *sine qua non* for successful hatching. Do not forget that the hatching-box frequently proves to be infested with lice, and a broody hen that is thus troubled cannot possibly be a steady sitter.

Some game-rearers keep their broody hens shut up during feeding-time, which in the author's opinion is a mistake. They must be allowed out for food and water.

Daily cooling of the eggs is indispensable, and if the hen is allowed ten minutes' recreation, the eggs will not take the slightest harm, whereas in warm weather she may be allowed out for a little longer. The best food for the sitting hen is barley, maize, buckwheat, and a little green bone, with plenty of grit and water. The best position for a nest-box is on the floor, and in making a nest, take care that the corners of it are well filled, but it must not be hollowed too much on the ground.

When the hatching-boxes are in the open air they must be so placed that neither excessive heat, nor rain, etc., will interfere with incubation. Select a warm corner and place the boxes on the level ground. Sand makes a very good nest if it is properly shaped with the hands, and then lined



BARN-DOOR FOWLS IN SITTING BOXES

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with a mixture of hay and leaves. There is no doubt that a good deal depends upon the nest for successful incubation. It must neither be too dry, nor yet too moist, both factors being detrimental to the eggs or rather the embryos within.

Protection must also be afforded against rats and other egg-stealers. Some keepers make the nest on the bare earth. If the sitting-boxes have six compartments, and large broody hens are selected, fifteen eggs may be set under each hen, though sometimes more than this number is placed under her. It is a mistake to set too many eggs, as the bird cannot cover them properly, and those eggs on the outer zone of the nest suffer from loss of heat, no matter however careful one may be to shift them from one position to another. A Silkie hen can cover from ten to twelve eggs, and this is just about as many chicks as the mother can properly look after, though upon this point opinions are divided. Very large broods have been successfully hatched out, both under natural and artificial conditions, but there is one matter upon which most men are agreed in connection with Pheasant-rearing, and that is that late nests of eggs do not, as a rule, prove very satisfactory, and by a late nest the author means one set in June.

A remarkable late hatching was recorded by Mr Walter Jones, gamekeeper to Col. Arthur Turner, on whose estate some young Pheasants about two days old, ten in number, were observed on the 20th of September, the brood being in a healthy condition. Such instances of late hatching, though exceptional, are by no means rare, yet game-rearers are not in favour of late broods, and this for multifarious reasons. About the third week in May is quite late enough.

When eggs get broken in the nest they should be removed and the rest of the eggs cleaned. Each sitting-box should be numbered, and precisely the same remark applies to the

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coops, so that the keeper can identify the various broods together with the dates on which the eggs were set. The number of eggs put down at one time varies, but for a single-handed keeper from two hundred and fifty to three hundred and fifty will be sufficient.

If cross-bred fowls are used, for three hundred and fifty eggs not less than thirty broody hens should be purchased, it being expedient to have an extra number to meet emergencies.

Hens that refuse to leave the nest during sitting must be gently lifted off. Plenty of materials for dusting, such as dry sand, ashes, together with a small supply of green food, are additional requisites when the sitters temporarily leave their nests. When there are no feeding yards in connection with the hatching-boxes, it is necessary to tether the hens to pegs, about a yard apart, so as to prevent them from fighting with each other, because broody hens are nearly always quarrelling with each other when allowed full liberty. One end of the tether is fastened to the fowl's leg and the other to the peg, but care must be taken not to have the loop on the leg too tight, otherwise damage will be done. If a broody hen is inclined to forsake her eggs, the best plan is to get rid of her, and either put the eggs under other hens or substitute another broody hen.

It is not advisable to interfere with the eggs too much, but one can assist nature by the exercise of tact. Frequent handling of the eggs is decidedly injurious, and so is constant testing of them. They can be tested on the eighth or tenth day, and all clear eggs removed ; but a broody hen does not like to be continually disturbed by man. If she is at all uneasy she should be lifted off the nest and given a good dusting with some flowers of sulphur and then replaced.

In some game-rearing establishments the sitters are

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allowed to go on and off their nests whenever they like, and whilst this has its advantages, it has its disadvantages. During dry weather it is a good plan to sprinkle the eggs with a little lukewarm water daily, though some only do so during the last week of incubation.

Pheasants' eggs ought to chip on the twenty-third day after they have been put down, and when they do so they can, as advised, be removed to the incubator to complete the delivery of the chick from its shell. When assistance is required it must be done very carefully, otherwise the chick will be killed. In the hatching of Pheasants' eggs, method is on the part of the keeper an indispensable part of the work, and not only must the rearer be methodical, but he must be systematic, and in order to fulfil these commissions a daily record of the work is an indispensable factor and one that proves of invaluable service for future reference.

Successes and failures should be recorded, and deductions are then easier to make.

CHAPTER XXV

THE FEEDING AND MANAGEMENT OF PHEASANT CHICKS

THE consideration of the rearing-field, as far as the best sites for such are concerned and various other matters connected therewith, have been dealt with in another chapter, whilst the best means of protecting the young birds against their multifarious enemies on the rearing-field has been discussed elsewhere in the work, so that, in the present chapter, the author will mainly direct his remarks to the feeding of the birds, together with the discussion of the most suitable foods employed for such purposes.

The coops must be so arranged that there is sufficient between one and another to prevent intermingling of the separate broods, whereas if they are close together, one hen will sometimes get the chicks from other broods, and in this way have a following of forty or fifty after her, which she is quite incapable of sheltering.

The presence of insect life and grit are indispensable for the rearing of young Pheasants, and on rearing-fields that are deficient in insectivora, it is necessary to supply the young birds with some substitute, such as ants' eggs, supplies of which can be obtained from dealers in game food requisites. Each nest of chicks as soon as hatched should be noted in the keeper's pocket-book, and its transference to the coops on the rearing-field similarly noted, so that the keeper can at once ascertain full particulars concerning any particular brood, such as the number of chicks hatched, subsequent deaths, etc.

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A warm dry day should be selected for the purpose of transference, and when a number are hatched simultaneously, they may be all put together and equally divided amongst their foster-parents in the coops. No food will be required for at least twelve hours, and each of the coops should be so arranged that they are neither exposed to cold winds nor to excessive heat. If the coops have been placed out in dry weather and the grass is short, the author believes that no flooring of any kind is necessary, though some keepers use mats, others chaff, wooden floors, and so forth, but from a hygienic point of view, the best material for the floor of a coop is cork, it having three distinct advantages over any other material, viz., that it is damp-proof, porous, and easier to clean than any other form of flooring.

Cork squares, exactly the size of the coop, can be obtained, though of course must not be permanently fixed to the coop, otherwise such will become insanitary.

Give each hen a full brood, and if mats are used they must be removed and cleansed daily. When the chicks are first put in the coop, say in the morning, it is a wise plan to close the shutter of the coop until the evening, as this facilitates the mother and chicks settling down. In passing it is worthy of mention that coops are manufactured in a variety of forms. The simplest ones and those most generally in use have bars at the front, with either a sliding or a drop front, so as to shut up the chicks at night and protect them against nocturnal depredations.

Some coops have a small wire run attached, and there is no doubt that these are much healthier for the chicks than the coops so commonly in use ; moreover, they are protective, the chief objection to them being the expense. Useful forms of keeper's coops, with sliding roofs and shutters, can be obtained for about £3 per dozen. A coop should be

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about 2 feet square, 18 or 20 inches height in front, and not less than 1 foot in height at the back. However, a selection of coops is a matter for individual consideration, the principal item being to shift them frequently, to keep them thoroughly clean, to place them on even ground, to arrange them so that they shall have the best exposure for light and warmth, as well as affording the chicks protection against their foes.

There is one factor that must never be ignored in connection with the rearing of Pheasants, and that is to keep a sharp look-out for any sickly birds which may form the starting-point of a fatal epidemic. The most economical plan is to destroy any ailing birds at once, and burn the bodies. Regularity in feeding, suitability of food, its fresh preparation each time, a supply of insect life and grit, and an absolute regard for cleanliness, constitute the fundamental principles upon which successful Pheasant-rearing is based.

Dirty coops, fouling of the ground, unsuitable food, irregular feeding, and stale food, constitute the surest channels for provoking the onset of disease, which, when once established, is bound to end in disappointment.

Another matter must not be overlooked, though quite beyond the control of the keeper, and that is the weather. A wet season is a bad one for Pheasant chicks, more especially if the rearing ground has been used in successive seasons, or grazed by calves or lambs affected with husk or hoose. It is on such a rearing-field that gapes will most likely become prevalent, and every keeper who knows anything about Pheasant-rearing does not give a very hearty welcome to a trouble of this kind. (*See Gapes.*)

The proper ventilation of the coops must not be overlooked, and the author considers that the keepers do not



YOUNG PHEASANTS FEEDING AT THE COOPS

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pay sufficient attention to this matter. If a coop is shut up at night, it ought to be provided with proper ventilation, as no birds will ever thrive when they are compelled to inhale for hours air that has been practically poisoned by their own breathing. As previously stated, the open-air coop, with covered-in run attached, if produced at a reasonable price, is the sort that ought to be used, provided that it is made portable, light and easy of transference from one part of the rearing-field to another. A fault with some gamekeepers is that they allow their coops to remain too long on one site. Coops should be shifted daily.

Healthy Pheasant chicks ought to grow like cucumbers, and, given sound stock to start with, and proper feeding, serious losses ought not to occur. Every Pheasant-rearer is bound to have a certain number of weakly chicks as well as a certain number of deaths, both being features inseparable from the art of Pheasant-rearing, but when chick after chick begins to die, the keeper should make an effort to ascertain the cause and cut short the loss in its initial stages.

For the first three days, Pheasant chicks should be fed four times per day, commencing the first feed early in the morning, say at six o'clock, and subsequent feeds at intervals of three hours, the last one being at a corresponding time to the morning feed. These hours of feeding should be continued until the chicks are a fortnight old, when they may be slightly modified, the first feeding in the morning being given at seven o'clock, and subsequently every three hours, up to the end of the second month, when it will only be necessary to feed three times a day, namely, early morning, midday and early evening, the last feed being given before the chickens begin to go to roost.

Regularity of feeding is a *sine qua non*, therefore the keeper must always endeavour to be up to time in this

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respect. Considerable differences of opinion exist as to what should constitute the food of Pheasant chicks from the time that they are placed in the coops until they are finally severed from their foster-parents at the covert side.

With Pheasants reared under perfectly natural conditions, the keeper has little concern, but artificial rearing necessitates the selection of such foods as approximate the food obtained by Pheasants living in a wild state.

All game food manufacturers make a speciality of Pheasant foods suitable for chicks from the time they are hatched up to the time that the birds are placed in the covert, likewise subsequently from the latter period until they require no further feeding, that is until they fall to the gun of the sportsman.

Two systems of feeding are adopted, one known as the dry method and the other the wet one, each having their advocates, though the one most generally employed is the wet system of feeding; not that wet food is supplied to Pheasant chicks, but food that is slightly moist and given to them in a granulated form.

From within the first twelve hours after incubation, some form of egg food is universally employed, as eggs contain all the constituents or provide materials essential for their growth. The albuminous material of eggs consists of the elements oxygen, hydrogen, nitrogen, carbon, sulphur and phosphorus, united together in such proportions as to form a food easy of assimilation, provided that such properties are not destroyed by over-cooking.

Very few keepers or game-rearers attempt to rear Pheasants without use of eggs, though they can be reared, as proved by the vigorous growth of wild birds, without such food.

There is a popular but erroneous notion that eggs

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should be hard boiled before being given to the chicks. That this is fallacious is proved by the successful rearing of Pheasants on eggs that are without any cooking whatsoever, being merely mixed with the other food.

Strictly speaking it is a matter of very little indifference in what form eggs be given, provided that they are fresh, there being a chemical change in decomposing eggs that renders them pernicious when given to Pheasant chicks. The only effect that heat has upon eggs is that of coagulating the albuminous material and solidifying the yolk.

If the rearer prefers to boil the eggs, they should not, as previously stated, be over-boiled. Sour food, or food that is too wet, is very liable to produce scouring, and once this is established, it is troublesome to check. Some rearers prefer to solidify the eggs with milk into custard form, and mix this along with the other food when it is cold. Again, another class of Pheasant-rearers are strongly in favour of curd made from milk, the latter being curdled with alum, which is a most objectionable drug to use, as it completely destroys the intestinal secretion and hinders digestion, as well as destroys the nutritive value of the milk.

Although not a natural diet for the Pheasant chicks, there is no doubt that milk is a valuable addition to their food, as it contains such a large proportion essential to the life of mammals, and is in a modified sense, a food for birds. Custard is easily made by adding six eggs to every pint of milk. The eggs should be beaten up, and cold milk then added, and gently heated until it is quite thick, and it will solidify into a solid mass when cold. When cold the custard should be broken up and mixed with some meal, preferably with fine biscuit-meal, which has been previously scalded in order to swell it. If biscuit-meal is not used, very fine barley-meal, oat-meal, wheat-meal, or maize-meal can

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be substituted, only all the meals must be scalded before mixing with the egg food, but must never be made into a paste, the best form to give it being in a finely divided granulous state, to obtain which some Pheasant-rearers pass it through a sieve.

The egg food should be given in the proportions of one to six of the meal.

The author considers that a most valuable adjunct to a Pheasant chick's food is chopped-up lettuces, dandelion leaves or onions, but only a small proportion of green food, certainly not more than one part to every twenty, ought to be allowed, otherwise the chicks will be affected with scour. The green food contains large proportions of water, so that very little water will be required beyond that contained in the food.

Earlier on in this chapter the author recommended that the chicks be fed four times per day, but where trouble and additional expense have not to be troubled about, it will be found advantageous to feed the chicks every two hours for the first fortnight. A few split groats added to the food will be found beneficial, or crushed hemp-seed can be substituted. Up to the period named, there need be no alteration, either in the composition of the food or the frequency of the feeding, the only matter being to increase the quantities of food. Immediately after the chicks are fed, any food that remains behind should be removed, and make a practice not to prepare more food than is necessary each time. Whatever surplus there is let the broody hens clear it off. Scald the dishes each time before they are used again.

A supply of grit and water should be allowed, and if the water is not absolutely necessary, finely divided grit is, and the older the chicks become the more the necessity



THIS PICTURE ILLUSTRATES AN IDEAL SITE FOR A REARING FIELD,
AND ALSO THE ARRANGEMENT OF THE COOPS

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for grit. Invaluable adjuncts to Pheasant chick's food is canary seed and white millet seed. The cost of the first named is usually about fifteen shillings per bushel, and the latter twelve shillings, but in giving these seeds it is not advisable to mix them with the other food, but scatter them freely around the coops, so as to give the chickens employment, in other words to "forage" for their food. If no eggs are used, the foregoing seeds along with ants' eggs and biscuit-meal, or some other form of meal, must be used instead.

After the first fortnight there will be no necessity to give the food in such a finely divided state, and the eggs can be gradually withdrawn, as every keeper knows that these are a most expensive item in connection with Pheasant-rearing, therefore they ought to be dispensed with as soon as ever such can be economically done. Biscuit-meal or other meal can be of a coarser character, and a little more green food may be used. Boiled rice, with a very small portion of mutton greaves added, would be suitable, but avoid giving too much greaves, there being in the author's opinion no more pernicious material than greaves in excess. The moral is to give this food most sparingly. If boiled rice is used, put the rice into boiling water, so that when it is cold, the particles of rice will be whole, instead of a starchy mass, as usually happens, when the water and the rice have been boiled together.

Another matter of importance is not to allow the rice to burn. Maize flour and barley flour are very useful when added to the food.

Most of the game food firms sell biscuit-meal in two grades as well as other special foods for chickens, and as these are largely used by keepers in the rearing of Pheasants, it follows that they are particularly suitable for such purposes,

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though, of course, every keeper has his preference in this matter. Gentles or maggots are highly esteemed as a food for chicks, and there are various methods of obtaining a supply of these; but where insect life is abundant on the rearing-field, such natural food has advantages over that artificially supplied.

Maggots can be obtained from either seaweed or flesh. If seaweed is used it must be placed in a heap and allowed to rot for a fortnight. The maggots can be cleaned by placing them in sand and bran, then gently heating them on an iron shovel over the fire when they are ready for feeding the birds. But even maggots must be given with discrimination.

Two parts of maize-meal, one of wheat and one of oats, mixed with hot water and allowed to swell for a couple of hours before feeding, is a capital food.

If feeding boards are placed in front of the coops, these should be scalded every day.

As a substitute for eggs and milk, dried yolk of eggs and dried milk can be employed, and when these are mixed with biscuit-meal, stale bread, rice, or any other meals mentioned, a really serviceable article of dietary is provided, and one that healthy Pheasant chicks ought to thrive on.

As showing some of the constituents of various meals, etc., used in Pheasant-rearing, the author appends an analysis of these, shown in tabular form:—

Barley-meal

Water	11.1		Carbo-hydrates	34.8
Mineral Salts	5.7		Fats or Oils	4.9
Fibre of Husk	31.9		Albuminoids	11.6

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Oat-meal

Water	10.5		Carbo-hydrates	52.2
Mineral Salts	6.8		Fats or Oils	4.5
Fibre of Husk	14.5		Albuminoids	11.5

Rice-meal

Water	11.5		Carbo-hydrates	63.3
Mineral Salts	5.3		Fats or Oils	7.3
Fibre of Husk	2.7		Albuminoids	9.9

Wheat Flour

Water	12.6		Carbo-hydrates	73.0
Mineral Salts	0.7		Fats or Oils	1.2
Fibre of Husk	0.7		Albuminoids	11.8

GRAINS AND SEEDS

Maize

Water	14.4		Carbo-hydrates	62.1
Mineral Salts	1.5		Fats or Oils	6.5
Fibre of Husk	5.5		Albuminoids	10.0

Barley

Water	14.0		Carbo-hydrates	66.1
Mineral Salts	2.7		Fats or Oils	2.3
Fibre of Husk	4.9		Albuminoids	10.0

Buck-wheat

Water	14.0		Carbo-hydrates	58.7
Mineral Salts	1.8		Fats or Oils	1.5
Fibre of Husk	15.0		Albuminoids	9.0

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Dari-seed

Water	3.10		Carbo-hydrates	61.5
Mineral Salts	1.6		Fats or Oils	5.0
Fibre of Husk	3.9		Albuminoids	15.0

Millet

Water	13.0		Carbo-hydrates	61.5
Mineral Salts	1.6		Fats or Oils	5.1
Fibre of Husk	3.9		Albuminoids	15.0

Hemp-seed

Water	12.3		Carbo-hydrates	15.0
Mineral Salts	4.4		Fats or Oils	30.1
Fibre of Husk	22.0		Albuminoids	16.3

Acorns

Water	56.0		Carbo-hydrates	34.5
Mineral Salts	1.0		Fats or Oils	1.6
Fibre of Husk	4.5		Albuminoids	2.5

Cow's milk contains 87 per cent. of water, 5 per cent. of carbo-hydrates, 3 per cent. of fat, and 3 per cent. of albuminoids.

Potatoes contain 75 per cent. of water.

Lettuces contain 95 per cent. of water.

Cabbages contain about 90 per cent. of water, and carrots 85 per cent.

From the foregoing analysis it will be gleaned that the carbo-hydrates and albuminoids, as well as the fats, are the principal constituents of food.

Concerning the feeding of Pheasants, the following remarks are those of a keeper, and being of a very practical character, the author has pleasure in reproducing the paragraphs from the *Gamekeeper*.



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A Keeper's Opinion on Feeding Young Pheasants

“It is astonishing how few keepers take the trouble to think out for themselves a system of feeding young Pheasants. The usual way is to do just as others did before, and to follow the old methods. Many of them never take into account any peculiarities of climate, soil, kind of produce on surrounding fields, quantity and quality of such produce, the many differences of the seasons as they come and go, sometimes even being more conspicuous by the absence of their usual accompaniments of heat, cold, moisture, insect life, etc. Of course, it needs intelligence in reading, study, comparison of books, reasoning out writers' opinions, one's own observation, experiments, conversation with others, exercising one's own originality in ideas, adopting new methods, studying sciences which might indirectly affect the subject in question, as the geology of the district, and other means of obtaining the best results. One finds many a keeper feeding his birds in cold, wet weather, and making no difference between wet and dry or cold and hot seasons which occur at the same periods of the year in different years. No one ought to expect that the same methods will answer satisfactorily to suit different requirements in feeding and rearing young Pheasants as in treating other things in natural or artificial life. Some alteration of treatment must surely be necessary under different circumstances. One must adapt oneself to one's surroundings and become master of one's circumstances and not allow circumstances to master us and render us like straws floating on the ocean. Any practical man will very soon learn what is really wanted on different rearing-fields, for such fields differ very much in supplying natural food for young Pheasants. There has been a great deal of talk and writing during the last few years about what

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it costs to rear young Pheasants. One point is clear to all intelligent minds, that is, no hard-and-fast line can be laid down as to what Pheasants should be fed upon during the four seasons of the year. From my experience I find that the cost in some seasons may not be above half what it is in the same seasons in different years. Take, for instance, the year 1907, when we had such a poor partridge season. People seemed positive in affirming that it was a disease among the partridges, but the conclusion I came to after hearing different statements and observing for myself was, that the partridges and wild Pheasants were simply starving for lack of insect life. Those, especially keepers, who remember that particular season sufficiently well to recall the state of affairs then, will no doubt be able to call to mind that fact that, until September set in, there was a marked deficiency in insect life, and then we were simply inundated with swarms of the insectivoræ, so much so, that it was remarked how the engines of railway trains were covered with swarms of flies. Therefore, I may confidently affirm that during the absence of insect life that year, the Pheasants obtained nothing of a substantial flesh-forming and vitality-producing nature except that which chanced to be given them by those who endeavoured to keep alive as many as they could. Scientists tell us that without a certain amount of proteid or albuminous food no animal life is able to exist for any length of time. Professor Gawgee, in his lectures on human food, said confidently, 'Without proteid we die.' He had shown what constituted real nourishment, for starchy, sugary, gummy, and fatty foods alone will not sustain the life of either man, beast or bird. We may note the harmful results to those of our own kind, and there are many persons whose chief foods are white bread, butter, fat bacon, potatoes, pastry, suet dumplings and tea. The only

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redeeming feature about their diet is the occasional week-day lump of cheese or a Sunday milk pudding, which perhaps is preceded by a small allowance of indigestible ham, pork or hard beef, or bacon a little leaner than usual, and maybe an egg in summer when they are plentiful.

“ I may say that my feeding account during that particular season ran up very considerably beyond its usual limit, for I was obliged to have recourse to feeding with eggs. Keepers differ with regard to the question of egg-feeding as to whether these oft-times expensive items are really necessary. I am acquainted with the fact that some keepers make eggs a staple part of their feed during the whole season. This I believe to be an unnecessary expense. But it is useless to disclaim entirely against the use of eggs, for men of science tell us that a chick, before it leaves the egg, absorbs all the yolk. This yolk is partly cooked by the hen sitting on the eggs, but it is not then exactly in the hard-boiled state in which we use it generally. It is advisable and necessary, no doubt, to give Pheasants eggs, for a piece of yolk will always tempt them to pick when nothing else seems to do so. Some keepers do not give eggs hard boiled after the first few days, but they simply use them in their raw state as part of the necessary moisture with which to mix the food up.

“ While I am upon the egg question, I should like to say I think one egg to twenty birds is about the proper proportion of this very concentrated proteid food to be used in their diet, and by the time that they are a week old I always give them in the proportion of only one egg to about thirty birds.

“ It is an open question at present how much flesh-forming food is really necessary on an average for the healthy maintenance of animal existence, vitality and vigour, as the amount seems to vary according to weather and circumstances. However, it is a great mistake (at least in bird

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feeding) not to use sufficient heat-giving, energy-producing, and filling-up material in the form of starchy foods as cereals, or meals, or other cooked preparations, also other seeds which are the natural foods of the feathered creation, for only birds have gizzards or 'mills' in their digestive organs. Oils and fatty foods which are two and a half times the power, weight for weight, of the starches, sugars, etc., in giving heat and energy, are necessary for lubricating the joints and digestive organs and for keeping open the bowels, also for stimulating the nervous system to nourish itself.

"Proteid food will sustain life if used alone so that it contains bone-forming phosphates and salts for the young and growing individuals of the animal creation, but by itself it seems to lack the 'filling-up' bulk which seems necessary to give the 'satisfied' feeling to the stomach, at least in mankind, while without vigorous exercise out of doors it certainly causes costiveness if used excessively or alone. With regard to the proportion of food constituents, I believe in the end it will be found that different treatment, and that almost indefinitely, is better; still, of course, an average may then be taken of a large number of cases.

"Pheasant chick foods are sold by game food dealers, and perhaps these foods might be materially improved by the addition of such special seeds as these birds love to pick, such as the acrid, biting, irritating seeds of buttercups, common arum (or cuckoo-fruit, or 'lords and ladies'), also pilewort and others to which an observant keeper may see them help themselves in the height of the seeding season.

Many of these seeds seem absolutely useless to other living creatures, although they are useful in certain medicines for our own kind. These seeds may add to or take the place of other seeds in the already prepared dry chick foods

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according to the constituents they may be found to contain if analysed as all foods should be.

“I have used certain chick foods for the last seven or eight years with beneficial results, and I am of opinion, although some may perhaps not agree with me, that a dry chick food might be prepared specially to rear Pheasants on the same footing as chickens are reared. If some of our large wealthy chick-food firms, or agricultural colleges, or both in co-operation, would only experiment on a scientific basis with which they are acquainted, using the birds' own special feed foods that I have named, and adding also the verifying safeguard of observation to their efforts, we should be able to solve more definitely, and consequently more satisfactorily, the question of how much it would cost to rear Pheasants, and also perhaps how cheaply it might be done, for by using thus a dry chick food, in uniform proportions, with or without eggs, as the case might be, according to the supply of insect life, we at least might compute the average cost. Perhaps it might even be arranged that certain insects could be captured and dried for Pheasants and chicks, as is done for certain cage-birds, and as the locusts and large grasshoppers are caught and dried in hot countries for human food, then even the natural insect food could be artificially supplied in case of need, as dry clover meal is supplied for fowl feeding, which is a flesh-producer in their case, besides being a 'vegetable' food even if it is 'dried.' Few of us are aware of the new firms which successfully dry green vegetables for the use of mankind in winter. Here again some of our feathered stock might reap a benefit, and a home industry be encouraged, also a rural occupation be increased as well as promoted. I shall speak of 'fresh' green Pheasant food further on. Even in this case, as I said before, a great deal depends on the rearing-field.

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“With regard now to the hours of feeding during the day. I always think that at intervals of four hours is sufficient; some say every three hours. I should say the latter course would suit better in cold weather. Old-fashioned people said, ‘Children and chicken will always be picking.’ But then the chickens’ picking was what they hunted for themselves. In the case of that which we supply them with, it is certainly not beneficial to give it at too short intervals. And even then it is a great point to give just a bare sufficiency at each time of feeding, neither too much nor too little. It is similar to feeding fowls if the food is given them a little at a time and they are made to run about for it, then when they cease to be anxious to run, you cease to scatter food, it will soon be discovered how much is needed and also how much waste may be prevented.

“This brings me to another point in feeding. Personally, I find a great difficulty in my helpers from time to time; they often do not intelligently graduate the amount of the prepared food they are sharing at the moment to satisfy the requirements of all the coops they must supply at the one meal. They throw out heavily to the first few coops, then suddenly realise that they must ‘draw rein’ and reduce for the rest, because they begin to see their food disappearing too fast, and even then the last few poor coops have to go without a share of that prepared food, and the upshot is that they must visit the dry meal store again, and carry food to the remainder that is only half prepared, and if there are no eggs ready boiled, these last poor birds get no substantial food. The helpers also do not graduate the handfuls for the varying numbers of birds in each coop, but serve all coops alike, and all this is of course without taking any note as to whether the birds in the several coops have any peculiarities. This last point, I am afraid, must as a rule often be left to take care of



PHEASANT CHICKS FEEDING AROUND COOP

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itself in these hurrying days. However, in my opinion, it is also a point of importance. I always make it a rule to direct my helpers to change the order of visiting the coops, and to commence alternately at the opposite end of the arrangement of the coops, and not begin at the same coop each time, so thus attempt to equalise matters to a great extent. Of course, we see that the middle ones get served the most regularly and systematically even then.

“Now with regard to water for young Pheasants. Of course, again a great deal depends on the rearing-field, whether the grass is long or short. In fields of short grass it might be needful to use water. I have tried both ways. I have used water for successive seasons, and I have reared season after season without water, and I really fail to see which is best. However, during very hot dry weather in the seasons when I did not use water I had carried a garden watering-can, with a rose on the spout of course, and the finer holed it is the better, and I have just lightly sprinkled the grass in front of and around the coops. Naturally in dry weather the feed ought always to be given in a more moist condition, and in wet weather *vice versa*, but to those who decide to use water regularly, I should like to say I find it very beneficial to place a little alum in the water, as I always find alum thus used will prevent gapes.

“In preparing Pheasants' food I think it is very beneficial to add a little bone-meal to every feed from the commencement, as I find that young Pheasants thus supplied from the first are very rarely attacked with that terrible disease cramp. In fact, the use of bone-meal is a cure for cramp, or perhaps I should rather say prevention, for it is of no use to wait till the birds have already contracted cramp and then begin the usual dosing with bone-meal, for they are then in too weak a state to assimilate but the smallest amount. Then another

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point is that grit must accompany bone-meal. Older birds will see that they obtain sufficient grit to keep their gizzards right, but young birds cannot do this, so we must supply them with it.

“Another thing I always like to see is that Pheasants are well supplied with plenty of fresh greens; watercress is the finest of all, for it contains iron in the best form for assimilation, besides being slightly pungent, as all cresses are. However, cabbage, lettuce, mustard and cress, and any other green salads and tender vegetable leaves, are all good, and they may always be obtained from the kitchen gardens belonging to the hall on the estate.

“I have mentioned the point of giving each coop just sufficient for the appetites of the birds it contains. This needs care and close observation, for the birds, it must be remembered, are wild, but it will repay the trouble. I believe many failures may be traced to the over-supplying of food, for if food is over-supplied some of it of course will be uneaten, and will lie in the hot sunshine and ferment; then it will perhaps be eaten in a sour state by the birds if they become hungry before next feeding-time, thus causing trouble by developing putrescent fermentation. In point of fact, I have occasionally noticed in connection with this statement some froth around birds' beaks, as if the poor things had eaten yeast. Dr Joseph Wallace asserts that ‘fermentation is the primary cause of disease.’

“Another thing, I always like to see food prepared ready to give the birds before the coops are opened to release them, so that they may not pick up all sorts of over-night foods which are certain then to be very sour, if there should be any on the ground, to satisfy their hunger before you have time to supply the sweet, fresh morning food. Of course, I might mention that in non-fox-hunting countries it is not needful to coop up Pheasants at all at night.

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“With regard to the hour of cooping them, we will say 9 P.M., with the last feed at 6 P.M. ; and as to the morning liberation, any keeper watching his wild charges in the small hours of the summer mornings will see the hens cautiously leading forth their respective broods as early even as 5 A.M. So here again comes in the fact that these birds are the wild, free denizens of the country game fields and captivity is unnatural to them, so they will chafe and fret under it, and the keeper late on his ground will assuredly lose his birds.

“As birds get older, I may say that with judgment the food must begin to be adapted more to adult needs, so that eggs are discontinued and greaves substituted, which of course will have to be mixed with rice and other starchy constituents to prevent diarrhœa. For the last feed at night, if boiling water is poured on to some dry grain and covered with a sack so as to imprison the steam, it will be in a nice soft condition. Of course, boiling the grain is best, but often time is very limited to allow much of that rule to be followed. Birds are thus gradually adapted to the adult food of hard corn and raw natural seeds by the time they are about a month to six weeks' old. At the present time there are many good dry chick foods which greatly facilitate this last operation before they are set free in their natural habitat—the woods.”

There is no denying the advantages of supplying all ingredients comprising the food of young Pheasants thoroughly scalded, or cooked for preference, particularly while the broods are young, although it is hardly necessary to prepare them in this way after the birds are half grown. If an ingredient is scalded it should be allowed time to soak completely through, for biscuit-meal is often used without the precaution being observed, with the consequence that each nodule contains a hard core very indigestible. Greaves and other dried meals

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are seldom properly softened right through, and a food prepared thus can hardly be described as perfect. Always allow scalded material time to cool, as the digestive organs of young Pheasants can only be weakened by being scalded also. A reasonable interval should elapse after the preparation of a feed before it is scattered to the broods; it is not necessary to leave it so long that fermentation sets in, but a sufficient time for the whole to become imbued with the different flavouring ingredients which every rearer employs to tempt the birds' appetites. The flavour of the greaves will also permeate the whole mass if it is covered over in the feeding vessel, and then there will be less picking and choosing on the part of the birds. Food permitted to become stale after mixing is supposed to be exceedingly harmful to the birds if fed with it, but it is nothing like so injurious as that which has also fermented. The latter is positive poison, and the effects of having eaten it soon make themselves apparent in the birds.

It should not be forgotten that the ingredients may be stale before the food is mixed, and in that case the preparation when ready to give the birds cannot be otherwise. The greatest care should be observed to see that all materials are fresh when delivered, the local miller being a great sinner in that respect. The meal he supplies may have been a long time ground, or the corn originally mildewed or stale. He is hard to convince of the stern necessity of supplying only the freshest meals prepared from dry, sound cereals, and imagines that what will not kill a pig is good enough for young Pheasants.

At first it is very little that the chicks require, and nothing is to be gained from over-feeding them. Always throw down their food within reach of the hen, for she will not only do her best to teach them to eat, but also clear up any left over, and where this plan is followed there is little risk of the chicks



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consuming stale food. It is somewhat difficult to estimate what the appetites of the young Pheasants will enable them to consume during the first ten days. They really require very little, and if one has been so fortunate as to capture a few flies it will ignore the artificial supplies for a meal at least. So do not be alarmed if a chick fails to feed with, or as heartily as the rest ; it has probably had a feed of something which will do it much more good.

It is a great mistake to feed so heavily that the chicks do not need to search for natural insect food. On some rearing-fields the feeds are so liberal, and follow each other in such quick succession, that the broods are never inclined in the least to search after other food. Slight hunger will cause them to range, and even if they get few insects the exercise has most beneficial effect. Overfed birds linger drowsily around the coop, their droppings accumulating on a small area, the inside of the coop getting filthy, and in that way disease is engendered. However adapted the field may be for rearing Pheasants there is certain to be insect life upon it to some extent, and while this is available the broods should be fed so that they take advantage of it, such fare being very beneficial to them during the first weeks of their existence. Later on, insect life will be more or less extinct, and then increased supplies of artificial food will not only be advisable but necessary.

A healthy Pheasant chick, properly fed and treated, is either cosily tucked beneath the hen or ranging eagerly and merrily after natural food. A sickly one is neither inclined to range nor content to stay beneath the foster-mother, but sits drowsily outside the coop and is by no means a pleasant object to the rearer's eye.

Rearers have of late recognised the necessity of paying every attention to fowls in charge of broods of Pheasants, although at one time they met with little consideration.

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However, the welfare of the chicks is closely linked with that of their foster-mother, as an ailing, hungry or thirsty fowl will be anything but an attentive mother. Should she be fretful and worried, her chicks meet with scant courtesy. The rearer should not too strictly adhere to the system of moving coops to a fresh site once a day only. A look round should always be taken early each evening to ascertain if any hen has fouled her coop since it was shifted, it being most unwise to confine the brood with such filth all through the ensuing night. Watch the fowls closely to see if any are attacked by scour, for if this is not at once stopped there will be losses amongst the brood. A hen inclined to be the least loose should not be removed from the sitting-boxes to the rearing-field, her condition being often the forerunner of an attack of enteric. When coops are being shifted be careful that the hen's legs and feet are not injured, especially at first, when she has not become accustomed to the process. Coops are sometimes dragged along so hastily that the most alert hen cannot avoid her toes being crushed and legs bruised, and how can she afterwards be expected to hover her brood steadily and properly. Probably she is suffering acute pain which forces her to change her position frequently, and then rearers wonder that members of her family are trodden upon and crushed. The writer has often pitied poor old fowls, shuffling awkwardly along in a fast-moving coop, endeavouring to save their poor legs from injury, and if such a process is characteristic of the rest of the procedure on a rearing-field, it is cause for wonder that any birds are raised at all.

"Wet days feed liberally, fine days feed less," are standing rules, but it should not be forgotten that wild broods are compelled to search for their food whatever the weather, and it is probably a longer and more arduous task when rain is falling. Do not become possessed with the idea that rain injures young

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Pheasants by day, and if they can be sheltered from it at night it does them not the least harm. Indeed, it is an excellent practice on a day when warm rain is gently falling, to feed sparingly so as to induce the young Pheasants to search for extra food and expose themselves to the rain. A thorough soaking, although it renders them pitiable to look at, really does them immense good, for it cleans their skins and feathers, and on becoming dry the birds appear all the brighter, smarter, and livelier for their experience. A little extra spice should always be added to the food during and after rain, just to correct any tendency to scour which may have developed amongst the birds owing to the moisture. Occasionally, a thirsty chick will drink copiously from the drops of water on the herbage, and then can hardly escape an attack of scour. Still, scour brought on in this way is rarely fatal, unless the bird is otherwise weakly, and soon stops of its own accord. Never allow puddles of water to linger on the field, but with a spade cut little trenches and at once drain them away. If the broods are ever allowed access to stagnant water all sorts of troubles are sure to arise. A little water standing amongst dead leaves in the bottom of a ditch adjacent to a coop of birds has before now escaped notice and been the cause of every chick dying, so such places should be carefully inspected.

Should a brood be noticed to thrive badly, follow the oft-repeated advice and move it near a growing fence, or to the outside of the field, where it can range over entirely fresh ground. Also give the coop a long shift twice a day if possible, so that the chicks may have every opportunity to obtain natural food. Even go the length of letting the hen out to wander with her brood if she can be kept from among the other coops.

CHAPTER XXVI

REMOVING THE YOUNG PHEASANTS TO COVERT

THE removal of the birds to the covert constitutes a most important part of the keeper's duties, and one that calls for the exercise of a considerable amount of tact as well as the display of a good deal of intelligence. Up to the time that the birds are considered fit to remove to the covert the rearer may have been very successful, but no matter how successful he may have been, it will not be possible to bring a good head of game to the gun, unless the rearer has exercised his ingenuity and resourcefulness during the removal of the birds to the covert side, as it is at this period of the lives of the birds that so many fall victims to the predatory habits of vermin. It is not in the mere transference of the process that the danger lies, but in the keeper's inability to persuade the birds to adapt themselves to such conditions as will afford them the best protection that nature can provide. In other words, success depends upon the early roosting of the birds, more especially in those instances where foxes and game have an equal share of preservation.

That a gamekeeper is seriously handicapped in fox-hunting districts is irrefutable, nevertheless he is expected to discharge the dual obligation of protecting one of his greatest enemies, namely, the fox. Many extraordinary stories have been told concerning this matter, but the conscientious keeper has a duty to perform towards the fox-hunter, and the man who commits vulpicide does, if found out, not find his future of the pleasantest order. There is a considerable diversity of opinion as to what is the best



LIFTING COOPS ON SACK FOR REMOVAL TO COVERT

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age for removing the birds to the covert. It is impossible to lay down any hard and fast law concerning this, because so much will depend upon circumstances.

The condition of the birds, the state of the weather, the arrangement of the coverts, the district, and many other circumstances, have to be taken into consideration. All these troubles never occur where birds are hatched and reared under natural conditions, but as the present state of game preservation does not admit of this, where a large head of game has to be reared, the keeper has to devise other plans and make the most of that which is placed at his disposal.

If the birds are well forward and the weather propitious the sooner they are removed to the coverts the better, otherwise a difficulty will be experienced in getting them into the coops. All practical game-rearers believe in leaving the birds *out* of the covert as long as possible. When the rearing-ground is situated by the covert side, the matter is simplified, but it is not every game-rearer that is thus favourably situated. If the birds are left too long before being shifted, they begin to wander, and either get lost or else are destroyed by vermin.

The best time for shifting the coops is at night, so that after they have been transferred to the covert side, the young birds will have time to settle down again before dawn. In shifting the coops from the rearing-field various plans are adopted, but one in general use is shown in the accompanying photograph, which depicts a sack being gradually drawn beneath the coop, and when underneath it, the edges are tacked round the side of it so as to form an artificial bottom. It is then lifted into the cart or conveyed in some other way to the covert. Two coops can be carried to the covert side on an improvised stretcher, but when the covert is a considerable distance from the rearing-field, the most expeditious manner is to employ a

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cart for the purpose. When the coop has a bottom to it there is no necessity for the adoption of this plan, but the author thinks most keepers will agree with him when he says that the best form of coop is that without any wooden bottom, the latter being a most insanitary addition.

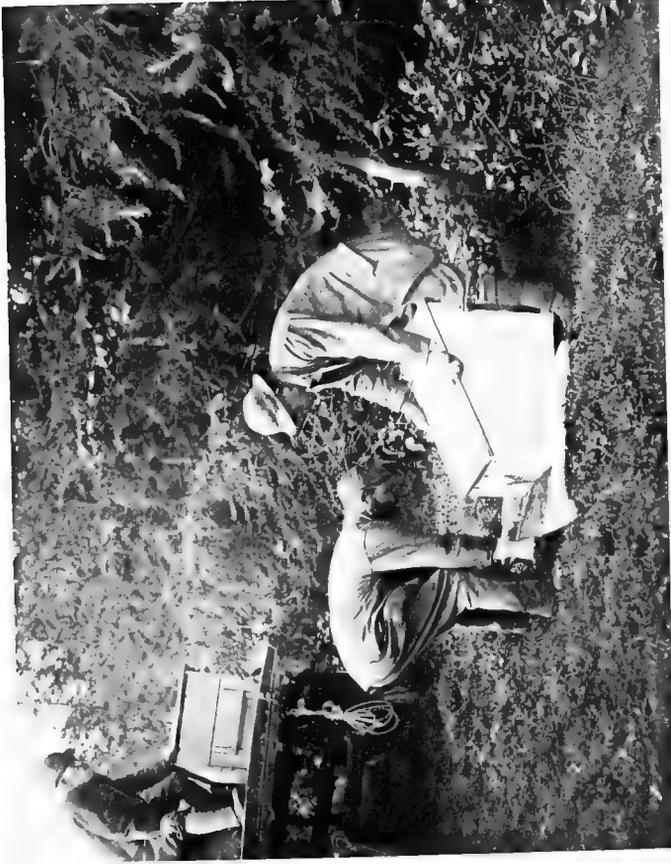
Release the birds one by one early on the following morning, and feed them around the coops, in order to keep them with their foster-mother for the time being.

The best covert to place young birds in is one with little or no undergrowth, otherwise they are apt to roost on the ground. To induce the birds to enter the wood, arrange all the coops so that their fronts look into it.

A young covert, say one about fifteen years old, should be selected whenever possible, so that the young birds have sufficient power of flight to go to roost in them. Some gamekeepers teach the young birds to roost by lifting the hen on to the lower boughs, and the example thus set is an incentive for the others to follow suit. Once the habit of roosting is acquired, the keeper's anxiety is materially lightened as to the future welfare of his charge, though unfortunately fresh anxieties arise—in fact, his life is one series of anxieties from the time the eggs are set until the birds have bitten the dust at the hands of the sportsman. In feeding the birds, particular care must be exercised to provide them with such food as will be most conducive towards strengthening their growth.

Once the birds have settled down to their new conditions and have been persuaded to roost in the proper manner, there ought to be little difficulty experienced in their subsequent management.

Rearers are often heard to remark that young Pheasants should be retained on the rearing-field as long as possible for their health's sake, but every gamekeeper cannot do as he likes in this particular ; for instance, if the field is hired, there



REMOVING SACK FROM UNDER COOP AFTER BEING PLACED AT COVERT SIDE

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is sure to be an agreement that it shall be vacated by a certain date, and however much the rearer may wish to keep birds out of covert, he has to leave the ground on that arranged date and take all risk. Then the birds themselves have a pleasant way of determining the end of their stay on the rearing-field, by displaying symptoms of refusing to enter the coops at night, and the keeper who would take all to covert knows that removal must not be longer delayed. The only person who is in a position to take advantage of the rearing-field as long as he likes is he who raises his birds close to the coverts to which they gradually find their way, but ground close to woods which have been stocked season after season cannot be very fresh, and therefore there can be no advantage in retaining the broods thereon.

The health of young Pheasants may be improved by keeping them off the rearing-field as long as possible, but that entirely depends upon circumstances. Should the field be stale and the coverts fresh, the sooner they are shifted the better ; and when July turns out hot and dry, and the rearing-ground is much exposed to the sun, it is advantageous to take the broods where they can obtain shelter and coolness.

Should a wet period set in about the time the young Pheasants ought to be removed to covert, it is the wiser course to let them remain on the field. Wet drip from the trees is certain to prove deadly to some, and probably to a lot. Removal to covert can easily be effected at a much later date than usual, if the rain continues, as it forces the birds to seek the shelter of the coops long after they would were it warm and dry.

I would like those who are my readers just to consider what I now have to say, and if possible state their opinions concerning my contentions. I have noticed that young Pheasants kept on the open rearing-field long after they have

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attained an age of eight weeks never take kindly to the covert, or, at least, are a long while doing so. Directly they are moved, if even to the centre of a large wood, they find their way to the outside, and the most forward are soon wandering over adjacent fields. Birds treated thus learn bad habits, and are more difficult to retain at home, however carefully fed.

On the other hand, Pheasants shifted to covert at six weeks appear to take more kindly to it from the first, and all through their short career are truly birds of the wood. I quite believe that the sportsman who has small coverts and a limited acreage would do well to get his birds shifted as early as the age last mentioned, and he would afterwards be less troubled with straying.

The day before I shift my birds they get very light feeding, and are kept in the coops late on in the morning following removal. All are consequently very hungry, and on being released, at once commence to feed heartily on the food thrown down for them. This helps in a great degree to settle them to their new quarters. It is also a very good plan to treat the foster-mothers the same, as some are inclined to be excited and noisy after the business of removal; but if they are hungry and are provided with a good feed directly the coops are opened, peace and quietness is more likely to prevail. Excitement on the part of the hens is sure to be communicated to the broods, so it is as necessary to calm the former as the latter.

The more quietly the work of removal is carried out the better, and it is not at all necessary to talk and shout during the process, which is quite alarming enough without these added terrors. Also begin placing the coops down at the far end of the covert so that the vehicle used does not have to pass to and fro at each journey in front of coops already transported to their places.



A CORN STACK BY COVERT SIDE

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CHAPTER XXVII

ENEMIES OF THE GAME-REARER, AND HOW TO DEAL WITH THEM

APART from the destructive effects of disease and the adverse conditions of the weather, the gamekeeper has many other enemies to contend with, but on the rearing-field and covert side his occupation is mainly directed towards the preservation of the young birds against the predatory habits of both ground and winged vermin; but it is not only the young birds that he has to protect, but the eggs and sitting hens against the felonious intentions of both bipeds, quadrupeds, and certain members of the feathered world.

His work is one continuous round of watching, not only during the silent hours of the night but from the streak of dawn to the setting of the sun. His watchword is, or rather should be, "vigilance," and it is the special province of the head-keeper and his under men to exercise such for all they are worth.

To protect the young birds at night, whilst on the rearing-field, it is a universal custom to close in the front of the coop or to let down the shutter, but this does not afford absolute protection, as any unevenness of the ground may lead to the upsetting of a coop by that artful rascal Reynard. Keepers in fox-hunting districts know that foxes are gifted with a certain amount of ingenuity, and more than one of these predatory creatures has been

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known to take advantage of a coop placed upon uneven ground, by inserting its nose under the edge of the coop and turning it over, there being little chance for the victims when this is done.

The destruction of enemies to game, in other words the vermin pole, is one of the best tests of the abilities of the head-keeper and his men, and no occupation requires to be followed more closely with eyes and ears. The cultivation of these two senses is an integral part of the game-preserve's existence, for without the possession of this commodity no keeper will ever be able to do justice to his employer. The study of natural history constitutes such an important part of a gamekeeper's work, that the author has often thought that there ought to be some qualification as tested by theory and practice for the registration of gamekeepers, and that all keepers in possession of such certificates should have precedence over those without such registration. Practical gamekeepers will perhaps feel somewhat amused at this suggestion as to the possession of a diploma, but a little mature reflection will probably show that the idea is not such a Utopian scheme as it appears. The up-to-date keeper has to combine science with practice, and there is such a large amount, or rather wide range of subjects, directly or indirectly under his control.

Natural history, forestry, botany, meteorology, aviculture, ichthyology, a knowledge of the disease of the dog and the game (pathology), trout and salmon fishing, guns and shooting, traps and trapping, the management of moorlands, and a host of other matters could all be introduced as essentials for the possession of a diploma. Moreover, the keeper's education, in a commercial sense, would be distinctly advanced. However, this is merely a

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digression, though the author hopes to hear more of it at some future time.

The necessity for the study of the habits of the multifarious enemies of game. is interlinked with their destruction, as it is only by an intimate knowledge of their various habits that they can be persuaded to fall victims to their own depredations. To become a successful trapper the whole matter is based upon this fact.

Knowledge is power, and its introduction into the life of a keeper is as indispensable as in any other occupation. Although it is the special province of the gamekeeper to wage war against the enemies of his charge, it is somewhat surprising to note the remarkable differences amongst game-preservers concerning the destructive influences attributed to birds of prey and to vermin. Upon some points keepers are agreed, whereas, as just stated, they are at variance relative to others. Honest differences of opinion contribute to the elucidation of facts, and it is in the practical exposition of these that the best results are most likely to be obtained. Resourcefulness and tact do, however, go a long way in the preservation of game, and unless the gamekeeper can outwit those of his enemies, his losses will be in ratio to the amount of vermin infesting the coverts.

The preservation of foxes and game is so diametrically opposed that one has a difficulty in believing that it can be carried on successfully, nevertheless it is done, and, be it said, to the credit of the keeper. The protection of the eggs, the sitting Pheasant, the young broods, and what may be termed Pheasants in the undergraduate stage—that is when they are removed to coverts and before they learn the art of roosting—constitute in the main the most im-

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portant items for protection, whilst the various devices and contrivances adopted for such purposes are innumerable, consequently each keeper has his own methods of protection.

The illegality of the use of the pole-trap in Great Britain removes once and for all this appliance from the keepers' weapons of offence, or rather defence, against feathered foes. A question that may present itself to the mind of a thoughtful reader is concerning the relative superiority in point of damage done by winged and ground vermin, and the only answer the author can give—in which he believes the majority will support him—is that the ravages of both are about equally divided. Amongst the former, the principal offenders are:—

Magpies, jays, hawks, falcons, hooded crows, rooks, owls, egg-eating Pheasants, jackdaws.

Among the latter, foxes and badgers, cats and dogs, stoats and weasels, rats, adders, hedgehogs.

There is one enemy with which keepers are unfortunately only too well acquainted, and that is that biped *Homo Vulgaris*, in other words Man; and as the eggs of the Pheasant are a decided delicacy, together with the fact that they have a certain amount of pecuniary value attached to them, seems to have a peculiar fascination, and the spirit of covetousness not uncommonly develops into one of appropriation. Fortunately such offences are not justifiable, or rather excusable, on the plea of kleptomaniac. The theft of eggs by labourers and others has been dealt with elsewhere.

A short account of some of the game-preserver's enemies, together with the methods adopted for dealing with such pests, may not be out of place—in fact, it constitutes such an essential part of the Pheasant-preserver's work, that



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to exclude it from a manual of this nature would be almost like asking a man to become a horseman without providing him with a horse to ride. The study of their haunts and habits is, as previously stated, of paramount importance, and when a good knowledge of this has been obtained, the application of the various weapons of offence will become easier of application, whilst suggestions for the improvements in connection therewith will, from time to time, offer themselves.

THE MAGPIE

The writer of an article was not far short of the truth when he said that the Magpie, or "Maggie," as this bird is more popularly termed, constitutes a study for the keeper in black and white, and that its black features certainly predominate. Howard Saunders defines the distribution of this bird in the following terms:—

"From the North Cape in Scandinavia southward it is found more or less plentifully throughout Europe, except in the Islands of Corsica and Sardinia; but it does not occur in Palestine though found in Asia Minor. Eastward—subject to a variation in the amount of white in the plumage which has led to the creation of several bad species—the Magpie is found across Asia, in India, China and Japan, and also in the northern portion of America from the Pacific to Michigan."

In Scotland, England and Wales, the Magpie (*Pica Rustica*) is very common, whilst in Ireland it is particularly plentiful. Its prevalence in particular localities is a fact well

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known to all ornithologists, but no man looks upon it with greater misgivings than the gamekeeper, for the simple reason that he knows its artfulness is on a parallel with its destructiveness, consequently it is war to the knife with "Maggie." As showing the prevalence of Magpies and allied pests, a gamekeeper destroyed in three weeks one hundred and eighty nine, most of which were Magpies. Its colour is mostly glossy black, with purple and green reflections. The scapular feathers are white, the belly is snow-white, and the bill and the feet black. The former is pointed and strong, which enables it to readily pierce eggs. The hen bird is smaller than the male, and its bill a bit shorter. It has a jerky flight, and does not remain long in the air. It is a restless, noisy bird, and strangely suspicious of man, preferring to remain in the open where it can take into account all that is going on, with a minimum of risk against its being shot.

Sometimes these birds are seen upon the backs of cattle, searching for ticks or for maggots. The food comprises worms, insects, young birds, eggs, acorns, beech-mast, fruit, etc., but it is its egg-destructive properties which renders it a foe to the keeper. It is a single-brooded bird, and generally begins to build its nest about the end of March, though sometimes in May, and is a bold bird when nesting. The nest is usually placed near the summit of a tree, and the Magpie displays remarkable ingenuity in the construction of this necessary receptacle for the perpetuation of the individual. It is very firmly planted in the tree, and it must be rare to find a Magpie's nest dislodged during a gale, no matter however severe—in fact, the author believes that there would only be two ways of dislodging it, namely, either its forcible removal by the hand or the levelling of the tree to the ground.

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The eggs are a pale emerald green, more rarely whitish, and generally from six to eight in number, but occasionally nine. They are mottled with irregular olive markings and dots of a similar colour. In some instances most of the markings are at one end. The male bird takes his part in sitting on the eggs, which relieves the monotony of the maternal duties. If the first nest is destroyed before the young are hatched, the pair will probably build another one. In any case a new nest is built every season, and the best plan is to destroy the birds before they have an opportunity of perpetuating the species.

The best bait for a Magpie is the nest together with the eggs of either a blackbird or thrush quite early on in the season, the first nests of these eggs being a *pièce de résistance*, but as soon as ever they become common, "Magpie" has very little inclination for earlier epicurean views. A very good bait is the rabbit's head with the eye exposed placed upon the plate of a well-concealed trap. One ingenious keeper has used as a deadly bait, sheep's eyes, and a number of these can be obtained and kept for almost an indefinite time in ice. The eye is sown up in a piece of rabbit's skin, with a hole cut in it, just sufficient to show the bright portion of it, and this is then placed on the plate of the trap.

Some gamekeepers scatter a few hens' eggs about, though Magpies look upon these with disfavour to begin with, and fight shy of them at first, but familiarity breeds contempt, and when they have had a good taste, the best plan is to set one on the foot of a trap. Another keeper used an old sparrow-hawk's nest, and dyed some bantam eggs a green colour, and then mottled these with darker markings. This nest was fixed on the top of a tall bush, together with a trap carefully concealed, and the device resulted in a large number of captures.

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The shooting of Magpies requires a good deal of skill, owing to the wily flight of these birds, and the way in which they enter and leave their nests.

JAYS (*Garrulus Glandarius*)

The Jay is widely distributed and resident throughout Europe, except in the south-east, and is common in the woodlands of England, less so in Scotland. It chiefly inhabits the woods, and its noise is most obvious in the evening, being akin to the words "Chaik! Chaik! Chaik!" having an evident desire to conceal its presence as much as possible. It nests in the Hawthorn, Holly, Fir, Yew, Hazel, etc., and makes a substantial nest, though rather crude in form. The eggs are from five to seven, pale green, mottled with dark or light markings. Most Jays' nests are discovered about May. It lives on worms, spiders, eggs, young birds, and fruit, but also upon berries, beech-nuts, acorns, etc. It is a handsome bird, and the female is very similar to the male though somewhat smaller.

On the crown there is a crest of light feathers tipped with black. The bill is brown, and the tail blackish-brown. The rump and upper tail coverts are white. The throat is also white. Some of the feathers are light blue, whilst the rest of the plumage is mostly a blend of terra-cotta and buff, or as described by ornithologists—vinaceous.

Keepers are not unanimous as to the damage done by Jays, but it is tolerably certain that this bird does harm. In relation to this matter the following contribution is worthy of reproduction.

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A trapper, writing in the *Gamekeeper*, gives a most excellent account of the Jay. He says:—

“The Jay is so pretty a bird and so interesting in its habits that it would be a matter for regret should it become extinct; but this is little likely to occur, as it undoubtedly is a migrant to this country. Persistent trapping certainly has not decreased its numbers, and while the Jay is preserved on the great forest-lands there are sure to be enough left to satisfy the most exacting naturalist.

“The Jay is supposed to be a flagrant destroyer of eggs, but the harm it does amongst game eggs is greatly exaggerated. The bird rarely leaves the coverts except it be in the early summer mornings when the fields are quiet, and then it continues in such a nervous state that it is doubtful if a nest in the fence is ever destroyed. Pheasant eggs laid in coverts may be consumed to some extent, but the Jay is far fonder of robbing the nests of small birds, and there is no surer sign than such empty nests that Jays are present. Judging by the way Crows and Magpies chase a Jay from the neighbourhood of their nests, it is to be surmised that this bird is no exponent of the old saying, ‘Honour amongst thieves.’ Probably an egg is an egg to the Jay, whatever has produced it, but the bird has an eye for those of a bright colour.

“Many keepers prefer to have a Jay or two in their coverts because they are so quick to utter their harsh cries of alarm if intruders enter, and it is certain that a Fox who attempts to hunt by daylight is considerably handicapped where Jays exist. He is hardly likely to venture into the open, and as long as he continues to prowl about the coverts, the Jays accompany him overhead screaming all the time and putting everything on the alert. Some naturalists say

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that the Jay follows a fox hoping to get a feed off the remnants of any meal he secures, but were this the object, it is to be assumed the bird would keep quiet and not attempt to place hindrances in his way. Whatever game and other birds may think of the Jay as a robber of nests they do not hesitate to take advantage of its warning cries, for the Jay never gives tongue without reason, and be it weasel, stoat or fox on the prowl, soon lets the feathered kind know.

“The Jay lives in mortal dread of the sparrow-hawk, its greatest enemy, and this bird is the principal reason that it so seldom leaves the coverts. Among the trees and bushes it can escape, but in the open its slow, hesitating flight renders it an easy prey. Indeed, it rarely attempts to escape by flight from the sparrow-hawk in the open, but at once alights on the ground, if any distance from the hedge or thicket, and seeks to keep its antagonist at bay by means of its powerful bill. The observer will witness a most interesting sight, a prolonged combat which always terminates in the victory of the hawk if no other Jays come to the rescue. Should other Jays hear the cry of their brother in distress they do not hesitate to assist it, recognising that safety lies in numbers. On seeing more Jays appear on the scene, the hawk invariably relinquishes the contest. The writer has never seen a kestrel tackle a Jay.

“Mr Jay is about the wariest bird alive and sees an intruder long before the latter sights him; and although he is so noisy, he is careful not to utter a sound until right out of the danger zone. The bird sees to its own safety first, and then thinks of others, which is the custom all the world over. Probably the Jay's worst time is on shooting days, when penned in between guns and beaters, the bird has to brave one or the other. Sometimes he goes forward and is shot, but more often decides that safety rests in a masterly

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retreat over the beaters. Should one be killed there is great competition for its blue feathers with which the beaters love to adorn their head-gear. These feathers are also valued for fly-tying, and in the north many a Jay is slain for those feathers alone.

“The Jay is particularly fond of acorns, and for that reason is rarely absent from large oak woods. It is suspected of watching squirrels visit their hordes of nuts during the mild days of winter, and subsequently taking toll therefrom. If this accusation is true, it is not to be wondered at, having regard to the bird's cunning. A large crop of acorns in one locality, and a corresponding lack elsewhere, is certain to lead to a big influx of Jays, but the birds generally leave again early in the year before eggs are laid. Perhaps the Jay's favourite food is the newly-hatched nestlings of small birds, and as regards the destruction of these it is a positive brute, insatiable and most cruel. Occasionally, it may be able to seize a stray Pheasant or partridge chick, but not often, although a very little rabbit frequently pays the penalty of venturing too far from its burrow.

“At night the Jay roosts in the densest part of a thick fir-tree, preferably one in the centre of a group, or amongst the ivy on an old wall or tree. It is not easily driven from its roosting-place, and where one is there are generally more. The Jay is very secret over its nesting, and is most careful never to make a noise or to be seen near; in fact, that part of a covert where the bird is heard and seen least generally contains its nest. The nest is situated at the top of an ash or alder pole, at the tip of a fir-tree, and always well hidden from view.

“The Jay is not an easy bird to capture at all times, being suspicious of everything in the nature of a trap, and scorns a bait when natural food is abundant. When snow

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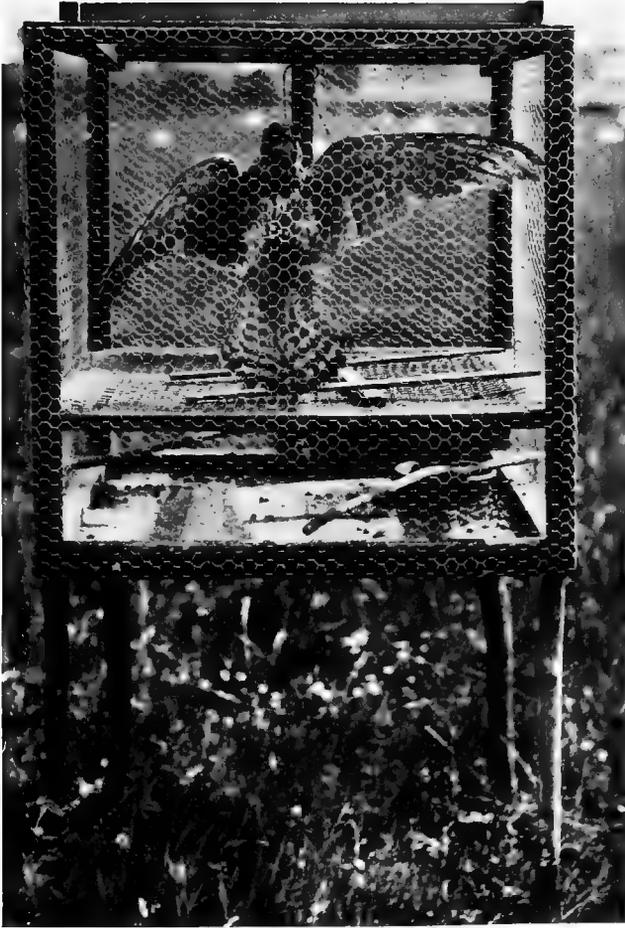
lies on the ground it succumbs to a bait consisting of a piece of fat or a little scattered maize. The reader needs to commence proceedings at once on the appearance of hard weather, as the Jay soon begins to reap a rich harvest among half-starved and weakened small members of the feathered kind, and then will not look at a bait, however cleverly disposed or enticing it be. Young Jays just fledged are not difficult to trap while they linger in the vicinity of the nest."

Both Magpies and Jays go to roost just before dark, so that if a watcher conceals himself after he has got a live bird trapped to call others, or by the aid of an artificial call, he can often shoot a number in this way. Although illegal, poisoned baits are sometimes employed, and the keeper gets rid of many of his enemies by this means, but unless particular care is exercised more damage may be done than is justifiable.

HAWKS

Both sparrow and kestrel Hawks are enemies of the gamekeeper, but the sparrow-hawk is the one against which the keeper devotes his particular attention. It is most destructive to young birds, and the more of these that a keeper can hang between his vermin poles the better for the game on the estate.

The best plan is to shoot them and to destroy all nests, though many keepers trap them. Both large and small Hawk traps can be obtained. Some of them have teeth, others are without. They are made with jaws, and range from 4 to 8 inches, the larger ones being particularly suitable for



BLACK'S PATENT HAWK TRAP

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large birds of prey. The traps depicted in the illustration are those of Mr Lane, Eagle Works, Wednesfield, Staffs. Another form of trap is that known as Black's Patent Hawk Trap, in which the birds are caught alive. This consists of a wire cage, with a compartment 2 feet square above and 1 foot below. In the lower compartment live sparrows are confined. These cage traps should be worked in the spring (March and April) before nesting, and again in August and September. The Hawk enters through a drop lid at the top, which as soon as the Hawk passes in, closes. The trap is placed on four uprights about 2 feet from the ground, and the drop lid then set as shown in the accompanying photograph.

The larger birds of prey can be dealt with in a similar manner to Hawks, but as they are rather uncommon in the British Isles there is no necessity to enter into consideration of them.

There is one species of Hawk, known as Montagu's Harrier (*Circus Cineraceus*), which is one of the few species of Hawks that are known to have the villainous habit of consuming game eggs.

HOODED CROWS (*Corvus Cornix*)

This bird, as well as the Jay, Jackdaw, Magpie, Nutcracker, Chough, Carrion Crow, and Raven, all belong to one family, known as the Corvidæ, which are characterised by the tail consisting of twelve feathers, powerful curved claw, with the middle toe shorter than the tarsus. They are cosmopolitan, omnivorous, build their nests in trees, walls or rocks, and lay from four to eight eggs, and they

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are all hardy birds strongly inclined to pillaging nests or acting prejudicially in some other manner on game preserves.

The Hooded Crow occurs throughout Europe, through Palestine into Egypt, and in Persia, as well as Afghanistan. It is an autumnal visitor to England and Wales, but in Scotland and Ireland common, resident and frequently breeds with the Carrion Crow.

Lord Lilford has the following remarks relating to this bird:—

“The habits of the bird are always abominable, and although from the accident of its not nesting in our county, we are not exposed to the detriment from this thief, to which those dwelling on the other side of the Tweed are subject, we have no plea to urge in the defence of the Grey Crow, and hold him as a sturdy vagrant, to be summarily dealt with at all times and at all places. We should be sorry to exterminate any bird; but this one could be better spared than any other with which we are acquainted.”

The Grey-backed Crow arrives about the first week in October and leaves again towards the end of March, and it is fortunate that these destructive birds leave during the breeding season. It is most destructive to eggs of all kinds, and a single pair of these horrible birds may create wholesale destruction on the estate, as it has no scruples as to how it gets a living.

Its plumage is brownish-black in part, and the rest a grey. The back, breast, flanks are all grey. The bill and the feet black. The head, throat, upper parts of the breast, wings, tail, and thighs are black, or sooty brown, the female being similar to the male. It is very fond of frequenting marshes near rivers, and is abundant about the coast.

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The destruction of these birds is best effected either by means of a concealed spring hawk trap, baited with eggs, or else by shooting, poisoning, etc.

THE CARRION CROW (*Corvus Corone*)

Although a particularly common bird in England and Wales, it is much more abundant in Scotland, or at any rate, certain portions of it. There seems to be a doubt as to whether it is ever found in the Orkney or Shetland Isles, whilst in Ireland it is an uncommon bird. The male and the female are similar in plumage, being glossy black. The bill and the feet are black, with greenish reflections on the head, neck and wings. It will hybridise with the Hooded Crow, and in many features it has a strong resemblance to the Raven. The gamekeeper and the shepherd both dislike it, and its destruction is keenly sought after. Its food consists of young hares and rabbits, partridges, Pheasants and grouse, as well as disabled sheep, lambs, etc. It emits a hoarse croaking sound, and its favourite nesting-places are tall trees, such as the Oak, Elm and Pine. The old nest is added to from year to year, and the eggs are usually about six.

A peculiar feature in connection with the Carrion Crow is that when it pairs with the female, it is a marriage for life, unless either of them meet with an untimely death. Probably the reader will take exception to my usage of the word untimely, with which I agree, it being impossible for the destruction of the Carrion Crow to be carried out too early.

Rook (*Corvus Frugilegus*)

The Rook is widely distributed in England, Ireland

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and Wales, and is plentiful in Scotland, breeding as far north as the Orkneys and Shetland. It also breeds in Western Siberia and Turkestan, and is found throughout Central and Southern Europe during summer. It is easily recognised by the caw. Its gregarious characteristics are well known, and thousands of these birds are sometimes seen wending their way home to the rookeries in the evening.

The chief food of the Rook consists of wire-worms, the larvæ of the cockchafers, but the farmer knows how very destructive these pests are in the autumn and the winter, likewise in the spring, when cereals have been planted. They are also a nuisance in the potato fields, and it is customary to wage war on the Rooks during the nesting season. Sometimes many thousands are destroyed at this period, as annual shoots on certain estates are organised for this purpose.

It is sometimes spoken of as the Black Pest. When short of food it is not very particular as to how it obtains its living, and will resort to predatory habits in a similar manner to the Carrion Crow. Fresh young birds, eggs, mice, fish, acorns, beech-nuts, berries and sundry other articles, such as potatoes and grain, are all alike palatable to Mr Rook. These birds begin to repair their nests early in March, and sometimes earlier, there being instances on record of Rooks commencing nesting in January. The nest is composed of strong sticks and twigs, dead leaves, mud and feathers. It is a slovenly built nest.

The knowing habits of the Rooks render them very difficult to shoot, excepting when returning to the rookeries in the evening. Their shyness in the face of man, especially when he is carrying a gun, is too well known to need further comment.

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THE JACKDAW (*Corvus Monedula*)

The mere mention of the word Jackdaw to a gamekeeper is sufficient to create a degree of uneasiness in his mind, yet in spite of the war that he wages upon these birds, they are, in certain localities, almost as common as stones, this being due to the fact that they breed in Great Britain. It is only an occasional visitor to the Shetland Islands. It breeds in Cashmere and Afghanistan, visiting the north-western plains of India in the winter. It is a bird that pairs for life, and lays from four to six pale blue eggs, spotted or unspotted, and rears a single brood in a season. The nest is generally built in April or May, and constructed of wool, moss, straw or feathers. The Jackdaws go about in flocks, though sometimes in pairs. Disused chimneys, ruins overgrown with ivy, the belfries of churches, as well as trees, are the favourite nesting haunts of the Jackdaw. A striking feature of it is its light, small piercing eyes, and very little will escape the notice of "Jack" or "Daws" as they are sometimes called.

Lord Lilford, in his *Birds of Northamptonshire*, has some extremely interesting remarks concerning the Jackdaw, which are worthy of repetition. He says :—

"This amusing but most pernicious bird is extremely common in our county and probably only too well known to most of our readers. In the hollow trees about the park and pleasure grounds of Lilford, they used to swarm at the breeding season, till we found it absolutely necessary to wage war upon them in the interests of our garden, poultry and game, to say nothing of those of the barn-owl, a species for which we have always entertained a sincere respect and

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affection. The Daw has not only carried off a number of young chickens, Pheasants and partridges, and committed havoc amongst our green peas and other vegetables, but in several instances, to our knowledge, took possession of the owls' nests, destroyed their eggs, and piled up their own nests in the cavities selected by the harmless and most useful bird of night. Occasionally, however, the tables are turned. For these misdemeanours we have, for some years past, made a practice of shooting the old Jackdaws and destroying their nests and eggs wherever we found them, with the result of decided benefit to ourselves and our neighbours. The Jackdaw disputes the palm for noisy and intrusive impudence with the house sparrow, and does not, to our knowledge, compensate us in any way for his misdoings. That the Daw fulfils his duty in the great scheme of Nature I do not deny, but must confess that I am unable to discover what it may be."

The flight of the Jackdaw is strong but without apparently much reason in it. He is frequently on the ground in search for worms, grubs, etc. When in confinement his mischievous propensities are strongly developed.

Trapping and shooting are the most effective methods of dealing with these birds, which are often particularly troublesome in pheasantries that are open at the top. In such instances the best plan is to trap one of the birds, and leave him in the trap in sight of the others, which, on seeing one of their colleagues in such an unfortunate position, will suffice to keep the birds away for a week at anyrate. In open aviaries string netting may be used to keep these pests, which are as wary of the gun as most other members of the order, from causing annoyance.

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EGG-EATING PHEASANTS

Pheasants that acquire this habit are even worse to deal with than the enemies already named, because it is so difficult when birds are in covert to obtain positive evidence against them. There may be circumstantial evidence, and when this is conjectured the best plan is to shoot the offenders; but egg-eating is common in aviaries and must be dealt with accordingly.

Penned hens when they are released to covert have been known to indulge in this detestable practice, which, as already stated, is one of the worst vices that a gamekeeper has to contend against in the preserves. Keep all unfertile eggs from year to year, and when birds begin to mutiny, either in pen or covert, give them a supply of these eggs, and it will be a case of "once bitten, twice shy." The substitution of pot eggs is another remedy, but there is no doubt that egg-eating is a vice largely fostered by insufficiency of food, want of grit, and idleness; therefore these facts should be borne in mind in searching for a remedy.

CHAPTER XXVIII

ENEMIES OF THE GAME-REARER, AND HOW TO DEAL WITH THEM (*continued*)

THE FOX (*Vulpes Vulgaris*)

FOREMOST amongst all enemies that the game-rearer has to contend against, particularly in hunting counties, stands the Fox, which, as stated in a preceding chapter, has to be preserved as much as the game—in fact, even more so, as shooting, viewed in the light of the true sportsman, must rank second to that of fox-hunting. Any form of sport into which an element of danger enters must have precedence over one unaccompanied by risks of any kind. In non-hunting localities, the gamekeeper usually finds a ready means of clearing out Reynard, either by trapping or by shooting, and failing the adoption of either plan, by poison. From time to time the author has had Foxes sent to him which have been found dead by keepers, with a view to ascertaining the cause of death. It is a most unfortunate occurrence for a gamekeeper to find Foxes either dead or dying upon an estate over which he has charge of the game preserves. In one instance, fox-poisoning extended over a period of ten years, which was anything but a pleasant coincidence for the head-keeper, as members of the hunt commonly associate such deaths with the preservation of game. In the case alluded to, the gamekeeper was as anxious to find the culprit as the master of the hunt, and spared neither time nor expense to solve the problem, which so far was solved. As a rule, strychnine is the drug

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employed for the destruction of Foxes, and this may be either in the form of pure strychnine, which is white, or else as a brown powder, known as nux-vomica, strychnine being one of two active principles contained in this plant of which the powder is a representative.

When a Fox is found dead in what is apparently a mysterious manner, it is advisable to have a post-mortem made in order to unravel the mystery. When a Pheasant is sitting, it is quite safe from the Fox until the eggs begin to hatch, it being a popular notion that a sitting Pheasant is free from scent. When the young birds are hatched and the hen begins to leave the nest, the danger of a Fox tracking her increases from day to day.

Foxes are very keen in searching fences at night and hedgerows where they have an idea sitting birds are likely to exist. Both mangy Foxes and Vixens, when the latter has cubs, are worse to deal with than a healthy dog Fox. For the first few weeks the cubs subsist upon the milk, and she only requires food for herself, so that her hunting exploits are of a very limited order—in fact, only just sufficient to supply her with the necessary sustenance. When the cubs become a drain upon her system she begins to forage for them, and it is in these foraging expeditions that she has to scour the ground of all it is worth, though for the time being she will avoid roaming far from her earth.

A gamekeeper can do a good deal towards regulating the depredation of a Vixen with cubs. He can, in fact, regulate her conduct so much that she will interfere very little with the game. Most of her foraging expeditions are carried out during the night, and the best plan is to feed her liberally at the furthest points to which she goes. It is no use feeding her at home, it being natural for a Fox to make nocturnal predatory excursions.

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If there is a rookery about, especially when young rooks are in the nest, she will generally visit such in the hope of finding some unfortunate young rooks. It is a very good plan for the gamekeeper to shoot a few and leave them lying about on the ground.

Sometimes it is a good plan to induce a Vixen to change her place of abode, and if there is a sandy bank with numerous rabbit burrows and plenty of rabbits around, a fresh earth can be dug for her. It is not a difficult matter to stink her out of her burrow by applying a quantity of Reynardine or some other pungent material at the entrance to her home. She will under these circumstances usually shift her cubs, and as the latter increase in size, the rabbits in the vicinity will supply them with food. Rats and mice, pigeons and rooks, stoats and weasels, rabbits and various other birds will all serve as food for the cubs. Foxes will destroy stoats, weasels, and rats, particularly rats, and this is about the only useful function that can be assigned to them beyond that of the pleasure they afford as sport in hunting them.

A mangy Fox is the most cunning of all, and when one is suspected of suffering from mange, the sooner it is destroyed the better. It is no use to the hunting man, and the constant irritation induced by the parasites in the skin renders life intolerable to itself, consequently it is always on the prowl and does incalculable harm. If a keeper has reason to suspect the existence of mangy Foxes, he should acquaint either the secretary or master of the hunt, failing this, one of the hunt servants, and co-operate with such for the destruction of the affected animals. Mange in the Fox is a parasitic skin trouble and readily spreads from one Fox to another both by direct and indirect contact. For instance, a burrow may be the medium of infection, if



AN ENEMY OF THE GAME PRESERVER, BUT IN HUNTING DISTRICTS TO
BE PROTECTED BY MUTUAL CONSENT
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it has been inhabited by a mangy Fox. Again, a Vixen is capable of transferring this horrible trouble to her cubs.

Foxes occasionally give trouble on the rearing-field, and the most effective method of excluding them is to enclose it by a wire netting to the height of about 8 feet. Four-inch mesh should be selected, and the netting turned over at the top to the extent of about a couple of feet. Stout posts must support it at intervals, and the bottom portion must be pegged well into the ground. Certainly not less than half a yard of mesh ought to be pegged down in the earth, to prevent a Fox scratching his way through at the bottom, as the pertinacity of this crafty animal is truly surprising, whilst his persistence in overcoming what may seem insurmountable objects is a fact that is well known to game-preservers in localities where Foxes are troublesome.

All sorts of devices have been adopted for the protection of the birds in the rearing-field, though with a variable degree of success. Probably one of the best is the alarm gun, and the more widely the utility of these becomes known the more universally they will be employed. The ordinary breech-loading alarm guns will take an ordinary twelve-gauge case, and may be either set on the ground or hung on a tree. Some alarm guns will fire immediately the wire is cut, whereas others yield a second report after the first shot. Automatic alarm guns will fire a shot every hour, and are particularly useful, either on the rearing-field or at the covert side, especially for the latter purpose, but before the young birds are turned into the covert the trap should be kept constantly going, as the more vermin destroyed the better the results.

Luminous paint, lanterns either plain or coloured, as well as tainting preparations, are amongst other devices employed

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for keeping Foxes off the rearing-field. Luminous paint is a very useful preparation, and one that, if not a preventive for keeping Foxes away, does, to a large extent, afford an additional means of protection. Either the coops or triangular tablets of wood may be painted and placed in various parts of the rearing-field or else at the covert side.

If cocoanut-fibre string, such as is used by gardeners and by harvestmen under the name of "Binder Twine," be well saturated with some substance such as Reynardine, and then several runs of it be fastened to stakes around the field to the height of about a couple of feet, it will help to keep these troublesome pests away. The only objection to it is that the dressing has to be frequently repeated, otherwise it loses its efficaciousness. In many instances Reynard becomes so troublesome that in spite of all the keeper's devices he is able to outwit the lot of them.

A number of good yelping curs on running chains attached to wire around the field sometimes prove a means of overcoming the difficulty.

BADGERS (*Melus Taxus or Ursus Meles*)

Also known as the brock, the pate or the grey, is not uncommon in certain localities, and there are good reasons for believing that he is troublesome to game at times. The weight of a male is about 25 lbs., and the female slightly less. They are very fond of eggs of game birds and will hunt hedgerows in search of them, so that it is better to get rid of them. Various devices are employed, a simple one being an open sack. When the Badgers are away from home, a sack with a running noose is placed in the mouth of each of the most frequented holes and the surrounding covert then hunted to put the Badger into the

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earth, but unfortunately, when the animal is pressed hard by dogs, they will often seek shelter in other directions.

The best means of getting rid of them is by means of terriers and digging, which resolves itself into one of sport. The necessary appliances are a couple of spades, a pick, an earth-raker, tongs, and a hatchet, combined with a wee drop of Scotch as a reviver during the arduous work.

CATS AND DOGS (*Canis and Felis Domestica*)

Both dogs and cats commonly become inveterate poachers, more especially the latter, which, once acquiring the habit of poaching, continues it until it meets with its quietus at the hands of the keeper. On some estates enormous numbers of cats are destroyed annually, and it seems to the author that it is part of the natural instinct of the cat to revert towards its original wild condition. The existence of the true wild cat in the British Isles has been disputed, and if such does exist, it is certainly rare. Trapping and shooting are the best means of dealing with these offenders, as the amount of damage either of them can do in a game preserve is wonderful.

A very good method of trapping cats is to make a spurious rabbit burrow, and put a flesh bait, such as a piece of liver, etc., in the burrow, and a trap at the entrance of it, leaving all the soil outside so as to attract stoats, weasels, cats, hedgehogs, etc. If the burrow is made in a hedgerow that vermin frequent the captures will be innumerable. It is a simple, safe, efficacious and reliable means of decoying ground vermin into a trap.

For trapping a cat, the carcass of a cat placed beside a trap is one of the best lures. Put a cat plus a trap to catch a cat, and if the carcass is beginning to putrefy, the more efficacious the bait becomes.

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STOATS, WEASELS AND POLE-CATS

The Stoat, Weasel, Pole-cat, Hedgehog and Rat are all very fond of eggs, and precisely the same remark applies to mice, and when the weather is dry, all these animals are very keen in searching for Pheasant and partridge eggs. The stoat, the weasel and the pole-cat belong to the same family—*Mustelidæ*—as the ferret, and their habits closely resemble this useful little animal.

The gamekeeper wages war on the Stoat and the Weasel all the year round, and his vermin poles usually display a goodly number of these destructive pests. They are equally fond of young birds and their eggs, and not uncommonly kill adult Pheasants, their point of attack being the neck. Their depredations are not confined to game birds by any means, any form of flesh being palatable to their stomach provided it is in fresh condition.

The hedges and the coverts are both favoured haunts of the Stoat. The Stoat is nomadical, in other words constantly on the move, and will travel along the banks of a brook, and as these little pests have a fancy for crossing a stream from one side to another, advantage can be taken of this by placing a tree or log of wood to form a bridge, with a trap in the middle of it, only the trap must not be exposed on the pole, otherwise the Stoat will jump over it.

A trapper, writing on the habits of the Stoat in the *Game-keeper* for September 1901, has the following remarks concerning this wily little animal:—

“If a gamekeeper wishes to insure the capture of every Stoat passing along a stream, he should dig at right angles to that stream a ditch about 4 feet wide, extending a

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distance outwards of 15 feet or so. It need not be deep, but it must be allowed to fill with water, and the banks should be as precipitous as they can be made. If a smaller stream joins the larger stream at any point, there is the place ready to hand. A Stoat coming down the bank of a stream must cross over this tributary or return, and if a pole is to be found stretching across the minor portion of water, at the spot where it joins the main body, Mr Stoat will make use of it to his final discomfiture if the gamekeeper has carried out the plot skilfully. Always hang a dead Stoat near the trap that has caught it, for surviving Stoats have a habit of showing their respect for deceased relatives by gathering around the spot where the keeper has exposed the mortal remains, and finally the place of mortuary becomes more fascinating than ever, owing to the speedy addition of the bodies of the various pilgrims to those already exposed. Some people say a fresh bait for a Stoat is the best, but a stinking bait is really the most attractive. It is not meant that the Stoat will eat such a bait, but he smells it at a greater distance than he would a perfectly fresh bait, and cannot resist coming to see what has been left behind by another Stoat. Of course he cannot believe anything besides a Stoat capable of killing rabbits, etc., so that his curiosity brings about his end. When a gamekeeper has been successful in capturing a succession of Stoats in a certain trap, he is apt to take it up under the impression that he has cleared the neighbourhood; this particularly refers if there happens to be a lull in the stream of victims. But he makes no greater mistake, for he has been fortunate enough to locate his trap within killing distance of one of the highways followed by travelling Stoats, and if that trap is kept going it will capture Stoats as they arrive. A Stoat rarely takes to the open, and when it does, only with the assurance that shelter is within easy reach; the line it

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follows is always beside a fence, along a ditch, or by a stream, and it is in such places that traps must be set. Every gamekeeper possessed of the slightest skill knows this, for when desirous of capturing Stoats, he sets his traps near the corners of the covert, and not in its centre. He displays knowledge of the Stoat's habits too when he places the trap in a dry drain beneath a gateway.

“An under-run or tunnel trap at the corner of a covert is a sure method of taking Stoats, for this kind of vermin cannot resist entering such a place. A tunnel of this description can be made double killing if fresh soil be regularly scraped out at its entrance. Fresh soil at the entrance to a hole is associated by the Stoat with the presence of rabbits, and he is bound to tread the place.”

The foregoing remarks are of a very practical nature and afford the gamekeeper just such information concerning the habits of Stoats as is most needed, though doubtless most keepers are well acquainted with the haunts of the Stoat and its ally the Weasel. Strange to relate several Stoats have been captured in the same trap at a single setting, and photographs of such captures have from time to time appeared in the *Gamekeeper*.

The Stoat is very fond of eggs which it eats by the side of the nest. The Hedgehog is another egg-stealer, only they remove gradually, say one or two every day.

THE COMMON HEDGEHOG (*Virnaceus Europæus*)

This is an insect-eating animal, but it also lives on frogs, eggs, mice, small birds and fruit. It is regarded as proof against animal poisons, and it is very good for hunting mice, lying in wait at their holes, and sometimes burrowing for them. The spiny projections on its skin make it a formidable foe to tackle.

CHAPTER XXIX

FEEDING ADULT BIRDS IN COVERT

THE management of Pheasants whilst they are in covert, which they are expected to be for nearly six months in the year—at any rate, from September until February—taxes the ingenuity of the keeper and his resourcefulness quite as much as on the rearing-field; in other words, his anxieties, as to the measure of sport to be afforded, are based upon the successful management of his charge whilst within the confines of the covert. In addition to the multifarious enemies in the form of vermin, he has a still greater enemy to contend with, or rather he may have, namely, the poacher, the latter existing either as the rank out-and-out poacher or as the pottering sportsman, whose observant methods enable him to take advantage of Pheasants that have strayed from the coverts, through which channel a considerable number of birds may, in a single season, be lost to the lawful owner.

Naturally the sportsman who devotes a large amount of time and a great deal of expense in connection with the artificial rearing of Pheasants, expects the keeper to be able to produce a good show of birds when the time for shooting the covert arrives. Not only must the birds be plentiful, but they must be strong on the wing, and in good fettle, which they will certainly not be unless they are liberally fed, or the conditions are such that the coverts yield an abundance of natural food in the form of beech-nuts, acorns, etc.

The fundamental principle of the complete preservation of the Pheasants in the coverts is based upon the keeper's

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ability to prevent the birds from straying, and if he can successfully do this, his responsibilities are not only materially lightened, but when the day of reckoning arrives, both master and servant, to say nothing of the guests in sport, will vie with each other in good fellowship, and feel amply rewarded for the expenditure and labour inseparable from the sport of Pheasant-shooting.

Five dominant factors stand pre-eminent in encouraging birds to stray from the coverts, and these are:—(a) The absence of drinking water; (b) shortness of food; (c) the search for acorns; (d) the withdrawal of the gun from the covert; (e) lastly, the natural withdrawal of the birds from the covert during the breeding season.

Only the two causes first named are under the control of the keeper, though he may, to some extent, modify the third cause in the straying of birds; therefore, the matter resolves itself into the best and most practical method of obtaining the object he has in view,

Most of the shooting gazettes have in their advertisements notices respecting the straying of Pheasants, and specifics advertised which the proprietors guarantee will prevent Pheasants from straying; but as the author has not had any experience of these, he is not in a position to say whether they possess the charm ascribed by the proprietors, though probably some of his readers have had practical experience of these various "Stay at Home" mixtures.

In the writer's opinion, the best method for preventing Pheasants straying from coverts is to give them plenty of food and water, and if this is done in a thoroughly systematic manner, the birds will have little inclination to stray very far. Shortage of food, shortage of water, irregularity in feeding, and the seduction of the birds by pot-hunting neighbours, through the scattering of tempting cereals, raising the planting



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of buck-wheat, etc., are, as previously stated, the prime causes for the birds wandering. The author attaches as much importance to the regularity of feeding as aught else in safeguarding the birds from straying.

When the snow is on the ground and soft on the surface, Pheasants have very little inclination to wander far from home, preferring, as in the case of animals, the warmth and shelter which a well-constructed covert affords; in fact, so great is their dislike to snow, no matter whether on trees or on the ground, that they will readily congregate in a tree from which the snow has been knocked off the branches, and remain sitting there for hours throughout the day, and will feed off the young and tender shoots within their reach, rather than descend in search of food.

Some gamekeepers take advantage of this fact and dislodge the snow from the branches of some of the fir-trees by means of a long pole, an act which the Pheasants readily appreciate by roosting therein.

It is a very good plan to sow a patch of buck-wheat, and also one of Jerusalem artichokes, near to the coverts, as these two foods offer the strongest inducements to Pheasants, and the mere fact of their existence adjacent to a plantation will keep Pheasants at home better than all the anti-straying mixtures in the world.

The foods that they are most fond of are: Maize or Indian corn, dari, beans, peas, wheat, oats; together with such fruits as raisins and acorns; likewise potatoes and various green stuffs, *e.g.*, kale, cabbage, clover, mustard, and such roots as turnips, etc.

Most game-food firms make a speciality of "Covert Seed Mixtures," the cost of which averages 8s. per bushel of 56 lbs., and such will be found very useful as well as economical for the purposes required. Dari seed of good quality can be

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bought for about 7s. per bushel, and an occasional feed of this will materially help to prevent birds from straying ; but as previously stated, no food of any kind, natural or artificial, will keep birds at home, unless there is a sufficiency of it, which they are able to obtain with regularity, and above all have free access to water.

The reason why Pheasants are inclined to stray after a feed on acorns is due to the large amount of tannin or astringent matter contained in the acorn. This creates a degree of thirst, so that unless water be readily accessible, the birds will wander to find it, and the habit, once acquired, like every other vice, becomes chronic ; the precedent thus established soon leads to others following.

Make a point of feeding the birds early in the morning, exactly at the same hour, and again at night, just about one hour before they go to roost, because if the night feed is left too late, this acts as another incentive to stray, it being contrary to the rules of nature to roost on an empty stomach.

It is in the covert that the keeper has to "condition his birds," and he cannot do this without an abundance of food, good in quality, reasonable in quantity, regularly given, and judiciously changed from one variety to another. As with human beings, a change of food is distinctly beneficial, and the epicurean views of the Pheasant cannot afford to be ignored, otherwise it will take upon itself to search "Fresh fields and pastures new."

The majority of keepers are in favour of maize, and there is no doubt that it has a higher feeding value than any other cereal ; but its continued use leads to an excessive deposit of fat, not only around the internal organs, but also between the skin and flesh, rendering the latter rather dark in colour. It has been asserted by epicures that it makes the birds tougher than they ought to be. It may be given either whole or

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crushed, preferably the latter. Maize contains more carbohydrates than oats, but it is deficient in salts ; nevertheless its digestibility is greater than that of oats, but it is totally unsuited for very young birds, owing to its deficiency in mineral salts.

The following analysis of maize shows the various percentages of its component parts :—

Water	12.7
Proteids	10.1
Fat	4.7
Carbo-hydrates	68.6
Cellulose	2.3
Salts	1.6

Another advantage of maize is that it is practically of very little use to small birds, so that there will be no waste from this cause.

The carbo-hydrates are principally starch and saccharine, both of which are heat-producing and fat-forming. The albuminoids, carbo-hydrates and fats are the three principal constituents required for feeding Pheasants, and the best proportion is five of carbo-hydrates to one of albuminoids.

Wheat and barley are both excellent foods. Barley is rich in carbo-hydrates, as it contains about 66 per cent., and has an advantage over maize, as it only contains about half the quantity of fat. When this cereal is cheap, it constitutes a good and economical food for covert feeding, but it is spurious economy to buy cheap barley. Good barley will weigh from 53 to 58 lbs. to the bushel.

Buck-wheat is another valuable seed, usually costing about 22s. per sack of 4 bushels, and Pheasants are very fond of this grain, which contains 35 per cent. of carbo-hydrates, 43 per cent. of fibre, $4\frac{1}{2}$ per cent. of albuminoids and 13 per cent. of water.

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When speaking of the formation of coverts, reference was made to the planting of a patch of buck-wheat. There are several species of this plant, but they are all natives of temperate parts of China, North-west India, and Central Asia, from whence they were introduced to this country. The prefix buck is a corruption of the German word *buche*, meaning beech, because the fruit of these plants is similar in shape to that of beech-nuts. The common buck-wheat is an annual plant, with heart-shaped leaves, and a pink stem, growing to a height of 2 or 3 feet. It will grow very well on a poor sandy soil, but it is very sensitive to low temperatures, and a night's frost will very often destroy it. The best time to sow is the middle of May or early in June. It grows rapidly under favourable conditions, attaining maturity in twelve or fourteen weeks. To sow 1 acre of ground, 1 bushel of seed will be required, and the latter should be drilled in rows about 12 inches apart, care being taken not to sow the seed deeper than about half an inch. If planted in the months stated, it will be ready for cutting early in September, but as parts of the plant are still green at this season, it requires care in harvesting, though it is not very likely that the game-preserved will want to grow buck-wheat for the purpose of harvesting the seed, this being left to the birds to gather, though many keepers do stack buck-wheat, and scatter the dried plant about the coverts at feeding-time. It is an excellent plan to have small stacks of wheat, barley, or buck-wheat here and there in the coverts, so that the birds have ready access to food ; but care must be taken to turn the ears or heads of the grain inwards, otherwise there will not be much left as food for the Pheasants. The placing of food stacks in the covert constitutes a very efficient and economical method of preventing the birds from straying, and it is one commonly resorted to by gamekeepers. A food stack

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in a covert is shown in the accompanying illustration. The author strongly recommends gamekeepers to have a number of these stacks about their coverts, particularly during severe weather, so that a portion can be pulled out and scattered as required.

In addition to dry grain a liberal allowance of roots and other vegetables are requisite and invaluable owing to the amount of water that they contain ; in fact, any shortage of water can be in part supplanted by a plentiful supply of such vegetable matter.

As already stated, a free supply of water is a *sine qua non* for keeping Pheasants for covert, though various contrivances are employed as receptacles for water. Of whatever nature these are, the keeper should see that they are kept well filled.

Most game-food firms, as well as manufacturers of poultry and Pheasant appliances, are vendors of water fountains, but the choice of such is more a matter for individual consideration.

With regard to the method in which grain, etc., is supplied to birds, there are many ingenious contrivances on the market, and some of these are shown in the chapter dealing with "Appliances of the Pheasantry." Many keepers scatter their grain over a wide area of ground, so as to give the birds plenty of occupation, and the only precaution that is necessary, when food is supplied in this manner, is to guard against fouling of the ground, which can be done by shifting the situation of the feeding area.

The straying of hand-reared Pheasants is often due to the older birds setting a bad example to the younger ones, as the former may easily find their way back to covert, whereas the latter, thus decoyed, may be unable to do so. By driving deserters into covert with a dog, a lesson may be taught, as fright certainly constitutes one measure of prevention.

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The straying of Pheasants is a subject that has given rise to a great deal of discussion, and a considerable amount of literature has from time to time been published in connection with the matter, which is one of vital interest in game preservation. In order to obtain the views of head-keepers concerning it, the editors of the *Gamekeeper* for June 1909 opened their columns to competition, awarding a prize for the best essay, and the selected one appeared in the issue of the following month, being from the pen of Thomas Bamford, head-keeper to the Earl of Clarendon, which the author has taken the liberty of reproducing. Mr Bamford says:—

“The straying of Pheasants is a matter which causes the keeper perhaps more anxiety than any of the obstacles he is called upon to surmount, especially on a small shoot, or where the coverts are situated near the boundaries. Needless to say, tame Pheasants are of a roving disposition, which can never be altered, although much may be done by taking the earliest opportunity of checking their first attempt to stray beyond certain limits, and attending to the many details that have a tendency to make home comforts. One of the first matters to be considered is quietude, for without this straying will not be prevented, no matter how favourably situated in other respects. Pheasants will not tolerate a covert that has to be continually disturbed; therefore every effort should be made to keep the covert free from anything of a disturbing nature. Pheasants bred in a wild state are naturally stay-at-home birds, and nothing but constant disturbance and lack of food will cause them to desert the locality in which they are reared. It is not quite so with tame birds, for as soon as they become independent of their foster-mothers

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the rambling fit takes them, and being quite ignorant of the geography of the neighbourhood, beyond a few yards around where their coops are placed, they go rambling on, and if not checked, eventually lose themselves. This is why it is so important that driving-in should be resorted to as soon as they begin to stray even a short distance from the covert. Each day they will go further out, but by constantly being driven back will gain a knowledge of the locality, and get their line of flight for home. It is not perhaps a good plan to allow the birds no law beyond the covert fence, especially if there is plenty of space between the covert and the boundary of the manor, for it must be remembered to make home surroundings comfortable, the birds must be allowed some open space. The need of this is most felt probably after a wet night, and when the covert is too dense to admit sufficient air to dry the birds within. Open space, too, is appreciated as a means of escape from the drip of the wet trees. Where space will allow, it is a good plan to grant so much law outside the covert, and never drive in beyond it, say limit to one field or about 300 yards. If this can be done birds will give less trouble, but no hard and fast rule can be laid down, as so much depends upon the situation of the shoot. Perhaps one of the greatest inducements to keep Pheasants at home is to leave small plots of corn standing adjoining the coverts. When this can be done not only will it act as a natural feeding ground, but will provide amusement for the birds, and will help to pass time which otherwise might be spent in straying over the boundary. Presuming that Pheasants have reached the straying age, it is most essential that attention should be paid to the feeding, not perhaps so much as to what the food consists of but as to how and when it is given; for

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instance, it is a mistake to feed one morning at six and the next at seven. Any delay in feeding will have a tendency to cultivate the propensity to stray. Punctuality and regularity should be strictly adhered to. If food is not there birds will not wait but make off in search of it, and that food may be found in a neighbouring shoot. At this time of year, for preference, the morning feed may consist of a mixture of maize, wheat, dari, and a little hemp-seed, as soon as the birds come down from roost. Feed in the evening about an hour before roosting-time on soft food of an appetising nature, thus giving them an inducement to put in an appearance and roost at home. Harvest rakings stacked on the feed-places provide amusement, and do much in the way of keeping birds from straying. Many so-called non-straying mixtures and such-like nostrums advertised as a means of preventing roaming are best left alone.

“Another means sometimes employed to prevent Pheasants straying is corn steeped in a strong decoction of quassia and thrown down in any place where the birds are given to stray. This is of little use. Rely wholly on suitable and liberal feeding, with constant attention to judicious driving-in. A keeper will need to be particularly active as regards driving-in during a fog, for at no time do Pheasants seem so persistent in breaking out as under the cover of a dense fog. At such time a good steady old retriever will render valuable aid in detecting birds that the keeper would be unable to see.

“Precautions should be taken to drive birds home without forcing them to flight in a thick fog, as once on the wing they are lacking in all knowledge of locality, and there is no knowing where they will finally alight.”

CHAPTER XXX

PHEASANT-FARMING

THAT Pheasant-farming can be made a lucrative form of rural husbandry may be fairly assumed, when one comes to consider what a number of game farms there are in various parts of the United Kingdom, though many of such farming operations are not confined to Pheasants only, but to various other game birds, such as partridges, more especially Hungarian partridges, the wild duck, etc.

Doubtless many readers will say that game-farming, like the majority of other industrial pursuits, is becoming overdone, whilst it has one striking disadvantage over the ordinary commercial occupation, and that is that it is a very speculative undertaking, as a single season of bad luck is followed by serious losses. It is a pleasurable form of occupation, and one that, with a reasonable amount of capital, the acquirement of suitable premises, along with the possession of sound judgment in the selecting and mating of the stock birds, combined with a reasonable measure of success, can be made fairly profitable.

Game-farmers do not, as a rule, become millionaires or even moderately wealthy men—in fact, it is only those possessed of capital and a special aptitude for following such a pursuit that ought to undertake the management of a game farm. Most of the game farms are situated in the south or south-east of England, comparatively few in Scotland, Ireland and Wales. On some of these farms Pheasants for covert purposes only are kept, whereas others

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combine the breeding of fancy birds for the aviary, and when there is convenience for doing so the breeding of fancy Pheasants materially assists to augment the income.

When considering the county in which it is desirable of commencing a game farm, it is necessary to study the topography of the district, it being essential that the premises are within reasonable distance of a railway station, as the majority of transactions in game-farming are by rail. Not only is it necessary that a railway be handy, but equally important that there is a tolerably good train service, as the despatch of both live birds and eggs is one in which the less delay there is the better.

Some game farms are what may be termed already made, others have to undergo a gradual conversion—*i.e.*, the young coverts have to be made, and the land, etc., drained. If there is a small covert and a fair amount of grass land, especially upland pasture, the premises ought, with a reasonable amount of expenditure, to form suitable ones for game-farming operations to be carried on.

It is useless to start a game farm where the land is insufficient, because it is an indisputable and well established fact that Pheasants kept in pens that are constantly being moved from one part of the land to another are very much healthier and stronger birds than others situated where no such arrangement can exist, or at any rate does not exist. Some Pheasant-farmers boast that their birds are shifted on to fresh ground every day. It must be a tremendous amount of trouble to change birds on to fresh soil every day, in practice at any rate, moreover there is no necessity for it, and if there is any wastage of labour in farming, no matter whether purely agricultural or that more directly concerned with game, it is hard to conceive of the ultimate prosperity of such an undertaking.

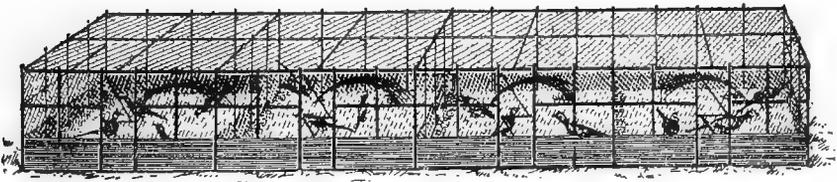
PHEASANT-FARMING

Economy of labour, economy of food, and various other economics have to be practised by the game-farmer in order to succeed. In other words, success is based upon careful husbandry.

A gravelly soil, especially if of a hilly nature, good drainage, a free supply of water, and a well-sheltered position, are desirable features for the establishment of a game farm. A low-lying piece of land, marshy, or one that is liable to be washed by the sea-board, is totally unsuitable for such purposes. Damp low-lying ground is not land for the game-farmer, and he indeed who would undertake to establish his farm upon land of this nature could only look forward to failure, unless, of course, miraculous aid intervened.

The best form of pens to erect are those which are movable, though on many game farms no such pheasantries exist. Movable pens for Pheasant-breeding can be constructed of wire hurdles by simply bolting them together, as depicted in the accompanying illustration.

The lower portion, about 2 feet from the ground, is covered with sheet-iron, which shelters the birds from the wind and from fright. To each pen there is a gate and



WIRE HURDLE MOVABLE PENS FOR PHEASANT-BREEDING

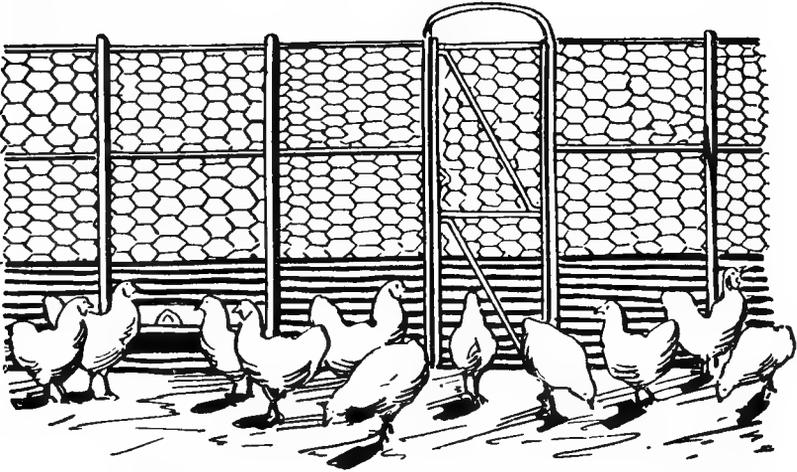
a lock and a corrugated iron shelter, and the top is covered with cord netting, which prevents the birds from injuring themselves when they fly against it. The best size for

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the pens is 18 feet long by 14 feet, and twelve such pens can be had for £60 or thereabouts.

Smaller pens, 8 feet in length by 8 feet in breadth and 3 feet high, are used by many. Low roofs are provided in the corners for shelter.

These pens can be shifted about three times a year, though some only move them once a year. If more



PORTABLE WOODEN HURDLES FOR PHEASANT PENS

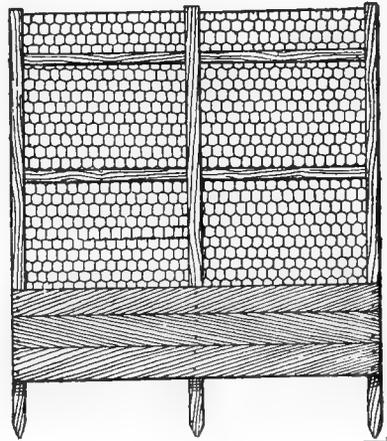
economical structures are desired, the prospective game-farmer must buy cheap second-hand timber for the uprights, and a supply of 2-inch mesh netting, boarding up the bottom of the pens 18 inches from the ground. A most useful form of improved portable wooden hurdles to form Pheasant pens are as depicted in the annexed illustration. The top, 4 feet 6 inches, is covered with 2-inch mesh netting, and the bottom boarded up 18 inches from the ground. The hurdles are made 6 feet long and 6 feet high, but not painted. The prices are 5s. each, but hurdles

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6 feet by 6 feet, with a doorway in the centre, are 8s. 6d. each. The hurdles can be obtained from Messrs Boulton and Paul of Norwich. The same firm make a 6 feet high movable fencing, with the upper portion of $1\frac{1}{4}$ inch meshing, at 4s. per yard, the lower part being of galvanised sheet iron 2 feet high. Doorways, angular iron pillars for the corners, reversible troughs, and various other etceteras can be obtained for a trifling additional cost. Cord netting can also be supplied for the tops. This is a capital form of fencing, and one that is efficient and economical.

Runs that have been used the preceding year should either be turned over with the plough or trenched, and then well dressed with hot lime subsequently exposed to the air from the autumn until the following spring. The action of the ozone in the air, together with that of the lime, is one of the most powerful disinfectant agents that can be employed, and it is always advisable to adopt some such plan in pheasantry pens. It must be borne in mind that Pheasants, unlike fowls, are, whilst in the pens, exposed to all conditions of weather both night and day, though the author considers that a certain amount of protection, especially during winter, is a necessary part, though we will not say indispensable portion, of the Pheasant-rearer's plant.

The other portions of the plant, which will either have to be purchased in the material or else already constructed,



HIGH MOVABLE FENCING

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comprise the Pheasant coops, hatching-boxes, feeding utensils, a portable boiler, a fodder house, baskets for the transit of birds and for eggs, vermin traps, incubators, etc. etc.

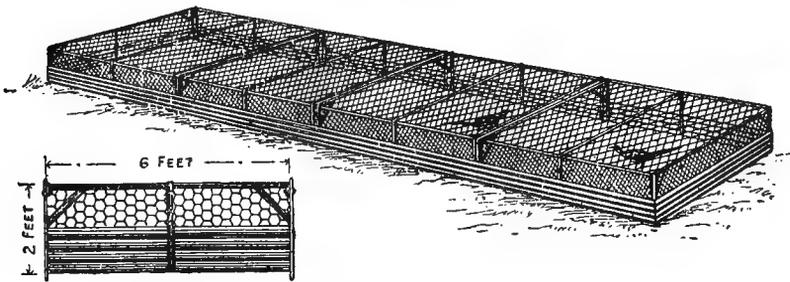
Egg cabinets to hold several thousand eggs should be on every game farm, as the eggs keep fresher much longer than when they are stored on bran, etc. The tray should run in and out of the cabinet, and the eggs fit into holes drilled in the trays.

The best time to commence a Pheasant farm is at the beginning of the year, so that the opening operations, if a successful season, will at once bring immediate return, through the sale of eggs, which constitutes the principal source of revenue in all game-farming operations. Early maturity and sheltered pens are mainly conducive to early production of eggs, and the highest prices are obtained for eggs that can be put down early. For instance, eggs which can be sold in April up to the 10th of May are worth about £4 per hundred, or £38 per thousand. From May the 10th to the 15th, 10s. less per hundred, and from the latter date to the 20th, another 10s. less, dropping by increments of 10s. every five days, up to the end of May, so that eggs that were worth £4 per hundred in April are during the last week of May only worth one half. After the date last named it is not a wise plan for anyone to purchase eggs—in fact, it is against Pheasant-rearing to set any eggs later than the 21st of May. However, Pheasants can be reared even later on than this, but every Pheasant-rearer will admit that the late broods are in 90 per cent. of cases at least failures. As it is, Pheasant-shooting begins a month too soon, and precisely the same remarks apply to partridge-shooting. The former should begin on 1st November, and partridge-shooting on the date as at present fixed for Pheasant-shooting.

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The most expensive items in connection with game-farming, during the foundation of the farm, will be the cost of plant, the cost of the stock birds, together with the surplus capital required for a year's independency for the farmer and his dependents to live upon.

Regarding the stocking of the farm, the author desires to say that it is impossible to acquire better birds than some pure Mongolians, some pure Prince of Wales, and some



PHEASANT COOP

pure Chinese male birds, together with a few Reeves' Pheasants. The hen birds should consist of pure Black Necks, pure Mongolian hens, and pure Prince of Wales hens. This will give sufficient variety to supply eggs, both from pure birds and from cross-bred ones.

Needless the eggs from pure birds are much higher in price than those from half or three-quarter bred stock. The most useful cross of all to the game-farmer is the first cross Mongolian Black-Necked ; the second one, the Prince of Wales cock with the Mongolian hen ; the third one, the Prince of Wales with the Black Neck ; the fourth one, the Mongolian cock with the pure Chinese hen. The main object for the game-farmer is to obtain clients who will patronise him from season to season, and this can be done

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by supplying birds that are large in size, robust in constitution, early to mature, prolific, sharp on the wing, strong on the wing, high on the wing, and last but not least, brilliant in their plumage.

A record of all eggs laid, the dates when they were laid, the nests and pens from which they were derived, and any other particulars, should be registered in a book specially kept for the purpose. In order to succeed there is one axiom that must never be lost sight of, and that is to keep one eye on the ledger, and the other eye on what other game-farmers are doing, and this apart from the methodical habits and strenuous existence required by this and other rural industries.

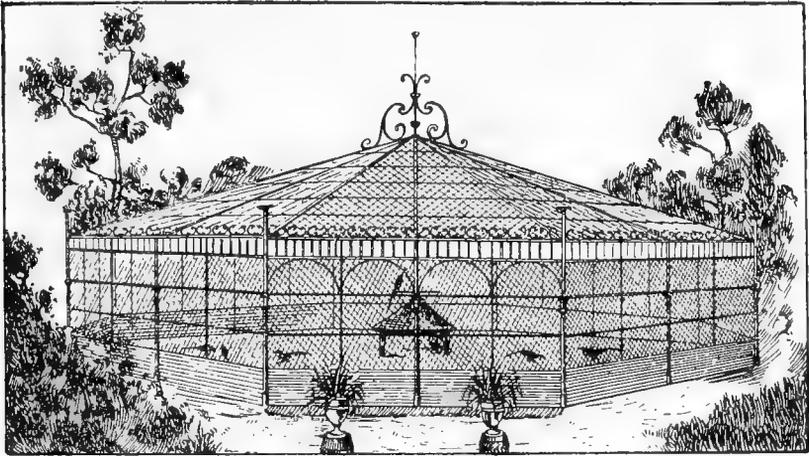
If fancy Pheasants have to be combined with those of the covert, though of course kept quite apart from such, then the best birds to keep are the Golden Pheasant, the Silver Pheasant, Amherst Pheasant, Scømmerring's Pheasant, Japanese Pheasant, and Reeves' Pheasant, though the last-named species both belong to the genus *Phasianus*, but of the two birds *P. Reevesii* is the one that is most eagerly sought after by gentlemen for introducing into their coverts. These birds are always worth at least a couple of guineas a pair, and their magnificent plumage combined with their strong flight are a great recommendation.

Elliot's Pheasant is sometimes introduced into coverts, and like Shaw's Pheasant, belongs to the same genus as the two last named, but for a description of these and others belonging to the same or different genera the reader is referred to the various chapters relating thereto.

For keeping fancy Pheasants, very elaborate portable aviaries are manufactured, and though somewhat expensive to purchase, their construction is so thoroughly well done that once purchased, they will last for more than a lifetime.

PHEASANT-FARMING

The illustrations depicted are the registered copyrights of Messrs Boulton & Paul, and any particulars concerning them can be obtained from the firm mentioned. The houses re-



AVIARY FOR PHEASANTS

ferred to are an ornament to any gentleman's premises, and materially add to the beauty of the occupants. They are, of course, houses which are almost exclusively used for fancy Pheasants—in fact, it is hardly likely that anyone would contemplate purchasing such elaborate structures for ordinary Pheasant-raising.

CHAPTER XXXI

HIGH PHEASANTS—HOW TO SHOW ON FLAT OR DIFFICULT GROUND—SOME OPINIONS OF GAMEKEEPERS

SPORTSMEN frequently complain of the low flight of Pheasants, and there is no doubt that Pheasant-shooting, unless accompanied by high-flying birds, becomes a very poor form of sport, and in some instances even a dangerous one. Every keeper likes to show high Pheasants, and on some estates the natural surroundings are such that the birds are compelled to adopt high flight, whereas on other estates there is nothing but a good system of management to produce high-flying birds. Another very important factor in the author's opinion is to breed only from those birds which by instinct are not only vigorous in their flight, but also good at "towering." In every covert there is a certain class of birds which are conveniently designated "Skulkers," and this remark is particularly applicable to many birds that have been released from the aviaries, and it is an open question whether it is advisable to turn penned birds out again into covert. The effects of domestication, frequent association with man, and the acquirement of a barn-door fowl sort of existence is inseparable from the acquirement of skulking habits. The mere presence of such birds in a covert establishes a precedent for similar habits amongst other Pheasants. Therefore the deductions to be derived from the foregoing remarks are well worthy of every Pheasant-rearer's consideration. It is in the practical exposition of high-flying birds that the keeper is likely to receive his greatest reward. In the

HIGH PHEASANTS

introduction of the Reeves' Pheasant and the Prince of Wales into coverts for hybridisation with the other varieties constitutes one means conducive towards the production of high-flying Pheasants.

The following essays are written by head-keepers who have taken particular pains to ensure high Pheasants being brought to the guns, and have expressed their opinions in the form of essays, sent in response to a competition, opened by the editors of the *Gamekeeper*. These essays are as follows. The first one is from the pen of Mr George Beilby, head-keeper, Kirklevington Hall, Yarm:—

“The problem of showing high Pheasants on flat or difficult ground is one of the most seasonable and one of the most difficult to solve on shooting days, as there are so many things which may happen to upset the most careful plans. I think the wind is the worst of all if blowing from the wrong direction. Shoots may be classed into two kinds, namely, all Pheasants, and a mixed shoot—I mean a shoot with a good percentage of ground game, which every keeper knows is decreasing very rapidly, making things no better for winged game.

“I will take a place where there is nothing but Pheasants kept. The first thing that must be seen to is to have plenty of covert at the end of all drives or beats, so that the birds may hide when driven up. This should be attended to in the winter months if possible, as it will allow the grass, etc., to grow through it and make it more natural as well as bind it together. Next, the birds must be watched to see where their favourite places are for working in and out of the coverts. If they are not working in the direction in which they will be required to go over the guns, the man in charge must do his best to get them there, by arranging

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his feeds so that they take the right way naturally. Then when the time comes to be forced or driven, they will go more readily.

“Now, to get the birds to rise and fly high is not nearly so difficult as a good many imagine. But of course there are exceptions to every rule, and the man in charge must use a certain amount of discretion according to the situation he is placed in, and the hundred and one obstacles he has to meet. Stretch wire netting about 3 feet to 3 feet 6 inches high right across your beat in any direction in which you want to corner the birds, with at least 50 yards at each side, so that the birds don't run past the sides. The netting must be set well inside of the covert, so that the birds cannot see the guns when driven up to the wire, and it must be at least 50 yards from wire to gun. Where there are a good many birds in one beat, it will be an advantage to put a second lot of wire about 25 yards further back from the other, setting it in a half-circle or half-moon shape, taking care to leave about 20 yards at each side open, so that a certain amount of the birds will pass. The rise should have abundance of under-cover, and the trees should be well thinned out to allow the birds to rise clean and easily. At the end of the drive at the outside of the covert there should be two or three men with white flags at even distances apart. Special care must be taken with these men so that the birds, when driven up, cannot see them or their flags; this can be easily done by making some sort of butt—for instance, a couple of stack bars woven with spruce, etc., will answer well. The guns should always be placed where the man in charge wants them, as two ideas, no matter how good they are, very seldom work out to the satisfaction of either party. Now drive the birds. Drive in the ordinary way until you get within 50 or

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60 yards from the first wire, then stop the line, advancing one man in every 40 yards or less to work up the birds. When these men have got the thickest of the birds up, the line can be steadily advanced, taking great care not to move too quick or get too near the advanced men. The men who are working in advance must be men with an interest in the work, or they will be liable to put the birds up too fast, or leave a good many behind them. As to the men at the end of the coverts with the white flags, as soon as the birds start to fly over them, they should work their flags continually, as the birds will not see them until they are well on the wing, and are right over the top of them then. As soon as the birds see these flags, up they rise, and the next objects they see are the guns which make them rise higher. Some might think that this would turn them, but it is far from that, as they are well on the wing, and the flag-man gives them the spurt at the right place. It will be found if the above is carried out properly, the birds will be as high as any ordinary gun can reach them, with a good percentage of them even higher. This has been worked successfully for high Pheasants risen from low ground as well as level."

George Legg, head-keeper, Buriton, Petersfield, referring to high Pheasants, says :—

"The above is a problem not easily solved, and although science has done and is still doing wonders in high flying, the time has not yet arrived when we can drive our Pheasants out of a level cover like Shepherd's Bush, and make them use their own 'quite safe flip-flap' to anything like the rocketing height that we soar to there!

"High shooting is invaluable in these days, both from a

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letting and a sporting point of view, and lucky are those for whom nature has settled the question of high birds. I am, perhaps, one of those lucky ones, living as I do near the South Downs, just on the borders of Hampshire and Sussex. The stiff slopes of some of our shooting ground are ideal spots, and when some of the guns who stand below hill don't come off well, it is no uncommon thing for us to hear the remark, 'Too high! too high!' But we also have some low level covers, and the difficulty has always been how to get good shots from these. Our own level covers are small, and consequently not so difficult to manage as large level covers, but all level shooting, whether big or small, can be made more interesting by a little care and thought on the part of those who are in authority.

"First, then, study the wind before you approach a small cover. Often shooting plans are made beforehand which, if carried out when the wind is all against you, must result in certain failure. Have an alternative way to beat your cover. You cannot manage the wind!

"Then, again, many people make a mistake by putting the birds up at just one particular spot, because it is the most likely way to get them forward into the next beat. Perhaps the birds always fly low and badly from that spot: whereas if they were flushed a bit farther back or at another angle in the cover, it would make all the difference.

"*Placing the guns.*—Very much depends on where the guns are placed as to what sort of shooting they will get. The best way, whether outside or inside a level cover, is for the guns to stand well back so that they can see which birds are going to be worth shooting at. I have seen some good results got thus. I have seen some fine shooting when birds have been driven out of a big cover across a field say five chains across, the guns all standing the opposite side of the

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field. Of course, some birds go back, but generally they find the host and another gun ready for them if they do.

“Always make a good rise in a big cover, and remember this, that you can drive a Pheasant almost where you choose while he is on his legs, and with plenty of strength you can often repeat a good rise by working the birds round again.

“*Flags in front and on flanks.*—Flags are a thing to which game is not by any means accustomed. It is a good plan to use about three conspicuous ones, if the master will consent, keeping two of them on the right and left to act as flankers, and one right in front of the rise. This will usually have the desired effect of making the birds get up. Even if it does turn some back, and if it can be arranged so that the birds have decided the line of flight they mean to take before they see the flag, so much the better.

“*Condition of birds and date of shooting.*—Much depends on the condition the birds are in as to how they will fly. Keep feeding twice per day with soft food right through October and even November, till the first shoot, and don't dispense with biscuit-meal and greaves too soon, as after all the latter does not cost more than wheat or maize, etc.

“The later the date of shooting the higher the birds; but I do not advocate that the first shoot should be much after the middle of November, as it is not fair to the keeper to have to keep his birds at home longer than this.

“*Uncommon sounds conducive to high flying.*—Everyone knows what a keen ear the Pheasant possesses, and how it can be trained to come to a whistle or almost any other call. It knows also every little warning note of the smaller birds, such as the blackbird, thrush, chaffinch, robin, etc. Let the blackbird give the ‘Chuck! chuck!’ note of warning, and every Pheasant is on the alert for a stoat or weasel.

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The different notes of a blackbird and other birds which tell of a hawk near by are all well understood by the keen-eared Pheasant. To imitate the squeal of a rabbit, the call of a hawk, or any other unnatural sound may help in a Pheasant rise. My late master often told me that a fox in a corner was the best thing to make birds get up."

"In conclusion I thank the proprietors of our little paper, the *Gamekeeper*. I fear they have set me too hard a sum, when they come to put my words together, but I know they want us all to try our luck."

A third essay on the matter is as follows :—

"I shall endeavour to show how we get high Pheasants ont his estate. But do not let our readers imagine that we in the low, flat counties can make Pheasants such rocketers as can be easily done by rising them from on high, and going over guns placed in a deep valley. No! we do not assume to do impossibilities. On the ground that is adapted for high birds the battle is nearly won, but on the ground that is as flat as the proverbial pancake it is otherwise.

"I am supposing that I am dealing with a large cover which measures considerably more in length than width. At the extreme is a large root-field, and into this field the birds are slowly driven. The utmost care must be taken to have the sides and extreme limit of the root-field well stopped. A few rolls of wire netting judiciously placed will greatly assist the stops. When the birds come to the net, and have plenty of roots for hiding, they mostly make themselves content, but if the wire was not present they would in a marvellous manner sneak away in twos or threes, between the stops, however vigilant the stops may be.

"We have now beaten the cover slowly and carefully, and

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given the birds plenty of time to get forward into the root-field. The birds have an open ride to cross, and I have heard that a great number have crossed into the roots. All noises now are rigorously subdued. The guns take their places. The beaters divide from the centre, right and left, and take a wide circle outside the flank stops. A responsible leader goes with each company of beaters, and he generally keeps placing a man here and there to stiffen the flanks. The remaining beaters have now reached the outside stops. Having lined out, they are ordered to remain still until further orders. The head-keeper must most carefully notice that the guns are properly placed, and that the flanks do not press the birds too much; also the greatest scrutiny must be given to the wind and flight of birds. If they are inclined to favour a certain direction, steps must be immediately taken to push them over more evenly. All beaters still remain stationary. About three keepers will now advance from the stationary line of beaters. The keepers, knowing their work, silently take the field of roots towards the guns, judging from the shooting if they are going too fast, and if the birds are going away without being shot at. What a pretty sight for the sportsman rising 400 yards in front of the gun! What a height they attain before they come in range! How beautifully they come all down the line of guns by twos and threes!

“The keepers have now reached a certain distance from the guns. I do not advise going too close; it may cause a little flush of birds, and they would be too near the guns to provide a high shot. Then the keepers advance right and left and go outside the flank stops, and from the main body of beaters. All now advance in line towards the butts, walking slowly and making no noise. If the head-keeper thinks that more birds are in front, there is a possibility they may rise too

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thick ; consequently a mute halt is called, then again the keepers advance with four or five staid beaters with them, going slowly and quite mute. They will proceed until they are nearly up to the guns, they then halt, each standing quite still ; the line that was left in the rear now comes on ; little noise is now made, and every foot of land must be brushed, or birds will be inclined to squat, and possibly may endeavour to go behind the beaters. The noise made by brushing the root tops will be of great use. The birds on rising and seeing the front line of beaters and keepers in front will soar to a great height, and will provide some magnificent sporting shots. Having to condense this article it is impossible to give the thousand and one details of such a shoot. I have seen eight hundred Pheasants killed in these ways, and what is more, not a bird was smothered with shot."

An extract from an essay by Peter W. Watson, game-keeper to His Highness Prince Eszterhazy, (*Oldenburg*) Hungaria, was also inserted in the same number of the *Gamekeeper*, and is as follows :—

"For several seasons I have used cord about 500 yards long. The cord must be strong, not too heavy nor too thick. Sewn on it every 4 feet, alternately, should be a red and white flag. (Sewelling is the ordinary name for it.) The cord should be wound round a windlass. Paths or small tracks should be cut through the underwood 40 to 50 yards in the covert from where the guns are placed. These paths can be made without any further damage to the trees being done than pruning off a few of the lower branches, unless the plantation is spruce fir, when a wider opening ought to be made, so that the Pheasants would be able to see the cord, and not run under it. If there are no suitable trees

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at the end of these openings a post should be firmly driven into the ground at each end, and forked sticks about 4 feet high stuck into the ground 15 to 20 yards apart to hang the cord upon. All these preparations should be made the day, or several days, before the shoot. On the morning of the shoot these cords should be given into the charge of an active keeper and a beater. The keeper of course will have had explained to him a day or two previously just what is expected of him. He should go to the first beat, and after tying one end of the cord to the post or tree, the beater takes hold of the windlass by the handle and walks on, the frame of the windlass revolving round the middle stick lets the cord out, when it can be put into its place by the keeper who is coming up behind. The modern frame or windlass, which I use, is much handier and lighter than the old-fashioned one, which was hung over the neck and belted round the waist, and which made the wearer look more like the well-known barrel organ than a human being. An estate with two or three of these cords, and an active man to work them, and providing that man, or men, goes quietly about the work, does not need more, as they can be shifted from the first beat to the third, and from the second to the fourth, unless the beats are a long way apart. I have used the sewelling for stop purposes made with wing feathers, but never found it so effective as the rags. I have also used netting, both made from wire and string, to try and get the birds to rise, and have seen birds rise well over it sometimes, and at other times merely jump over it. The reason for their jumping over it was, I think, that they were used to it, so much being in use on nearly every estate. Sewelling is better than netting, for nets stop all ground game from going forward, and although perhaps it is not shot, it is all the better when seen by your employer.

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Perhaps, too, an old fox is sent back, which if it had been sent forward might have cheered the heart of a sportsman, and, who knows, might have got the poor keeper a better name? Now, if the sewelling is used, directly the Pheasants run up within seeing distance, they halt, stretch their necks, then up they go, never having seen such a thing before, and hearing the beaters coming up behind they very seldom turn and fly back, but will go high over the guns. If hand-reared birds, they will rise and fly better than wild ones; this I have proved over and over again. My theory for this being that the wild bird is so often disturbed by foxes and other vermin—(are foxes vermin?)—that they only rise and fly far enough to get out of their way. Not so with the hand-reared Pheasant. He is on most estates watched by night and day from the minute he comes out of the shell until the minute he falls to the shot, and when shooting day comes with all the fresh sounds, and being driven about as he has never been before, up he goes, and as I said before, if flushed well in front of the guns, he will go high enough.”

CHAPTER XXXII

THE DISINFECTION AND CLEANSING OF THE AVIARY, COOPS, AND OTHER APPLIANCES OF THE PHEASANTRY

IN the rearing of Pheasants it matters not how skilful and how experienced a man may be, if he neglects the periodical cleansing of both the fixed and portable portion of the plant, disaster must inevitably occur sooner or later. Every Pheasant-rearer knows perfectly well that one of the chief causes operative in the production of the enormous losses that sometimes occur amongst Pheasants is mainly ascribable to infection, and that such sources of infection commonly arise through appliances, such as coops, feeding vessels, etc., having been fouled with the disease. The author does not mean to say that all diseases of a communicable nature can be controlled by disinfection, etc., because such a view would be incorrect ; but it stands as a well-established dictum that infectious diseases are more likely to make their appearance in the rearing-field, aviary, etc., where the keeper has not exercised sufficient care as to cleanliness, than amongst birds in which a thorough system of cleansing the coops and all feeding appliances has been rigidly adhered to.

The rearing of game under artificial conditions is one that calls for the exercise of a high degree of intelligence, patience, perseverance, observance, resourcefulness, and other qualifications of more or less importance. When

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broods begin to die in a wholesale manner, one is naturally forced to the conclusion that some specific, though undetermined, infective disease producing agency, is at work, and that its channels of communicability either reside in the food, water, feeding vessels, coops, hands of the attendants, or the ground upon which the birds are reared.

It is only by what may be termed a "process of exclusion," isolation and disinfection, that such specific maladies can be curtailed, more rarely stamped out. It is impossible to dissociate heavy mortalities either in the rearing-field or on the removal of the birds to the covert from specific infectious causes, and as previously stated, the determination of the actual causative agency is, as a rule, one of great difficulty; therefore, the moral is, to aim at prevention, and if this fails, to attack the disease, by what the writer has previously termed a "process of exclusion," which implies thorough disinfection of all articles capable of being treated by such disinfectants; the immediate removal of the birds as yet unaffected to fresh ground; the destruction of all sickly ones; a change of food, also of the water supplied; together with strict personal supervision of the birds, which really constitutes one of the first duties of a head-keeper in spite of the fact that his under-man may be thoroughly reliable.

There are so many details in connection with Pheasant-rearing that any single individual may easily overlook some of these, and the most trifling causes not infrequently form the nucleus or starting-point of what subsequently turns into a most disastrous season for the Pheasant-rearer.

Most Pheasant-rearers will admit, I believe, that the best aviaries are those which can be shifted every season,



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so that adult birds are not kept on the same ground as in the preceding year. Portable pens are sold by many dealers in game appliances, and as a rule the prices are usually reasonable, but for a description of these the reader is referred to that section of the work dealing with "Appliances of the Pheasantry." The woodwork of the pheasantry should be scraped, then brushed over with a solution of some strong disinfectant, and afterwards lime-whitened, using freshly-slaked lime for the purpose. This periodical lime-whitening of the woodwork is of the greatest importance, and in carrying it out it is better to employ a spraying apparatus, as this insures all particles of the lime-whitening being brought into contact with the interstices of the woodwork. Precisely the same remarks are applicable to the coops before being removed to the rearing-field. Mere surface cleaning of the coops is of no use; each coop must be washed with boiling water and washing-soda, then brushed over with a strong disinfecting fluid, and, finally, thoroughly sprayed inside with freshly-prepared lime-wash. The more portable coops are made the better they are to cleanse, and if made so that all parts can be disunited the facility for cleansing is greatly augmented. Unfortunately the coops are often kept in a dirty condition, thus inviting the onset of disease. The best fluid disinfectants for such purposes are Carbolic Acid, Formalin, Pino-Eucalypt, Lysol, Pearson's Antiseptic, Creolin, etc.

In some instances, especially in those cases where the coops are infested with vermin, it is a good plan to first of all scrub them out with boiling water, and then expose them for a few hours to the combined vapours of Sulphur and Formalin, for which purpose Sulpho-Formalin Candles are sold, and the vapour emitted is very destructive to minute forms of animal life. There are various other

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gaseous disinfectants, several of which are prepared as follows :—

Sulphurous Acid Gas

This is a very useful gaseous disinfectant, and one that is very extensively employed in houses by local authorities, as a means of disinfecting the premises, when there has been an outbreak of some disease such as scarlatina, small-pox, and so forth, in the human subject.

The coops require to be placed in a close shed, and “Flowers of Sulphur,” say a quarter of a pound, is allowed to burn, by throwing it on the top of some red-hot coal, contained on a shovel, the shed meanwhile having all windows, doors, etc., closed.

Chlorine Gas

This is a powerful disinfectant and particularly suitable when a gaseous disinfectant can be applied. It is made by taking a mixture of manganese dioxide and common salt, say half a pound of the former to a quarter of a pound of the latter. A little oil of vitriol is then poured upon it, and the shallow tin containing the mixture placed on a stand, so that it can be gently heated with the flame of a spirit lamp below. The gas is evolved, and will fill the shed, provided the place is rendered air-tight. It is needless to remark that no live-stock must be left inside, as both are very suffocating gases.

The use of solid disinfectants about pheasantries in the rearing-field is objectionable, as the birds are very liable to pick up the gritty particles contained in such disinfectant powders, which in all probability will lead to death.

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On some estates the Pheasant-rearer has to be content with the same ground year after year, consequently the land is very liable to become fouled, and disease fostered. When a keeper is placed in this unfortunate position he must make the best of that which is at his disposal, although the uninitiated in the art of game-rearing may not be capable of appreciating the tremendous disadvantages under which he labours, attributing, in all probability, any measure of bad luck either to his want of knowledge or to lack of perspicacity.

Under these conditions the game-rearer must above all things avoid overcrowding the ground—in other words, he must have his coops widely distributed, taking advantage of the intervening spaces not occupied by the coops in the preceding year.

The presence of insect life, grit, and young grass are conducive towards success in Pheasant-rearing, and the existence of all three quite compatible with the time-worn rearing-field, though of course secondary to conditions obtainable where fresh ground could be had each season.

Nest-boxes must be treated, so far as disinfection, etc., is concerned, in a manner similar to that applied to the coops, as these appliances are equally liable to become media for the transference of disease, first to the sitting hen, and from her to the brood. The presence of lice on broody hens is well known to every gamekeeper and to every game-rearer, and these vermin are readily transferred to the brood, and subsequently to other broods. It is impossible for Pheasants to thrive when affected in this manner, and it is a very much commoner cause of birds dying, through the irritation induced, than some people are apt to suppose.

Lice are transmitted from bird to bird both by direct and indirect means. All broody hens should be critically examined to see that they are free from lice, which ought

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not to exist in a stock of well-kept poultry, and here is just where the difficulty comes in, of ascertaining whether common fowls are really well kept, as the author's experience teaches him that the poultry-houses on many farms are kept in a disgusting and filthy condition, being totally unfitted for the well-being of the occupants.

CHAPTER XXXIII

SPECIFIC DISEASES

Roup

THIS is a specific catarrhal affection affecting Pheasants, domestic and other fowls, and one that is readily transferred from the latter to the former, and there is no doubt that many attacks of roup in pheasantries are brought into them by fowls which have been previously infected. In some respects this affection is analogous to distemper in the dog, with, of course, its symptoms modified in accordance with the anatomical construction of birds and mammals. In some establishments this affection is constantly present, although it may exist in its dormant form ready to revive whenever conditions favourable to such present themselves. A wet season and badly drained ground must be looked upon as predisposing influences in the production of roup, though, accepting the dictum that it is a specific or micro-organismal disease, it would be impossible for roup to occur amongst Pheasants unless infection—direct or indirect—had been brought into the pheasantry. It is a most troublesome complaint to eradicate, and rapidly spreads from bird to bird irrespective of age, sex or breed; nevertheless, it is a disease that can, by carefully adjusted measures, be curtailed in its spread, though, unfortunately, it is generally allowed to disseminate through the carelessness of the attendant. Various forms of roup have been described from time to time by writers on the subject, who have been mainly guided

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by the predominating symptoms ; thus, for instance, wet, dry, and diphtheritic forms of roup, all of which are in reality merely manifestations of identically the same complaint ; therefore, any such distinctions are as unnecessary as they are useless.

This complaint is less liable to attack Pheasants than poultry, and when it does occur, the most economical method of dealing with it is to destroy the affected birds, so as to stamp out the trouble at the outset. It is a disease easy to recognise, being characterised by a watery discharge from the mouth and nostrils which is purely of a catarrhal nature ; this discharge accumulates around the nasal openings, and in the so-called dry form, forms cheesy-like masses at the situation last named. When this trouble makes its appearance in a brood the hen should be examined and destroyed if affected, the birds being placed in an artificial rearer. Thorough disinfection and the change of the coops to fresh ground, along with attention to the general welfare of the birds, are the main principles for the guidance of the Pheasant-rearer.

Tuberculosis

Tuberculosis in Pheasants is identically the same as that occurring in the domestic fowl and other gallinaceous birds, in most of which it is a fairly common malady. It may be defined as a specific infective complaint, communicable from bird to bird by cohabitation, though infection in all probability mostly occurs by the digestive tract—hence the reason why the liver and glands of the mesentery, or bowel sling, are so commonly the seat of the lesions of this trouble. When Pheasants feed off ground that has been previously

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infected by tuberculous fowls they are predisposed to infection, as the evacuations of diseased birds contain the organisms of tuberculosis.

Pheasants that are reared under natural conditions are unquestionably much less likely to develop the disease than birds reared under artificial conditions. When Pheasants have been interbred they become physically defective, and this favours the development of tuberculosis or consumption. It is customary to regard this malady as hereditary ; therefore infected stock birds should be destroyed.

Tuberculosis is due to the presence of minute living organisms, known as bacilli, circulating in the blood and lymph streams, with a disposition to locate themselves in the tissue or organs, such as lymphatic glands and the liver, where their presence sets up minute new growths known as tubercles, which in advanced cases may stud the whole surface of the liver, penetrate into its substance, likewise lead to the production of variable sized new growths in connection with the mesentery glands, which are at times of stone-like consistency.

The chief signs of tuberculosis are gradual emaciation.

The introduction of infected broody hens may be a source of infection, therefore every game-rearer should make it his duty to select fowls kept on grass runs, and where the birds are likely to be free from the trouble under consideration. Tuberculosis is certainly much less frequently encountered in Pheasants than in domestic fowls, the reason for this being—in the writer's opinion—attributable to the different conditions of existence and other reasons of secondary importance.

CHAPTER XXXIV

PARASITIC AFFECTIONS OF THE RESPIRATORY TRACT

Syngamosis, Verminous Bronchitis, or Gapes

THE Pheasant-rearer and the poultry-man are both well acquainted with that trouble popularly known under the title GAPES, a name derived from the most striking symptoms the birds display, namely, a gaping or gasping for breath. During certain seasons, enormous losses are produced through this trouble, and it certainly constitutes, in particular localities at any rate, one of the worst scourges that the game-rearer has to contend with. Birds are not the only sufferers from these worms, there being corresponding parasites in calves, sheep, and pigs, but particularly the two first named, in which the trouble arising from the presence of the worms in the air tubes is known as "Husk" or "Hoose." To the game-rearer and to the poultry-man this fact is of some significance, chiefly because considerable doubt has been entertained as to whether there is not some relationship existing between the different species causing the infestation. Some poultry and game rearers believe that land which has been grazed by cattle—mainly by calves and lambs—favours the appearance of this trouble, a theory that is worthy of consideration. In both instances the parasites have a predilection for attacking the young, though autumn appears to be the season when "Husk" is most prevalent in farm-stock. The flockmaster dreads this trouble just as much as

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the game-rearer, and he has one advantage over the latter, namely, that of being able to apply remedial agents, and adopt measures for the suppression of this undesirable affection, which would be quite inapplicable to either the game-rearer or poultry-man. There is no doubt that this parasitic trouble is more prevalent in some localities than others. A moist atmosphere combined with a moderate degree of warmth must be looked upon as favourable to the multiplication of these worms. It is a singular fact, nevertheless a true one, that the earliest intimation of the trouble in young Pheasants is usually the most readily detected when all is quiet after the coops have been closed for the night. The observant Pheasant-rearer usually listens for such early intimation, the time for the detection of which may be the means of averting serious losses, to say nothing of the inconvenience arising in other ways. The young birds emit a sneezing sound or modified form of cough. It is a very difficult matter to trace the starting-point of a parasitical disease of this nature, especially when one comes to consider that other species of birds, such as the magpie, the hooded crow, the partridge, the green woodpecker, the turkey, the peacock, the common fowl, the martin, and last but not least, so far as a medium of infection is concerned, the sparrow, are all prone to it. In all probability other birds are liable to the same complaint, therefore no great surprise need be expressed when the disease appears, considering that the facilities for the transmission of the gape-worm are so varied. Although adult birds are not free from infestation, the percentage that becomes affected in this manner is exceedingly small.

History of the Affection.—It is said that Wiesenthal in 1799 first observed this disease at Baltimore amongst poultry, and that, in 1806 and two subsequent years, Montagu noticed

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its existence in England as an epizootic amongst Pheasants, partridges, and poultry, so that, in all probability, the trouble originally came from the United States. It has been noticed in Germany, France, and Italy, but apparently not until after the discovery of the disease in England. The importation of turkeys from America, of which these birds are natives, may have had something to do with its appearance in England.

The genus to which the parasite belongs is technically known as SYNGAMUS, and the worm itself as *Syngamus trachealis*. Worms belonging to the genus have a large mouth and a thick head, the males being smaller than the females, the former measuring about $\frac{1}{8}$ th inch, and the latter $\frac{5}{8}$ th inch. These small worms are round, of a reddish colour, the ovary being double in the female. The eggs of the parasites measure $\frac{1}{10}$ th inch, and the ova may contain fully formed embryos, which are liberated from the body of the female after the latter has been coughed up by the bird. It is stated that it takes from one to nearly six weeks for the eggs to hatch, provided that the conditions are favourable. Ehlers has shown that an intermediate host is not necessary in order for the embryos to develop into the adult worms. Birds which have been compelled to ingest the ova containing embryos have been found after seventeen days to contain female parasites filled with eggs. The channel or pathway through which the parasites gain entrance into the windpipe has never been satisfactorily demonstrated, but it is very probable that when swallowed they attach themselves to the back part of the throat and subsequently wander into the air tube, gradually descending towards the main branches of the bronchial tubes.

Symptoms.—These are very characteristic, but to anyone

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unacquainted with this trouble such might be mistaken for a disease known as ROUP, but the differential diagnosis becomes comparatively easy when one comes to consider the absence of a catarrhal discharge from the nasal openings, etc., so diagnostic of the trouble last named. A very characteristic sign is the constant opening of the beak, the young bird evidently feeling as though it were going to be suffocated, which, in some cases, does actually occur. Megnin has estimated that two or three couples is sufficient to kill a Pheasant at a month or six weeks old, whereas it will require twenty or thirty to produce suffocation in an adult bird. In addition to the difficulty experienced in breathing, the bird is dull, has its feathers erect, mopes about, and takes little or no food. Some very extraordinary epizootics have been brought about through the invasion of pheasantries by these worms, and those who rear a large head of game are only too well aware of this fact.

The red or forked worm invades any part of the windpipe, but seems to be particularly fond of taking up its abode just where the air tube divides into the right and left bronchi, in which situation the parasites are sometimes found enveloped in a frothy mucous. They are attached to the windpipe by the mouth, and the point of attachment sometimes forms into a small tumour filled with matter. Although a very minute abscess, the latter acts as a mechanical impediment to the breathing, and may be sufficient to produce suffocation. When young Pheasants are dying it is always expedient to dissect out the whole course of the trachea, and hold it up to the light, when the worm, if present, will be seen shining through the cartilage of the tube.

The Treatment.—As previously stated, the early detection of the trouble constitutes one of the most valuable methods

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of controlling the spread of this complaint, so that isolation can be carried out. It is no use to begin to isolate young Pheasants when the trouble is running north, south, east, and west of the coops. If the game-rearer keeps his eyes and his ears open he ought to have the disease in check ere it has had time to spread, but negligence coupled with ignorance will soon disseminate the trouble amongst the whole of the young birds, and such dissemination will very likely be followed by that of a closely allied word, decimation, or something still worse. The most economical plan, if only a few birds are affected, is to destroy them and burn their bodies. Coops should then be thoroughly disinfected and changed to high and dry ground. It is a very good plan when this affection makes its appearance to shift the whole of the coops to fresh ground, and to thoroughly disinfect all the feeding-vessels and water-troughs. The author strongly believes that by the timely adoption of precautionary measures this troublesome scourge can be curtailed at its outset. It is customary amongst Pheasant-rearers to resort to the use of various volatile substances, either as a direct application to the windpipe or for the purpose of fumigation. Oil of eucalyptus, terebene, spirits of camphor, asafoetida, garlic, turpentine, menthol, paraffin, and a variety of other substances are employed. Sulphurous acid gas is occasionally used to fumigate the affected birds, but it requires very great care, otherwise the young birds will be suffocated. Iodine vapour is a tolerably good remedy, and can be used in the following way:—First of all place the birds in a small air-tight shed, and then take a spirit lamp over which a shallow tin saucer is placed. On this deposit half an ounce of iodine crystals and apply a light to the lamp, so adjusting the saucer that steady fumes of iodine vapour will gradually permeate the air in

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the shed, allowing this to go on almost to the point of suffocation but not beyond. Another good remedy is oil of eucalyptus one part, olive oil four parts, paraffin half a part. Mix together, then dip a feather into the liniment and apply it down the throat, say every day, until three applications have been made. Tobacco smoke blown into the coop through the stem of a pipe till the birds are nearly suffocated is spoken of as a favourable remedy. The small fumigating stoves sold by the chemist make admirable appliances for fumigating young Pheasants, and the fluid, as per following prescription, will be found suitable for using with the stoves :—

Oil of Eucalyptus	.	.	.	.	1 oz.
Terebene	.	.	.	.	1 oz.
Creolin	.	.	.	.	1 oz.
Carbolic Acid	.	.	.	.	$\frac{1}{2}$ oz.

Mix and pour one or two tablespoonfuls into the tray over the lamp, then place the birds in an air-tight compartment and allow the fumes sufficient time to penetrate well into the lungs, which will probably be an hour or more, depending upon the size of the place in which the birds are confined.

CHAPTER XXXV

MYCOSIS OF THE RESPIRATORY TRACT

VEGETABLE moulds, or certain species of fungi, are liable to produce in Pheasants a diseased condition of some portion of the respiratory tract, which also affects fowls, pigeons, ducks, geese, swans, plovers, parrots, owls, bull-finches, jays, and various other birds, to which the term ASPERGILLOSIS is applied owing to the mould producing this disease belonging to the genus ASPERGILLUS, of which four species have been recognised, both in their parasitic state, and also as living upon decaying organic matter. Mycosis of the air-passages was first of all observed in Pheasants by Robin in 1848, and by Rivolta in 1887, but the first recorded case is that of Meyer and Emert observed as far back as 1815. Heat, moisture, and darkness are distinctly favourable to the growth of the mould, which is extremely common in musty litter, and on mouldy grain, soil, etc. Not uncommonly this trouble is spoken of as "canker," an ambiguous term that may cover multitudinous ailments, provided that the signs of the disease are localised. The mucous membrane of the air-passages, providing as it does both warmth and moisture, seems to constitute a favourable medium for the growth of the spores, which in all probability are inhaled. The symptoms indicative of this trouble are difficult breathing; the sick birds mope about with eyelids half-closed, and yellow bunches of cheesy material congregate about the mouth—in fact, the mouth is sometimes completely filled with this yellow material, so that

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the birds are unable to close their mouths. It is an exudate composed of fibrine and the result of inflammatory action. In the superficial layers of the deposit the fungus and its spores can be found upon the presence of which the diagnosis of the disease depends. The best plan for detecting the mould is to lightly scrape the surface of the cheesy-like growth, mount it in a drop of glycerine contained on a slide, and then examine with a low power of the microscope. The windpipe, bronchi, and lungs are usually invaded by this fungus. When in the lungs these organs have caseous or cheesy-like nodules in them. Mycosis of the air-passages is generally a very fatal disease, more especially when the birds are kept in damp places. The best treatment is, unquestionably, prevention, which comprises an absolute regard for cleanliness, and the strict avoidance of feeding upon damaged grain or such that has become mouldy. Game-rearers should take particular care to have their foods kept in dry places, as nothing can be more pernicious than feeding birds on damaged fodder. Individual treatment of affected birds comprises the removal of the growth, and the subsequent application of tincture of steel to the part by means of a camel-hair brush. When used all appliances should be washed with hot water and some disinfectant.

CHAPTER XXXVI

THE DIGESTIVE ORGANS AND AILMENTS IN CONNECTION THEREWITH

THE digestive organs of the Pheasant are similar in most respects to those of other birds, there being no teeth, the beak acting as an organ of prehension—in other words, for picking up the food. As the food cannot be broken up in the mouth, it is necessary for the bird to have a receptacle into which the food can pass, and such provision is made in the form of a pouch or dilation at the lower end of the gullet, which thus acts as a store-house and hopper for the food. Immediately below the crop the gullet passes into the so-called chemical stomach or PROVENTRICULUS, an organ that is richly supplied with gastric and peptic glands, imbedded in the mucous membrane. These glands secrete true digestive fluids, and pour them into the second compartment of the stomach, which is the gizzard, into which the true digestive stomach (*proventriculus*) directly opens. The gizzard is lined with tough, cuticular membrane, and has very thick muscular walls, whilst its form is that of an ovoid body, slightly flattened from side to side. With the aid of grit it is able to exercise a grinding action, so that its contents are very often of a dry nature, but whole grain, beans, etc., are commonly found in this organ. The necessity for a liberal supply of grit thus becomes obvious, and if Pheasants are unable to obtain such they will never thrive, grit being as essential for their welfare as food. The small intestine follows

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the gizzard, and into it the ducts from the liver and the small pancreas pour their secretion, which comprises the bile and the pancreatic juice. There is a gall bladder which serves as a reservoir for the storage of the bile. The small intestine is long, and succeeded by the large bowl which, in its turn, ends in the cloaca. Considered as a whole, the digestive system of birds is similar to that found in animals, modified to meet the requirements of the individual. The crop may be said to correspond to the rumen or paunch of Ruminants; the gizzard to the Omasum or third compartment; and the *proventriculus* or chemical stomach of the bird as corresponding to the *abomasum* or true digestive stomach of cattle.

DISEASES OF THE DIGESTIVE APPARATUS

Impaction of the Crop

This trouble, though of common occurrence in poultry, is occasionally observed in Pheasants, the result of feeding too long upon dry food; especially food too stringent in its nature, or in excess, the last-named being rather a frequent cause of the malady. It is an abnormal condition which is easily recognised, the over-filled crop failing to reduce itself. In order to deal with it the best plan is to give the bird a teaspoonful or two of warm glycerine, and knead the crop freely with the hands.

Infectious Enteric

Truly this may be said to be the game-rearer's scourge, and one that is unfortunately very prevalent in some

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localities, especially if the same rearing-ground is used season after season, enteric being a trouble that seems to taint the ground for an almost indefinite period, its appearance upon certain estates being followed by its reappearance during succeeding years, until the disease seems to finally exhaust itself. Some game-rearers are much more fortunate than others as regards this malady. The author now refers to those to whom it is unknown.

Infectious enteric is most prevalent in damp situations. If the rearing season happens to be accompanied by a good deal of wet weather the chances are that this disastrous ailment will make its appearance, but that it can do so without the existence of infection, direct or indirect, animate or inanimate, would be to accept a doctrine as erroneous in theory and practice as one could possibly conceive. There is every reason for believing that this malady arises through the presence of micro-organisms or germs gaining an entrance to the digestive tract, either through the food, drinking water, feeding off infected ground, or some other agency that has been previously infected with the organisms of this disease. It is quite a tenable theory that birds, various rodents, as well as the hands and clothing of man, also the various appliances of the pheasantry, such as coops, water-troughs, and feeding-vessels, may all of them act as carriers of the contagion.

The domestic fowl is very often the medium for the introduction of this deadly malady into the game-rearer's establishment, therefore it is impossible to be too careful in the selection of broody hens—in fact, every game-rearer ought to insist on a clean bill of health from the purchaser.

Pheasants from a few hours after being hatched up to adult birds are liable to enteric, but it is particularly liable

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to affect them when about six weeks old, and the malady is so virulent that they die with apoplectic suddenness, not singly, but numbers are picked up in the daily rounds in a dead and dying condition. Where extensive Pheasant-rearing operations are carried on several thousands of the poults may be cleared off through this cholera-like affection.

Infectious enteric, the prefix being used in order to distinguish the malady from enteritis arising from other causes of a non-infective nature, presents certain classical features which at once render it distinctive, and these may be summarised as follows:—

- (a) Suddenness of attack.
- (b) That a number of birds are simultaneously affected.
- (c) The high percentage of deaths.
- (d) The rapid manner in which the malady spreads from the diseased to the healthy.
- (e) Diarrhoea or scour so constantly accompanying this trouble and materially aiding in its dissemination on the rearing-field.
- (f) The liability towards a recurrence of the affection in succeeding years, when birds are reared upon the same ground. Both living and dead chicks appear to be capable of acting as sources of infection, hence the necessity for either deep burial or else destruction by fire of the dead birds.

Any careless disposal of the latter is very liable to be followed by perpetuation of this malady, a fact which it is impossible to insist too strongly upon. It is negligence in

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relation to this and other apparently trifling details that so commonly leads to the rapid spread of enteric and yet the rearer remain quite at sea as to the increase of the trouble amongst his birds. The best plan is to look upon the malady as one that can be transmitted through all agencies, living or dead, that may have been brought into touch with the germ of the disease.

The author does not believe that infectious enteric is capable of *aerial* transmission, in other words that the virus or poison is of a "*volatile*" nature, but rather of an opposite nature, viz., "*fixed*," necessitating transference through channels other than atmospherical.

Klein appears to have been the first scientific investigator in connection with this complaint, the disease appearing in a poultry yard at Orpington (Kent) during the year 1888. The earliest indications of the approach of this trouble are those afforded by the general appearance of the birds, such as moping about, separation from the other birds, drooping of the wings, followed by severe diarrhoea. In the less acute cases scouring is a constant feature of this malady, which, as previously stated, materially influences the dissemination of the trouble. Drowsiness is usually very marked. This, along with wandering from the coops, scouring, and evidence of internal pain, plus its infectious nature, must be accepted as the best (though not positive) evidence one can have of this affection. The after-death appearances—as revealed by the naked eye—are liable to variability, and greatly depend, in the author's opinion, upon the duration of the complaint being proportionate to its severity or otherwise. Sometimes there is distinct evidence of pneumonia either in one or both lungs, but the most significant changes are in connection with the gall bladder, the liver, and the intestines. The first-named

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is nearly always distended with a blackish-coloured bile, so much so that the surrounding tissues are generally deeply stained, especially the under surface of the liver and the commencement of the intestine; but the staining may extend into the flesh and cellular tissue. The discoloration of the liver—particularly at the borders—is commonly observed post-mortem, the colour assumed being that of buff. The bowel shows evidence of acute inflammation particularly at the beginning of the small intestine, and this may involve the whole of the coating of the intestines or the mucous membrane alone may be mainly implicated. The last-named is frequently stained by the offensive contents of the bowel.

MEASURES TO BE ADOPTED WHEN AN OUTBREAK OF INFECTIOUS ENTERIC IS SUSPECTED

Although enteric is a disease particularly prone to attack chicks, it is not confined to such, though the mortality mainly occurs between the ages of three and six weeks. The slightest illness amongst chicks in a coop should receive sufficient recognition to warrant the immediate isolation of birds in that coop from the rest of the stock. The ground where the coop has been should be freely sprinkled with slaked lime or gas lime or other matter of an allied nature. When the chicks are carried off suddenly with the symptoms already indicated enteric should be suspected, and perhaps the most economical way is to destroy all the birds in the coop, also the coop itself. It must be borne in mind that fowls and other gallinaceous birds are liable to be the victims of infectious enteric and may be the source of the introduction of the disease. Two factors stand pre-

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eminent as prophylactics of this Pheasant cholera, and these are :—

First.—Avoid overcrowding on the rearing-ground.

Secondly.—Not to rear on the same ground in successive seasons.

Thirdly.—Never rear birds on ground where there have been previous losses—in other words, on infected land.

Fourthly.—Avoid purchasing eggs or broody hens from poultry-men and game farms which have had losses from enteric, such being unquestionably a fertile source of perpetuating the malady.

Fifthly.—Whenever possible, select as a site for the rearing-field an upland pasture, where the drainage is natural, the sub-soil dry. The coops must be well sheltered yet freely exposed to as much sunlight as possible.

Sixthly.—Keep all feeding utensils and drinking troughs scrupulously clean, scalding them out daily. A free supply of pure water is indispensable. The author strongly advocates, where a large number of birds have to be reared, that the coops should be placed as wide apart from each other as can be conveniently done—in fact, the wider apart the better. Always avoid placing the coops on land that is badly drained or exposed to the north or north-east winds. Dryness, warmth, cleanliness, and a liberal supply of pure water, combined with regularity of feeding, along with the selection of suitable food and sound stock birds, are mainly contributory towards the prevention of this Pheasant scourge, though not preventive. Infectious

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enteric is liable to occur under the best of conditions, all that is necessary towards its production being an infected bird or some other agent capable of carrying the virus of the disease. With reference to remedial agents, there are none, and any specifics advertised for such purposes may be regarded as of no practical value. The periodical lime-whitening of the coops along with the disinfection of the same must, as a matter of course, be duly observed, but it is more economical to destroy infected coops than to retain them, as it is quite possible they may, in spite of disinfection, act as media for keeping the trouble alive.

Liver Disease

Reference has already been made to disease of the liver when speaking of tuberculosis, in which disease this organ is frequently implicated. More especially do such remarks apply when Pheasants have been reared in aviaries, and kept there for a considerable period. Congestion of the liver is liable to arise when the food has been of a too stimulating nature or unsuitable in other respects. Many young Pheasants die from this trouble, caused in the manner indicated, but a large percentage of deaths are likewise attributable to a similar condition of this organ, only in association with a much more troublesome malady, namely, infectious enteric. Needless to say, the liver constitutes a very important part of the digestive system, it being in this organ that the starchy constituents of the food are stored up as reserved material to be subsequently used up according to the requirements of the economy. The liver is composed

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of numerous minute cells, and has a rich blood supply, so that it is an important matter for this organ to be kept in proper working order; otherwise derangement of other parts is bound to occur. The term "rupture of the liver" is applied when one of the blood-vessels, no matter how small, supplying this organ is ruptured, an injury which, as a rule, speedily proves fatal.

Inflammation of the Bowels (Enteritis), also Coccidiosis

Infectious enteritis has already been referred to, but inflammation of the bowels may and does occur in Pheasants quite apart from specific causes, and when it does so, it usually results from some form of irritant, such as unsuitable food, the ingestion of poisonous plants, mineral irritants, the presence of worms, coccidia, etc. etc. Either the large, small, or whole length of the intestine may be implicated in the diseased process, whilst the degree of inflammatory action varies in accordance with the potency of the irritant and the condition of the digestive tract at the time of the ingestion of the irritant. For instance, in some cases the mucous lining of the bowel only is affected, whereas in other instances there is intense redness throughout the whole thickness of the wall of the gut. Young birds are particularly liable to intestinal irritation, and the slightest aggravation may lead to inflammatory action, which, in every instance, so far as the author is aware, proves fatal. There is no method of distinguishing infectious from non-infectious enteric, excepting the evidence afforded by the numerous deaths, together with the rapidity of the same, arising through the disease first-named, along with the post-mortem

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appearances, though the latter are not by any means "always" confirmatory. When speaking of the causes of inflammation of the bowels, no mention has been made of the disease coccidiosis, which is an affection occasionally observed in young Pheasants, producing an epizootic, and sometimes attacking fowls and turkeys about two or three months old, in which it is a very fatal malady. The coccidia are found in the glands of the intestine, and their presence destroys the epithelial cells of the glands. The leading symptom of this disease is diarrhœa, therefore the rearing-ground soon becomes a medium of infection. The moral of this is to change the birds to fresh ground. No other treatment beyond that of prevention in the manner indicated, combined with thorough disinfection of all the coops and appliances, is likely to be of any service, when dealing with a trouble of this kind.

Worms

Pheasants, like all other animals and birds, are liable to harbour in the digestive tract various species of worms, some being flat, others round. The tæniadæ or tape-worms are occasionally very numerous in the intestines of the Pheasant, and capable of setting up, by their presence, acute inflammation of the bowels, particularly in young birds. Sometimes the bowels will be almost completely blocked up with masses of tape-worm, which, needless to say, soon lead to a fatal issue, although there are no symptoms during life that will enable one to suspect the existence of a parasitic trouble of this nature. Until verified by a post-mortem, one can easily conceive an affection of this kind being confounded with enteric arising from other

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causes. Various remedial agents have been suggested for the treatment of worms in Pheasants, but a practical man will not attach much importance to the use of drugs in cases of this nature, it being much more important to limit the power of infestation, which can be done by the destruction of the affected birds and also by changing the young stock to fresh, well-drained, close cut, old pasturage, where plenty of insect life prevails, but not where cattle or sheep are grazed, nor yet to land over-run by vermin, etc.

CHAPTER XXXVII

CRAMP

UNFORTUNATELY for Pheasants, cramp is a rather common disease, but it must not be confused with that spasmodic contraction of the muscles bearing the same name in the human subject. Nearly all game-rearers and poultry-men are acquainted with this complaint, which is specially prone to attack young birds, it may be only a few days old. It is generally during the second or third week that most birds are affected. In some localities cramp is particularly prevalent, and seems to be associated with the soil. A wet soil, no matter whether such moisture is beyond the surface, or in the sub-soil, will, especially if east winds are prevailing, be almost certain to be followed by cramp in some of the broods. Sudden changes of temperature are, without doubt, "exciting" causes of cramp. Klein regards the disease as being due to the presence of micro-organisms circulating in the blood, and if this theory is correct, it follows that the trouble is of an infective nature, although the author is not aware that any positive evidence has been adduced to support this statement. If due to infection of the system by germs, it does in certain features resemble a malady affecting foals, known as "Joint-ill," and like the latter complaint, it makes its appearance quite suddenly. It is denoted by a lameness in one leg, the bird being stiff in the limb, and dragging its leg along the ground. The opposite leg soon becomes affected in the same manner, and the young birds usually die from exhaustion on the third or fourth day. The first or second thigh bones are

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the parts mainly implicated, and a peculiar feature is the tendency towards fracture of the bones at their extremities, which not uncommonly occurs in advanced stages of the disease. Both the bone-skin "periosteum," and the interior of the bone, show evidence of pathological change, which is revealed by microscopic examination. If cramp is due to the entrance of micro-organisms into the system, one would naturally expect that all the young birds in the same coop as an infected one would suffer in a similar manner; but this is not the case as a rule, as cohabitation of the diseased with the healthy commonly give negative results, yet many game-rearers certainly look upon cramp as an infectious malady. Whenever this trouble makes its appearance, the game-rearer should remove his coops to high and dry ground, as this constitutes the most practical method of handling or rather dealing with a complaint of this kind. Treatment individually is of very little use—in fact, it is better to destroy the affected birds, as this will prove the most economical in the long run.

Gamekeepers have not always an opportunity for changing their birds to fresh rearing ground, therefore some alternative method must be adopted in cases where cramp makes its appearance amongst the young birds. Some agent, capable of absorbing the excessive moisture in the ground, is indicated. Moss-litter will prove the best. A few bales of German peat moss-litter should be procured, well broken up, and the coops placed on this, as the absorbent and antiseptic properties of the moss-litter render it specially suitable for such purposes.

CHAPTER XXXVIII

DISEASE AFFECTING THE EYES

PHEASANTS, like other birds and animals, are, unfortunately, occasionally troubled with eye affections, and the worst feature about such is that the trouble is not, as a rule, confined to one or two birds, but usually affects a considerable number, as most game-rearers are aware. The most frequent eye trouble in Pheasants is that known as

Ophthalmia

This is a most troublesome affection, but not one that is confined to game; therefore, the media of transference is much greater than in the case of a disease specially prone to attack some particular variety of animal or bird. Young Pheasants are most liable to suffer, and hot weather is said to be favourable to the production of the complaint. The eyelids become inflamed and adhere together through the sticky secretion that is poured out. First one eye is attacked and then the other; the cornea becomes opaque; the eyeball shrinks; the whole organ becoming more or less disorganised. Doubtless this is a specific form of ophthalmia, the one that is communicable to other Pheasants. The main principles in the treatment of this affection are based upon the immediate isolation of the diseased birds, each of which, if considered worth the trouble, must be treated separately. The eyes first of all ought to be washed with a weak solution of boracic

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acid (20 grains of powdered boracic acid to an ounce of tepid water), and the eyelids then smeared with the following ointment :—

Yellow Oxide of Mercury Ointment	.	.	1 drachm
Boracic Acid Ointment	.	.	1 ounce

Mix and apply to eyelids night and morning.

In addition to this treatment the following pills will be found very efficacious :—

Powdered Sulphate of Iron	.	.	12 grains
Powdered Sulphate of Copper	.	.	12 grains
Sulphate of Quinine	.	.	6 grains
Extract of Gentian	.	.	12 grains

Mix and divide into forty-eight pills, one of which must be given night and morning to each bird suffering from ophthalmia.

Regarding the malady as an infectious one, the Pheasant-rearer must exercise good care in the matter of handling healthy birds, before doing which the hands, etc., should be thoroughly disinfected, otherwise one may unwittingly act as a medium of infection. As hens are liable to this malady, it is necessary to be careful when introducing these for broody purposes to see that they are not suffering from this complaint, otherwise such will form the starting-point of the trouble.

CHAPTER XXXIX

PARASITIC AFFECTIONS IN CONNECTION WITH THE SKIN

PHEASANTS, like other gallinaceous birds, are liable to be infested with various kinds of acari and pediculi, some of which are almost constantly present on them, though birds that are infested in this manner certainly never thrive as well as those without them. The existence of pediculi or lice may be accepted as evidence, more especially in young birds reared under artificial conditions, that the coops have been the source of infection, or else the broody hen, or a combination of the two. The introduction of lice through the domestic fowl amongst the young birds is by far the commonest medium of infection, and game-rearers should take particular precaution to guard against the advent of such unpropitious circumstances. One of the commonest parasites infest the legs of Pheasants and also of fowls, producing scabies of the legs, or what is more popularly known as

Scaly-leg

A disease that attacks the legs, though most authorities are of the opinion that it is confined to these parts only. As poultry are commonly affected, it may be readily introduced amongst Pheasants during the rearing season, therefore every game-rearer should endeavour to see that all the fowls he purchases are free from this trouble. Most gamekeepers

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are acquainted with it, and readily recognise its existence, as it is denoted by the appearance of scaly-like elevations on the legs and toes. This disease is due to the presence of minute parasites or acari, which live under the epidermic scales of the legs, setting up in this situation a considerable degree of irritation. The acari alluded to are known as the sarcoptes mutans, which are very small parasites with round bodies, the female parasite being larger than that of the male, the limbs being destitute of suckers and terminating in two hooklets. Scaly-leg is mostly confined to the front surface, and the elevation of the epidermic scales is due to the presence of a white powdery substance beneath them, the result of the irritation. The scales ultimately become detached, but are replaced by others as they are cast off. On the under surface of the scales or crusts there is a honeycomb appearance, and it is in these depressions that the female parasites are lodged, and in them the eggs are laid. In advanced cases of this trouble the birds are liable to become lame, and in consequence suffer constitutionally. Being a parasitic affection, it follows that it is communicable from one bird to another, either by direct or indirect contact, whilst breed appears to have an influence in determining its appearance. It is certainly not readily transmitted, as healthy fowls or Pheasants may cohabit where the disease is for a long time without contracting the malady.

Treatment and Management.—Both game-rearers and gamekeepers likewise, though they are interested themselves in the study of this disease, have experimented with numerous applications for the cure of this trouble, and various results have been recorded. It is not a difficult disease to treat if attacked in a proper manner, and the best method of doing so is first of all to wash the legs and feet with a strong

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solution of ordinary washing-soda, or better still, immerse them in this, say for a quarter of an hour. Their legs and feet may then be dressed with the following ointment :—

Sublimed Sulphur	1 oz.
Bicarbonate of Potash	2 drachms
Paraffin Oil	2 drachms
Creosote	1 drachm
Red Oxide of Mercury	2 drachms
Balsam of Peru	$\frac{1}{2}$ oz.
Lard to make the whole weigh	4 ozs.

Rub this ointment well in night and morning.

Another simple and very efficacious remedy is paraffin oil applied to the legs in an undiluted condition, and repeated until a complete cure has been effected ; but it is always advantageous to wash the legs with the soda solution, previously recommended, before the application of any remedial agent. Another matter of importance is that of thoroughly disinfecting all appliances that have been in contact with the legs and feet. Scaly-leg is a very simple disease to recognise, but positive diagnosis is necessarily based upon the presence of the acari, which can be detected by removal of the scales or crust and by examining their under surfaces with a low power of the microscope, it being sufficient to take a scraping from the affected part, or from the scale, then mount it on a slide with a drop of glycerine and examine it as directed.

Scabies of the Body

This affection, also known as Depluming Scabies, occurs in fowls, and it is possible that the same affection might be transmitted to Pheasants through the introduction of an infected fowl. It is due to the presence of parasites or acari,

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known as *sarcoptes lævis*, which exist at the base of the feathers, causing the feathers to be shed or break off at the surface of the epidermis; the head and the upper part of the neck are commonly affected, but the thighs, back, etc., as well as neighbouring parts, readily become implicated, whilst the trouble seldom affects the wings and the tail. One bird will soon affect others, unless preventive measures are adopted. It is sometimes mistaken for early or late moulting in birds, but its infective nature serves to distinguish it from the normal process. The best treatment is to arrest the affected parts with a liniment as per prescription below:—

Flowers of Sulphur	.	.	.	2 oz.
Linseed Oil	.	.	.	$\frac{1}{2}$ pint

Mix and apply daily.

CHAPTER XL

VEGETABLE AND MINERAL POISONS

Introductory.—Innumerable instances of accidental poisoning in Pheasants have been brought to the writer's notice, likewise such cases have been recorded by other observers, some of which are of an extremely interesting nature. A noteworthy feature in connection with the ingestion of poisonous substances by Pheasants is the reason why these birds should partake of such at one time, and yet refuse it at another, in spite of the fact that they have been liberally fed on both occasions. It is reasonable to assume that the discriminative power of Pheasants, as regards their selection and rejection of esculent herbage, is allied to that of other birds, but why they should resort to feeding upon toxicological plants is a matter too speculative to decide upon. To feed upon poisonous grain is a totally different matter, as the toxic material is hidden from view. The malicious destruction of Pheasants by poisonous substances is certainly of uncommon occurrence, most instances of poisoning in these birds being due to accidental circumstances. In some localities a very dangerous practice prevails, namely, that of scattering poisoned grain for the destruction of rooks and other pests of the farmer, whilst the gamekeeper is not altogether free from this pernicious practice. The grain (maize, oats, etc.) is usually soaked in either a solution of strychnine, or else arsenic, and then scattered about. When Pheasants are hungry they will stray a considerable

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distance in search of food, and one can easily conceive cases of accidental poisoning occurring in this manner. There is recorded in Tegetmeier's book on *Pheasants*, an instance of lead poisoning, in which a score of Pheasants died from the same symptoms, which were those analogous with lead poisoning in other animals, namely, paralysis of the legs and emaciation, accompanied by drawing up of the feet, corresponding to that of "Wrist-drop," observed in man. When the birds were post-mortemed leaden pellets were discovered in their gizzards which they had picked up in the coverts after the latter had been shot through, a fact that it is well to bear in mind when birds begin to die after heavy shooting has been indulged in.

Yew Poisoning

The Yew (*Taxus Baccata*) is a perennial ornamental shrub frequently attaining tree-like dimensions, and often forming, when closely cut, dense hedges, surrounding parks and gardens. The leaves are extremely small, dark green on their upper surface, but lighter below. In comparison to their size, they are thick, being only little more than half an inch in length. The young shoots are readily distinguishable from the older ones, being of a light green colour. Many cases of Yew poisoning have been recorded amongst horses, cattle and sheep, and some in Pheasants. The deadly nature of the Yew is well known to all veterinary surgeons, and the remarkable manner in which horses succumb after partaking of it, whilst cattle and sheep sometimes consume it with impunity, has been the subject of considerable discussion. But cattle and sheep do not always consume it with harmless effects, as

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proved by the numerous deaths following its ingestion. Its toxic effects, in some cases but not in others, thus becomes a mystery. Two Pheasants were recently picked up dead by the head-keeper in a garden adjacent to his master's coverts, and they were forwarded to the writer to be post-mortemed. In both birds the crops and gizzards contained large quantities of Yew leaves, in addition to beans, whilst throughout the whole length of the intestines there was acute inflammation of the bowels, evidently of rapid origin, obviously the outcome of the toxic material contained in the Yew leaves. This occurred during the latter end of September or the beginning of October, but the consumption of the Yew had not been due to shortage of food, as the birds were well-nourished and had plenty of facilities for obtaining suitable food. Analogous instances of Yew poisoning are also recorded in Tegetmeier's book on *Pheasants*. Therein reference is also made to some experiments conducted at the Agricultural College at Downton, by Stuart Wortley, as to the amount of poisonous principle contained in the male and female plants, which, according to his experiments, tends to show that the toxicological principle—taxine—exists in the leaves of the male plant only. Feeding experiments of a similar kind were conducted by Sir John M'Fadyean at the Royal Veterinary College, Camden Town, but the writer is not aware that any definite conclusion was arrived at.

To plant Yew trees in the neighbourhood of coverts or hedgerows must be condemned, as there are plenty of other shrubs, less harmful, that will fulfil all the conditions of the Yew. Pheasants, after partaking of this plant, die with almost apoplectic suddenness, but it is reasonable to assume that when the crop is fairly well filled with other food the deadly effects of the plant will be of a less acute nature.

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One feature of particular interest in connection with the ingestion of poisonous substances by Pheasants is the total absence of inflammatory signs in any portion of the digestive tract, excepting that of the intestines. In all probability this is explicable on the ground of the actual absorption or digestion of nutriment carried on in this portion of the alimentary canal. All the juices are extracted from the food in the gizzard by the severe muscular contractions, assisted by the grit, of this organ.

Ivy Poisoning

Cases of poisoning in Pheasants through the consumption of Ivy berries have on several occasions been recorded; but why the birds should partake of this, as in the case of the Yew tree leaves, is as yet a mystery unexplained. The berries of Ivy act as a gastro-intestinal irritant, provoking acute inflammation of the bowels, and a speedy death. The only positive evidence as to death having been thus caused is that afforded by the discovery of the Ivy berries in the crop, or else in the gizzard, in conjunction with acute inflammation of the bowels. In addition to this, there may be evidence of the birds having a feed of the berries of the Ivy in some adjacent garden, or the birds may have been picked up dead close to the place where the Ivy is growing. These and other facts have all to be considered by an observant gamekeeper, in cases where he finds isolated instances of death amongst his birds.

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