



be much difficulty in settling the important question of housing the birds. As a rule where it is intended to keep numerous varieties with a view to breeding, it is indispensable to give the birds full liberty during the spring and summer upon a small pond or moat.

My own ducks of the smaller kinds are turned upon a moat, 130 ft. long by 40 ft. broad, one end of which is fringed with flowering rushes, and partly overhung in places by laurel bushes, elders, and sycamore trees. The soil is clay, and the banks are turfed on each side. These banks are somewhat precipitous at one end, having a slope of from 2 ft. to 4 ft. from the edge to the level of the water. The moat is about five feet deep in the centre, and tapers to about two feet at the lower end. The sun shines, on the south and west half of the day, on the south and west half of the moat, the strip of grass 50 ft. long by 6 ft. wide being shaded by bushes. On this space the coops or houses for the ducks are placed. As the birds only inhabit this run during the warm weather, I found it sufficient to make the houses of light wood one board thick, with the outside painted and the inside thoroughly whitewashed, containing of course no other furniture than a bed of straw.

The Rev. Thomas Berney, in response to a request for assistance as the proper style of house for waterfowl, was good enough to give the following instructions for the construction of a duck coop suitable for both winter and summer use, which I reproduce verbatim from the columns of the *Live Stock Journal*, in which paper the correspondence occurred :—

"Get from a saw and planing mill a plank of red or yellow deal 12 in. by 3 in. (full), and order it to be split and planed into $1\frac{1}{2}$ in. boards. Of these good kennels may be made, with sides 12 in. high, and of inside length 18 in., and width $13\frac{1}{2}$ in.; but not with wooden floors. The birds are better with the breast to the ground, or on a bed of dry sedges, obtainable of any basket maker."

I may mention that where sedges are not procurable, refuse straw or the dry beech and other leaves which may be swept up during the autumn, and kept in a cool dry place, are very suitable for this purpose.

The same gentleman described a fence which he had found sufficient to protect the waterfowl from the attacks of rats and foxes.

"The enclosure is formed by unclimbable iron hurdles. Each hurdle is 6 ft. long by 4 ft. 6 in. high, formed of two heads and two horizontal bars, pierced with 18 vertical $\frac{1}{2}$ in. sharp-pointed rods, between them, rising 11 in. above the bar; and all painted with genuine white lead and bin-oxide of iron paint. Under the bottom bar of each hurdle three slates, 2 ft. by 1 ft., are let into the ground edgewise. Above it, and between the heads (except where glass is used), is fixed by wire to the rods a sheet of zinc 6 ft. long by 2 ft. 6 in. wide. Along the top of the sheet is also affixed a half-inch spline of wood 3 in. wide, and painted green; and to the top edge of this spline is nailed with tin-tacks $\frac{3}{4}$ in. long and with round shanks, a shelf of zinc 4 in. wide and projecting outwards. This shelf must be continuous, or the rats will run up the hurdle heads.

"Such a fence, if nothing be set against it, will assuredly keep out rats, but foxes may still be troublesome; for that very rat-puzzling shelf of zinc might assist them. Pointed staples, however, 10 in. long, made of drawn ribbed iron bar and galvanized, are sold by ironmongers. By means of the screw bolts connecting the hurdles, the head of one of these, with its hole enlarged, may be fixed between the hurdle head so as to project outwards horizontally, at about 6 in. above the zinc shelf, at the end of every hurdle. To a second hole in each of these staples, to be made at 6 in. from the head, a long length of American four-barbed twisted wire may be securely fixed with wire; and, by means of two hook screw bolts in the two gate posts, may be tightly strained round the whole enclosure, except the gate, to which a piece must be adjusted independently. There are various samples of this four-barbed wire; but it must be that which has the barbs at every three inches. Such an apparatus, if properly adjusted, must keep out foxes and cats also.

"Furthermore, there are times when ducks like sun, and others when they like shade. On the south side, therefore of the enclosure, every other hurdle frames three plates of stout clear glass, 2 ft. 6 in. by 2 ft., instead of the sheet of zinc."

Mr. Berney states that there is no fear of the ducks hurting themselves against the barbed wire, which, of course,

should be strained upon the outside of the hurdles. Every description of poultry hurdle of iron and wire netting is offered for sale by iron manufacturers, any of whom will send an illustrated price catalogue, thus materially assisting the selection of purchasers. These are, however, somewhat expensive, so I contented myself with placing wire netting, 6 ft. high, strained on iron stakes, all the way round the portion of shrubbery devoted to the duck run. The pond itself was enclosed with netting sunk into the water and firmly secured to posts placed at intervals in the sides of the bank and projecting about 2 ft. from the water, in order to prevent the birds landing on the grass, or dogs and other animals plunging into the pond. The moat itself was sub-divided by a partially submerged length of iron netting in order to separate the larger varieties of duck from the smaller during the breeding season, a precaution afterwards proved to be indispensable, the sub-division being of course continued upon the bank. A gravel path, 3 ft. wide, was made along the side of the water as it was found the constant paddling of the ducks soon converted the edge into mud. The birds also speedily ate off every blade of grass and rendered the bank brown and unsightly, when it became necessary to plant shrubs and other plants in order to prevent the enclosure from becoming an eyesore. I found for this purpose nothing better than hardy ferns, angelica, rhubarb, gorse, box, privet, *Berberis aquifolia*, which the birds would not touch, with cowslips, primroses, periwinkles, peonies, ivy, garter-grass, coleus, &c., which are likewise safe from their attacks. Creepers, such as nasturtium, convolvulus, sweet pea, and any other succulent shoot they will eagerly devour, but I found that the Kentish hop in its different varieties was untouched by them, and formed an admirable cover for the bare wire netting. As an embellishment small rockeries may be erected, planted with fern and hardy creepers serving at

the same time as resorts and hiding places for the ducks, who like, especially in the breeding season, to conceal themselves from view, and perhaps make their nests in such secluded corners.

If it is possible to command the banks on both sides of the moat or pond, a great deal may be done to convert a waterfowl run into a pleasing landscape feature; though it should be clearly understood that no persons are to be admitted inside the enclosure itself except the attendant or owner, a constant influx of visitors proving highly disastrous as regards the chances of breeding.

If a couple of rustic seats can be placed on the unenclosed bank, the view across the water, with its flock of many-coloured birds swimming, diving, or lazily reposing on the grass and flowers will prove an alluring sight, and one calculated long to enchain the attention of the naturalist or fancier.

Where, however, it is not possible to utilise a natural piece of water as a duck pond, the fancier may be obliged to contrive a small basin dug out in the ground lined with brick and covered with cement. This is a work easily executed by a competent mason, the water supply being provided for, either by conducting a stream through iron pipes, or by conveying rain water from the gutters of a neighbouring building. In my own case the latter method is the plan adopted for furnishing the small basin attached to the shed which constitutes the winter quarters of my fancy ducks.

To return to the pond before described. I will give for the benefit of my readers some interesting notes on the subject of housing ducks with which I have been favoured by Mr. William Jamrach.

“Besides wooden houses built in the water you should have drain pipes and large earthenware jars (mouths towards the water) placed all round the edge of the pond or moat, these should be placed about two inches above the watermark (supposing the water always remaining at same

height), in which some varieties of ducks will form their nests. The houses should be placed on stakes, these must be well driven in, small steps leading up to the entrance; these houses must be fixed about six inches above water so that the birds can see inside, after a time they will enter, when accustomed to surroundings, noises, &c., &c.,

"No bird likes to go into a hole of any kind. It is at the breeding season in spring that they look about for enclosures of this kind, otherwise they prefer the open, night and day.

"Foxes will certainly try and get at the birds; this must be guarded against by high wirework, as the habit of all Waterfowl is to remain in the middle of the pond during the night, when one of them is always on sentry to give alarm."

If the piece of water is sufficiently large to admit of it, a small island is a great improvement to its appearance besides being a source of endless delight to the birds. A couple of empty casks rendered watertight and carefully bunged, may be nailed together with planks laid across them after the manner of a raft, upon which pieces of bark, willow chumps, and turf, should be arranged until the whole fabric sinks to the proper level. The willow twigs, if there be any on the stump, will shoot, and form a pretty little shelter for the shyer varieties of birds which will sleep on the island, and if undisturbed, might possibly also nest there. The island must be anchored to the bottom by a chain and iron weights, or by a tarred rope tied to heavy stones, otherwise it will float about at the mercy of the winds and tide.

Flowering rushes, flags, water-lilies, and other aquatic herbage should be encouraged to grow round the edges of the pond, furnishing natural shelter for the birds which find an abundance of small insects and mollusæ among the succulent green leaves.

In winter it will be found desirable to remove the more delicate varieties of birds to warmer quarters. About the middle of October, especially if it be a cold season, many of the tender ducks, particularly if newly imported, begin to look

miserable, standing shivering on one leg uttering peevish cries, while the feet and bill lose their colour and look perceptibly paler. These symptoms should not be neglected, being the possible precursors of consumption or dysentery; complaints which often prove fatal to waterfowl recently imported from warmer climates. I usually drive all my birds into a galvanized iron shed with large glass windows, likewise furnished with a strong door and extra inside panels of wire netting, so that air may be admitted or excluded as occasion demands. The floor is of cement, sloping to the door, the upper part furnished with a low sparred bench thickly covered with straw, upon which the ducks rest, their bed being renewed daily.

Round their house is an enclosure containing grass and gravel, where is likewise to be found the cement-tank, supplied by the rain water from the house described in the previous paragraph.

Where ducks have to be kept in a confined space, the utmost cleanliness will be necessary, and care must be taken that where water is supplied by artificial means, such as the rain water above described, and is received in a cement or iron tank that the receptacle be cleared out as often as is required. In times of drought, or when the water has unavoidably much fouled, a bottle of Condyl's Fluid may, with great advantage, be added.

A plantation of winter cabbage, comfrey, or other vegetable will be found most useful when grass is no longer procurable, and in hard winter, mangolds, carrots, and other roots may be cut up and thrown down for the birds to peck at. Geese will sometimes eat hay if tied in little bundles within their reach.

Up to the present moment we have been considering the condition of waterfowl, which, from the fear of foxes, or for other reasons, are compelled to be kept within bounds. Should

such precautions not be necessary, and the birds be allowed full liberty on a lake, nothing can promise better as regards the chances of successful breeding. In full liberty, waterfowl will require much less feeding than when in circumscribed spaces, owing to the greater quantity of aquatic herbage at their disposal, while for the same reason the breeding birds will in all probability fulfil the expectations of the fancier, owing to the enjoyment of greater quietness and solitude indispensable to them at that season.

The Londoner can see this charmingly exemplified by a visit to St. James's Park, where a great variety of waterfowl of every description may be seen disporting themselves on the beautiful lake, engaged in incubation or leading their little broods on the velvety sward which is enclosed for a considerable distance at intervals on each side of the water. On this lake (about half-a-mile in length and averaging 200 yards in width), may be found about fifty different kinds of *Anatidæ*, a list of which, by the courtesy of Mr. Riley, the keeper of the Waterfowl, I am able to append, the names of those which have bred being printed in italics:—*Black Swans*, *White Swans*, *Chinese Geese*, *Bernicle Geese*, *Brent Geese*, *Bean Geese*, *White-fronted Geese*, *Egyptian Geese*, *Canada Geese*, *Magellanic Geese*, *Hybrid Geese*, *Common Sheldrake*, *Ruddy Sheldrake*, *Carolinas*, *Mandarins*, *Spotted Bills*, *Chilian Pintails*, *Common Pintails*, *Tufted Ducks*, *Muscovy Ducks*, *Call or Decoy Ducks*, *Australian Ducks*, *Black Indian Ducks*, *Wild Ducks*, *Hybrid Ducks* of various kinds, *Golden-Eye Ducks*, *Pochards*, *Widgeon*, *Garganeys*, *Teal*, *Coots*, *Moorhens*, *Porphyrio* (*Blue Water Hen*), *Dabchicks* (or *Grebes*), *Black-backed Gulls*, *Herring Gulls*, *Black-headed Gulls*, *Storks*, &c.

There were some time since *Hérons* and *Spoon-bills*, which have now died out, while there still remains *Pea-fowl* of various sorts with *Gold* and *Silver Pheasants*.

At the time of my visit (July) I was shown by Mr. Riley a number of nests, and noticed with pleasure the unusually large broods of ducklings which were following the mother birds. The Bernicle Goose was sitting under a dead tree in a shallow hollow scooped in the bare earth and richly lined with black down plucked from her own breast. The enormous erection of sticks and rushes made by the swan was close by, some eggshells lying about showing how recently the young had left it. Under a weeping willow I perceived the neat flat couch of the Moorhen, which plunged into the water at the sound of our steps, while near by Mr. Riley pointed out the nest of a Spotted-Bill, which had selected for her breeding place the shelter of a rough wooden coop, of which a couple of dozen are set invitingly around.

It is under circumstances such as these that waterfowl look best and do best, while it is interesting to remember that the St. James's Waterfowl are a matter of history. First introduced by Charles II. (1661), whose pleasure it was to feed the ducks and play with his dogs, they were here bred in great numbers, as were also a variety of other animals, including roebucks, red deer, antelopes. &c., &c. It would appear that St. James's Park at that period became, as Mr. Hare expresses it, "a kind of Zoological Garden for London." We gather from the writings of Evelyn that the wicker baskets which are at this time in use on the Continent as nesting places for the smaller fancy ducks, were then employed for the same purpose in England, as may be seen by the following curious extract from this author:—

"9th February, 1664. I went to St. James's Park where I saw various animals. . . . The park was at this time stored with numerous flocks of severall sorts of ordinary and extraordinary wild fowle, breeding about the Decoy, which, for being neere so grette a City, and among such a concourse of souldiers and people, is a singular and diverting thing. . . . There were withy-potts or nests for the wild fowle to lay their eggs in, a little above ye surface of ye water."

The birds of St. James's Park are fed with a mixture of round maize and barley, the food being thrown on the island in order to be out of the reach of rats and mice, and to encourage the birds to resort there for laying.

Where there is no island upon which the birds may be fed, it will be found best to feed them on a floating raft, or in tin vessels nailed to boards, as will be described hereafter. In Battersea Park there is also a collection of waterfowl which, although not comprising so many varieties as that at St. James's, is nevertheless very attractive, including, as it does, a considerable number of the Black Swan, which appear to the greatest advantage on the spacious sheets of water beautifully diversified with small islands well covered with ornamental bushes and forest trees, the borders clothed with graceful rushes, beds of water-lily, and other aquatic plants. The White Swan is also represented, and there is a considerable flock of geese, among which may be seen the Chinese, Bean, Bernicle, and White-fronted, while some magnificent Cereopsis occupy a small islet where they spend the greater part of the day grazing the short turf, and descending but very rarely to the water. From time to time a flock of Wild Duck, numbering from six to two dozen, may be seen circling high in the air over the lake, and settling simultaneously with a loud splash on the bosom of the still water. These flocks constantly leave Battersea to visit the lake at St. James's, and return often accompanied by other birds to their roosting or breeding places, thus offering to the Londoner a glimpse of nature both instructive and refreshing in the turmoil of a great city. How intensely this rural scene is appreciated by the dwellers in our great Metropolis can be amply verified by any one who will visit the Park on Sundays and holidays, the quantity of bread thrown to the birds by the working classes being so enormous that upon Bank Holiday, 1886, men were

employed to fish up the crusts which the satiated birds had rejected and were rotting in the water, and of which I am credibly informed more than two large cart-loads were removed.

Other Parks and Zoological gardens in England possess interesting collections of waterfowl, among them being that at Clifton, near Bristol, where the Pintail, Golden Eye, Pochard, Divers, and many other species enjoy liberty on a charmingly laid out piece of water surrounded with turf and shadowing trees.

As Dr. Sclater remarked in the address hereafter quoted, it is greatly to be desired that some of our landowners who possess suitable grounds should devote themselves to forming living collections of the beautiful birds of which I write. Ornithology received a severe blow in the death of the thirteenth Earl of Derby, President of the Zoological Society, whose celebrated menagerie at Knowsley contained a magnificent collection of Anatidæ which were dispersed by auction in the autumn of 1851. This collection contained birds unique and interesting in the highest degree, which have never since been seen in this country, and it is much to be hoped that the Waterfowl Club will utilise its formation, not merely to insure a good classification at shows for known varieties, but to encourage and stimulate the acquirement and acclimatisation of the many beautiful and rare specimens still unrepresented in England.



CHAPTER II.

FOOD.

It is, I believe, universally admitted that the best staple food for all waterfowl is a mixture of wheat, buckwheat, and barley, giving, in addition, to newly-imported specimens a small quantity of round maize and hemp seed, especially in cold weather. Green food is also indispensable for their health, and the best forms in which this can be given are that of grass and duckweed, which last is the natural salad for aquatic birds. It also contains in the Spring innumerable quantities of small snails and insects, and possesses the property of stimulating breeding propensities. All sorts of waterfowl will greedily eat soft food, such as meal, but this is best avoided unless in the case of sickly birds, as a great deal of it is wasted, and it has a tendency to turn sour if thrown about.

In view of the attraction for rats which grain possesses if sprinkled on the bank, or set about in pans to which they can obtain access, I have found it best to feed waterfowl in zinc vessels nailed to two floating cross-planks, or in partially submerged pans so arranged that the birds have to put their heads under water to get at the grain, a system which entirely obviates the possibility of rats congregating at the birds' feeding place. Well-boiled potatoes given hot and mixed with a little meal slightly sprinkled with salt, is very acceptable to most varieties of geese and the larger kinds of ducks. Stale bread thrown on the water is eagerly rushed after by ducks and affords a wholesome variety in their bill of fare. It is most important that the necessity for green food should not be overlooked, and unless there is an abundance of grass at

the disposal of the birds, large handfuls should be torn up and thrown to them in the water, together with any sort of cabbage, lettuce, chichory, or other attainable vegetable. Animal food also enters into their dietary, such as worms, slugs, and small frogs, while even mice have been known to be devoured, the latter in one case causing the death of a beautiful Chiloe widgeon which bolted its prey head foremost, and died from suffocation, with the tail protruding from its beak. In the case of delicate newly-imported specimens, or where the appetite fails after illness, I have seen great good accrue from the administration of small pieces of well-boiled meat from the stock-pot; at the same time this is not to be regarded as a regular article of diet, but rather as a remedial agent in cases of urgency, while Spratt's meat biscuits broken up and thrown on the water may be classed in the same category. It is a good plan to plant chichory, dandelion, comfrey, and cabbage, &c., in the early spring so as to ensure a succession of green food for the waterfowl, thus obviating the necessity for constant calls upon the kitchen garden, and permitting the fancier if he pleases to transplant young roots into the duck run where the birds can pluck them at their pleasure.

Regularity in feeding, both as regards time and quantity, is as essential in the treatment of waterfowl as in that of any other live stock, and it is for the fancier to determine whether he will leave the grain constantly within reach of the birds, or if it shall be administered once or twice a day. This latter plan, when accompanied by the whistle or call of the feeder, has, however, the desirable effect of rendering the birds more familiar, a circumstance of great importance where ducks or geese are kept for the purpose of exhibition.

The grain mixture in use by the Zoological Society's Keepers for feeding the waterfowl at the Gardens is as follows :

half a bushel of wheat and the same of sound barley, with one peck of heavy buckwheat; hemp is given in cold weather, and young birds receive a portion of Spratt's Patent Meal.

We may judge that the above treatment has been successful when we consider how very extensively the Anatidæ are represented in the Gardens.

Mr. Sclater, speaking before the Zoological Society in 1880, stated—

“Great attention has always been paid to the acclimatization of rare exotic Waterfowl, the present being the most extensive collection in existence. During the past twenty years eighty-six species of *Anatidæ* have been exhibited in the Gardens, while at the present moment there are to be seen two hundred and seventy individuals, belonging to fifty-three species.”

Several years have elapsed since the delivery of this address, during which other specimens have been added to the list of waterfowl, among which may be mentioned the Wild Muscovy Duck, *Cairina Moschata*, from South America; the Slender Duck from Australia, *Anas gibberifrons*; the White Marked Duck from Antarctic America, *Anas specularis*; and the curious Lobated or Musk Duck, *Biziura lobata*, from Australia, of which examples were received for the first time in 1882, together with other rare and interesting varieties.

It is of course impossible to lay down a hard and fast rule respecting the feeding of waterfowl, either in kind or quantity. The circumstances of the case as regards the health of the bird, whether in moult or newly-imported, whether breeding or not, the severity of the weather, the character of the soil, must modify all that has been written with regard to the foods necessary for ducks and geese. It may, however, be roughly estimated, to use a homely measurement, that a Mandarin Duck, Bahama Pintail, or other bird of similar size, will, if fed twice a day, require at each meal not more than two table-spoonsful of grain; birds the size of a Spotted-Bill, three table-spoonsful;

the large Australian or Variegated Sheldrake, three to four while the small varieties of geese, such as Magellan and Bernicle, will eat under half a pint of barley, and the Cereopsis Canadian, and Chinese geese, a full half pint, in addition to grass or other vegetables. Where soft food, meal, bread or scraps are given, the quantity of grain might be slightly diminished.

It is highly desirable that the breeder and fancier should acquire all possible knowledge respecting the habits of the bird in its wild state, and note whether, like the Cereopsis goose, it grazes and is indifferent to the water; or, like the Bernicle, feeds upon water weeds, shell-fish, and small reptiles whether it is a diving variety and seizes its food under water as do the *Fuligulæ*, or belongs, like the Shoveller, to a family feeding on the surface. Such information, combined with intelligent observation and perseverance, will be the fancier's best guide as regards the feeding and treatment of the interesting birds touched upon in this little work.



CHAPTER III.

BREEDING.

Quietness and privacy are essential if it is desired to breed any kind of waterfowl. The amateur must not expect to be able daily to visit the nest of a Carolina or Rosy-bill, as he would that of his prize Cochin or Game fowl. Ducks are extremely wary, and will forsake a nest in many instances if the eggs are touched or the surroundings disturbed. No matter with what care the amateur may have prepared tempting nest boxes beautifully furnished with straw, nine times out of ten the duck will choose the bare earth under a bunch of heather, or a quiet corner behind the gnarled stump of an old willow tree. If this be the case, let her alone. Should the banks be bare and destitute of cover, some substitute may be supplied by placing a pair of hurdles covered with straw, a little barrel laid on its side containing some dry rushes, and concealed by a couple of larch boughs stuck in the earth, an empty hen-coop with a sheaf of straw set upright before the opening, with such other contrivances as the ingenuity of the fancier may suggest to him, as likely to encourage incubation. Some breeds of ducks will seek their nests in the hollow stumps of trees, others have been known to dig a hole in the thatched roof of their cabin, and there deposit their eggs. In the Zoological Gardens of Paris, a pair of pinioned Mandarins nested in the gutter of one of the principal aviaries twelve to fourteen feet above the ground.

Speaking of the acclimatisation of wild fowl M. H. de la Blanchère recommends that large straw baskets shaped like a bottle should be placed at the water's edge thoroughly

concealed with foliage, or partially buried among stones and pieces of rock. The little water houses to which Mr. Jamrach previously alludes are often very acceptable as breeding places to the small varieties of ducks. These may be made either square or round, thatched or boarded over, according to the taste of the fancier, the essential point being that the floor board be above water level, and that the only entrance, turned towards the water, should be approached by a slanting board furnished with cross-pieces which the ducks can easily ascend.

The breeding season for many ducks commences about the end of March, when the females will begin to form their nests, and having made them, to furnish them with the down from their own breasts, with which they will cover the eggs in the intervals of incubation.

Sheldrakes will probably seek a hole or burrow in which to nest. An artificial sand bank or mound of earth should be prepared with convenient cavities at different levels which they will appropriate and arrange to their own liking.

Some of the fancy ducks, especially if fairly tame, will take to any little house near which they have been accustomed to be fed, and will there lay a nest full of eggs. A Spotted-Bill duck in my possession installed herself in a nest of straw which I had prepared in a house with boarded floor, and there deposited nine eggs, to which a Rosy-Bill added two.

It is important when setting the eggs of waterfowl under hens to remember that the duck covers her eggs on leaving the nest, as also does the goose. So that it is best, if not absolutely needful, to imitate Nature in this respect, and to place a piece of light woollen material over the eggs, when the hen leaves them to feed. The decision as to whether the ducks should be allowed to sit on their own eggs, or whether these should be confided to hens must depend upon the circumstances of the duck run, and whether there is sufficient

privacy to ensure the birds not being disturbed should they nest in the natural manner.

In most cases it will be found desirable to adopt the surer method and set the valuable eggs under small hens of steady disposition, rejecting pullets in their first season. Nothing can be more disappointing than to find a rare duck chased off her nest by some quarrelsome Muscovy or other drake, and the precious eggs, perhaps within a few days of hatching broken, partly eaten, or strewn along the bank. To deny, however, to the breeding duck the wholesome and natural gratification of incubation is imprudent, and sometimes tells severely upon the health of delicate birds when the moulting season arrives. It is, therefore, a good plan to replace valuable eggs taken from her nest by those of the common Wild-Duck or other ordinary breeds, thus permitting to the mother the repose which Nature demands after the production of her batch of eggs.

Supposing that the eggs are being incubated by hens, it is safest as a rule to remove the young as they hatch, and to restore them to the foster-mother when they are quite dry and able to stand.

If, however, waterfowl are themselves allowed to sit, it is safest not to interfere with the nest until the hatching is entirely accomplished, when it will be found advisable to pen the mother with her brood inside hurdles or wire netting, in which enclosure should be placed a large shallow pan of water containing fine gravel and abundance of duckweed, if procurable. At the end of a fortnight the young birds may be allowed to go to the pond, care being taken to provide means of ascent from the water, unless the bank be sufficiently sloping to permit of their easy exit.

The following method of rearing Mandarin and Carolina ducklings was given to me by a French breeder who has been

very successful during a score of years in raising the small ornamental varieties.

It will be observed that this gentleman advocates the use of vermicelli for young birds, an opinion I can warmly endorse, for it is valuable both from its nutritious qualities and the readiness with which, from its shape, it is devoured by the birds. Maccaroni and all sorts of Italian paste are likewise acceptable to ducks, but it must not be forgotten that fine flour in so highly concentrated a form is too binding in its character to form the staple food, and should be used in conjunction with plenty of vegetables and other articles of diet of a more succulent character.

Mr. Pottier Cohen's method of rearing Mandarin Ducks is as follows, being a literal translation from his letter to me :—

"The eggs are set under Bantam hens, which, after an experience of 20 years, I have found preferable to allowing the duck to sit herself, and by this means securing the laying of the second batch of eggs, which would not be the case were the duck employed in rearing her young after the moult."

"The day before the eggs are due to hatch, the nest should be surrounded (with boards or a piece of wire netting), for the ducklings when hatched are very active and would leave the nest of their own accord and be lost."

"It is necessary to use insect powder in the nest and among the feathers of the sitting hen in order to destroy the "*icaris*," a sort of tick, which is very detrimental to the health of the young bird. Every day I lift the hen from the eggs and feed her under a coop, where she finds food, drink, and a dust bath, covering the eggs in the meantime with a piece of woollen stuff."

"I allow her to be off for ten minutes, she is then replaced carefully on the eggs."

"On the day previous to hatching, the hen is twice fed in this manner, in order that she may not be disturbed during hatching."

"For twelve hours the hen and ducklings are left undisturbed on the nest, during which time the young birds are engaged in assimilating the yolk of the egg which has been absorbed into their system. After this lapse of time the hen and her brood are placed in a rearing box of which the larger half forms a run for the ducklings, while the mother is confined in the smaller compartment, divided off by bars."

"Food for young Mandarins.—I give them in a shallow dish (or little sardine tin), Vermicelli which has been scalded by being thrown into boiling water, and with sufficient liquid (cold) left round it to enable the birds to swallow easily. In a similar dish or tin I give them a good supply of duckweed and water."

"It is desirable to arrange the food dish in such a manner that the bird cannot paddle in and dirty it. The ducklings should also be supplied with small earth worms."

"When the birds are eight days old I add to this bill of fare ants and their eggs."

"At this age they may, for the first time, be allowed to bathe, which they can do in a small quantity of shallow water, which should have duckweed added to it."

"At six weeks old the ducklings are pinioned, and when they begin to moult and to assume the adult plumage, I redouble attention and supply extra food of a nourishing character, such as Vermicelli, &c., to them for a week."

"At two months old, and even earlier, they will eat small wheat, or larger grain may be crushed and given to them in a saucer of water."

In rearing the ducklings of any ornamental breed it will be found desirable as stated above to confine the young brood within limits for the first fortnight of their existence, otherwise they may die of cramp if the water be cold, or fall a prey to rats, eels, or pike, which often do great havoc among young waterfowl. The first food for newly-hatched ducklings may, in my opinion, be eggs boiled hard, crumbled bread mixed with chopped lettuce or duckweed, which is better; oatmeal and curds well pressed and finely crumbled are excellent as a change of food.

Barley meal, Spratt's Food, and other patent meals may be gradually introduced into the dietary, remembering always to give a plentiful supply of fresh water in shallow dishes, the best being that which is procured from a pond and containing duckweed, which if collected in the cool of the morning or at sunset, will be found full of animalculæ, larvæ, and other microscopic forms of life which are excellent for the young birds. It may be proper to remark that although grass is a

natural and very proper food for ducklings, it should always when given to them be chopped small with a pair of scissors, not thrown down to them at full length, as the blades are often eagerly swallowed whole and form a dangerous impaction between the crop and gizzard from which death will result.

As the birds lose their down and assume their feathers, grain should be given thrown into water; groats chopped or whole, canary, millet, wheat, hemp seed, buckwheat, barley, and split Indian corn (maize), may all be used successively.

Animal food may be supplied sparingly, especially when the young birds are shooting their feathers; nothing is better than minced liver well boiled, the liquor poured upon stale crusts or broken ship biscuit and well mixed up together. Small worms, slugs, meal worms, and maggots of various kinds may be offered, but care should be taken not to give *large* earth worms, for Mr. Berney states that such when swallowed whole by young ducklings have actually been known to eat their way out of them, biting through the delicate intestines and causing the death of the bird.

The young of the swan tribe may be fed in much the same manner as ducklings, but when the birds are very wild it is not always possible to feed them from troughs, in which case pieces of Spratt's biscuits, stale bread, groats, &c., may be thrown on the water, which will have the effect of accustoming the cygnets to their keeper. Goslings of nearly every variety may be successfully reared in the manner familiar to farmer's wives, with hard-boiled eggs, bread crumbs, oatmeal, Spratt's food mixed with young green onions, dandelion leaves, and the weed called clivers, to which goslings are extremely partial. As they grow older the more expensive food may be mixed with good barley meal to which grain may be added by degrees, while an abundance of grass should be placed at their disposal.

With respect to the young of the more uncommon birds, particularly of such as frequent the sea, the breeder will require to consider the natural diet of the wild birds and strive to imitate nature as nearly as possible.

For example, the *Mergi* (Goosanders and Mergansers) in the wild state subsist exclusively upon fish, selecting usually those from four to six inches in length; it will therefore be right when practicable to give small live fish, such as are ordinarily used as bait by anglers, larvæ, water insects, and such forms of animal life as can be obtained. I would suggest experimenting with the grub of the caddis worm, tadpoles, slugs, meal worms, maggots, &c., if the amateur be fortunate enough to breed either the preceding varieties or any of the Scoters and Eider Ducks.

When live animal food is not procurable, small pieces of raw mutton, beef, or other flesh may be pulled into fibres and offered to the newly-hatched birds. Study of the many beautiful works on ornithology will, if carefully pursued, throw much light upon the natural habit of waterfowl, and will tend to lessen the difficulty which undoubtedly exists in the acclimatization of the rarer specimens of which this little Manual treats.



CHAPTER IV.

DISEASES AND ACCIDENTS.

Waterfowl are undoubtedly less liable to disease, especially epidemic disease, than are poultry ; but on the other hand it is much less easy to "doctor" a sick duck than a sick fowl, on account of the peculiar conformation of the tongue and throat in the former, which makes it a difficult matter to administer globules of paste or liquid medicine.

The usual time for the importation of waterfowl is in early autumn, thus it will probably happen that the first illness developing itself among a stock of newly-arrived ducks, will be symptoms of cold with shivering and diarrhoea. In such cases it is wise to remove the birds affected, from the pond, and place them in a dry house, with an abundance of straw for their bedding, and coax the appetite by offering warm meal, bread and milk, boiled rice, hemp seed, and any dainties which the stranger accepts willingly. It is of the utmost importance to prevent ducks moping and refusing food, as under these circumstances, they are very likely to grow thin with alarming rapidity, and to fall into a consumption which invariably proves fatal. This is frequently the case when newly-imported birds, arriving in their old plumage, catch a chill, and are then unable to cast their feathers. Every precaution should be taken during the moulting season, when an abundance of nourishing food should be supplied and the bird kept warm.

Worms. Ducks are liable to the invasion of several sorts of worms, one of which, called by Mr. Mégnin the *histrichis tricolor*, a small hairy parasite, is found entangled among the follicles and glands of the crop. In cases where these are

present in large numbers the juices necessary for digestion are not secreted, the food remains unchanged in the crop, producing a condition of malnutrition necessarily resulting in the death of the bird. Wherever intestinal or other worms are suspected it is prudent to give leeks, onions, chives, or garlic, chopped up, which, as a rule, are eaten with avidity. Small doses of calomel or castor oil may be administered after this treatment.

Disease of the Liver is often recognisable by the duck falling lame, and where this malady is generated by over-feeding the abdomen nearly touches the ground; the state of the digestion can also be ascertained by observation.

Liver disease, when much advanced, is practically incurable, developing, as it does, a degeneration of that organ which will, upon examination, be found covered with tubercles. Dandelion leaves are a preventative, to a certain extent, of the development of this malady.

Atrophy or Consumption manifests itself by loss of weight and moping, with paleness of beak and feet, and should be treated with warmth, stimulating food, and doses of cod liver oil; but where this complaint is not traceable to recent arrival or a difficult moult, it is almost hopeless in its character. Ducks will sometimes eat bread soaked in cod liver oil and warm milk, when the forcible administration of the oil alone would be a matter of great difficulty. I have found Scott's Emulsion of Cod Liver Oil very useful in cases of wasting amongst fowls, and have no doubt it would be equally applicable to ducks.

Dysentery. This complaint, even in its earlier stages, is generally very amenable to Battley's Sedative, which, being a preparation of Opium, has usually marked effects for good.

It may be administered every two hours in doses of one to four drops in a little water, having due regard to the age

and size of the patient. In cases where the cause of the attack is not known, the presence of some irritant substance may be suspected, and a dose of castor oil is advisable an hour before the administration of opium. Hard boiled eggs and boiled rice are suitable food. Opium as well as all other medicines, should be carefully measured in a minim glass, or fatal accidents may ensue.

It must, however, be used with great caution, Battley's Sedative containing one grain of opium in twenty-two drops, which would be an ordinary dose for a grown up person.

It is necessary for the fancier to recollect that opium is highly poisonous, and not only to use it with caution, but to ascertain from a chemist the strength of the preparation before administration.

Sores are not uncommon among ducks, and often proceed from a blow received in fighting or from scratches when striving to escape and thrusting the head through wire netting. The patient is best isolated and should be allowed plenty of water, which will assist in healing the wound, which, if inclined to gather, should be bathed with warm water and dressed with Friar's Balsam, and later with zinc ointment.

Specks on the eye or films are usually amenable to the same treatment as would be followed in the case of the human subject, and it is always worth while, where valuable specimens are concerned, to ask the opinion of a competent medical man upon the nature of the disease. As these affections of the eye proceed from various causes, it is in the case of so delicate an organ as that of sight, most imprudent to treat with any powerful drug, such as opium, cocaine, or caustic, without a distinct knowledge as to the seat of the disease.

Swollen, bloodshot, or roup eyes, occasioned by cold, should be bathed several times a day with warm water, and I have found in the case of poultry a perfect cure result from

the use twice daily of a drop of weak solution of *Vini Opü*, with a tincture of *Hammemelis* in equal parts, which can be prepared by any chemist. During this treatment, the bird should be well fed, and kept in a warm place free from draught.

Ophthalmia, of a virulent type, occasionally attacks waterfowl. The symptoms are shrinking of the globe of the eye, which is covered by a thick film, accompanied with profuse discharge, which carries away by degrees the actual tissues with the inevitable result of blindness and probable death. This disease is highly contagious. therefore the patient should be immediately isolated, and the eye bathed with a lotion, composed as follows:—

Liquor of Atropia	...	...	...	15	drops.
Sulphate of Zinc	...	...	...	10	grains.
Liquor of Permanganate of Potash	}			30	drops.
(Condy's Fluid.)					

Water to half a pint.

This lotion may be used twice a day, mixed with warm water, in the proportion of one tablespoonful of lotion to one tumbler full of warm water. The sponge must be used for for no other purpose, and burnt when no longer needed.

This lotion may also be used as drops for the eye, if bathing is not convenient, putting one drop into the eye four times a day. I have only once, however, seen a case of recovery from this complaint which almost invariably destroyed the sight.

The greatest caution should be observed in thoroughly disinfecting with hot lime-wash and Condy's Fluid the house and feeding vessels, before placing any other bird in the same pen, as the disease is communicable by the discharge from the eye, which may have remained on the wood work, metal pans, or wire, the virus seeming to live for a considerable length of time.

Diseases of the Respiratory Organs are not, so far as I know, usual among waterfowl, but on three occasions I have met with a singular disease originating in the windpipe. My attention was first attracted to the condition of the bird by the way in which it screwed its head round and breathed with difficulty. Upon pressure of the crop and neck I was led to form the opinion that the bird had swallowed a stone which could not pass into the crop, or that there was inpaction in that organ of some undigested substance. All means for relief of the bird's evident suffering proving fruitless, an attempt was made by an experienced poultryman to open the crop in the hope of removing the offending substance. It was found impossible, however, to proceed with the operation the object seeming to recede as the incision was made, and I, therefore, sent the bird to Mr. Jamrach for his inspection.

I cannot do better than give the result of his observation in his own words.

"A large globular accrescence had formed on the windpipe,"

Here followed a rough sketch representing an oval about the size of a small walnut—

"Either caused by an injury, or else this is a disease to which waterfowl are subject, owing to the want of *flying* exercise. The respiratory organs of waterfowl are never brought into violent action in captivity, and I am sure disease may be brought on from torpidity, as in a wild state waterfowl travel five hundred miles in twenty four hours. The excrescence was broken into three pieces, causing an incision in the windpipe itself; the bird now breathes through the slit in the side of the neck, the stitching having come undone."

A week later the report stated—

"Except for a wheezing noise the bird seems well; as a curiosity it is unique. The bird feeds and moves about, but breathes rapidly; if gangrene does not intervene it may live. It is a most extraordinary case."

Within two months from the date of the accident this bird, perfectly recovered to all appearance, was returned to me by Mr. Jamrach, who, speaking of it as a "living miracle," requested to have the body should it ever die, expressing a strong desire to ascertain the manner in which the ruptured

windpipe had re-united. Of this, however, there seems no immediate probability, as the bird made a perfect recovery and shows no traces of the accident. Subsequently I lost a Chilian widgeon, and a post-mortem revealed similar symptoms to those described above, but it remains an open question whether the disease originated in the manner suggested by Mr. Jamrach, or whether the bird had hurt itself in the meshes of wire netting, or had been the victim of some spiteful larger duck, for the method of attack common to all Waterfowl is to seize their antagonist by the throat.

Lameness often attacks waterfowl which have a limited amount of swimming exercise, and often proceeds from walking on hard stones and unyielding concrete, or brick floors. The best remedy is a grass run and the use of a pond.

Sore Feet. Cracked and sore feet are not uncommon among small varieties of ducks, and often proceeds from the effect on the soft webs, of the pressure from brick or concrete floors. Wounds are not unseldom produced when birds are kept in a gravel enclosure, the edges of flints inflicting severe cuts. It is desirable to cover the floor with dry mould and chaff, or peat moss litter an inch thick, and to avoid the presence of rough stones in the enclosure. The feet should be bathed with warm water and kept constantly anointed with vaseline, glycerine, or some healing ointment.

Rheumatism in the joints, or a *Gouty* condition, manifests itself by heat and swelling in the thighs and legs. Celery leaves and the stalks chopped fine, minute doses of colchicum dropped on bread, with warmth, are applicable in such cases.

Prevention is, however, better than cure, and there is no reason why the fancier should not keep his birds in perfect health and high condition by regular and careful nutrition, cleanliness in the houses and feeding troughs, combined with an observant eye and prompt treatment of the bird on the very first symptom of indisposition.

CHAPTER V.

PINIONING.

It may be as well briefly to state the proper way of pinioning waterfowl, as this operation is of absolute necessity in the case of nearly every kind of goose or duck, and if carefully performed is not followed by any injurious results.

In the case of a very large bird, such as a Swan, Cereopsis, or Spur-winged Goose, the operator will require an assistant. The necessary implement is a pair of stout sharp scissors rounded at the points, and if possible provided with a "stop" between the handles which prevents the possibility of the scissors crossing where much force has to be employed. There should also be ready to the operator's hand a stick of caustic (nitrate of silver) with which to staunch the blood, while an hot iron should not be used both because of the additional pain it causes to the bird, and on account of its tendency to leave an unsightly scab as the cauterization heals. The wing of a bird is composed of three joints, each of about equal length, which we may call the "shoulder," the "arm," and the "wrist" joints. It is the "wrist" joint which should be removed in pinioning, and care should be taken not to sever at the same time the little "thumb" joint or pointed bone which terminates the second or "arm" joint, as it carries several feathers which, when the wing is closed, in great part hide the absence of the amputated pinion.

If there is only one operator he should place the duck between his knees facing himself, the right wing folded to its side, and retain it in that position by an even gentle pressure of his legs. The left wing must be firmly held by

the operator's left hand which should rest upon the bird's back, his thumb and finger sharply closed upon the "arm" joint just above the pinion, with his right hand he places the scissors on the "wrist" joint and severs it with one clip. Without letting hold of the wing the caustic should be instantly applied to the wound, which will in all probability scarcely bleed. In the case of a large bird, or if from any accident there should be much loss of blood, the caustic should be applied repeatedly, and the arm held firmly for some time, and cold water poured upon it. In such an event it would be desirable to tie a firm ligature just above the wound. This is, however, but seldom needed, for as a rule the bird will not appear to suffer any inconvenience and can be restored to liberty almost immediately. Birds of the year are best pinioned about October, hot weather being unfavourable as regards the chances of loss of blood, while in the case of adult birds requiring pinioning, care should be taken not to attempt it during the breeding season, and it will be usually found best to wait until the moult commences.

The work of M. H. de la Blanchère has furnished the principal portion of the above notes, a diagram being also given in his "Manuel d'Acclimatation."



CHAPTER VI.

EXHIBITING.

Provided a duck or goose be in perfect condition and full plumage, there is little or nothing that can be done in the way of preparation for the show-pen. Waterfowl should be exhibited in "hard" condition, grain fed, not fat, the feathers should lie tightly like a satin coat, firm and glossy to the touch. Carolina, Mandarin, Wild-Duck, and such birds as undergo the summer change, should only be exhibited when in perfect feather. In the case of those breeds which do not attain full plumage until the second or third year, it is useless sending them out in an immature condition to compete against birds older, and consequently better furnished. Ducks should never be exhibited during their laying, and it is not prudent at any time to subject to much journeying the pair of birds on which you depend for the breed.

Care should be taken to accustom both geese and ducks to the show-pen before sending them out. On their first introduction to the wire cage the birds will thrust their heads through the bars, flutter wildly round, attempt to rise, and dash their crowns against the roof of the pen, finally sinking down exhausted in a corner, bruised and terrified among their own dropped and broken feathers.

Waterfowl are by nature shy and timorous; it is therefore necessary for the fancier, where a regular system of exhibiting is intended, to provide himself with goose and duck show-pens of the usual pattern, in which the birds intended for exhibition should be placed from time to time, and while there be coaxed and fed with some favourite dainty, in order to accustom and

reconcile them to their unnatural position. It is a good precaution to stretch a piece of baize or stout canvas simulating an Indian ceiling, three or four inches lower than the top of the pen, in the case of newly-arrived birds, a precaution which will save many severe injuries to the head. Duck and drake of strange birds should not be penned together for exhibition, many males both of the goose and duck tribe being extremely spiteful and capable of injuring or killing the female either in the exhibition basket or the show-pen. No soft food of any kind should be placed in the hamper of birds proceeding to a show, as with it they will smear and disfigure themselves most completely; but if the journey be a long one, some boiled grain may be put into the hamper, or half a loaf of stale bread soaked in water may be fastened by a string to the side of the basket.

The best shape of hamper is undoubtedly the ordinary round one, which should be lined with canvas and well furnished with straw, some fanciers preferring a sacking top to the usual lined lid.

If opportunity occurs, the exhibitor will do well to attend the show, and ascertain for himself that his birds are well fed and watered, that his Japanese Teal, and Mandarins are not being crammed with oats, that his Carolina Duck is not being murdered by her mate, and that the water tins are not placed at such a height that the thirsty birds are unable to reach them.

Should the show last several days, it is well worth while, in the case of valuable specimens, that some chopped green food be supplied to the geese and ducks, whose natural craving for it is proved by the avidity with which they will snatch and bolt the tender lettuce or handful of grass, offered for their acceptance.

Great exhaustion necessarily ensues upon an exhibition

lasting three to eight days, and it is impossible not to reflect how trying the ceaseless noise, heated air, glare of gas, and cramped position upon an unyielding board, must be to creatures whose nature it is to fly for miles at a stretch in the breezy expanse, to plunge beneath the refreshing water, and to roost upon the sedgy bank, to say nothing of the torments they endure from being continually poked up for inspection by the sticks, catalogues, and busy fingers of the exhibition loving public.

On their return from a show the birds should be carefully examined, and if, as is often the case, they are thin, or suffering from cold, a roomy warm* house should be prepared for them, the necessary medicine being immediately administered.

It is imprudent to throw the small fancy ducks on open water after exhibition, till they have had a good feed and a wash in some suitable tub or tank. The plumage is then generally very dry, and chills of a serious character often follow upon rash exposure after a show of several days duration, especially in winter.



Part III.

SUBFAM. I. ANSERANATINÆ.

GENUS *ANSERANAS*.

Only one species exists of this Subfamily and Genus, of which the principal characteristics are stated by Mr. Sclater to be as follows: hind toe free; the feet half-webbed; the neck of moderate length.

BLACK AND WHITE OR SEMI-PALMATED GOOSE.

Anseranas Melanoleuca.

The Zoological Gardens of London possesses several specimens of this bird, the first having been acquired in 1855. It is of interest to naturalists on account of the extraordinary conformation of the *trachea* which is about $4\frac{1}{2}$ feet in length in adult specimens, and is also peculiarly situated, being folded several times outside the pectoral muscles under the skin. An interesting description with an illustration of the wind pipe, may be found in Latham's "General History of Birds."

The Semi-palmated Goose is an inhabitant of Australia, where it frequents the swampy districts of the east and southern coasts, being at one time very abundant in New South Wales. In size it resembles the Common Goose, but differs from the domestic bird in its stately walk, and more handsome appearance, standing high on its legs, and exhibiting white and black in its plumage. The breeding season would appear to be from September to November, as in a letter of Mr. E. P. Ramsay to the Zoological Society (1877), he states that young

birds were brought in by the natives between March and April, while encamped on the Herbert River in South Australia. It appears doubtful whether this bird has ever bred in captivity, and it certainly has not done so in the Zoological Gardens. According to Dr. G. Bennett, F.Z.S., it is of a sociable disposition, and when kept with other birds is lively and playful, drooping and refusing food when kept in solitary confinement.

Dr. Bennett speaks of the Semi-palmated Goose as "passing a great deal of its time upon land, only frequenting the lagoons to breed, or to obtain food." Mr. Henry Clarke, of Sydney, hatched several birds by placing the eggs, brought in by the blacks, under a hen ; seven being successfully reared. The note is a shrill whistle.

These birds were at one time plentiful in this country, but have become scarce of late. They may be obtained occasionally at from £6 to £10 a pair.

Male—Bill, which is placed far back so as to include the eyes, strong and hooked at the extremity, orange at the base, red in the centre, tip and under mandible pale horn colour ; head, neck, back, wings and tail black ; small wing-coverts, upper back, breast, and abdomen white ; legs, long and bare, orange yellow ; webs, small. Weight, six to seven pounds.

Female—Similar to male.

Young—In first feather, splashed black and white ; bill and legs reddish.

Egg—Cream colour ; eight to ten ; somewhat small ; September.

SUBFAM. II. CEREOPSINÆ.

GENUS *CEREOPSIS*.

The Subfamily and Genus *Cereopsis* are represented by a single example of goose, in which the bill differs entirely from that of the *Anserinæ* in being short, sharply pointed, and curved, the base being covered with a large flat cere, extending two-thirds of its entire length; the neck is short and thick, the webbed feet have short toes and powerful claws. Dr. Bennett remarks that the *Cereopsis* "is allied by its external anatomy more to the waders than to the geese, and is strictly an Australian form."

CEREOPSIS GOOSE.

(*Cereopsis novæ hollandiæ*.)

Of late years these birds have been very successful in the show pen, winning prizes over a number of geese and ducks, compelled to compete in the "any other variety" class. They are annually imported from Australia, ten or a dozen pairs arriving at a time, and selling at about £6 to £8 a pair. The first record we have of this species as being kept by amateurs in England, is a statement by Yarrell in the "Proceedings of the Zoological Society" (1831), of some *Cereopsis* possessed by Earl Derby about 1830, examples of which being presented to His Majesty King William IV., and being placed on the ornamental water in the Great Park at Windsor, there bred freely, as they also did in the Zoological Gardens. The species is much more addicted to the dry land than to the water, being excellent runners, but very awkward swimmers. When pursued they take to their legs before rising into the

air. In their native country, they breed in the spring answering to the English autumn, a circumstance which would militate against their successful breeding in this country, were it not for the second batch of eggs which they would probably produce in the early part of the year. Dr. Brehm states that the female alone constructs the nest, and that it is superior in point of finish to that of the Common Goose, being round and neatly lined with feathers. He also relates that the young birds emerged from the shell on the thirty-eighth day and ran after the mother, picking up their food from the grass, refusing to eat eggs, bread, or earth worms, and preferring green vegetables. Dr. Brehm conjectures that the period of incubation varies somewhat with the climate, and that a month may be reckoned the usual time.

Although these birds are considered by most amateurs to be very quarrelsome, I found them on the whole less pugnacious than the Egyptian Goose, nevertheless they appear capable of forming very strong dislikes to individuals; at which time they would pursue the object of their antipathy, seizing the clothing in their strong curved bill, and administering rapid cutting blows with their long powerful wings. The *Cereopsis* in my collection appeared to feel cold winds very acutely, suffering more from them than during a still frost. It is necessary on this account to create shelters, behind which the birds may run, composed of hurdles covered with straw or felt. *Cereopsis* graze persistently, and will soon eat every blade of grass in their enclosure, when green food must be supplied to them regularly, without which they will not thrive.

Dr. Bennett furnishes a few notes upon this singular bird, which he describes as being allied by its external anatomy more to the waders than to the geese—

“It is about the size of the Common Goose, which it resembles in general form, excepting the bill and legs. It has been found in numbers

in Bass' Straits, and is known by the name of one of the islands of Furneaux group, as the 'Cape Barren Goose.' It is much less common near Sidney than formerly, from being killed in numbers and not bred in confinement."

Male—Bill short, sharp, and somewhat hooked, adorned at the base with a cere of a greenish yellow colour, which covers the black bill about three parts of its entire length. Plumage, clear brownish gray; the tail and a few feathers on the shoulders black; the top of the head of a dull white colour; shoulders and upper portion of the back exhibit round brown spots; foot, black; leg, red; eye, white, closely speckled with minute scarlet dots, giving it a red appearance.

Female—Same as the male, but smaller.

Young—The young of the *Cereopsis*, even at birth, exhibit the characteristic cere on the upper mandible, the down being ashy-brown, a stripe of a darker shade extending across the cheeks and down the nape of the neck. In first feather closely resemble adults.

Egg—Somewhat small, oval, smooth-shelled, yellowish-white; about five. March—May. Incubation, thirty-five days.

Nest Down—Large, grey, slightly darker on the tips.



SUBFAM. III. ANSERINÆ.

In his "List of the Species of *Anatidæ*," the following Genus are included by Mr. Sclater :—*Plectropterus*, *Chenalopex*, *Anser*, *Bernicla*, and *Nettopus*.

GENUS *PLECTROPTERUS*.

The birds of this Genus have the bill large, narrow at the apex, a strong hook at the tip, and an excrescence at the base; the skin from the base of the bill to the eye being bare of feathers. The body is slender, the long neck carried straight, the thighs somewhat naked, the legs thick and strong, the feet powerful and armed with sharp claws, the toes connected by broad webs. The representatives of this Genus are furnished with a sharp spur on the wing, which they use as a weapon of defence; they are savage in disposition, biting fiercely when enraged.

The Spur-winged Geese inhabit Africa, and are not migratory; they breed in pairs, depositing four to seven eggs in a large nest on the ground near water, the male guarding the nest during incubation. Their plumage is black and white, and the voice is best described as a hoarse sibilant whisper. There are three species of *Plectropterus*, all of which have been imported into this country.

SPUR-WINGED OR GAMBIAN GOOSE.

(*Plectropterus gambensis*.)

This formidable bird, ten to fifteen pounds in weight, is an inhabitant of Central and Southern Africa, and is easily

recognized by its great size, bare face, long strong legs, and spurred wing.

Although Yarrell states that it has twice been shot in England, it cannot properly be reckoned as a visitor to our coasts. Like the Egyptian Goose, the *Plectropterus gambensis* pairs, and in some solitary place constructs its nest, which is usually placed in a marsh.

It was one of the species kept in the Knowsley aviaries, and laid in the Zoological Gardens in 1868, though no young were hatched. It is a quarrelsome bird, and likely to be dangerous in a mixed collection. I have seen it seize smaller birds, such as teal and pochards, in its powerful bill, and run rapidly round a paddock with its prize, dropping it when pursued, and evidently enjoying the mischief. Some fine specimens are preserved in the British Museum. The market value varies from £4 to £10 the pair.

Male—Top of head, nape, neck, upper breast and back black, with metallic green reflections; cheeks and throat brownish white; breast, shoulder, and abdomen white; feet reddish yellow, with long strong toes; wings long and pointed, armed with a powerful curved spur at the first joint; bill large, with a horn or tubercle on the upper mandible, both of which are of a reddish colour; eye very large, dark brown.

Female—Similar to male, but less, and the knob on the bill smaller.

Young—In down, fawn and brown; bill large and yellow. First feathers more brown than black. The tubercle not developed during the first year.

Egg—Yellowish white; three to six. July—August.

Nest Down—Ashy gray.

RÜPPELL'S SPUR-WINGED GOOSE.

(*Plectropterus rueppelli.*)

This Spur-winged Goose, which is considerably larger than the preceding variety, was acquired in 1858 by the Zoological Society of London, and was there identified as a separate species from the Spur-winged Goose of Western Africa, (*Plectropterus Gambensis*), by Mr. Sclater. There are also stuffed specimens in the British Museum. The Rüppell's Goose is an inhabitant of Abyssinia and Eastern Africa, being larger, higher on the leg, and somewhat different in appearance from the Gambia Geese. Mr. Sclater points out that "there is a large oblong naked space of bare pink skin on the throat, which is wholly wanting in the West African bird; the beak is longer, and the bony protuberance on the front is much larger and more elevated." This bird is occasionally procurable at £10 to £12 the pair.

Male—Back of head, neck, upper body, and sides, glossy bronze and black; front of face, throat, and under parts white; bill red, with a large bony protuberance on the upper mandible; naked pink skin on the throat; feet red.

Female—The same, but without the protuberance on the bill.

Young—No information.

Egg—No information.

BLACK SPUR-WINGED GOOSE.

(*Plectropterus niger.*)

Two males of this species were presented to the Zoological Gardens of London by Lieut.-General A. V. Cunyngnam, Commanding H.M. Forces at Cape Town in 1876. These birds were identified as a separate species by Mr. P. L. Sclater,

F.R.S., who in an address to the Zoological Society, stated that the habitat of this variety is Zanzibar and the S.E. African Coast. It is from Mr. Sclater's letter that I extract the description appended of the adult birds. That of the young bird I offer with diffidence, not being absolutely certain as to whether it is *Plectropterus Niger* or the preceding species *Plectropterus Gambensis*, the bird examined not appearing to be in all respects like the young of that variety.

Male—General appearance resembling *P. Gambensis*. Head and neck bronzy black, as is also the throat and under body; a small white patch on the lower abdomen; back and scapulars white, with a greenish lustre; wings bronzy purple; bill bright red, with the tip whiteish; eye black; legs and feet dull red.

Female—Similar but smaller.

Young—Entire plumage brownish black, with greenish lustre on wings, a line of white feathers round lower mandible and encircling eye; lower belly white; shoulder white; a few white feathers under chin; bill red, without protuberance, tip bluish white; eye large, almost black, encircled by a narrow rim of red skin; legs long, light red; long toes, broad web; shoulders terminating in spurs nearly half an inch long. Size, that of a hen turkey.

Egg—No information.

GENUS *CHENALOPEX*.

This small Genus is stated by Prof. Macgillivray to resemble somewhat in colour the Shieldrakes, and in form the Geese; the birds of this Genus, are of a reddish colour, resembling that of a fox, from which they are often termed Foxy Geese.

The body is full, the neck rather long and somewhat slender, the wing provided with an obtuse bare knob.

There are two species of this genus, both of which are represented in the Zoological Gardens.

EGYPTIAN OR NILE GOOSE.

(*Chenalopex Ægyptiaca.*)

The Egyptian Goose is, as its name implies, a congener of Africa, extending from Egypt to the interior of the Cape Colony southwards, and repairing northwards to the neighbouring countries of Europe. It may be identified on many of the old sarcophagi and bas-reliefs, where it is represented with singular fidelity in carving by the ancient Egyptians, (by whom it was revered as an emblem of parental affection,) while it is rudely delineated upon the pottery of the Nile. These birds are generally to be seen in considerable flocks on the banks of the rivers, and near ponds and tanks, uttering their peculiar cry, something between a bark and a quack, excepting during the breeding season, when they are usually met with in pairs. They are excellent swimmers and divers, and can progress under water for a considerable distance. They feed upon every description of vegetable, and obtain animal food from the mud of the shallow ponds of their native regions. Dr. Brehm, in his Work on Birds, states that the young birds are passionately fond of locusts, but do not appear to eat fishes. The flesh is very coarse and dark.

“In places where no trees are to be met with, these birds may construct their nests upon the ground, but whenever there are woods coming to the waters’ edge, or even single trees of suitable dimensions, their nests must be looked for among the branches. In Africa, they generally select for this purpose the thorny mimosa. Their nest is very generally constructed of branches derived from the tree itself intermixed with smaller twigs, and warmly lined with grasses.”

The breeding season in that country commences in the

early autumn, but this would, of course, differ in the case of specimens kept in confinement with us. The Egyptian Goose is extremely savage, and a terrible pest when kept with other waterfowl: it is, in fact, so dangerous an inhabitant of the duck-pond that it is scarcely advisable to admit it into a mixed society, unless the extent of the water is such as to permit of easy escape for the smaller and more inoffensive kinds. Two male birds of this description will fight to the death, pursuing each other with shrieks of rage, biting fiercely, and striking out with their long strong claws, the victor finally standing on his antagonist's back, seizing him by the neck, and literally drowning him by keeping his head under water. Their evil propensities are so marked that the amateur will do well to consider before he decides to introduce this bird to his collection, although tempted by its beauty, and the low price (about £2 a pair) at which it is usually offered. When caught they will turn round in the hand and grip their captor savagely, the strong pinch often bringing blood, at the same time striking with the wings, which are very strong and inflict such severe bruises that it is a matter of difficulty to retain the birds.

Male—The sides of head, and front of throat, white; a ring round the eye and collar round the neck, reddish brown: a broad band of the same passes down the nape of the neck; upper body gray with black markings; under parts reddish-yellow; breast and abdomen light fawn colour with a large chesnut patch in the middle of the breast; wing armed with a short spur; flight feathers metallic black, as is also the tail; beak red, with gray tip; foot and leg yellowish-pink; eye bright yellow orange.

Female—Similar to male, but smaller and colours less defined; eye yellow.

Young—Yellowish brown when in down. First feathers closely resemble adult plumage; eye gravel-yellow.

Egg—Grayish white or buffy white; thick shelled, round and smooth; four to eight. February—March. Incubation four weeks.

Nest Down—Short, uniform pale mouse gray.

ORINOCO GOOSE.

(*Chenalopex jubata*.)

This species, often called the Maned Goose, must not on account of the similarity of name be confounded with the *Bernicla Jubata*, or Maned Bernicle of Australia, the bird under consideration being allied to the Egyptian Goose and like it, armed with a knob on the wing. In the beautiful "Catalogue of the Knowsley Menagerie," date 1846, we find the following notes by Lord Derby—

"These birds breed freely at Knowsley. On the approach of a stranger they have the habit of raising their bodies nearly erect, swelling out their breasts and flapping their wings against the legs of the intruder. They sometimes bend themselves backward to such an extent that they appear as if they would fall on their backs."

It is an inhabitant of South America, being found upon the Amazon River. Examples of this goose have existed in the Zoological Gardens since 1830, but it has not bred of late years.

Male—Head, face, neck, throat, and breast white; shoulders, wings, and tail lustrous black; middle of back full chestnut; sides of body below wings, brown; upper mandible black, lower mandible orange; eye yellowish-brown; legs bright crimson. Length from breast to tip of tail about 1½ feet.

Female—Upper parts grayish-brown; wings and tail darker; under parts whitish; bill and legs dark brown.

Young—No information.

Egg—No information.

GENUS *ANSER*.

The Genus *Anser* comprises a number of different species, the greater part of which breed in the cold latitudes. The geese are the largest swimming birds with the exception of the swans. Professor Macgillivray says of the geese that the body is nearly equal in width and height, the neck slender, leg longer than that of the swan, the head small and arched; the feathers of the neck disposed in ridges. The bill is stout and short, much higher at the base than at the tip. The upper mandible has a series of ridges or plates at the edge; the throat is long and narrow; the stomach is furnished with an extremely powerful gizzard; the windpipe is uniform, without the enlargement observable in the swans; the eyes and ears are small; the legs are placed forward: the feet have four toes, the first small and free, a full web connecting the remainder; the claws are short and blunt. The geese inhabit chiefly the Arctic and Antarctic regions in summer, migrating in autumn to warmer climates. They are gregarious, fly rapidly and strongly, walk slowly and awkwardly, swim rapidly, but do not dive. Their food is entirely vegetable, consisting principally of grass. Their nests are placed on the ground, generally near water. The eggs of the *Anseres* are usually of a dull white colour, from six to thirteen in number, incubation lasting from four to five weeks. There are fourteen known species of this Genus, of which the following have not yet, as far as I know, been introduced alive: *Anser middendorfi* (Middendorff's Goose); *Anser gambeli* (Gambel's Goose); *Anser albatus* (Cassin's Snow-Goose); *Anser rossi* (Ross's Goose); *Anser canagicus* (Emperor Goose).

GRAY-LAG OR WILD GOOSE.

(*Anser cinereus*. *Anser ferus*.)

This species is the stock of our domestic birds, and occurs in Europe, Asia, and Africa, visiting our shores in the winter, when it arrives in flocks of from twenty to thirty. It is very swift and strong on the wing, and when migrating flies very high in a double line like a $\lessgtr$, led by an old gander. It nests among rushes, and has been found in Finland and in the North of Scotland during the months of May and June, when it is extremely shy and difficult to shoot.

Male—Head, back, and neck ash-brown ; front parts lighter in shade ; under body white, with a few large black spots scattered over the sides and under parts ; upper tail coverts white ; central tail feathers with a brown line ; beak and legs flesh-coloured ; eye hazel.

Female—Inferior in size ; colour same as male.

Young—When in down, upper parts are brownish and yellowish, white underneath. When feathered, colouring duller than the adult.

Egg—Dull creamy white ; six to sixteen ; heavier than those of any other British species. April—May. Incubation, four weeks.

Nest Down—Whitish gray.

TOULOUSE GOOSE.

(*Anser cinereus* var.)

Viewed in the light of an Ornamental Waterfowl, this domestic goose can scarcely be considered to claim a place in this manual. It is nevertheless a well-known exhibition variety,

and furnishes a striking illustration of what domestication and selection can effect ; specimens being known to weigh as much as thirty-eight to forty pounds, young birds even attaining twenty-three to twenty-five pounds, while the parent stock, the Gray-lag or true Wild Goose, *Anser cinereus*, weighs from seven to ten pounds.

Male—Deep, long, and square in shape ; head, neck, and breast rich gray, the feathers edged with lighter ; back, wings, and sides of a darker shade ; vent and abdomen whitish ; legs orange ; beak reddish orange, paler at the tip.

Female—The same, but smaller.

Young—In down, yellow and dusky.

Egg—White ; large, thick shelled. Incubation, thirty days.

EMBDEN GOOSE.

(*Anser cinereus* var.)

This fine bird, descended in the same manner as the Toulouse Goose, is another well-known exhibition variety. Somewhat similar in shape to the preceding, it nevertheless does not equal it in weight, rarely attaining more than nineteen or twenty pounds.

Male—Pure white ; bill pinky flesh-colour ; legs and feet orange ; eye blue.

Female—Similar, but smaller.

Young—In down, yellow ; bill, legs, and feet pink.

Egg—White. Incubation, thirty days.

SEBASTOPOL GOOSE.

(*Anser cinereus* var.)

This beautiful variety of the domestic goose has probably been produced by an accidental variation in the plumage of our farmyard birds in the same manner that the "Frizzled" and "Silky" fowls have been created. Its peculiarity consists in the extraordinary elongation of the back wing and body feathers, which in good specimens trail on the ground, the web being non-adhesive, giving a silky appearance to the birds. They are hardy and highly ornamental, yet are seldom seen at poultry shows. As a rule the plumage is pure white, though in some specimens pale gray or brownish patches are present. These geese are excellent sitters and fairly prolific layers. They roam less than most varieties, and are very suitable, owing to their gentle disposition, for small pieces of water, as they never take to the wing. A pair may be obtained at from £2 to £4 the couple.

Male—General form resembling the Emden Goose. Bill rosy red ; eye bright blue ; legs and feet red. Weight about eleven pounds. Many specimens have a round tuft on the top of the head.

Female—Similar to male. Nine to ten pounds weight.

Young—Silky down, bright yellow ; eye blue ; legs and bill pink ; fledge slowly.

Egg—Pure white, rough shell ; seven to nine, twice a year. Incubation, twenty-eight to thirty days.

PINK-FOOTED OR SHORT-BILLED GOOSE.

(Anser brachyrhynchus.)

This goose was frequently confounded with the Gray-lag and Bean Geese. Competent ornithologists have, however, identified it as a separate species. The first record of its appearance in England, according to Mr. Dresser, is the notice by Yarrell of a specimen killed in January, 1841, on the Marshes at Holkam. Lord Leicester supplied Mr. Dresser with a number of interesting notes on the appearance of this goose, which he states to have been seen almost yearly, since 1841, in large flocks, amounting to several hundreds. Of the two species with which it has been confounded, the Pink-footed Goose resembles the Gray-lag most closely. The species is said to occur in India, and a description of it is included in Dr. Jerdon's work on the birds of that country. It breeds, however, in the extreme north of Europe, during the months of June and July. This goose, with the other wild varieties, such as the Bean, Gray-lag, Bernicle, etc., are procurable in the London markets at prices varying from 20s. to 38s. the pair.

Male—Upper body grayish brown, feathers edged with white; head and upper neck brown, lightening into a brighter shade at the throat; shoulder and wing with the flight feathers, ashy-gray edged with white; abdomen whitish; legs and feet bright pinkish red; bill bluish black at base and tip, the remainder pink; eye dusky brown.

Female—Resembles the male.

Young—Upper parts brownish gray, barred with brownish white; lower hind neck reddish brown; lower parts more gray.

Egg—Pure white; six to eight. May. Incubation, four weeks.

BEAN GOOSE.

(Anser segetum.)

The Bean Goose is usually seen in flocks during the autumn months in the British Isles, and its general distribution resembles that of the Gray-lag Goose, being like that species an extremely shy bird. In Russia the Bean Goose arrives in enormous flocks of several hundred, and probably breeds in the northern latitudes. It has nothing special to recommend it as an ornamental waterfowl, being much less pleasing in appearance than its cousin, the Pink-footed Goose.

Male—Head and neck dark brown, with a narrow white line at the base of the upper mandible; the breast of a light tint, is flecked with pale brown; legs yellow orange, a band of which colour crosses the dark bill; eye dark brown.

Female—Similar to male, but smaller.

Young—Paler in shade than the old bird, with a yellowish tinge on the head and neck when in first feather.

Egg—Yellowish white, washed with stone coloured patches; "creamy white, rough" (Seebohm); five to seven. May—June. Incubation, four weeks.

Nest Down—Pale gray.

WHITE-FRONTED OR LAUGHING GOOSE.*(Anser albifrons.)*

This handsome bird has obtained the name of "Tortoise-shell Goose," on account of the mixture of brown, white, and black in the plumage. Mr. B. Morris speaks of it as being easily tamed, which alone would make it a desirable addition to our ornamental waters. The same author states that it

frequents more hilly districts than the Gray-lag or Bean Goose. It breeds in the Arctic Ocean, being found abundantly in Lapland, Sweden, and Northern Russia, while it has also bred in the Zoological Gardens. It can be obtained at £1 the pair.

Male—Head and front parts brownish gray, marked with splashes of black and brown; back, brown of several shades; tail and wings touched with white; bill, which is yellow, much serrated, having a broad band of white round the base of the upper mandible; breast pale brownish white, with broad irregular black bars; legs and feet orange colour; eye dark brown.

Female—Similar, with less white on the forehead.

Young—Upper parts dark, the head and neck of a lighter brown, the white band on the forehead very narrow, and tinged with orange. The dark bars on the breast not assumed the first year.

Egg—Whitish buff; slender and long; five to ten. May. Incubation, a month to thirty-three days.

LESSER WHITE-FRONTED OR LITTLE GOOSE.

(*Anser erythropus.*)

This beautiful miniature goose, which is an inhabitant of Northern Russia, and weighs about four pounds, would be a great addition to our list of fancy waterfowl, if it could be offered to amateurs. I am not aware that it has ever been found in England, although it has been shot in Northern Europe, as well as in Asia and India. Its breeding season occurs from April to June, five to six eggs being found in the nest, but we have very little information respecting its habits.

Since the above was written, Mr. Seebohm exhibited before the Zoological Society a skin of this goose shot in September, 1886, on the coast of Northumberland, being the first recorded visit of this variety to our Islands. It was a young female in first plumage, and without the white forehead.

Male—Head and neck reddish brown ; top of head, part of face, and throat white ; wings bluish gray ; tail dark gray, with a white tip ; bill whitish orange, with black tip ; legs and feet red.

Female—Resembles the male but smaller.

Young—Black and white plumage absent ; forehead brown ; legs yellow ; bill greenish brown.

Egg—Cream colour ; one end pointed ; five to six. April—June.

BAR-HEADED GOOSE.

(*Anser Indicus.*)

As its name implies, this goose is distinguished by three broad bands of black upon the back of the white head, the lower bar melting into a dark stripe extending down the back of the neck. The species is exclusively Indian, arriving in the northern parts of that country in the autumn in flocks of many hundreds, where it feeds upon the banks of the rivers, and takes toll of the rice and corn fields, breeding probably in the great lakes of the Himalayas. It is hardy but not a good breeder, a defect which will be overlooked on account of its ornamental appearance. The Zoological Society possesses several specimens, the first birds having been acquired in 1852. They usually cost from £5 to £6 a pair.

Male—Head white, barred with black on the nape of the neck ; sides of neck white ; upper body pale ash colour

with a reddish tint, each feather lightly bordered with white; the general appearance of the plumage ashy gray; wings and tail of a darker shade; eye light brown; bill yellowish; legs and feet orange.

Female—Similar to the male; less distinct in colouring.

Young—The young bird at three months old differs from the adult in head and neck markings. According to Messrs. Hume and Marshall, the bill is yellow with dark brown tip; legs and feet brown orange; forehead brownish white; top of head and back of neck dusky black; no trace of bars on the neck.

Egg—White and nearly round. July—August. Incubation, four to five weeks.

CHINESE GOOSE.

(*Anser cygnoides*.)

There are two varieties of this handsome goose, the Gray, better called Brown, and the White. They are great favourites in America, where they are much bred by fanciers, and are known as the "Swan Goose," "Chinese Swan," "Knob Goose," "Siberian Goose," and a variety of other fanciful terms. The bird is, however, a true goose, and will be found to eat quite as much grass as any other of our domestic varieties. Its special characteristic is a very long neck, and a large knob or tubercle at the base of the bill, having in addition a long dewlap attached to the under mandible and extending down the throat. It is a native of China, but has been brought from Africa and parts of Asia. The cry is very loud, and the bird seems to distinguish distant sounds with extraordinary facility, appearing in the night time to be constantly on the alert, when at the most distant footstep it will trumpet forth its note of alarm. When

excited, the bird takes to the water, and, elevating the tail and hinder parts, sinks its throat and breast, and proceeds in this singular attitude to scour through the water at a tremendous rate, uttering the most discordant sounds. This species appears to pair, and in the breeding season is extremely quarrelsome, being excellent layers, often commencing in January, and producing twenty-five to thirty eggs before wanting to sit, which they will do two or three times in the course of the year. They may be obtained at from £1 to £3 the couple.

Male—Ground colour of plumage, gray, each feather edged with a paler shade ; a dark brown stripe extends from the back of the head down the neck to the shoulders ; front of throat and breast clear reddish-fawn colour ; back, wings, and tail dark brown ; the beak, knob, and legs black ; eye black.

Female—Similar to male ; very much smaller ; knob on bill less developed.

Young—Top of body ashy-brown ; under parts yellowish-white in down. First plumage resembles that of adults.

In the White variety the plumage of both sexes is of that hue throughout, and the bill, knob, legs, and feet of a bright gamboge-yellow. Where there exists any deviation from this rule, I am inclined to regard it as the result of a cross between the two varieties.

Egg—White ; ten to twelve. March and September. Incubation, four weeks to thirty-two days.

SNOW GOOSE.

(*Anser hyperboreus*.)

Respecting the origin of this bird much confusion has existed, Wilson and Bonaparte considering it to be identical

with the "White-fronted Goose," "Blue Snow Goose," and "Bean Goose," in various stages of plumage at different ages—a theory which is now definitively exploded. Mr. Seebohm, in his excellent work on British Birds, states that there are two races of Snow Goose, a large and a smaller; those which have been obtained in the British Islands being probably the Lesser Snow Goose (*Anser hyperboreus*).

"The larger variety, distinguished as *Anser hyperboreus nivalis*, is at present only known to breed in Hudson's Bay Territory, wintering in the United States as far south as Texas."

The smaller race is only known to breed in the Arctic regions of North-West America, but the author quoted, observes that in all probability its breeding range is much more extensive, and that it may eventually be proved that both forms nest in Siberia. Wilson and Bonaparte refer to the Snow Goose as arriving in large flocks on the Delaware river, frequenting those shores from November to March, "feeding on the roots of the reeds, tearing them up from the marshes like hogs." Mr. Dresser observes—

"That this bird feeds on rushes, insects, and in the autumn on berries, particularly those of the *empetrum nigrum*; when well fed it is a very excellent bird, far superior to the Canada Goose in juice and flavour. It is said that the young do not attain their full plumage before their fourth year, until which period they appear to keep in separate flocks."

This bird is very shy and difficult to shoot, but may be caught in large, carefully prepared traps. Lord Derby's aviary at Knowsley possessed specimens of these birds, which were purchased at the dispersal of that collection by Mr. Castang, of Leadenhall Market; it is, however, but seldom offered for sale, though I have seen specimens in excellent condition at Mr. W. Jamrach's establishment, the price asked being £5 to £6 a couple.

Male—Fore part of head yellowish; remainder of plumage pure white; primaries black; large wing-coverts pale

gray; bill red, the mandibles much separated; the edges blackish, deeply dentated; legs and feet red; eye brown.

Female—The same.

Young—In first plumage, upper parts grayish brown; under body white; bill reddish brown; legs and feet bluish brown.

Egg—Yellowish white colour; "three inches in length" (Richardson). May. Incubation, about a month.

BLUE SNOW GOOSE.

(*Anser Cærulescens.*)

The Zoological Society of London obtained specimens of this Snow Goose for the first time in August, 1884; and careful observation will establish the fact that it is a different species from the preceding. Its size alone is sufficient to demonstrate this. It arrives in the interior of the North American continent from Hudson's Bay, incubates in the marshes of Labrador, and is considered excellent eating. Undoubtedly it is one of the rarest species of goose known, and it is much to be desired that other importations should be received in order to prevent the loss of the breed.

Male—Head and upper neck white, with reddish tint; upper body grayish brown; rump and wings pearl gray or ash blue; wing feathers black and gray; tail ash colour, bordered with white; bill and feet reddish.

Female—The same.

Young—In first feather, very similar to adult, but with less white; bill and feet blackish.

Egg—No information.

GENUS *BERNICLA*.

The members of this group are distinguished by Professor Macgillivray from the true Geese as having a short, narrow beak, which is somewhat high in the centre, and by the feathers of the neck being smooth, and not disposed in ridges, as in the *Anseres*. In this Genus the body is oval, the neck slender, and the bill much shorter than the head; the *lamellæ* or plates at the edge of the bill scarcely observable, the eyes are small, and the eyelids feathered; the moderately short legs are placed well forward; the wings are long, extending to the tip of the short rounded tail, which is generally composed of sixteen broad feathers.

The Bernicles are found in every quarter of the globe, and exhibit much variation both of plumage and habits. They frequent sand banks, salt marshes, and estuaries of rivers, feeding on grass, marine vegetables, shell-fish, and other mollusca. The nests are placed on the ground, being of rude construction; the eggs, usually from six to sixteen in number, are greenish white in most of the species. Incubation occupies from twenty-eight to thirty-one days.

Fifteen specimens of Bernicle are known to naturalists, of which two—*Bernicla nigricans* (Black Brent Goose) and *Bernicla cyanoptera* (Blue-winged Goose)—have not yet, Mr. Sclater states, been imported alive.

COMMON BERNICLE.

(*Bernicla leucopsis*.)

It was of this bird that was current the ancient superstition that the Barnacle, a shell-fish which attaches itself to rotten wood, and other objects in the sea, developed in time into a bird. The similarity of the name, and the fancied resemblance of the feathery body of the mollusc protruding from the half-

open shell, easily accounts for this absurd fable. The Bernicle is an ordinary winter visitor to the British Islands, and breeds during the summer months in Northern Russia, Greenland, and Iceland, migrating in large flocks to winter in Southern Europe. Its nest is composed of moss, dried herbage, and down, being usually placed in a sheltered position under low shrubs, or among rocks. It is easily domesticated, breeding freely in captivity, during May and June. In the winter live specimens brought from Holland may usually be purchased at about 20s. a couple.

Male—About four and a half pounds in weight. Forehead, cheeks, and chin white; a black band from eye to bill; nape of neck, throat, upper back and breast glossy black; back, shoulders, and wings silvery gray, each feather edged with black and white; tail black; lower breast and abdomen white; bill and legs black; eye dark brown.

Female—Resembles the male.

Young—Olive gray in down. In first plumage the head is white, spotted with black, with a buff tinge, and the black part of the plumage is rusty; legs brownish black.

Egg—White; five to six. April and May. Incubation, a month.

Nest Down—Whitish gray, with a lavender tinge.

CANADIAN GOOSE.

(*Bernicla Canadensis*.)

The habitat of this handsome goose is, as its name implies, North America, from whence it occasionally visits England, where specimens at different times have been shot, Yarrell therefore including it among British birds. This hardy species is distributed all over the United States, and extends its travels

into the Arctic regions. In Hudson's Bay it is shot in great quantities by the settlers, who depend much upon these birds and on their eggs for food. When in good condition these geese weigh about fourteen pounds, and being free and hardy breeders, would be a valuable addition to the game birds of our country could they be reared in sufficient numbers to afford sport. The species exists in large numbers in a semi-domesticated condition in most of the countries of Europe, Lord Leicester and the Earl of Wemyss possessing hundreds of these geese, which nest regularly upon the lakes on their estates. Their flight resembles that of other wild geese, and their nesting habits are similar. They can generally be procured at 12s.6d. to 15s. each.

Male—Head and neck black; throat and chin encircled by a broad white band extending to behind the eyes, whence its French name of "Cravat Goose"; breast and under parts fawn, margined with white; back and wings brown, each feather edged with a dull white line; rump and tail black, as also are the legs, feet and bill; eye dark brown. Weight ten to fourteen pounds.

Female—Similar.

Young—No information.

Egg—Dull yellowish green, sometimes dull white; six to nine. April—May. Incubation, thirty days.

Nest Down—Large, white, mixed with palest gray.

HUTCHINS' GOOSE.

(*Bernicla Hutchinsi.*)

This North American Goose is much smaller than the Canadian, though resembling it in colour, and breeds on the shores of the Arctic Sea, being seldom seen in the interior,

feeding on shell-fish and marine plants. According to Mr. Barnston, Hutchins' Goose does not incubate in scattered parties, but proceeds in united flocks to the extreme north, reaching Hudson's Bay about May, and re-appearing with the young broods in September. These birds are occasionally for sale, and dealers have offered them at £10 and £20 per pair at different periods, while a single specimen of this goose was received by the Zoological Society in 1860, but I am not aware that any others have been acquired.

Male—Head and neck brownish black, white crescent shaped patch each side of the neck, meeting under the chin; upper body bluish gray, with brown shades; tail-coverts white, black underneath; beak and legs dark.

Female—Similar.

Young—In feather similar but paler, and more white in plumage.

Egg—"Ivory white; three to four" (Baird, Brewer, Ridgway). Probably March—May. Incubation, about thirty days.

BRENT OR COLLARED GOOSE.

(*Bernicla brenta*. *Bernicla torquata*.)

Of this Bernicle Mr. Seebohm states that there are three forms, the Pacific Brent Goose, the ordinary Black-bellied Brent, and the White-bellied Brent (*Bernicla glaucogaster*). Both these last species visit our shores, the latter variety being very scarce. Mr. Seebohm states that unlike many species the Brent Geese migrate in one flock, old and young together, being very shy and wary, descending in large numbers to tear up and devour the roots of the grass-wrack (*Zostera marina*),

which grows upon the mud banks of the sea shore and estuaries of our rivers. The breeding place of the Brent Geese is, according to this author, Arctic America, Nova Zembla, and Spitzbergen, whence they descend in winter to the Mediterranean, and as far as the Black Sea and the Delta of the Nile. According to Major Feilden, who accompanied the Nares Arctic Expedition, the Common Brent arrives in the extreme north of the Arctic regions to breed early in June, the nests being placed on the slopes near the sea, containing four or five creamy-white eggs embedded in down. Dr. Brehm writes of the Brent Geese that they are caught in enormous numbers in decoys upon the southern coasts of the Baltic and in Holland during the spring and autumn months, whence they are sent into our markets, after having been fattened for some time upon grain and vegetables, in order to remedy the disagreeable flavour imparted to their flesh by the shell-fish, which form their usual diet. Being ornamental, and easily domesticated, these Bernicles are well adapted for our lakes and ponds, and may usually be purchased during February and March at 20s. to 30s. a couple.

Male—Head, neck, and breast with the quills and tail black; back, lower breast, and upper belly dark gray, edged with lighter; wings gray; a white crescent-shaped band each side of the upper throat; eye dark brown; bill and legs black.

Female—Somewhat smaller; black parts slightly rusty.

Young—In down, dark grey, "shading into white on the centre of the belly and sides of the head below the eye" (Seebohm). In first plumage the black parts are brown, and neck crescent absent.

Egg—Creamy white; four to five. June. Incubation, thirty to thirty-three days.

RED-NECKED OR RED-BREASTED GOOSE.

(Bernicla Ruficollis.)

This rare Arctic Goose is not at present procurable, and indeed is but very seldom seen in this country, Mr. Jamrach stating that its market value is about £30 a pair, skins alone fetching £5 to £6. Specimens have occasionally been shot in Britain, the first example, which is now in the Newcastle Museum, having been secured during the severe frost of 1776. Mr. Temminck states that it is seldom seen in Western Europe, and that its breeding places are the Frozen Ocean and the large rivers of Siberia, where it is so plentiful that, according to Professor Seebohm, thousands are sold at twopence each! The bird is strikingly beautiful, and well worth the attention of amateurs. I have, however, been able to collect but very slight information respecting its habits. Mr. Gould, in his "Birds of Britain," speaks of it as being the finest species of its own particular family, "for no other goose excels it in the richness of its colouring or in the fantastic character of its markings." Its general contour and size are as near as possible those of the Little Brent Goose, and a specimen lived for some time in the Zoological Gardens, where it became very tame and would feed from the hand. Mr. Seebohm, who undertook two arduous journeys to Siberia in search of Arctic birds, states that he found a Red-breasted Goose incubating during the month of June, and that young birds were observable in the Boganida river in the end of July. This bird, according to the author just quoted, never breeds more than three hundred miles from the coast, its range being extremely restricted.

Male—Beak small, almost black; irides hazel; between beak and eye a white patch; top of head and down back of neck dark brownish black, edged with white; upper surface of body and the long wings very dark brown, almost black;

wing-coverts edged with grayish white; throat dark brown; neck, ears, and upper part of the breast rich chestnut red, edged with and ending in a collar of white; lower part of the breast black; legs dark brown, almost black. Weight about three pounds.

Female—Duller in colouring but otherwise very similar to male; black collar on throat carried up to the chin and not so low on the breast; tip of tail white; the ear patch hardly indicated.

Young—Male in first plumage similar to adult male, but duller.

Egg—Greenish white; small and smoother than that of the Brent goose; six to ten; "creamy white with obscure traces of an underlying green shell; the surface rather smooth but not glossy, very fragile" (Seebohm). June—July. Incubation, twenty-eight to thirty days, as far as can be ascertained.

MAGELLAN OR UPLAND GOOSE.

(*Bernicla magellanica*. *Chloephaga magellanica*.)

The importation of this goose is much more extensive than formerly—one dealer alone having received 121 pairs in the spring of 1887. They may be procured at from £6 to £8 a pair, that being less than a third of the price which they formerly realized. When we consider the immense risk attending the importation of exotic birds and other animals into this country, we realize that prices—which at first sight appear exorbitant as the cost of a pair of fancy geese—in truth do not always recoup the dealer for the immense outlay their first introduction occasions. The Magellanic Goose is an inhabitant of Patagonia and the Falkland Islands, and is the

best known of the two varieties usually seen in this country, being easily distinguished by the extraordinary contrast of the plumage in the male and female. In their native country, the Magellan geese breed from August to October, Captain Abbott, in a letter to the "Ibis" (1861), stating "that he found from seven to eight eggs in a nest." The young birds nearly acquire their full plumage in the first year, but are distinguished by the mottled colour of their feet, and plumage somewhat less bright. They moult their wing feathers in the second year, and are then found in large flocks near the sea coast; being disturbed, they run down to the salt water, as they are unable to fly in this condition.

Dr. Cunningham, who accompanied an expedition to the Straits of Magellan as naturalist to H.M.S. "Nassau," from 1866 to 1869, states that the Upland Goose is very plentiful in the Falkland Islands and on the lower slopes of the Chilian Andes, as well as in the Straits, where it breeds in numbers. He remarks that these birds allowed the sportsman to approach within a few yards without taking alarm, one pair running over the ground without rising on the wing.

The Governor of the Falkland Islands (Mr. Moore) despatched the first pair of these Bernicles to the Zoological Society in 1857, another couple following five years later. They have since bred with tolerable regularity in the Gardens, being also reared with great facility on the Continent, and placing the nest by preference under a low bush hidden by tufts of herbage.

M. de Montlézun, a successful breeder of this species, found that his birds paired during February, the female not depositing her eggs till April, when she set herself upon seven; leaving them two or three times a day to feed and bathe. This gentleman states that the goslings left the nest at twenty-four hours old, being covered with gray down, whitish on the under

parts, with jet black feet and bill. The food which appeared to agree with them best, was a mixture of chopped lettuce, yolk of egg mixed with maize meal, and small millet moistened, the yolk of egg being discontinued after ten days. At the end of a fortnight he observed the colour of the birds' legs change, those of the males remaining black, while those of the female presented a yellow shade, the sexes being thus early distinguishable. The young geese were completely feathered at about two months old, and resembled the adults, but with more gray, and the markings less distinct.

M. H. de la Blanchère states that this Bernicle will mate with the true geese, and even with the larger variety of ducks, but that their offspring is incapable of reproduction. I have found it to be very gentle and timid, being often cruelly persecuted by other geese, and flying in terror before their open bills. It is necessary to remember this when placing the Magellan in a mixed collection, as there is great danger of mortal wounds being inflicted upon this unresisting cowardly bird, which will suffer large pieces of flesh to be torn from its back without attempting any retaliation. This bird will devour a large amount of grass, and is mentioned in the "Voyage of the Beagle" as living entirely on vegetable matter.

Male—Rather high on the leg; general appearance white; back pale gray, lightly barred, as is also the case on the shoulder and under side of the body, below the wing; the head is rather flat, and neck short; legs and bill black; wing-bar green.

Female—Ground colour, clear chestnut fawn, with black bands, the body evenly barred with black; neck and head chestnut; legs orange yellow; shoulders white; wing-bar green.

Young—In down, ashy brown; throat and upper breast white; short bill black; legs black. In first feather both sexes have the head and upper part of the neck ashy brown, below

grayish white, barred with dark brown ; thighs and under parts white ; bill black ; legs blackish.

Egg—Creamy white ; four to eight. April—May. Incubation, thirty to thirty-three days.

Nest Down—Small ; brownish white ; uniform grayish white, interspersed with small barred feathers.

CHILIAN GOOSE.

(*Bernicla dispar.*)

This Bernicle is usually offered for sale by dealers under the name of "Second Species of Magellan Goose," at prices varying from £7 to £10 the pair. The first specimens of this Bernicle were received by the Zoological Society in 1871, but the female unfortunately dying soon afterwards, the male was mated with a female Upland Goose (*Bernicla magellanica*) which produced a pair of young birds exhibiting in the male the characteristic stripes on throat and under body of *Bernicla dispar*. This species has been very successfully bred on the Continent, and is much to be desired as an inmate of a collection of waterfowl, being gentle in habits and considerably more ornamental than the first variety. It is an inhabitant of Central Chili, and recorded by Burmeister to frequent the districts southwards of Buenos Ayres. Like its congeners this goose lives in small flocks, seldom approaching the sea, and is a vegetable feeder. The only distinction between the males of *Bernicla magellanica* and *Bernicla dispar* consists in the black bars on the breast and under body of the latter.

Male—Head, neck, and shoulders white, barred on the back and breast with broad dark bands ; wing and tail-coverts white ; flight feathers and tail black ; legs and bill black.

Female—Similar to female of *Bernicla magellanica*.

Young—In first feather, head and neck brownish gray ; under body, grayish white, indistinctly barred ; legs, greenish black.

Egg—White. April—May. Incubation about four weeks.

ASHY-HEADED GOOSE.

(*Bernicla poliocephala*. *Chloephaga poliocephala*.)

This rare goose, of which there are several specimens in museums, was first acquired alive by the Zoological Society in 1851, a pair of these birds having been purchased from Lord Derby's Knowsley Menagerie, which subsequently bred well in the gardens. Dr. Cunningham, Naturalist to H.M.S. Nassau in the years 1866 to 1869, during the expedition to the Straits of Magellan, remarks upon the beauty and tameness of these birds, of which he describes the flesh as being very good and superior to that of the other species. The young birds do not acquire the ruddy breast of the adults until their second feathering. It is some time since any were offered for sale, when they realised £5 to £7 a pair.

Male—Head and upper part of neck, ash gray, changing into reddish brown on the back and breast, barred with a darker colour ; shoulder, white ; upper part of legs and centre of breast, white ; rump and tail, black ; bill, black ; legs, orange,

Female—The same but smaller.

Young—In first feather, brown, upper body and lower breast barred with darker ; red breast absent.

Egg—Creamy white ; four to five. April—June. Incubation, about four weeks.

RUDDY-HEADED GOOSE.

(*Bernicla rubidiceps.* *Chloephaga rubidiceps.*)

This Bernicle is not at present procurable alive in Europe, which is a matter for regret, as it is both hardy and ornamental, doing well in captivity, the value being about £10 10s. the couple. It is a native of the Falkland Islands, and may at some future time, be included with an importation of the other Bernicles which come to us from that locality. Captain Abbott, in a communication to the "Ibis," states that he saw them in considerable numbers near the Strait of Magellan, associating strictly in pairs. We have but little information concerning the habits of the Ruddy-headed Goose, but it is said that during the breeding season, the male remains near the spot where the female is sitting on her nest, this being usually placed among low shrubs. The young are hatched about the first week of November, assuming full plumage during the first year, with the exception of the wing-bar, which is of a dull greenish black.

In 1860, the Zoological Gardens exhibited two pair of this Bernicle, which were obtained from the Falkland Islands, and bred from 1865 to 1870, after which time the entire stock unfortunately died out. The stuffed specimens in the British Museum are stated to have been imported from the Island of Chiloe. The sexes are absolutely similar, the female only distinguishable by her inferior size, and quacking call, the voice of the gander being a long whistle.

Male—Head, throat and breast sandy red, finely barred with a darker shade; shoulder white; back and wings ash brown; wing-bar brilliant green, edged with white; under parts light red; bill dark brown; legs and feet reddish yellow; eye brown.

Female—Similar, but smaller.

Young—In first feather similar to adults; wing-bar blackish green.

Egg—Whitish. April—June. Incubation, about a month.

ANDEAN GOOSE.

(*Bernicla melanoptera*. *Anser montanus*.)

This goose is referred to in "The Voyage of H.M.S. Beagle," which occurred during the years 1832 to 1836, under the command of Captain Fitzroy, who was accompanied by Mr. Darwin as Naturalist to the Expedition. Very little is known of the habits of this bird, which is a native of Antarctic America, the specimens possessed by the Zoological Society not having bred. Messrs. Sclater and Salvin describe this fine Bernicle as inhabiting the heights of the Andes of Peru and Bolivia, descending during the winter to the plains, and retreating in summer to the mountains on the verge of the line of perpetual snow. It has been observed at Lake Titicaca at an elevation of from 11,000 to 14,000 feet above the level of the sea. (P.Z.S., 1876.)

Male—White; wing feathers black; gray shade on head and neck; bill orange, tipped with black; legs and feet yellow orange.

Female—The same, but considerably smaller.

Young—No information.

Egg—No information.

KELP GOOSE.

(Bernicla antarctica.)

Mr. Sclater's "List of the certainly known species of *Anatidæ* (1880)," informs us that a single example of this *Bernicla* was imported in 1868, and I am not aware that it exists in any of the Continental Zoological Gardens. It is an inhabitant of Antarctic America, Dr. Cunningham stating that it is common throughout the western part of the Strait of Magellan and on the west coast of the Continent as far west as Chiloe, where he found it exceedingly wary, probably in consequence of being often disturbed by the Indians who occasionally kill it, although, as this author remarks, its flesh is quite uneatable at most seasons of the year, owing to the nature of its food which consists of shell-fish and other marine animals. The Kelp Goose is never seen in large flocks, being usually found in small parties of five and six, and more constantly in pairs only. An illustration is given in the account of the "United States Astronomical Expedition, 1849," representing these striking birds, which, like the Magellanic Geese, exhibit a marked contrast in plumage, that of the adult male being white, and of the female rich brown barred with black; while an illustration of the female is given in the "Voyage de la Coquille." The following is taken from the "Cruise of the Alert, 1878 to 1882":—

"Tom Bay.—The month of January is here the breeding season with most of the water birds. About the middle of the month the Steamer Ducks (*Tachyeres cinereus*) and the Kelp Geese (*Bernicla antarctica*) were paddling about with their young ones. . . . We remarked that the Kelp Geese, which as a rule never wet their feet, except with the damp seaweed of the foreshore, take to the water, as soon as their young are hatched, being probably induced to do so in order the better to protect their goslings from the hawks and rats."

Mr. Darwin calls this bird the "Lowland Goose," from the fact of its frequenting the Lowlands and sea coast of South

America, and the adjacent islands. Captain King brought home skins of this Bernicle, which are preserved in the Museum of the Zoological Society. It is necessary to observe that in dried specimens the bill and legs are often dark brown, a deterioration of colour which generally occurs after death. My description is founded upon the plates referred to above.

Male—Pure white, with the exception of part of the wing feathers, which are ashy black; legs orange; bill black; (according to Azara, orange).

Female—Face, throat, breast, and abdomen black, each feather barred with white; back of the head reddish brown; wing-coverts brownish black; back, tail, and remainder of wings white; wing-bar bluish green; legs yellow; bill dusky orange.

Young—Ashy gray. Sexes scarcely distinguishable till after the first year.

Egg—No information.

MANED GOOSE.

(*Bernicla jubata*.)

This small Bernicle is stated by the great traveller, Gould, to breed in hollow trees, but very little is known of its habits. In Mr. Silvester Diggle's work on the "Ornithology of Australia," the Maned Goose is reported to be very largely distributed over the Australian Continent, associating in companies of from eight to forty, generally being found feeding among the grass in the neighbourhood of lagoons, perching commonly on trees, as do also other species of Australian ducks and geese. It is known among the colonists by the name of the "Hawkesbury Duck," being very plentiful on that river. The

flesh is excellent, and the bird betrays its presence by a loud barking note which Gould states to be unlike that of any other species. The Zoological Society received it for the first time in 1864, but it has not, I believe, yet bred here, although this has been successfully accomplished by several Belgian and French amateurs, among them being M. Roffay, of Angers, M. E. Courtois, of Paris, M. de Montlézun and others, who have by the exercise of talent and perseverance, succeeding in breeding not only this variety, but a large number of other exotic waterfowl. The Maned Bernicle, according to the experience of several amateurs communicated to the "Bulletin de la Société Impériale d' Acclimation," is prolific in captivity, M. Courtois obtaining in one year thirty-five eggs from a pair, which he describes as white tinted with yellow, the female sitting in the month of May, and invariably covering the eggs on leaving the nest. M. Courtois in breeding these birds found them to thrive upon wheat, barley, and buckwheat, and expresses his opinion that animal food is indispensable during the laying season, at which time the buckwheat and barley were discontinued, and worms were plentifully supplied. This amateur is strongly in favour of allowing the birds liberty in running water where practicable. The Maned Bernicle is very seldom for sale in England, but Continental bred specimens may occasionally be obtained at from £4 to £6 the couple.

Male—Head (which is slightly crested) and neck, brown; the feathers, which are long and ruffled down the back of the neck (giving rise to the name of Maned Goose), darker on the upper part; throat and breast white, each feather bordered with two irregular brown bands, causing the breast to look as if marbled; flanks silver gray, pencilled with wavy black lines; centre of abdomen and under tail coverts glossy black; shoulder and upper wing-coverts reddish gray; wing-

bar green and white; bill olive brown; eyes, legs, and feet dark brown.

Female—Similar to male. Two pale lines extending from bill to back of head across eye; centre of abdomen and under tail-coverts white.

Young—No information.

Egg—Whitish yellow. April—June. Incubation, about a month.

SANDWICH ISLAND GOOSE.

(*Bernicla Sandvicensis*.)

This goose, which is yet somewhat rarely offered for sale, is so extremely handsome and hardy, as to render its acquisition desirable by all who can afford £10 or £12 for a pair, at which price it is now offered, in striking contrast to the sum of £60 which a few years back was willingly given for them. It arrives in this country from Polynesia, the date of its first importation being about 1832, when a pair was presented to the Zoological Society, a gift soon followed by young birds from the Knowsley Menagerie, the descendants of both breeding regularly for many years. This bird is a great grazer, and does not appear to frequent the water much. The nesting season is from March to June, and it has bred in captivity in the collections of several amateurs, as well as in various European Zoological Gardens. This variety is a favourite among Belgian amateurs, who find a ready sale for young birds at from £6 to £8 the pair.

Male—Top of head, chin, back of neck, and sides of face black; sides and front of throat creamy brown, lightly spotted with a darker shade; a black ring encircles the neck; remainder of plumage brown, each feather bordered with a

broad white line; breast and under parts mottled; abdomen white; eye full and dark; bill and legs black, with a shade of orange.

Female—The same.

Young—In first feather, and even in down, easily identified from its likeness to the adult bird.

Egg—White; large; five to eight. April—May. Incubation, one month.

GENUS *NETTOPUS*.

This Genus comprises four species of diminutive Bernicles, none of which have been imported alive. Their size is somewhat less than that of the Common Teal; they are found in Africa, India, and Australia, nesting in trees and in crevices of rocks. The best known species is the Indian Pigmy Goose, inhabiting India and Malacca, which is described; the other three are *Nettopus auritus* (Eared Pigmy Goose); *Nettopus albigennis* (White-winged Pigmy Goose); and *Nettopus pulchellus* (Beautiful Pigmy Goose), of which we know but little, save from the writings of Gould.

INDIAN PIGMY GOOSE, OR COTTON TEAL.

(*Nettopus coromandelianus*.)

This pretty little bird, which, although not so large as the Teal, is yet a true goose, derives its misleading title of "Cotton Teal" from the quantity of white in its plumage. It is abundant in most parts of India, as also in Ceylon and the Andaman Islands, Hume and Marshall stating that throughout the year this miniature goose is so common in the Calcutta market, that as many as three hundred are brought in every

morning. The favourite resorts of these birds are pieces of water much overgrown with weeds, and shaded by trees; they are said to be very fast upon the wing, flying in flocks of twenty to thirty during the cold season, but during the breeding time they associate in pairs, breeding generally in holes of old trees. Indian travellers describe them as breeding in July and August, the ducks only attending to the duty of incubation, Dr. Jerdon stating that they lay from eight to fifteen small eggs. They dive like grebes, but, as was remarked by Blyth, they can hardly walk at all, "their shuffling gait distinguishing them as water birds. The pictures representing them as standing on the ground like ordinary ducks are erroneous, as they squat and creep, but are only able to shuffle forward a few paces." They feed chiefly upon rice and shoots of water-plants, with a proportion of worms and insects. Mr. Jamrach reports that much difficulty would attend the importation of these birds, owing to an affection described as paralytic which seizes them when removed from the water, which I think may be analogous to the cramp referred to in connection with the "Paradise Duck."

Male—Top of head, back, and wings black, with purple and green reflections; wings dark, with a large white patch on each; face, neck, and under parts pure white, with a black circle round the neck during the breeding season; eye reddish brown or crimson; leg yellowish green, with black foot; bill black.

Female—Smaller, and much duller in plumage; the markings more indistinct; eyes dark brown; legs and feet dusky green.

Young—In down, entirely black; in first feather, resemble female.

Egg—White; eight to fourteen; size of small bantam's egg. July—August.

SUBFAM. IV. CYGNINÆ.

GENUS *CYGNUS*.

This Genus, says Macgillivray, includes a small number of species remarkable for great size and length of neck. The bill as a rule is rather longer than the head, being furnished with a tubercular protuberance at the base, which attains its greatest development during the breeding season, afterwards decreasing in size. The plumage is close, full, and firm, usually pure white ; the wings long and broad ; the tail short, composed of from eighteen to twenty-four feathers, rounded at the tip. The legs, which are short and furnished with broad webs between the toes, are placed a little behind the centre of the body. The young of the *Cygnus* do not moult during their first year.

The swans chiefly inhabit temperate and cold regions, in which last they breed. The nest is generally close by or upon the water, so arranged as to float in case of inundation. The eggs are usually whitish, six to nine in number, incubation lasting about forty days. The food of the swans is very diversified, consisting of every variety of vegetable matter, together with small fishes, tadpoles, worms, and similar animals. All the species are migratory and gregarious, flying in large troops.

Ten species of swans are recognized ; the two which are not yet known in captivity being *Cygnus Americanus* (Wild American Swan) and *Cygnus Davidi* (Père David's Swan), a species inhabiting Northern China, which Mr. Sclater states is as yet only known by a single specimen at Pekin.

COMMON OR MUTE SWAN.

(Cygnus olor.)

This variety is the best known of the family, a pair being found upon almost every piece of ornamental water of sufficient size ; they may be said to exist in a state of semi-domestication, being undoubtedly the descendants of the Wild Swan, which lives in large flocks in the temperate and cold latitudes of the world. The swan is migratory and leaves the Polar Seas early in the autumn, when flocks numbering about twenty-five to thirty, make their way to more genial climates. It is, therefore, necessary to pinion individuals retained in captivity in order to prevent their escape when the migratory instinct comes upon them. Our Common Swan was introduced into England, according to Yarrell, about the twelfth century, and therefore has a good right to be considered as a domestic waterfowl, while it also possesses the proud distinction of having been long considered as a royal bird, only to be held by subjects as a privilege from the crown. During the breeding season the swan becomes very savage, and is then dangerous to approach. The nest is a huge mass of reeds, sticks, and other rubbish, and is usually placed close to the water, by preference at the edge of an island. These birds pair for life, and are a model of devotion one to the other. The male bird may be seen during incubation either swimming as a sentinel, or seated close beside his mate half hidden by the water reeds, among which the nest is usually built. The food of the swan consists in great part of various kinds of aquatic vegetables ; they are large feeders, and will devour snails, small fish, eels, as well as various sorts of insects. These birds are very long lived, and have been known to survive over fifty years. They are always procurable at from £2 a pair.

Male—Plumage of a dazzling whiteness; feet and legs black; bill reddish orange, with a tubercle at the base, black.

Female—Similar to male, but smaller.

Young—Ashy gray, becoming white when about two years old; bill dark slate colour.

Egg—Greenish white; five to seven. March—April. Incubation, about forty days.

POLISH SWAN.

(*Cygnus immutabilis*.)

This bird derives its name from the unchangeableness of the plumage, the cygnets being white from the egg. It was first identified by Mr. Yarrell as a separate species in 1838, at which time flocks numbering several score visited both Scotland and England from the Baltic Sea, when several specimens were shot and submitted to examination; others have been shot in England, and also a young male in Scotland during September, 1872. It has since been included in various collections, where it has bred freely, notably in that of Mr. J. H. Gurney, F.Z.S., who furnished the Zoological Society with a number of interesting notes on the cygnets. The Polish Swan has also been bred in confinement by Lord Lilford for two generations, each time the young birds hatching of a white colour.

Male—Plumage white; very small black tubercle on the bill which is orange, edges and tip black; feet yellowish gray; eyes brown.

Female—The same.

Young—White; bill flesh colour; feet ash coloured.

Egg—Dirty white; four to eight. April—May. Incubation, five to six weeks.

HOOPER OR WHISTLING SWAN.

(*Cygnus musicus.* *Cygnus ferus.*)

This swan is the largest of the species found wild in Europe, the adult male often weighing from twenty to twenty-five pounds. It is occasionally shot during severe winters in England, and is distinguished from other varieties by its loud whistling cry. Upon the water it resembles the goose, from the upright way in which the neck is held, and is altogether less graceful in its movements than our tame bird. It breeds, according to Seebohm, in Siberia, frequenting the same countries as the Mute Swan, and, like *Cygnus olor*, migrates in flocks towards the approach of winter. Its breeding season commences about the middle of April, the domestic arrangements being similarly conducted to those described under the head of Mute Swan. The Zoological Society possess the Hooper, which bred in 1839 to 1842, but has not done so of late years, Mr. Sclater stating that it cannot by any means be considered a free breeder in confinement.

Male—Plumage pure white ; base of the bill, from eye to nostril, bright clear yellow ; remainder of upper and under mandible black ; legs and feet dull black ; eye hazel. No knob on bill.

Female—The same, but somewhat smaller.

Young—Upper parts grayish brown ; under body dirty white ; bill and legs yellowish pink.

Egg—"Creamy white with a slight gloss" (Seebohm) ; five to seven. March—May. Incubation, forty-two days.

. TRUMPETER SWAN.

(*Cygnus buccinator.*)

This swan is similar to the common domesticated form, but of nearly double the size. The Trumpeter is prolific in captivity, having bred both in the Zoological Gardens of London and of Paris. It breeds in its wild state in the interior of North America, the skin being exported in large quantities from Hudson's Bay. Messrs. Baird, Brewer, and Ridgway's book on "North American Birds" furnishes a full description of its habits. Its name of Trumpeter is derived from its peculiar cry, dependent on the formation of the wind-pipe, described as "very long, bent in S shaped turns through hollows of the breast bone." Sir John Richardson states that this swan arrives in the spring, and frequents fresh water lakes and rivers; it is described as a most rapid swimmer, shy and cautious, extremely difficult to take, scudding before the wind with its wings raised like sails, being reckoned, when flying in a gale, to travel at a rate of a hundred miles an hour. The weight of a good specimen is about thirty pounds—Mr. Audubon says thirty-eight pounds, he having kept one alive several years which became very tame. Herne describes the flesh as excellent eating, resembling young heifer beef, and says that one of the enormous eggs is a sufficient meal for a man. The Trumpeter, which, like all swans, pairs strictly, makes its nest among reeds, dry grass, and leaves.

Male—White, the head and neck occasionally being tinged with rusty colour; bill and legs black.

Female—Similar.

Young—In feather; bill black, with a patch of light flesh colour; feet dull yellow; head reddish; other parts grayish white.

Egg—Four in number, of a chalk-white colour. May—July. Incubation, thirty-six days.

BEWICK'S SWAN.

(*Cygnus Bewicki*. *Cygnus minor*.)

Bewick's Swan, although discovered nearly a hundred years ago, was confounded by Pallas, the Siberian traveller and naturalist, as a small variety of *Cygnus musicus*. It was again identified as a distinct species in 1829, at which time several specimens were shot near Newcastle by a gentleman named Wingate. Mr. Seebohm, writing on this species, remarks that its breeding grounds are confined to the tundras east of the White Sea, in the lower valleys of the Petchora and other Arctic rivers, and to the islands of the Arctic Ocean near these limits. This traveller observed Bewick's Swan arrive in the valley of the Yenesay, within the Arctic circle, early in May, being very shy and difficult of approach, and to him fell the distinction of obtaining the first identified eggs of this interesting bird. Bewick's Swan is a winter visitor to the coasts of Great Britain, having been observed in thousands during frosty weather on the west coast of Ireland. In 1871 *Cygnus Bewicki* was obtained on the lakes of the Northern Hebrides. Examples of this bird are plentiful in Natural History Museums, some fine specimens existing in the Dover collection, which were shot near Rainham (Kent) in March, 1845, and presented to the Museum by the well-known local ornithologist, Dr. Plomley. Respecting the nesting of *Cygnus Bewicki*, we learn from Mr. Seebohm's work that it resembles that of the Hooper, the eggs being somewhat smaller.

Male—Pure white, very brilliant in hue ; bill deep yellow at base, not extending below the nostrils ; remainder of bill black ; legs and feet black ; eye dark chestnut.

Female—Similar, but smaller.

Young—In first plumage, upper body dark gray, under parts whitish ; eye orange ; bill paler in colour than adult.

Egg—"White ; smaller than those of Hooper ; somewhat less glossy" (Seebohm). April—June. Incubation, probably six weeks.

BLACK SWAN.

(*Cygnus atratus.*)

This bird is not quite so large as the Mute Swan, and is more slender in make. It is found in large flocks in the South and West of Australia, breeding from the end of September till the middle of January. Dr. Bennett mentions in his "Gatherings of a Naturalist in Australasia" that the Black Swan was some time since so abundant in the southern districts of Australia and Tasmania, that he has seen a drove of them being driven like a flock of geese up one of the principal streets of Sydney. He states that the breeding season commences in October and continues until the middle of January, and that these swans, like many other Australian birds, are very prolific, producing two or three broods in twelve months. The nest, which is of large size, and formed of dry reeds, usually contains five to eight eggs of a pale green or blue colour, stained with brown, nearly five inches long. In this country *Cygnus atratus* have been successfully bred in Surrey by Mr. Samuel Gurney, of Carshalton, who gave the following interesting account to Mr. Gould :—

"They were purchased in 1851, and laid their first egg January 1st, 1854 ; it was a most severe winter, snow on the ground, and intense frost nearly the whole time they were sitting ; it was observed that both sexes assist in the duties of incubation, the female usually remaining on the nest during the night ; they hatched their young during the greatest cold of that winter, from which they did not suffer, though they had no shelter of

any kind, and their nest was fully exposed to the east wind. Out of the ninety-three young ones hatched by them up to the present year, 1862 (inclusive), about half that number have been reared. Some of them have died from disease, but most of them have been killed by the old ones dragging them about in the fields, when they have fallen into small holes on their backs, and have not been able to recover themselves. They have bred sixteen times in seven years, having laid 111 eggs."

It is needful to recollect that owing to the inversion of the seasons, the breeding time of imported Australian birds undergo modification. Mr. Gurney's birds bred at their natural time, but those in the Zoological Gardens have laid in different years during March, April, May, August, September, October, and November. A pair of these swans may usually be obtained at from £8 to £10.

Male—Entire plumage dull black; part of the flight feathers white; eyes bright red, as is also the beak, which has a white tip; feet black.

Female—The same.

Young—Grayish white in down.

Egg—Pale green, with brownish patches; four to eight. January—April; August—November. Incubation, thirty-four to thirty-seven days.

COSCOROBA SWAN.

(*Cygnus coscoroba.*)

The Zoological Society first acquired these elegant birds in 1870, which made a nest, but did not succeed in hatching their eggs. They are natives of Chili, and were observed by Burmeister in large numbers during the winter near Santa Fé, where they frequented the lagoons in flocks like the Common Swan. The Coscoroba was observed by Darwin, Cunningham, and Musters, in the Straits of Magellan, on the Falkland

Islands, and in Patagonia. Captain Abbott records that this species breeds in the neighbourhood of East Falkland, young birds of about a month old having been observed at Mare harbour.

Male—Very slender and graceful in appearance, about the size of the Egyptian Goose. Plumage pure white; the primaries touched with black; bill wide, without a tubercle, of a fine rosy pink, with whitish tip; feet and legs pinkish red.

Female—Similar.

Young—No information.

Egg—Whitish. October.

BLACK-NECKED SWAN.

(*Cygnus nigricollis*.)

These magnificent birds are the most striking of the swan tribe, and are natives of Antarctic America. Dr. Cunningham, in his work on the "Natural History of the Strait of Magellan," mentions finding the nest of the Black-necked Swan during the month of October, containing eggs, as also the nest and eggs of *Cygnus coscoroba*. The first specimens brought to Europe were presented to the Earl of Derby in 1851, by Admiral Hornby, then commanding H.M.S. Fleet in the Pacific. From his collection a pair were sent to Windsor, and at a later period some birds were presented to the Zoological Gardens in Regents Park, where this species first bred in 1857, and have since continued to do so regularly. Respecting *Cygnus nigricollis* I have a note to the following effect from the pen of Mr. Edwin H. Banks, of Wigton, in Cumberland, who states that his Black-necked Swans went blind during the winter, which apparently was too severe for these tropical

birds, while the Black Swan bred freely, nesting both in the spring and autumn. It would probably be found necessary to keep the Black-necked Swan in a sheltered enclosure, with a warmed sleeping house on its first arrival in this country, and to pay special attention during the first moult, which often proves fatal to newly-imported birds. The Genus is, however, now so firmly established in Europe, that it would be easier to procure hardy home-bred specimens than recent importations; the value of this Swan being generally about £20 to £25 the pair.

Male—Body pure white; head and neck glossy black, with a white line round the eye; bill gray, with a patch of red on the cheek; feet dark pink.

Female—Similar.

Young—White when hatched, acquiring the black neck at the first feathering.

Egg—Greenish gray; six to seven. May—June. Incubation, thirty-four to thirty-six days.



SUBFAM. V. ANATINÆ.

This Subfamily is a large one, including the following Genus which I give in the order adopted by Mr. Sclater:—*Dendrocygna*, *Sarcidiornis*, *Cairina*, *Tadorna*, *Stictonetta*, *Aix*, *Mareca*, *Dasila*, *Anas*, *Chaulelasmus*, *Heteronetta*, *Marmaronetta*, *Rhodonessa*, *Querquedula*, *Spatula*, *Malacorhynchus*, *Metopiana*. Only such birds of each Genus are described as have been, or are likely to be imported alive.

GENUS *DENDROCYGNA*.

The Tree Ducks are a Genus comprising ten species of birds, which, although web-footed, are remarkable for perching, and in many instances nesting in trees.

They have a high slim body, long neck, small head, and weak bill. The legs are very long, the feet not fully webbed, the hind toe free, the claws long and strong, the wings moderate in length, the tail somewhat short, round at the tip, the plumage gray and brown of various shades.

Messrs. Sclater and Salvin describe this Genus "as a good example of what may be called a Tropicopolitan group, being represented nearly everywhere within the tropics. In America four very distinct species are found, besides another that is scarcely more than a representative form." P.Z.S. (1876.)

From various works we learn that the Tree Ducks usually rest during the great heat of the day, feeding at sunset, and in some instances throughout the night. They are vegetable feeders and gregarious, living in large flocks, they are monogamous, the female being much attached to her young, which

she conveys to the water when hatched, in her bill or claws. Their eggs are whitish, the breeding season lasting in most instances from June to September. Of the Tree Ducks enumerated by Mr. Sclater,—*Dendrocygna guttulata* (Spotted or Müller's Tree Duck), from the Moluccas; and *Dendrocygna vagans* (Wandering Tree Duck) from the Philippines and North Australia, are undescribed, not having been yet introduced alive so far as I know.

WHITE-FACED TREE DUCK OR WHISTLING DUCK.

(*Dendrocygna viduata.*)

These birds, first received by the Zoological Society in 1835, are said to exist in enormous quantities in South America, where they spend the hot hours perching on the branches of the trees overhanging swamps. Dr. Brehm states that he has met them on the Upper Blue Nile in such numbers that on taking wing they presented the appearance of a dense cloud. In Baird, Brewer, and Ridgeway's work on the "Birds of North America," the White-faced Whistler is stated never to alight in deep water, on account of the alligators, of which it has a great dread. These ducks, known to dealers as "Widow" Ducks, are constantly exhibited, being sufficiently plentiful in the market as to be obtainable at from £3 to £5 the pair, and are a most desirable addition to the duck pond, becoming extremely tame, and even attached to their keeper. In exhibiting this variety it is necessary for the judges to ascertain that the pen contains a veritable male and female, as the plumage being exactly similar, it is, in some cases, almost impossible to identify the sex at a first glance. The colours, however, in the female are less bright, and the edges of contrasting colours not quite so sharply defined as in the male.

Male—Face and cheeks to behind the eye, pure white;

chin and a band round front of throat white; back of head and neck black, extending to under the chin; upper neck and breast dark chestnut; back dark brown, with an olive shade; wings brown, each feather laced with lighter; tail, abdomen, and thighs black; flanks yellowish white, finely barred with black; bill and legs blackish blue; eye small and black.

Female—Similar to male, less distinct in colour.

Young—No information.

Egg—Yellowish white, streaked with buff. July—August. Incubation, about thirty days.

RED-BILLED TREE DUCK OR WHISTLING DUCK.

(*Dendrocygna autumnalis.*)

This variety, also known as "Black-bellied Whistler," is well known in the show-pen, from which it too often returns deteriorated most sadly in plumage and condition. It is about the size of the Widgeon, though considerably more slender and standing high upon a pair of long red legs. Its natural habitat is Mexico and Central America, where it is found on the hot marshes of Guiana and Brazil; nevertheless it is capable of acclimatization, and when safely over the first year's moult and winter, may be reckoned fairly hardy. These charming little birds are offered by the importers during the autumn at prices which I have known as high as £7, and as low as £2 a pair. Mr. Eyton received specimens from Peru, where he states it is kept tame as in this country. Colonel Grayson reports that its habits resemble those of the Fulvous Duck, having two broods in a season, and that large numbers are offered for sale in the markets in Texas. These Whistlers are well known among English fanciers, and no collection is complete without a pair. They

are very easily tamed, and soon recognise their keeper, flying even when pinioned, assisting themselves with an occasional spring from the surface of the water with their broad-webbed feet. They suffer when exposed to cold and wind, being subject to diarrhoea and kindred complaints, and requiring a little animal food during autumn and winter, in order to enable them to pass safely through the moult. Although, like the rest of its family, the Red-billed Whistler is not naturally a diver, it is nevertheless capable, upon emergency, of descending to considerable depths to procure food, which it brings to the surface in order to swallow. My own birds learnt to dive in company with some Pochards, which were fed with maize in a somewhat deep pond, their whereabouts being clearly manifested by a string of bubbles, occasioned by their endeavours to keep below.

Male—General colour various shades of brown; the cheeks and throat yellowish white; the breast feathers shading to bay; eye hazel; abdomen black; legs and bill red; nostrils yellow.

Female—Similar to male; bill and legs occasionally slightly paler.

Young—No information.

Egg—Ivory white, somewhat round. Incubation, twenty-eight to thirty days.

Nest Down—Long; centre ashy gray, tips nearly black.

SOUTHERN RED-BILLED WHISTLING DUCK.

(*Dendrocygna discolor.*)

This Tree Duck was received by the Zoological Society in 1874 from Pará, in South America. Messrs. Sclater and Salvin state that this form is easily distinguished from *Dendro-*

cygna autumnalis by the upper portion of the back being gray instead of chestnut, while the breast is of the same colour. It is stated to inhabit the northern parts of South America.

BLACK-BILLED TREE DUCK OR WHISTLING DUCK.

(*Dendrocygna arborea*.)

This variety of Tree Duck inhabits the West Indies and adjacent parts of America, and is occasionally for sale in this country, realising from £3 to £4 the pair. Mr. Gosse states that these birds are much dreaded by the cultivators of "guinea corn" (millet), on account of the immense depredations committed by them in the fields. During February they assemble in immense flocks, and, collecting together, "dash forcibly down upon the ears of grain, which, being then in the milk, is passionately desired by them, thus striking it down so that it lies on the ground, and they can eat it at their ease." This is usually the case during the moonlit nights, when their presence is involuntarily betrayed by the incessant whistling they keep up. The Black-billed Whistler nests in cavities or in hollow trees, the parent bird feigning lameness in order to decoy the sportsman from her eggs. *Dendrocygna arborea* has been an inhabitant of the Zoological Gardens since 1831, but has not been known to breed in captivity.

Male—Top of the head black, with a dark brown streak down the back ; face and upper neck dirty white ; lower throat spotted black and brown ; breast and neck pale reddish brown ; under parts dirty white ; upper body dark brown ; bill lead colour ; legs and feet black.

Female—The same.

Young—No information.

Egg—White. June—September. Incubation, about a month.

FULVOUS TREE DUCK OR WHISTLING DUCK.

(Dendrocygna fulva.)

This bird is found in Mexico and California, where, according to Colonel Grayson, it arrives at the close of the wet season in large flocks, never being found near the sea-coast, but inhabiting fresh-water lakes and ponds, being much hunted on account of the flesh, which is white and juicy. He states that when pursued, these birds dodge through the long grass towards water, and when, after diving, it is obliged to return to the surface, it keeps the body immersed for fear of detection. The first examples of this Tree Duck were obtained by the Zoological Society in 1867, other specimens being received subsequently. Eight species of Tree Ducks have been exhibited in the Society's Gardens, but the only species which has bred is *Dendrocygna fulva*. Mr. C. Bartlett furnished the following note respecting this interesting occurrence, which I extract from the P.Z.S. (1880):—

“The Fulvous Tree Ducks bred in the Gardens in the north pond in August, 1872, while under my charge. The nest was upon the ground and was domed, the dome being formed of the long grass surrounding the nest. This is the only instance I know of any of the waterfowl building a dome over its nest. Many of the common waterfowl build in the long grass, but do not attempt to form a dome. Two birds were hatched, but unfortunately killed by rats.”

When alarmed, the Fulvous Tree Duck has the power of erecting the long feathers of the crest. The price of these birds varies from £3 10s. to £5 the pair.

Male—Head and neck bright reddish brown; top of head darker, with a line of deep chestnut down the back of the neck; upper body and wings reddish brown, shading into black, relieved at regular intervals by bars of light fawn colour; a band of pale cream colour passes over the front of the throat; the sides of the bird display regular bars of cream colour and black feathers; bill, legs, and feet ash colour; eye very dark brown; wings very long, nearly covering the short tail.

Female—Similar, but smaller.

Young—In down, yellowish brown.

Egg—Pure white ; ten to fifteen. July—August.
Incubation, about four weeks.

LARGER TREE DUCK OR WHISTLING DUCK.

(*Dendrocygna major.*)

This duck, like the preceding, is as yet rather uncommon. It is found throughout most parts of India, and is twice the size of *Dendrocygna arcuata*, which it resembles in plumage, but is distinguishable by its greater size, and the white band crossing the tail-coverts. Dr. Jerdon states that these birds are called the Whistler by sportsmen in India from their sibilant cry, and their Hindustani name of "Sillee" also signifies "Whistler." They are found in flocks of various size, frequenting the smaller reedy and grassy tanks. Their flight is heavier than that of the duck tribe, and they are distinguished by the comparatively lazy flapping of their wings. They breed in the hot weather ; their flesh is poor, tough, and fishy in flavour. The specimens in the Zoological Gardens, obtained in 1867 from the Société d'Acclimatation in Paris, were believed to have been received from Madagascar. Mr. Jamrach states that he has never seen more than two pairs at a time imported into this country, and that it is not greatly in request.

Male—Head and neck chestnut, a dark line extending down the back of the neck, a white patch in the centre of the throat ; back, breast, and wings various shades of brown and chestnut ; under tail-coverts yellowish white ; flank feathers very long, bright brown on the upper side, yellowish white below ; bill bluish lead colour ; legs and feet same colour but darker.

Female—Similar to male.

Young—In first feather pale brown.

Egg—"Dirty white, spotted with rusty red" (Jerdon); six to ten. July. Incubation, twenty-eight to thirty days.

SMALL INDIAN TREE DUCK OR WHISTLING DUCK.

(*Dendrocygna arcuata*.)

This is essentially a Tree Duck of a migratory habit, and it travels in flocks of from twenty to a thousand, there being no rule as to the number; during the breeding season, however, they separate into pairs. Vegetarian in their diet, they frequent the paddy fields, where they do an infinity of damage to the young rice plants. The nest, usually constructed in a hollow tree or in some broad fork, is made of sticks lined with grasses. *Dendrocygna arcuata* is stated by Dr. Jerdon occasionally to hide its nest, when placed on the ground, by entwining grass stalks over it to form a shelter, while Hume and Marshall, in their "Game Birds of India," state that upon occasion it appropriates the deserted nests of crows and other birds, the mother carrying the ducklings from her nest in her claws to the water. Thousands are annually captured, and large numbers find their way to Europe, being sold at 40s. per couple. The birds which I had, appeared very sensible of cold, and succumbed to a chill, which produced an affection of the eyes.

Male—Upper body and wing-coverts chestnut, deepening into maroon, each feather edged with a darker line; under body brown of various shades; bill, feet, and legs lead colour; head and neck whitish.

Female—Similar to male, but smaller ; the colours less distinct. The pair weighed about two pounds.

Young—In down, grayish buff ; head pale brown ; bill and legs dark.

Egg—Pure white ; six to twelve. July—August. Incubation, twenty-eight to thirty days.

EYTON'S TREE DUCK

(*Dendrocygna Eytoni.*)

This bird, distinguished in Eyton's Synopsis as the "Brown Slender-legs," was named by Mr. Gould as a testimony to the value of Mr. Eyton's services to ornithology. It is stated to be common on the north-west coast of Australia, where it may be seen in $\angle$ shaped flights resembling those of the Wild Goose. It is easily identified by its peculiar whistle, which Mr. Gould describes as breaking into a chatter, as it alights on the boughs of trees. It is occasionally for sale in this country at prices varying from £8 to £10 per pair, but none have been received by the Zoological Society since 1867, when Dr. Bennett, of Sydney, sent a couple, which have not as yet bred in the gardens.

Male—Upper parts grayish brown, with a dark blue tint ; flank feathers very long and pointed, clear buff edged with black ; lower breast and sides chestnut broadly barred with black ; under parts lemon buff, lighter on throat and chin ; bill black, with orange tip ; legs dark yellow.

Female—Same as male.

Young—No information.

Egg—No information.

GENUS *SARCIDIORNIS*.

This Genus is represented by three very similar species from India, Africa, and America.

BLACK-BACKED GOOSE OR COMB DUCK,

INDIAN WATTLE DUCK.

(*Sarcidiornis melanonota*.)

This bird, although often spoken of as a duck is properly a goose, and as Mr. Jamrach expresses himself "a very spiteful one into the bargain." It is, however, sufficiently singular looking to attract the attention of fanciers of waterfowl, and is procurable at times in the market, the price being £6 a pair; they are hardy, but bad breeders in this country. These birds are natives of India and Ceylon, Dr. Jerdon stating that this species is most common in Central and Western India, where, though occasionally met with in flocks of a hundred, it is more usually seen in parties of about half a dozen. From the same author we learn that this is not a particularly shy bird, nor rapid in flight, allowing itself to be closely approached, breeding in that country during the months of July and August. The Zoological Society of London possesses living birds, and the stuffed specimens in the British Museum convey a very fair idea of the singular appearance of this bird during life.

Male—High on the legs; the back (as its name implies,) being black, shading into metallic hues of violet and green, especially on the wings; head and neck white, speckled on face and neck with black; tail and wings black glossed with green; lower parts pure white; bill black, bearing on the upper mandible a large boss or semi-disc, between two and three inches in height; eye bright yellow; weight about six pounds.

Female—Considerably smaller; plumage less bright; protuberance on bill absent.

Young—Legs and feet pale blue lead colour; upper mandible black with bluish tip; lower mandible pinkish. The general plumage resembles that of adults, only without protuberance on bill, and back portions less glossy; eye dark brown.

Egg—Whitish; six to seven. July—September.

AMERICAN BLACK-BACKED GOOSE OR COMB DUCK

AMERICAN WATTLE DUCK.

(*Sarcidiornis carunculata*.)

This, the American form of *Sarcidiornis melanonota*, was first acquired in 1876 by the Zoological Society of London, but has not bred in the Gardens. Messrs. Sclater and Salvin state that the range of this duck in South America is somewhat limited, seldom occurring beyond the upper waters of the basin of the Parana. The general appearance of the American Comb Duck is similar to that of the Indian variety, with the difference that the female is adorned with a comb as well as her mate, the appendage being very large in both sexes, and earning for it the name of Wattle Duck. There is also a good deal more black upon the sides and flanks, than in the Indian variety.

AFRICAN BLACK-BACKED GOOSE OR COMB DUCK.

AFRICAN WATTLE DUCK.

(*Sarcidiornis Africana.*)

Mr. Sclater states that an example of this form of *Sarcidiornis* was purchased at the Knowsley sale in 1851. It is an inhabitant of Africa and Madagascar, and differs only from the Indian species in its inferior size.

GENUS *CAIRINA*.

Only one species of this genus is as yet known, represented by a bird which for many years has bred freely in Europe, exhibiting under domestication a remarkable variation from its original plumage. *Cairina moschata* (Muscovy Duck) is an inhabitant of South and Central America.

MUSCOVY DUCK.

(*Cairina moschata.*)

This bird, also known as the "Barbary" or "Brazilian Goose," inhabits the hottest portions of tropical America. "During the day it lives in swamps, where it finds congenial food, and towards the evening may be seen sitting in rows on the lower branches of large trees, descending then to make inroads into the maize plantations and cornfields, where it does considerable damage, plucking up at the same time the mandioca or tapioca plants" (P.Z.S., 1876).

It has long been introduced as a domestic variety, some authors stating the date of its introduction to be as far back as

the Spanish Conquest of America. The bird is chiefly remarkable for its enormous size ; adult male specimens occasionally reaching fourteen to fifteen pounds, the female exhibiting a strange disparity in this matter, seldom weighing more than half that of her mate. The most ordinary colour is black splashed with white, chiefly about the head and neck ; they are also pure white, and occasionally a kind of beautiful slate blue, which, however, is very rarely seen. The name by which this variety is most generally known is supposed by some to have reference to a musky odour, perceptible both in the plumage and flesh of the bird. In Mowbray's old Treatise on Poultry a suggestion is made that the designation of Muscovy is applied to this variety of duck in honour of an important branch of Turkey merchants styled the "Muscovite Company," by whom probably the bird was first introduced from the New World, and in an old work of that period (1570) it is styled the "Turkish Duck," which lends colour to that supposition. The Muscovy is somewhat savage in disposition, and will attack and bite most sharply, especially during the breeding season. It grazes a great deal, often remaining for hours on land, and occasionally perching upon trees, the wings being very long and powerful. The female is an indifferent layer, and usually "steals" her nest in a tuft of rushes or grass, some distance removed from the water. The birds may be procured at about 10s. each, and often at a lower price. The wild bird is nearly jet black, the only white in the plumage being a few feathers about the head and upper wing-coverts ; the legs are black ; a long curved crest adorning the head. Specimens of *Cairina moschata* were received by the Zoological Society in 1851 and 1880, from Paraguay, which exhibit very marked distinctions from our domesticated birds.

Male—Head, with a small crest, whitish ; neck thick and strong ; bill small and much curved ; surrounded at the

base by bright scarlet caruncles ; face naked, covered with scarlet skin round and behind the eye ; legs and feet orange yellow ; wings long, and armed with a long pointed knob.

Female—Similar to male ; much smaller.

Young—In down, yellow and black, or splashed white, brown, &c., according to variety ; legs and bill yellow.

Egg—White, very large ; ten to fifteen. April—May. Incubation, twenty-eight to thirty days.

PATAGONIAN DUCK.

(*Cairina Moschata* var.)

Several pairs of a large white duck, described by the dealer as Patagonian Crested Ducks, were offered to me during the summer of 1886. Their bodies were white, the long feathers of the crest being black ; the general build and appearance of the bird closely resembled that of the ordinary Muscovy, of which they are a variety. The eyes were blue, feet yellow, and the upper mandible and face furnished with large fleshy caruncles. Mr. Bartlett, Superintendent of the Zoological Gardens, describes them as follows :—"They are hardy and good breeders, the young are good for the table, but I parted with them as they would not live in the company of other waterfowl, being very pugnacious." The pair which I acquired in 1887 proved, however, very tractable, living in peace with the Mandarins, Carolinas, and other small breeds. The mutual affection of the male and female was very marked, the drake erecting the black feathers of his crest, spreading the tail like a fan, and emitting a series of wheezing sounds somewhat similar to the distant panting of a steam-tug ! The birds were strongly impregnated with the odour of musk, which appeared

to originate in the enormous oil gland, from which they continually dressed their feathers. They are extremely strong on the wing, and perch with ease, the hind toe being furnished with a long, sharp nail. They are usually procurable at from £1 to £2 the pair.

Male—Pure white, flat black crest; blue eyes; bill yellow, with large scarlet caruncles at the base.

Female—The same, but considerably smaller.

Young—Yellowish down.

Egg—White; seven to ten. April—May. Incubation, twenty-eight to thirty days.

Nest Down—Pure white.

GENUS *TADORNA*.

The birds of this Genus somewhat resemble in build the geese; the body is large, the neck long and slender, and the oblong head rounded above. The bill has an elevated tubercle, much developed in the male bird during the breeding season. The plumage of the *Tadorna* is bright in colouring, the two sexes generally resembling each other, the male moulting only once a year. Their food is both of an animal and vegetable character. The feet are armed with thick claws, the hind toes not webbed; the tail is short. The Shieldrakes are remarkable for the formation of their windpipe, which in the male has a curious enlargement, lending to the voice a trumpet-like sound characteristic of the Genus. The nests of these birds are placed on the ground, among rushes or coarse grass, the eggs being round, and usually of a yellowish white, or cream colour. Incubation varies from twenty-three to twenty-eight days. We are acquainted with seven species of the Genus *Tadorna*, all of which except one, *Tadorna radjah* (Radjah Shieldrake), have at some time formed part of the Zoological Society's Collection.

COMMON SHIELDRAKE.

(*Tadorna cornuta.* *Tadorna vulpanser.*)

This variety is one of the most beautiful, although most common, of its tribe, having a large distribution throughout the continents of Europe and Asia, and were it more easy to domesticate, would doubtless be oftener seen both on ornamental waters and at poultry shows. It is known by the familiar names of "Sly Goose," "Fox Goose," and "Burrow Duck," the latter appellation having been given it in consequence of its habit of nesting in sand-hills, where it either excavates for itself a home, or appropriates the deserted rabbit-burrows. This disposition on the part of the Shielduck is well known to the natives of Holland, who prepare for the birds tunnels to lay in, taking the eggs as they are produced, which form an important addition to their food. The eggs are laid in April and May, and if taken from the nest and placed under a hen, can easily be hatched. The young might with advantage thus be reared, and subsequently turned down when pinioned on our lakes and ponds. The Shieldrake is undoubtedly more of a marine than a freshwater duck, a circumstance rendering it more difficult to adopt as an ornamental waterfowl. It does not pair till its third year. Although not properly diving birds, my own Shieldrake invariably "went under" when pursued or alarmed, and would progress for some distance below the surface of the pond with great ease. Like all the Genus, Shieldrake are very quarrelsome during the breeding season, and will attack and drive other ducks from the nests in order to secure a favourable position for their own, which is a neat round structure of dried grasses, lined with down and feathers. These birds can be usually obtained in the winter at from 18s. to 25s. a couple.

Male—Head and upper part of the neck dark glossy

green, bounded by a broad white collar, to which succeeds a broader band of rich chestnut; lower parts white; a broad black band down the abdomen to between the legs; tertiaries black, ending in chestnut; flight feathers black; wing-bar bronze green; bill, with knob at base, red; eyes dark brown.

Female—Similar, but less bright; bill without knob.

Young—In first plumage, head and neck grayish brown; chin and front of neck white; wings brown, under surface white; beak and legs flesh colour.

Egg—Yellowish white; seven to twelve. May—June. Incubation, twenty-eight to thirty days.

Nest Down—Very small; delicate pale gray, darker than Ruddy Shieldrake, mingled with a few short white feathers.

RUDDY SHIELDRAKE.

(*Tadorna rutila.* *Tadorna casarca.*)

This handsome bird is known by a variety of names, in India being the "Brahmin" or "Radjah" bird, and in this country "Ruddy Goose," "Collared Duck," etc. It inhabits the south and south-eastern parts of Europe, parts of Asia and North America, breeding in Algeria, Palestine, and Southern Russia. Dresser states that in its habits the Ruddy Shieldrake has more affinity with the geese than with the True Ducks. It walks, like a goose, with ease, grazes in the cornfields on tender shoots, eats grain, seeds of all kinds, and feeds to some extent on fish, worms, and frogs. Like the Common Shieldrake, its nesting habits vary, as it will incubate equally on the bare ground, in fissures of cliffs, or in hollow trees. The Ruddy Shieldrake have hybridized in the Zoological Gardens with the Egyptian Goose, the progeny proving very handsome, and

continuing to breed *inter se*. They are early breeders, and hardy, producing this year a nest full of eggs during the heavy snows of March, 1888. The Ruddy Shieldrake is fairly plentiful in the market, and can be obtained at from 40s. to £4 a pair.

Male—Head and upper neck cream colour, terminating in a black ring which encircles the throat; back, breast, and under parts fox colour, with bright red reflections; shoulder creamy white; wing-bar glossy green; flight feathers and tail black; beak and feet blackish; eye yellowish brown.

Female—Resembles the male, without the black collar, slightly grayish on head and neck.

Young—In down, mostly white, with brownish red patches. In first feather, like the female, but with brownish wings.

Egg—Cream colour, smooth on the surface; seven to twelve. April—June. Incubation, twenty-eight to thirty days.

Nest Down—Very small; uniform pearly gray, approaching white.

VARIEGATED SHIELDRAKE.

(*Tadorna variegata*. *Casarca variegata*.)

These birds, known in the trade as "Paradise Geese," "White-headed Shieldrake," and "Dissimilar Shieldrake," are natives of New Zealand. Imported specimens are but rarely for sale, as the supply of European bred birds is now plentiful. In the beautiful work by Sir Walter Buller on the "Birds of New Zealand," we find the Variegated Shieldrake named as being the finest of the eight species which inhabit that country, where they may be found at certain seasons of the year, congregating in large flocks. It is said that they require to

be constantly on the water in order to preserve their health, and that if removed from it they are attacked by a species of cramp which often proves fatal, the bird lying on the ground on its breast, unable to use its legs, and flapping its wings apparently in the greatest agony. The nest of dry grass, lined with down and feathers, is usually placed among reeds near the water, but on one occasion Buller discovered a nest in a hole on the face of a sandstone cliff at some considerable distance from the ground. During the breeding season these birds separate in pairs, and are then extremely fierce, attacking and often destroying birds considerably their superior in size. I have seen a pair set upon a Canadian gander, and with screams of rage drive him round and round the pond, until the gander was thoroughly exhausted, when both birds fastening on his back, they pushed him under the surface of the water, until he was nearly drowned, the attendant arriving only just in time to draw him to land in a net. It will be found advisable to separate the Variegated Sheildrake from the smaller varieties of duck during the breeding season, as they will in all probability destroy or permanently injure them, besides interfering materially with their breeding prospects. The Paradise duck requires an abundance of green vegetable, and it is therefore desirable to cut and throw in large handfuls of grass daily, unless the birds have a supply within reach. *Casarca variegata* is undoubtedly one of the most attractive and showy of the large varieties of duck, the strongly contrasting plumage, together with their singular moaning cry invariably attracting much notice. They are however somewhat expensive, and the fancier will find he must be prepared to lay down £6 or £8 for a pair of these beautiful birds, which at the time of their first importation realized £20 a couple. This Shieldrake has the power of covering the white shoulders with the mantle or long feathers of the back, which occurring usually

when the bird is resting, causes it to present an entirely different appearance to that displayed when in motion or excited, at which times the strongly contrasting tints of the iron-gray back, the snow-white shoulder, vivid green wing-bar and chestnut sides, present a magnificent spectacle.

Some interesting particulars respecting the breeding in France of the Variegated Shieldrake, are communicated to the "Bulletin de la Société Impériale Zoologique d'Acclimatation" (1884), by M. le Comte A. de Montlézun and M. E. Courtois.

These gentlemen remark upon the violent disposition of the Paradise Ducks, which they found it imperative to keep in solitary confinement during the breeding season. The duck in one instance deposited her eggs on the ground behind a bundle of straw, and also in a wooden house elevated just above the level of the water in the centre of a pond, the eggs being white tinted with yellow, the size of those of the Common Duck. The bird on leaving her nest concealed the eggs with the down which composed its lining. The young, which were hatched after thirty days incubation, are described by M. G. Rogerson as white, with black streaks. The food found to be most acceptable to the ducklings consisted of bread, duckweed, chicory, hard eggs, chopped mussels, crumbled and mixed with milk, buckwheat being added in a few days. Experience appeared to differ on this point, one gentlemen stating the ducklings would not touch ants, eggs, or chopped meat; this may however have been influenced by the fact that in the latter instance the young birds were reared by a bantam hen. At forty days the young shieldrake were entirely feathered, the upper body being reddish, variegated with gray on the back and wings; at sixty days old they were able to fly, but the sex was only distinguishable in the autumn following their birth.

Male—Head and neck velvety black, with metallic

reflections; lower portion of neck, and upper part of breast chestnut brown; back clear dark gray, pencilled with narrow waving lines of white; rump and tail jet black; shoulder pure white; flight feathers black; wing-bar red chestnut and brilliant green; under tail bright chestnut; bill and legs black; iris dark umber brown.

Female—Head and neck snow white; upper parts red brown; shoulder and upper wing white; flights and tail black; wing green and chestnut. Size, less than male.

Young—In down, greatly resembling *Tadorna rutila*. In first feather at three months old resembling adult male; white head of the female assumed about the sixth month.

Egg—Creamy white; five to eleven. May—June. Incubation, thirty days.

Nest Down—Uniform pale ashy brown, centres whitish.

AUSTRALIAN SHIELDRAKE.

(*Tadorna tadornoides*.)

This large and splendid duck comes to us from New Holland, and is a native of Southern Australia. The specimens possessed by the Zoological Society of London were presented by the Acclimatization Society of Victoria.

“It resorts to rivers, heads of the bays, and inlets of the sea near Hobart Town; and breeds on the alluvial flats in that district; it is also said to breed in the hollow spouts and boles of the lofty gum trees. The nest is formed of the down plucked by the bird from its own breast. Its food consists of the small fish, crustacea, molluscs, &c., which abound in the flats and swampy places.”

The above notes are taken from Mr. Gould's magnificent work on the “Birds of Australia,” and form the bulk of our information respecting this shieldrake. These birds have been

procured at from £6 to £8 the pair, but they are not often offered for sale, which is a matter for regret, as in all likelihood they would breed under favourable conditions; which would probably entail a separate "run," their disposition, like that of all the shieldrakes, being somewhat pugnacious.

Male—Size somewhat superior to that of the "Paradise Duck," which it resembles in its general appearance. Head glossy black, terminating abruptly in a sharply defined white ring round the neck, below which extends a broad band, six to eight inches in depth, of bright orange brown; back and breast clear dark ash colour, finely pencilled with hair-like white lines; shoulder white; flights green and black; wing-coverts orange brown; tail black; bill and feet black; eye brown, encircled by a band of paler feathers.

Female—Similar but smaller; markings less distinct, a ring of whitish feathers round the base of the bill.

Young—No information.

Egg—Whitish buff; thirteen. September. Incubation, thirty days.

RADJAH SHIELDRAKE.

(*Tadorna radjah.*)

This remarkable bird is found in immense flocks in Australia as far south as Brisbane, and occurs, according to Mr. Diggles (the author of a work on the "Ornithology of Australia"), in various islands of the Malayan Archipelago. Its usual habitat is mud flats, and mangrove swamps, on the banks of tidal rivers, where it nests and perches on trees, and its food consists for the most part of small shell-fish. The flesh is coarse, and of an unpleasant flavour. There are

specimens of these sheldrakes in the British Museum, but the delicate colour of the bill and legs is naturally wanting in the stuffed specimens.

Male—Head, neck, upper portion of the wing, breast, and abdomen pure white; back and a band across the chest black, marked with fine pencillings of chestnut; tail black; wing feathers green, black, and white; tail feathers speckled with gray; bill pale flesh colour; feet salmon colour; eyes straw colour.

Female—The same.

Young—"Upper body rusty, the white wing-coverts finely pencilled with blackish, a broad black band on the wing, the speculum dull." (Salvadori).

Egg—No information. Probably September—October.

WHITE-FRONTED SHIELDRAKE.

(*Tadorna cana.* *Casarca cana.*)

This rare bird, sometimes erroneously termed the "White-headed Goose," is the South African form of the Ruddy Sheldrake, and resembles that bird with the head and neck paler, approaching to white. Only one specimen has as yet been possessed by the Zoological Society, which was the duck purchased at the sale of the Knowsley Collection in 1851, dying in 1862 presumably at the age of fifteen years, having been imported in 1849. The White-fronted Sheldrake inhabits Southern Africa, where it is called by the Boers and Cape Colonists "Berg-Ente." It is stated to be of sufficiently rare occurrence, appearing at odd times in different places. "Three specimens," writes Mr. Ayres, "were killed by my brother on a lagoon in the Free State, but birds of this species also occur on this side the Vaal, where I have seen them, but have never

been able to get at them." Mr. E. Symons, writing to the "Ibis," 1887, states that this Shieldrake is not plentiful in the Orange Free State, appearing to nest on the ground at some distance from water, being captured when quite young by the Boers, who cut their wings, and keep them tame about the house. We are told it breeds among rocks, and like the *Dendrocygna*, conveys its young down to the water on its back. Our only information upon this bird is collated by Mr. Sclater in the P.Z.S., 1864, and a short notice by Messrs. Layard and Sharpe in their "Birds of South Africa." It is to be hoped that those amateurs who have any correspondence with the Cape Colony will endeavour to procure some examples of this interesting variety. The following description is taken from a stuffed specimen in the British Museum, and immediately following it is that given by Messrs. Layard and Sharpe. Considerable variation would no doubt be found between specimens examined in the flesh, and the very aged dry skin upon which my own observations have been based. It would be impossible to fix a market value for a pair of these Sheldrake owing to their unfrequent occurrence, a skin alone at the present time realizing £5 or £6.

Male—Head white, with ashy brown stripe; neck ash brown; back and breast light chestnut; wing-coverts white; green patch on wing; tail black; bill, eye, and legs dark brown.

"**Male**—Easily distinguished by its rufous colour and grey head. General colour, rufous, inclining to yellow on the chest and vent, and mottled with minute wavy black lines on the neck; rump and lower part of back very dark gray; tail black, shining green; shoulders pure white; green patch on the wing very large; head and neck ash coloured, with a dark rufous collar."

Female—Similar.

Young—No information.

Egg—No information.

WHITE-WINGED SHIELDRAKE.

(*Tadorna scutulata*. *Anas scutulata*. *Casarca leucoptera*.)

This scarce Indian Shieldrake, sometimes known as the "Shielded Duck," was represented in 1851 in the Zoological Society's Gardens by one living example received from Mr. Blyth, curator of the Calcutta Museum. It is beautifully figured in Sclater and Wolfe's "Zoological Sketches," a water-colour picture also existing in Sir William Jardine's "Contributions to Ornithology" (1848), from which work the following description is gathered. The bird referred to died shortly after arrival, and was deposited in the British Museum.

Male—Head and upper neck white, evenly marked with black spots; lower neck and breast dark glossy green; sides and abdomen chestnut brown; back brown; shoulder white; wing-bar velvety black; flight feathers ashy blue; bill orange; leg yellow; iris reddish orange.

Female—Smaller; head somewhat similar to male, but more dusky; back brown; under parts reddish.

Young--No information.

Egg—No information.

GENUS *STICTONETTA*.

The only bird of this Genus is *Stictonetta nevosa* (Freckled Duck) from Australia, which has not yet been received alive. (P.Z.S. 1880.)

GENUS *AIX*.

Two well-known examples comprise this Genus, *Aix sponsa* (Summer Duck) from North America, known among amateurs as the "Carolina Duck," and *Aix galericulata* (Mandarin Duck) from China. These beautiful little birds have considerable affinity with the Teals, and the males are remarkable for their brilliant colouring, which is exchanged during part of the year for a sober plumage, resembling that of the female.

MANDARIN DUCK.

(*Aix galericulata*.)

This exquisite little bird is one of the oldest favourites among English fanciers, being the variety most common at poultry shows, where it often competes in the same class with the Carolina. It was added to the Zoological Gardens of London in 1830, first breeding in 1834. In one of the reports of the Council of the Society it was stated that four of these birds were purchased at an expenditure of £70. It is a native of Japan and China, where it is considered a symbol of conjugal fidelity, being carried in marriage processions. A flock of such exquisite birds must be a wonderful sight when, according to Schrenck, they appear in the countries watered by the River Amoor about May, departing at the end of August, at which season they are extremely shy and rarely come within gunshot. From July to September the drake undergoes the change of plumage, when he closely resembles the female in appearance. Imported specimens as a rule are much more brilliant in colouring, with fuller crest and whiskers than the home-bred birds, these last almost invariably deteriorating in those respects, a fact which holds good with most

ducks imported from hot countries. It is necessary to exhibit the Mandarins in perfect condition and plumage, competition being excessively severe. To ensure this they should be shown in "hard" condition, a state which is best arrived at by feeding on wheat, buckwheat, and a little hemp, and permitting the birds perfect liberty (within limits) on a small pond. They should be handled as little as possible, as the accidental loss of the wing-fan, tail, or crest, would destroy all hopes of a prize. These pretty little Teal breed freely in captivity, laying from twenty-five to thirty eggs yearly, in a round nest which the duck will line lavishly with the down from her breast, sometimes even plucking herself bare in her maternal solicitude. It will be noticed that on leaving her nest to feed, the Mandarin will cover her eggs entirely from view by dispersing the down over them, an example which should be imitated when the eggs are confided to a hen, whose instinct, on the contrary, is to leave her eggs uncovered. The value is from £2 2s. to £5 5s. a pair. The following excellent description of the Mandarin in full plumage was contributed some time ago by a fancier to the *Bazaar* newspaper :—

"**Male**—General shape very round; legs short; a crest falls gracefully over the back of the head almost touching the back; each wing is provided with a beautiful feather called the fan. These characteristics give the bird a most quaint appearance. In colour, the head is a rich green black, running into a rich red brown in the plume or crest, and terminating in a green black: the back is a rich shot colour, the fans, which rise over the saddle, of a rich light brown on the inside web, the outside black; under parts are white from the centre of the breast to the end of the tail, the top of the breast being a beautiful plum colour, crossed by two white and two black stripes on either side. The hackle and whiskers are a rich chocolate brown, the feathers being very narrow; wing mossed brown, with white stripes on the shoulders; eye black; beak red; from the base of the beak runs a white stripe up the side of the head and over the eye, where it becomes broader; a similar white mark encircles the eye, running off at the back towards the plume; the face is of the same colour, but a much lighter shade than the hackle; feet dull yellow."

Female—General appearance, mottled gray and brown; upper breast spotted with lighter colour; white line over upper mandible extending down front of throat; head ashy grey; small soft crest; black eye encircled by a white line extending to the back of the head; bill and legs same as male."

Male—Summer plumage: crest, wing-fans, and whiskers absent; breast and sides mottled gray and brown; shoulders and wings greenish brown; head and neck light gray; under parts white; bill pinkish horn colour; legs yellow.

Female—Summer plumage: duller in tint and crest less flowing.

Young—Pale brown down; cheeks white; dark stripe from back of eye to head; bill dusky yellow; eye black; feet and legs ash colour; breast and abdomen dirty white.

Egg—White; eight to twelve. May—July. Incubation, twenty-six days.

Nest Down—Delicate pale gray, perfectly uniform.

CAROLINA DUCK.

(*Aix sponsa.*)

This bird, which is called the "Summer Duck," is a native of America, where it is plentiful in the United States, being also occasionally found in the West Indies. It builds and perches on trees, being the only perching duck, properly so called, of America. Wilson and Bonaparte state that it rarely visits the sea shore, frequenting solitary ponds and mill dams, making its nest in April or May, in old trees, and laying its twelve or thirteen eggs upon soft decayed wood in hollows, many feet deep. From this secure retreat the duck conveys her young to the water in her bill, carrying them by the wing or back of the neck. The Summer Duck flies

in flocks of not more than half a dozen. Wilson states they feed principally on acorns, insects, and seeds of the wild oat, and are frequent in the markets of Philadelphia, their flesh being inferior to that of the Blue-winged Teal. The skin of the head and neck of this lovely duck is, according to the authors above quoted, often used by the Indians as a covering for the calumet, or pipe of peace. It is necessary, in exhibiting the Carolina Duck, to use the same care as indicated for the Mandarin. Value £3 3s. to £6 6s. a pair.

Male—The head is furnished with a falling crest of a magnificent glossy green, through which pass two white lines from the eye; throat white; cheeks and upper neck violet; breast glossy brown violet, spotted with triangular patches of white, increasing in size as they descend; breast on either side marked by a large double crescent of white and black; flanks thickly and exquisitely pencilled with fine black lines on a clear fawn ground; tail-coverts very long and silky, glossy green; back greenish bronze; wings and tail black and green; wing-bar, a rainbow of colour, white, blue, violet; legs and feet yellowish red; bill red, edged with black; eye red.

Summer plumage—Head and neck blackish green; throat white; upper breast dusky brown, spotted with white; sides light gray; back and top of wings bronze; crest absent.

Female—Head crested, dark violet; broad yellowish white band round the eye; chin and throat white; head and neck brownish drab; breast umber brown, with large triangular spots of white; back glossy bronze; bill, eye, and legs same as male.

Summer plumage—Resembles above, but less glossy; crest absent.

Young—When in down, can only be distinguished from the Mandarin duckling by its superior width of head between the eyes, and broader bill.

Egg—Yellowish ivory colour, oval; eight to thirteen. May—June. Incubation, twenty-three to twenty-six days, varying with the climate.

Nest Down—Pale ashy brown.

GENUS *MARECA*.

Three Widgeon comprise this Genus, of which *Mareca Americana* (American Widgeon), has not yet been imported into Europe alive. The Widgeon are closely allied to the Pintails, both Genus exhibiting the delicate narrow bill of which the sides are parallel, slightly broader towards the tip; the legs short, with free hind toe; the wings rather long and pointed, and the tail wedge-shaped. The food of the Widgeon consists of fresh water and marine insects, grass, and other vegetable substances. The males undergo a summer change of plumage, at which time the sexes somewhat resemble each other. The young Widgeon do not attain adult plumage until the spring following their birth.

COMMON WIDGEON.

(*Mareca penelope*.)

These birds are known by a variety of names, such as "Baldpate," "Whim," "Whem-duck." They arrive in Britain in the autumn, and begin to pair by the middle of February, migrating northward to breed. They are most abundant on our southern coasts, and are seen in large flocks near the sea shores. The Widgeon are less timid than the Teal or Pochard, being easily tamed. Their food consists almost entirely of vegetable substances, but they will also devour worms, and water-insects, seeking their food during the day, chiefly at early morning and evening; they are rapid walkers,

and swift on the wing, being shot or decoyed in large numbers for the markets. The drake undergoes the summer change of plumage about March, and is not again in full beauty until the autumn.

The Widgeon breeds in May and June, the nest being usually placed near water, and consisting of a hole scratched in the ground, lined with dry grass and feathers. During February and March, Widgeon may usually be purchased at from 25s. to 30s. the couple.

Male—Crown of head cream colour; cheeks, nape, and upper neck rich chestnut, speckled with black; back and sides gray, finely barred with black; breast pale red, white below; wing-coverts black, edged with white; shoulder white; wing-bar green, edged with black; tail and flight feathers dusky black; bill narrow and lead coloured; eye dark brown; legs and feet bluish lead colour.

Summer plumage—Head and neck yellowish gray; back, shoulders, and rump dark gray, indistinctly pencilled with black; wing-coverts bluish gray; sides and upper breast reddish brown; under-parts white.

Female—Smaller; head and neck dark brown, with a red shade; upper breast reddish brown, white below; sides yellowish brown; back grayish brown; wings and tail dark brown; legs and bill dark gray-blue; eyes brown.

Young—In down, upper body brown: cheeks and throat reddish; no black band across eye. First feathering of young males resembles the adult female, but the former may be identified by the indication of a green wing-bar.

Egg—Creamy white; five to ten. March—April. Incubation, twenty-four to twenty-five days.

Nest Down—Dusky brown; very similar to that of White-eyed Pochard; the tips marked alternately brown and white.

AMERICAN WIDGEON.

(Mareca Americana.)

This handsome bird may be viewed as the American type of our European Widgeon. It arrives in the United States at the beginning of winter, leaving early in May, and repairing to its breeding grounds in Hudson's Bay. Its food consists of aquatic herbage, worms, insects, and grain, Mr. Audubon stating that it often frequents the ploughed fields in the Southern States, especially after heavy falls of rain. This bird has not, so far as I am aware, been imported alive into Europe, although Morris records the shooting of a male bird in Belfast Bay, during the February of 1844. It was also identified by Mr. Bartlett from among a number of Common Widgeon exposed for sale in Leadenhall Market, about five years previously. This bird presents a connecting link between the Widgeon and Pintail, exhibiting the bill of the former, and the characteristic long tail feathers of the latter.

Male—Head and crown cream colour, approaching to white, with a slightly indicated crest; from the eye to back of neck extends a band of violet, green, and gold; throat and sides of neck cream colour, dotted with black; breast and sides fawn; the flanks waved with black lines; abdomen white; back reddish brown, pencilled with black and brown undulating lines; wings and tail dark brown; upper wing coverts white; wing-bar green, black, and white; bill slate colour, tipped with black; legs reddish brown; eye hazel.

Female—Head and neck yellowish white, speckled with black; back dark brown; smaller than male.

Young—Males resemble females during their first season.

Egg—Dirty yellowish white; six to eight. May—June. Incubation, about twenty-four days.

CHILOE WIDGEON.

(*Mareca sibilatrix.* *Mareca Chiloensis.*)

This charming little duck, which we receive from Chiloe, an island of the South Pacific situated on the west coast of Patagonia, is one of the most beautiful species of its tribe, and has for about fifty years been known to scientific amateurs in England, and was first acquired by the Zoological Society in 1831, birds collected in the Magellan Straits having been presented by Captain King on his return from surveying those regions. The birds purchased by the Zoological Society have bred regularly since 1871. Mr. Sclater states that this beautiful duck was first described by the great discoverer Azara. They are very plentiful in the vicinity of Buenos Ayres, where numbers are sold in the market. It is one of the wildest and scarcest birds in East Falkland, Captain Abbott was never able to procure a nest, but stated that young ones were seen during the month of January. The price asked for a couple of these birds I have known to vary from £3 10s. od. to £8. They are sufficiently hardy to bear the winter out of doors, provided there is enough shrubbery to protect them from the cold wind, which appears injurious to them. It is necessary at the same time to supply them with abundance of maize, and even a little raw meat pulled into strings. A very fine bird in my possession was found dead with the tail of a field mouse protruding from its bill, a fact affording proof that the bird craves for animal food. The Chiloe Widgeon is gentle and easily tamed, living peaceably in a mixed collection, which alone recommends it to the attention of amateurs. The male when excited will stretch his neck upwards, and swim about rapidly in this position, emitting a long drawn whistle. The plumage of one-year-old birds is deficient in gloss and lustre, and it is a matter of some difficulty to determine their sex until the first breeding season arrives.

Male—Head and neck glossy blue-green; breast and throat creamy brown, finely pencilled with black, each feather bearing an arrow shaped brown mark; forehead, cheeks, and breast white: back metallic brown, the feathers very pointed and edged with white; top of wing black; wing-bar white and black; flank and under parts creamy and pure white; tail brown; bill and legs bluish brown; eyes black, a violet streak extending from eye to back of head; small dark brown eyes.

Female—Similar, but less brilliant.

Young—In down, light brown on back, brightening to chestnut on cheeks; short broad bill.

Egg—Creamy white; seven to nine. May—July. Incubation, twenty-five to twenty-eight days.

Nest Down—Dark brown; very short white tips.

GENUS *DAFILA*.

Four Pintails comprise this Genus, all of which are known in captivity.

The Pintails in their habits and general characteristics resemble the Widgeon, but are immediately identified by the singular elongation in the males of the central tail feathers.

PINTAIL DUCK.

(*Dafila acuta*.)

The Common Pintail is a winter and spring visitant to Great Britain, and it is extensively dispersed over Europe, Asia, and the northern parts of America; the sharp long pointed tail feathers of the drake have caused it to be known as "Sea Pheasant." The Pintail usually arrives in the autumn,

occasionally breeding in Ireland. Sir R. P. Gallwey states that he has seen as many as three to five hundred together, while Mr. Seebohm describes them as assembling in thousands on the low land near the river Petchora, in Siberia. The male experiences a change of plumage during the summer months, when it becomes for a time like the female, only slightly more red on the under parts, reassuming the masculine feathering by the middle of October. The Common Pintail has been successfully bred in captivity, both in the Zoological Gardens and also by an amateur in Westmoreland, the parents being pinioned birds. A pair of Pintail may usually be obtained in Leadenhall Market for about 30s.

Male—Neck and breast snow white; cheek outlined with white; head, neck, back, and flanks gray, pencilled with black; brilliant wing-bar of green and violet; bill lead colour; feet and legs dark; tail feathers, much elongated, black; eye yellow.

Female—Head and neck brown, feathers edged with lighter; white throat absent; upper body, tail, and wings brown, edged with white; under parts yellowish white; tail much shorter than male; legs and feet brownish gray; bill light slate colour.

Young—When newly hatched, body almost entirely brown, the down being paler about the throat and breast; eye black, with a singular square chestnut line to the back of the head; under parts and breast white, the white breast with a yellowish tinge; feet yellowish brown. First feathering resembles the duck.

Egg—Pale buff, occasionally white, washed with green; seven to eight. April. Incubation, twenty-three days.

RED-BILLED PINTAIL.

(Dafila erythrorhyncha.)

It is to be wished that this pretty Pintail may become more general among amateurs, as there is every hope that it would succeed as well as in the Zoological Gardens, where it bred the year after purchase until the variety became extinct. It is known also as the "Crimson-billed Duck," or "Red-billed Teal," and is common in South Africa, where, according to Mr. Layard, it is found in little flocks of from six to eight in the vicinity of water. It is most plentiful after the heavy rains, at which time it is shot in considerable numbers in the south-east of Cape Colony, being considered excellent eating. In the British Museum are several well-preserved specimens. From the author above quoted we learn that the Red-billed Pintail breeds among rushes, where it forms a large flat nest of sedge and dry grass.

This Pintail somewhat resembles the Bahama Duck, but is larger, and the wings and tail are more blunt than in *Dafila bahamensis*.

Male—Crown of head dark brown; upper parts brown, darkest on the shoulders and back, and edged with a paler shade; chin, lower cheek, and underparts white; sides and breast ornamented with large irregular brown spots; narrow wing-bar of pink, fawn, and white; legs and tail slate colour; bill red, with a lilac tinge; eyes reddish hazel. Dissection shows a singular enlargement of the windpipe resembling a bladder, which is absent in the female, a fact noted by Mr. Frank Oates, F.Z.S., in his work on South African Travel.

Female—Similar, but bill duller with a brown shade, and legs blackish slate.

Young—In down, resemble the nestlings of other Teal with a pink bill.

Egg—Creamy white; six to ten. June—July.

CHILIAN PINTAIL.

(Dafila spinicauda.)

This is the Pintail most frequently seen at our poultry shows, having been successfully exhibited by English amateurs. It was received for the first time by the Zoological Society in 1870, and in their Gardens it has bred freely ever since. In the "Proceedings of the Zoological Society" for that year we find a few notes upon the species together with an illustration. It is there stated that some confusion has occurred respecting this Pintail, it having been supposed that the birds obtained from the Argentine Republic and those from Chili and Peru were allied, but Mr. Sclater distinguishes the Chilian Pintail from *Dafila Oxyura* by the yellow marked bill of the former. The Chilian Pintail is nearly as large as the Carolina Duck, but fanciers endeavour to procure it as small as possible for exhibition, still it will be found wiser not to depend entirely for the breed upon greatly stunted specimens. The following notes on the rearing in captivity of the Chilian Pintail, are kindly furnished by the well-known breeder and importer, Mr. John Baily:—

"The ducklings when hatched are dark, with a light buff stripe on each side of the head, the down is also lighter on the sides and thighs, the bill is slate colour, which afterwards becomes yellow, the bird attaining its plumage the first year."

"The Chilian Pintail is very prolific; the duck when sitting defends her eggs, making a rattling noise when approached. The ducklings should be fed in a shallow wooden pan let into the ground, so that the edge is flush with the surface; it should be about two or three inches deep, and from two to three feet square, and not more than an inch of water should be put in at first. Some dry oatmeal, barley meal, and bread crumbs, scattered on the top will float, and be readily eaten by the ducklings. I have known these birds reared in the above manner without losing any, no other food being given them, with the exception of what they afterwards foraged for themselves on the lake or pond."

This bird is constantly offered for sale, the prices varying from £2 to £3 10s. the pair.

Male—Head and neck buffy white, speckled with brown; upper body brown; sides of throat and cheeks lighter; under parts pale fawn; entire plumage laced with paler colour; wing-bar blue between two buffy white bands; tail long and sharply pointed; legs dusky; bill blue at base, edges yellow, tip black.

Female—The same but less bright.

Young—In down, dark ashy brown above, under parts paler; light stripe from eye to nape; bill slate colour; legs dark.

Egg—Very pale reddish drab; about nine. April and August. Incubation, twenty-eight or twenty-nine days.

Nest Down—Pale mouse grey.

BAHAMA PINTAIL OR ILATHERA DUCK.

(*Dafila bahamensis*.)

The Bahama Marbled Duck, as it is sometimes called, is an inhabitant of Brazil and the Bahamas, where it frequents the large salt marshes of the interior. The nest, made of grass intertwined into a flat mat, usually contains eight or nine eggs. Mr. Jamrach considers these birds to be hardy, and that they are good breeders is proved by their having bred in most of the Zoological Gardens of Europe, including that of the Regents Park, London, where they have reproduced yearly since 1860. The value of the Bahama Duck is from £3 10s. to £4 10s. the pair. This variety, which is in full plumage in May, was very successful in the show pen during

the season, 1887—1888, the neat and “smart” appearance of the birds rendering them very attractive.

Male—Crown of head, back, and tail brown, the scapulars edged with a lighter shade; cheeks, chin, and throat white; breast grayish fawn, spotted with dark brown; wing-bar metallic green and violet, edged with a narrow buff stripe in front, and a broad one behind; legs and bill lead colour, lighter on the sides, with a triangular patch of rosy red behind the nostrils on each side; eye vermilion yellow, very clear and brilliant; in some specimens red chestnut. It is worthy of notice that in Catesby’s splendid work on the Natural History of Carolina, the life-size coloured illustration represents the Bahama drake with a triangular *orange coloured* patch on the bill bordered with yellow.

Female—Same as male; in my own birds, especially out of the breeding season, the red bill patch of the duck was of a paler pink than in the drake; eye umber brown.

Young—In down, yellowish white with brown splashes on back and side; the sex is difficult to distinguish until the second year, up to which time the bill is reddish brown.

Egg—Pale brown; seven to ten; two broods in the year. It has been noticed that the second nest of eggs are slightly darker than the first **May**—August.

Nest Down—Remarkably dense; sooty dark brown, darker tips.

GENUS *ANAS*.

According to the most recent specification, sixteen species are distinguished as belonging to this Genus, though it must remain a point of great difficulty to determine accurately where the Pintail shall end, the True Duck continue, and the Teal commence. The as yet unIntroduced species of *Anas* are as follows: *Anas melleri* (Meller's Duck) from Madagascar; *Anas wyvilliana* (Wyville-Thomson's Duck) from the Sandwich Islands; *Anas luzonica* (Luzon Duck) from the Philippine Islands; *Anas bernieri* (Bernier's Duck) from Madagascar; *Anas chlorotis* (Brown Duck) from New Zealand; *Anas cristata* (Crested Chilian Duck) and *Anas specularis* (Mirror Duck?) both from Antarctic America; *Anas zonorhyncha* (Ring-billed Duck?) from China; and *Anas sparsa* (Rare Duck?) from Africa, none of which have yet been imported alive into Europe.

The birds of this Genus are found distributed about the four Continents, nesting as a rule on the ground, under bushes or among dry grass; feeding on seeds, roots, mollusca, worms, and various other animal and vegetable substances. Much of their food is procured under water, to obtain which they submerge the head and neck, diving, however, but seldom.

WILD DUCK (MALLARD.)

(*Anas boschas.*)

The proper distinction in the many names by which this charming bird is known, is to apply the term "Mallard" to the male only, his mate being properly the "Wild Duck." *Anas boschas* is distributed over a vast area, being found in one form or another in almost every country of the Northern Hemisphere. It arrives on our shores in the autumn, when

it falls a prey to sportsmen in large flocks during the months of October and November. From the Mallard are descended all our domestic varieties of duck; the variations in the plumage of these, including pure white and black, having been produced by judicious selection and cross-breeding. The Mallard is among those birds which undergo a complete change of plumage during the summer, a process which most fanciers have watched among their exhibition Madarins and Carolinas. About the end of May the first change of colour occurs in the Mallard, his beautiful sexual plumage gradually dropping out, so that in eight or nine weeks he is scarcely distinguishable from the female bird. In August the male plumage begins to re-assert itself; the brilliant chestnut and green feathers return, and thus, by the middle of October, the drake appears again in all his magnificence. "Wild Duck" frequent fresh water ponds and streams, where, if not persecuted, they will freely breed, rearing from eight to nine active little ducklings, which, the moment they leave their nest, exhibit great independence, and may be seen scuttling along the oozy banks and plunging under the water at the first approach of danger.

The Wild Duck constructs her nest of grass and small rushes, lining it with down from her own breast; this is usually placed on the bank, but occasionally young wild ducks have been found in a nest in trees, the parent bird in such instances carrying her young from the cradle to the water. Mr. Bowdler Sharpe informs me that he has known the Wild Duck to nest as far as a mile distant from water. It is very necessary to pinion Wild Duck when it is desired to keep a flock of them on a pond, under which circumstances, if undisturbed, they will freely breed, and serve as decoys to the wild birds of their own species. Mr. Woodham, who has kept these birds for a considerable time, states that they thrive well

on boiled rice, greaves and barley meal. He describes them as breeding freely and rearing large broods, the young ones proving perfectly tame, while the ducks exhibited extraordinary maternal courage, flying at any person or animal approaching the ducklings. At the same time Mr. Woodham states that the drakes were very troublesome in a mixed collection of waterfowl, by crossing continually with the ducks of other breeds.

Male—Head and neck brilliant metallic green, the lower part encircled with a pure white ring; back and upper breast rich chestnut; remainder of breast and under parts grayish white, finely pencilled with dark lines; four centre feathers of the tail stiffly curled upwards; wing-bar blue, violet, and green; feet orange; bill yellowish green.

Female—Plumage of various shades of gray and brown; white throat; without the curl in tail.

Young—In down, olive yellow, with a stripe on the forehead, passing over the eyes to the back of the head.

Egg—White, washed with green; eleven to sixteen; March—May. Incubation, twenty-eight days.

Nest Down—"Neutral gray in colour, occasionally with a slight tinge of brown" (Seebohm).

AYLESBURY DUCK.

(*Anas boschas* var.)

This well-known variety takes its name from the town in Buckinghamshire, where it is bred in large quantities for the table, this work being principally carried on by men called "duckers," who will eagerly buy up and give good prices for early-hatched ducks and fertile eggs. The subject of

the market value and best methods of preparation of these birds for the table does not enter into the intention of the present manual, so I will only advert to the Aylesbury Duck as an ornamental waterfowl. In this light we usually find it represented at poultry exhibitions, where liberal prizes are offered for the best specimens. The points required in a prize bird are pure white plumage, and long straight rose pink or flesh coloured bill; legs of a brilliant orange, and a massive frame. Water containing any taint of iron, much exposure to the sun, or digging in the earth, tend to discolour the bill; exhibitors therefore afford the birds considerable shelter, and restrict their liberty, in order to ensure the requisite size, and perfection of points. The application of vinegar and pumice stone, I am informed, is occasionally resorted to when the bill shows any imperfection. In the district of Aylesbury a particular sort of white grit, found in the locality, is placed in pans of water for the birds to shovel among.

Male—Entire plumage brilliant white; two central tail-coverts well curled over; legs brilliant orange; bill pale pink or flesh colour, free from discolouration or spot. Weight, about eight to ten pounds.

Female—Same as male, without curled feathers in tail; inferior in weight.

Young—Clear primrose colour in down; yellow legs; pink bill.

Egg—White or greenish, very numerous. Incubation, twenty-seven to twenty-eight days.

ROUEN DUCK.

(Anas boschas var.)

The origin of the name of this bird is doubtful, some concluding that it is derived from "roan" duck, others stating that the town of Rouen in Normandy is the birthplace of the breed; be this as it may, the duck pies and duck ragoûts served in Rouen are quite sufficient to confer distinction on the bird which furnishes them. The Rouen Duck is almost exactly similar to the female of the Mallard, but the size is nearly three times as great. Like the Aylesbury, it is a favourite at poultry shows, where there are usually large entries of this beautiful breed. For table, again, they are excellent, although not so precocious or fattening so readily as the Aylesbury Duck. Like the Mallard, the Rouen drake undergoes a periodical change of plumage, and for three months in the year assumes an almost feminine garb.

Male—Head and neck brilliant lustrous green, a white ring at lower part, not meeting at the back; back metallic greenish black; curl-feathers of tail black; tail grayish brown, edged with white: vent velvet black; abdomen pale gray; sides gray, finely pencilled; breast rich brownish claret colour; wings brown, free from white; wing-bar lustrous blue, between two white lines; legs and feet orange; bill long and broad, straight like that of the Aylesbury, yellowish green, with black tip.

Female—Head and neck creamy brown, distinctly pencilled; throat and remainder of plumage brown; every part accurately pencilled with a darker shade; wing, bill, and legs same as male.

Young—In down, brown and yellow; legs yellow.

Egg—Pale green, large and abundant. Incubation, four weeks.

PEKIN DUCK.

(Anas boschas var.)

Originally from China, as their name implies, these ducks were first brought into notice about 1872 by an American fancier; Mr. Fowler, of Aylesbury, receiving an importation about the same date. At the first glance they greatly resembled the Aylesbury, a likeness in which the experienced eye of the amateur will soon however detect disparities. In plumage they are pure white, with a very erect body, somewhat resembling that of the Penguin. The legs and bill are bright orange, the down below the upper feathers having a decided yellow tint, a point which most fanciers agree in considering as a characteristic of the breed. They are excellent layers and good for the table, as they attain a large size and fatten readily.

Male—Pure white, bright yellow feet and bill; carriage erect; weight, ten to twelve pounds.

Female—Resembles the male: weight, eight to ten pounds.

Young—In down, pale yellow.

Egg—White. Incubation, four weeks.

CAYUGA DUCK.*(Anas boschas var.)*

This handsome black duck is much less often seen at exhibitions than the breeds previously described, the date of its introduction into this country being more recent. It has, however, been largely cultivated in North America for nearly fifty years, and is said by American exhibitors to have originated at that date from a cross between the Mallard and

some variety of domestic duck ; it takes its name from the lake Cayuga (New York), where it has been bred for a series of years by Mr. J. S. Clarke. The disqualifications in this variety are white feathers, incorrect bill, or small size. Mr. Woodham speaks very highly of the Cayuga Duck as a useful variety, being in his estimation the most delicious eating of all the breeds, possessing the additional advantage of great hardiness and a strikingly handsome appearance. A good pair usually weighs about sixteen pounds.

Male—Brilliant black throughout, with violet and green reflections on head, back, and wings ; bill greenish yellow, with clearly defined black bean at the extremity, not so straight as that of the Aylesbury, but somewhat retroussé at the tip ; the two centre tail-coverts curled ; legs dirty orange.

Female—Similar to male ; curled feathers absent.

Young—When hatched blackish, with buff patches.

Egg—Very dark green ; fifty to ninety during the season. Incubation, twenty-eight days.

DECOY OR CALL DUCK.

(*Anas boschas* var.)

Poultry shows recognise two sorts of so-called Decoy Ducks, the white and the gray, the name having originated with the old practice of placing tame ducks in a cage or pen called "Kooi," in Holland. Their use was by their incessant cries, to attract the wild birds into the snare. The gray variety resembles exactly the Mallard in colouring, or may be compared to a miniature Rouen Duck, with the exception that disqualification is not visited upon the Call Duck, should there be a little too much gray on the breast, or white on the under

parts. The disposition of these birds is very tame, but neither variety should be kept in a flock of ornamental ducks of the smaller kinds, should it be desired to secure the pure breeds, as the Call Duck is polygamous like other domestic varieties.

Male (Gray)—See Mallard and Rouen drake.

Male (White)—Body short and round; wide, rather thick bill, with prominent forehead in both varieties; legs and feet orange.

Female (Gray)—See Mallard and Rouen duck.

Female (White)—Same as male.

Young (Gray)—Yellow with dark splashes.

Young (White)—Yellow.

Egg—White. Incubation, twenty-seven to twenty-eight days.

EAST INDIAN DUCK.

(*Anas boschas var.*)

These birds do not owe their origin to India, as would be inferred from their name, being known also as "Labrador" and "Buenos Ayres" Ducks. There is little room for doubt that they were originally bred from the Mallard. They are a favourite breed as an exhibition duck, the requisite points in a winner being very small size and a uniform black plumage, beautifully glossed on the head, back, and wings with shades of violet, blue and green. The female is more nearly the weight of the male bird than is usually the case among the duck tribe, an exhibition pair weighing from four to five pounds. These birds give evidence of their wild origin by their extreme love of the water and their shyness, taking to the wing on every possible occasion. White feathers are very apt to make their

appearance after the second moult, and these, as well as brown feathers, should disqualify in the show pen.

Male—Plumage, intense shining black with lustrous colouring on the head, back, and wings; bill short, olive green; legs black; weight from two to two and a half pounds.

Female—Same as male, but bill black.

Young—When first hatched, black with yellow shade on back; bill and legs black; fully feathered at three months old.

Egg—Greenish, often overcast with a layer of sooty black, capable of removal by scraping, usually seen in the first eggs of the nest; ten to thirteen. April—May. Incubation, twenty-six days.

DUSKY DUCK.

(*Anas obscura.*)

This bird is an inhabitant of North America, where it is known as the "Black Duck," and breeds by the sea coast, migrating further north on the approach of spring. Wilson states that it feeds principally on minute snails, occasionally visiting the sandy beach in search of shell-fish. It is a large bird about two feet in length. Being quick on the wing it is very difficult to shoot, but dives very rarely. Specimens of this unattractive bird were to be seen in the Zoological Society's Gardens in London, but the species has recently died out. It is stated by Mr. Sclater to have been first received in 1850, breeding well for fifteen years, and also producing hybrids with the common Wild Duck.

Male—Head and upper body brown; throat and foreparts of a lighter shade; wings and tail sooty brown; wing-bar beautiful violet blue; bill greenish; legs and feet dirty yellow.

Female—Similar to male.

Young—In down, head and upper body dark brown, a straight dark line from base of bill across eye to nape of neck, another similar line below; face yellowish white; chin and throat white; breast and abdomen dirty white; legs and bill dusky yellow.

Egg—Greenish; "yellowish white"—(Audubon); eight to ten. May—July. Incubation, about four weeks.

AUSTRALIAN WILD DUCK, SUPERCILIOUS DUCK.

(*Anas superciliosa*.)

This bird, also known as the "Eyebrowed Duck," is an inhabitant of Australia, where it is the Wild Duck of those regions, as also of the Pacific Islands. Specimens were first received by the Zoological Society of London from the late Mr. Edward Wilson, of Melbourne, in 1860; other examples following in 1863, 1865, 1866. Mr. Sclater states that it may now be considered well-established in Europe, having bred freely for a succession of years in the various Zoological Gardens of Europe. Its appearance is not prepossessing, resembling at the first glance the female of our Mallard, the glossy green head feathering of *Anas boschas* being absent in the Australian type. *Anas superciliosa* does not undergo the summer moult of the European species. It is occasionally for sale in England at from 30s. to £2 10s. the pair.

Male—Head and upper body brown, an arched white stripe resembling an eyebrow passing from the bill to the back of the head, an exactly similar crescent meeting it below; throat and fore-neck yellowish white; wing-bar metallic violet, bounded with black; under wing-coverts white; bill black; legs brown.

Female—The same.

Young—No information.

Egg—Dark cream colour; eight to ten. June; (in Europe). Incubation, twenty-eight to thirty days.

YELLOW-BILLED DUCK.

(*Anas xanthorhyncha*. *Anas flavirostris*.)

This bird has bred freely in the Zoological Gardens, and is sufficiently common in our markets to be purchased at about £4 a pair. The first specimens possessed by the Zoological Society were obtained from Lord Derby's collection in 1851, breeding in the gardens several times subsequently. It is a native of South Africa, where it is called the "Yellow-billed Teal," and is, according to Messrs. Layard and Sharpe, migratory, being usually seen in pairs. The Yellow-billed Ducks breed in considerable numbers among rushes and rocks at the Lake of Vogel Vley; their nests are generally placed in a dense bush, and the female sits so close as to allow herself to be trodden on before rising. The breeding season in Africa is October.

Male—General plumage, ashy brown, edges of the feathers lighter; wing-bar orange green and black, edged with white; tail somewhat pointed; bill yellow, with a black patch down the centre; tip black; legs and feet bluish brown.

Female—Similar.

Young—In down, crown of head and upper body ashy brown; face, cheeks, and under parts yellowish white; eye black.

Egg—Cream colour; four to six. May—June. Incubation, twenty-seven to twenty-nine days.

SPOTTED-BILLED DUCK.

(Anas pæcilorhyncha.)

This is another of those varieties of waterfowl most commonly seen at poultry shows, varying in price from £2 to £6 the couple. It is a native of India, over the whole of which country it is found, including Burmah and Ceylon. Dr. Jerdon speaks of it as being excellent for the table, rivalling in flavour the Mallard and Pochard. He states that it frequents well-wooded districts, marshy grounds, and sequestered waters, being usually met with in parties of from eight to twenty. It is a true Mallard, its habits resembling those of that bird, and being very hardy, and a good breeder, it is a desirable acquisition for amateurs. I found it among the most easily acclimatized of my fancy ducks, supporting considerable cold, but evincing a strong disposition to wander, the bird contriving to escape even when pinioned, depositing its eggs among dry grass or under a bush. The breeding season varies with locality. In some parts of India the Spotted-bill nests twice.

Male—Slaty brown; feathers edged with yellowish white; under-parts whitish, with numerous brown spots, varying in size; neck white, splashed with brown; wing-bar metallic green, velvet black, and white; tail and wings brownish black; the irides vary from light to deep brown; the bill is black, base red, tip bright orange; legs and feet orange, with a shade of red. The bill and legs are less brilliant the first year.

Female—General appearance, similar to male; upper back paler; bill and legs less bright, in some instances yellowish flesh colour. The sexes resembling each other so closely, judges should ascertain by careful scrutiny that an exhibition pen contains a real pair.

Young—In down, brown above, yellowish white below. In young birds, legs and feet orange yellow ; bill black. The brightly coloured patches at the base of the upper mandible are either wholly wanting or barely indicated.

Egg—White ; eight to ten. June—September. Incubation, four weeks.

Nest Down—Small, pale brown, obscure white tips.

CHESTNUT-BREASTED DUCK.

(*Anas castanea.* *Anas punctata.*)

This bird, also known as “Chestnut Widgeon,” is an inhabitant of Australia, and one which should not fail to be secured by the amateur when it is offered for sale, which is however but seldom, the price being usually about £4 the pair. Mr. Gould’s magnificent work on the “Birds of Australia,” states that it is a true grass feeder, and that it is found in large flocks in the southern parts of Van Diemen’s Land. The male undergoes a change of plumage, presenting the aspect of the female during more than half the year, and not attaining full dress until his second or even third year. The Zoological Society of London possesses two examples of the Chestnut-breasted Duck.

Male—Breast chestnut ; head and neck metallic green ; back and tail dark brown ; legs red ; bill black ; eye red.

Female—Somewhat smaller. Head, nape, and upper body brown, edged with lighter ; breast pale brown, spotted with dark ; wing-bar green, white, and black ; eyes, bill, and legs similar to male.

Young—In feather, head and neck striped brown and white ; remainder of plumage splashed with black.

Egg—Dark cream colour ; seven to nine. September.
Incubation, probably about a month.

**SLENDER DUCK, MULLER'S DUCK, OR SUMATRA
TEAL.**

(*Anas gibberifrons.*)

This pretty duck is an inhabitant of Sumatra, Australia, and New Zealand, and is very rare in the European market. The Zoological Society received eighteen Slender Ducks in 1860, which have since bred in the Gardens, where it is known as Müller's Duck. The market value is about £3 to £4 the pair. The British Museum possesses some well-preserved specimens.

Male—Brown, each feather edged with a lighter shade, giving a spotted appearance ; bill black ; legs brownish black. Some light feathers on the head, wing-bar white.

Female—Similar.

Young—No information.

Egg—White. July. Incubation, twenty-eight days.

**CRESTED CHILIAN DUCK OR BROWN-BELLIED
CHILIAN PINTAIL.**

(*Anas cristata. Dafila pyrogaster.*)

This bird has been identified by Messrs. Sclater and Salvin as the *Dafila pyrogaster* (Eyton)—*Anas pyrogaster* (Meyen). Its size is considerable, and it would appear to partake of the characteristics of *Anas* and *Dafila*, possessing the deep round body of the former, with the delicate bill, and

elongated tail of the latter. The Crested Duck is common on the Falkland Islands, where it was shot in great numbers by Dr. Cunningham, who states that the flesh at times had an unpleasantly fishy flavour, doubtless attributable to its diet, which consists of shell-fish. These Pintail retire inland to breed, the eggs, according to Mr. Sclater, being deposited in a nest thickly lined with down. Eggs and young birds of this species were procured in 1870—1874 by M. Constantin Jelski from Central Peru, where he states the bird inhabits the mountains near Lima. The Zoological Gardens received two live specimens in April, 1887, from the Falkland Islands, presented by Frederic E. Cobb, Esq., C.M.Z.S., this species being new to the Society's collection of waterfowl.

Male—Upper body reddish brown, lighter on the upper back; crown dusky, terminating in a long crest; under parts and breast dirty white, the feathers tipped with brown; wing-coverts brown; wing-bar metallic purple and green, edged with white; upper mandible black; lower mandible yellow; legs and feet black; eye orange.

Female—The same.

Young—No information.

Egg—Brownish white; five. October—November.

GENUS *CHAULELASMUS*.

Of the two birds comprised by this Genus the second in the "List of the certainly known species of the Anatidæ," *Chaulelasmus couesi* (Coue's Gadwall), from the Fanning Islands in the Pacific Ocean, has not yet been brought alive to Europe.

GADWALL.

(*Chaulelasmus streperus*. *Anas strepera*.)

The Gadwall is not to be considered as a regular winter visitor, although specimens are shot upon occasion, chiefly on the inland lakes of Ireland. Sir R. Payne Gallwey gives some interesting particulars respecting these birds, which he states are extremely shy, haunting lonely pools and rush-grown lakes, where they arrive during the winter. The Gadwall or Grey Duck is larger than the Widgeon, and at first sight somewhat resembles the female of the Mallard, a likeness which disappears when the observer is able to remark the white crescent bordering each feather of the neck and upper breast. The Gadwall is strong and rapid in flight, feeding on vegetable matter, aquatic insects and small fish. The drake undergoes a summer moult, when the small feathers are shed for the second time in the twelve months. It has been successfully bred by amateurs, among whom I may mention the late Mr. Samuel Woodwell Thomas, of Briton Ferry, who found these birds to be very prolific, laying from fourteen to sixteen eggs; they have also reproduced in the Zoological Gardens during a succession of years. Their value is from 10s. to 15s. a pair.

Male—Upper parts dusky brown, pencilled with white; wing feathers gray and chestnut red; wing-bar black and white; tail gray; under parts white; bill bluish black; feet dull orange yellow.

Female—Somewhat similar, with a light speck over the eye.

Young—The first plumage resembles that of the female, but without chestnut or black on the wings.

Egg—Ashy green; occasionally yellowish buff; both ends rounded; eight to twelve. April—May. Incubation, about four weeks.

Nest Down—Small; similar to that of the Mallard; "white tips scarcely perceptible" (Seebohm).

GENUS *HETERONETTA*.

Heteronetta melanocephala (Black-headed Duck), from South America, has not yet been introduced. P.Z.S. (1880).

GENUS *MARMARONETTA*.

This Genus comprises but one example which is distributed throughout Southern Europe, Northern Africa, and Western Asia. It appears doubtful whether this duck has ever existed in confinement.

MARbled DUCK.

(*Marmaronetta angustirostris*. *Anas marmorata*.)

Mr. Dresser states that this bird is found in the extreme South of Europe along the Mediterranean shores, and has been observed to breed in Spain during the summer season. It has been classed by different ornithologists as a Teal, a Pochard, and a Pintail, Gould, in his "Birds of Europe," placing it as *Anas angustirostris*. In Dresser's "Birds of Europe" it is described as feeding on worms, and nesting among herbage and rushes on the lakes of Algeria, being also seen in the reedy waters in certain parts of India in flocks of many hundreds. This bird Mr. Bartlett believes to have existed in captivity, but has no record of its habits and nesting under

those conditions. Major Irby communicated to Mr. Dresser some excellent notes upon the habits of this bird, to which author I am also indebted for the descriptions.

Male—Entire ground colour creamy brown, darker on back and wings, equally mottled with a darker shade ; a dark stripe across eye to back of neck ; lower breast and abdomen grayish white ; tail and wings bluish buff ; beak and legs bluish black ; eye brown.

Female—Similar, but paler.

Young—No information.

Egg—Yellowish white ; six to eleven. May—June. Incubation, twenty-five to twenty-seven days.

GENUS *RHODONESSA*.

One duck represents this Genus, of which the habitat is India.

PINK-HEADED DUCK.

(*Rhodonessa caryophyllacea*. *Fuligula caryophyllacea*.)

This magnificent bird is but too seldom imported, being even in India, its native country, extremely rare, the last importation having been made by Mr. Jamrach in 1887, when he introduced several pairs which sold readily at from £40 to £60 the couple, finding purchasers chiefly upon the Continent. Some idea may be formed of this beautiful waterfowl from the stuffed specimens in the British Museum. It is most common in Bengal, where Dr. Jerdon found it in tanks and ponds crouching among the dense weeds, and hiding among overhanging bushes in flocks varying from four to twenty. It is said to breed at the conclusion of the hot season, making

its nest among thick grass near the water. The specimens obtained in 1874 by the Zoological Society only lived a few years and did not breed. This rare bird was by Mr. Eyton placed with the Pochards, as also does Stephen, but the examination by Garrod of the *trachea* of the Pink-headed Duck proves that the structure of these organs declares its affinity with the *Fuligulinae*. I have, however, followed the list of Genus adopted by Mr. Sclater. The voice resembles that of the Common Duck.

Male—Head and neck clear pale rose pink, developing in the breeding season a small tuft of richer colour on the head; upper body fine glossy chocolate brown; under parts paler, inclining to fawn; edge of the wing white; upper part of wing green, with a tinge of pale pink; under surface of wings pinky; the bill differs in colour, being either reddish white or pale orange; eyes orange red; legs and feet blackish lead colour.

Female—Pink of the head duller; otherwise similar.

Young—First feathers of head and neck dirty claret colour; plumage light brown.

Egg—Whitish. June—July.

GENUS *QUERQUEDULA*.

The birds comprising this Genus differ from the ducks in having a more slender form, a narrower bill, longer wings, and more pointed feathers; the tail is wedge-shaped or pointed, the feathers of the back or saddle being considerably longer than in the *Anas*. The *Querquedula* feed on vegetables, mollusca, insects, and worms, frequenting lakes, marshes, and rivers, and are rarely seen by the sea coast. Excellent swim-

mers, they nevertheless seldom dive; their flight is very rapid, and when on the ground they walk well and gracefully. The nest of the Teals is constructed of grass, short rushes, and other suitable materials, with a thick lining of down, containing white or cream coloured eggs, seven to sixteen in number. In most of the species the male assumes a sober plumage after the breeding season, regaining his full dress at the autumn moult.

Seventeen species of Teal are enumerated by Mr. Sclater, of which the following have not been imported alive:—*Querquedula Hartlaubi* (Hartlaub's Teal), from West Africa; *Querquedula oxyptera* (Sharp-winged Teal); *Querquedula andium* (Andean Teal), from Ecuador and Venezuela; *Querquedula versicolor* (Brilliant Teal); *Querquedula puna* (Puna Teal), from the Andes of Peru and Bolivia; *Querquedula torquata* (Ringed Teal), from Paraguay and Buenos Ayres; *Querquedula Eatoni* (Eaton's Teal), from Kerguelen's Land; *Querquedula Carolineensis* (Carolina Teal), from North America; *Querquedula discors* (White-faced Teal); *Querquedula punctata* (Hottentot Teal); *Querquedula cyanoptera* (Raffle's Teal). I have, however, given descriptions of such birds as from communication with our Colonies, or for other reasons, we may still hope to see introduced.

COMMON TEAL.

(*Querquedula crecca*.)

This bird being greatly esteemed for the table, is much persecuted by sportsmen on its arrival on our shores. It is first seen about September, flying in large flocks. It breeds by preference in the northern parts of the British Isles, but its nest, thickly lined with black down, may be found during April and May in many districts in England, nor is it to be

discovered without skill, secreted as it is under some low bush usually a considerable distance from the water, or concealed in a tuft of coarse grass, where the duck will sit three weeks on from seven to ten yellowish white eggs. If allowed seclusion, the Teal will breed in captivity. A ready sale is found for these birds at from 10s.6d. to 15s.6d. the pair.

Male—Fourteen inches long. Head fine chestnut red, with a soft hanging crest ; round the eye and extending to the back of the head, a broad band of green and blue, with a yellowish white margin ; upper body ash gray shading into brown, finely pencilled with black ; small wing-coverts white ; flights dark ; the breast of a light shade passing into white, is dotted with round black spots ; wing-bar brilliant metallic blue and green ; legs lead colour ; bill nearly black ; eye hazel.

Female—General plumage brown, each feather margined with a darker shade, edged again with paler ; head light brown, speckled with darker ; feet, legs, and bill, similar to male.

Young—For the two first months, according to Morris, the young resemble the female, but are somewhat darker in plumage ; the males assuming their distinctive dress about the middle of December.

Egg—White, tinged with buff ; eight to fourteen. June—July. Incubation, three weeks.

Nest Down—Small, dark brown ; darker at the tip.

GARGANEY TEAL.

(*Querquedula circia*.)

This Teal has a wide distribution, breeding not only in India but in the fens of our south-eastern counties. It is said

to be rare in Scotland, and to be even more uncommon in Ireland. These birds usually arrive in this country about the middle of March when they are in their perfect plumage. Dresser gives the following description of their habits:—"The food of the Garganey consists of worms, insects, and insect-larvæ, small frogs, occasionally small fishes, also of grain of different sorts, seeds of many of the water-plants, buds, leaves, and the soft ends of leaves, and soft succulent roots. They are not difficult to keep tame, and if given the run of a pond covered with reeds and water-plants, they will do well with what they can pick up there, if a little grain and pieces of bread are thrown out to them." From the same work we learn that "the Garganey commences laying its eggs about the middle of April. The nest, which is composed of rushes and dried grass mixed with the down of the bird, is placed upon the ground in low boggy situations, amongst the coarse herbage and rushes in marshes, and on the borders of inland waters and rivers." In India these birds are caught in large numbers, and kept alive, being fed up throughout the summer for the table. The value in this country varies from 25s. a pair upwards.

Male—Upper part of head and back of neck dark brown, a white crescent over the eye and along the neck, by which this bird may always be known; chin black; throat and breast yellowish brown; upper body brownish gray, with green reflections, each feather margined with darker; wings pale blue gray: scapulars long, pointed, and black, with a central stripe of white; abdomen white; sides white, pencilled with black; feet brown; bill black; eye bluish brown.

Female—General appearance, brown of various shades; under body white; dark brown line round the eye; chin and throat white.

Young—Dark brown down, two yellow white patches

each side of rump ; dark eyebrow ; under body yellow white. First feathers like female but redder.

Egg—Yellowish white ; ten to twelve. May—July. Incubation, three weeks.

Nest Down—Long, dark dull brown, white tips.

WHITE-FACED OR BLUE-WINGED TEAL.

(*Querquedula discors.*)

The work on "American Ornithology," by Wilson and Bonaparte, states that the Blue-winged Teal arrives in North America early in September from its breeding place in the north. These birds may be seen on the banks of the river Delaware, crowded together in such vast numbers that quantities are killed by the single discharge of a gun. They fly rapidly, and in alighting drop suddenly, like the woodcock, among the reeds. They feed on vegetables, and are fond of the wild oat, committing also vast depredations on the rice-fields of the Southern States, where they are caught alive in traps. The breed is somewhat delicate, being very susceptible of cold. It has not yet been offered alive in England, though, from information recently received, I have reason to believe that either this Teal, or the Raffles Teal, is possessed and bred by two amateurs on the Continent.

Male—Head rich brown, black on the crown ; neck glossed with green and purple ; the eye encircled from the front with a large crescent-shaped patch of white ; breast and neck reddish, marked regularly with curves of whity brown, giving the plumage a spotted appearance ; wings beautiful blue ; wing-

bar white and green ; shoulders pale blue ; bill slate colour ; legs and feet yellow ; tail pointed, and extending a couple of inches beyond the wings.

Female—Head and neck dusky slate ; markings on back and belly less distinct.

Young—In immature birds the bill is of a brownish green tint. Young females have the legs and bill very pale lead colour.

Egg—Resembles that of *Querquedula crecca*, but a trifle more yellow ; six to thirteen. May—June.

BAIKAL OR JAPANESE TEAL.

(*Querquedula formosa*.)

This is a very beautiful bird, which is found in North-eastern Asia, penetrating into China and Japan. It takes its name from the great inland lake Baikal in Siberia, where it is stated by Dr. Jerdon to breed in May and June, laying its eggs in a slight hollow on the bare earth, lined with feathers. This teal was among the earliest acquisitions of the Zoological Society, breeding from 1840 to 1843, after which time the species died out, and was not re-acquired until 1867, when two pairs were purchased out of a merchant vessel. Mr. Sclater (Secretary to the Society) states that neither these nor more recent specimens have as yet been induced to breed. These birds are occasionally offered by dealers under the name of Japanese Teal. The value would probably be from five guineas upwards, though I am informed that when first introduced they fetched from £20 to £30 the couple.

Male—Cheeks pale delicate fawn ; top of head and chin black, connected by a black band crossing the eye ; broad band of glossy green from back of eye to nape of neck, terminating

towards the front of throat, below which runs a corresponding line of silvery fawn ; remainder of head whitish ; back of neck glossy green ; upper body gray and brown, brightening into chestnut ; narrow white band on shoulder ; wing-bar velvet black, brilliant green, and white ; saddle feathers long, reddish fawn regularly striped with black, under parts pinkish white ; abdomen white ; legs and feet yellow.

Female—Head creamy brown, flecked with darker shades ; upper body dull brown ; throat white ; breast reddish, with dark brown spots ; under parts whitish.

Young—In down, yellowish, dark stripe at base of bill, near eye ; “first feathers have broad and rather bright reddish brown edges” (Dresser).

Egg—Creamy white ; “small ; bluish yellow” (Middendorff) ; ten to twelve. June—July. Incubation, twenty-eight days.

FALCATED TEAL.

(*Querquedula falcata*.)

This beautiful bird inhabits Eastern Siberia and Japan, migrating, according to Dresser, southwards in the winter, into India and China, the beautiful specimens examined by me in the British Museum having been brought from the latter country by Mr. R. Reeves. The Falcated Teal is said to travel in flocks of six or seven, and to resemble in its habits the Common Teal. The price asked varies from £6 to £10 the pair.

Male—Head and crest lustrous reddish, with brilliant green reflections ; under chin and throat white, crossed by a metallic purple ring ; breast, back, and under parts white, pencilled with brown saddle feathers, or scapulars, very long,

curved, and falling below ; the sides black, edged with white ; wing feathers brown, with brilliant white, green, and blue wing-bar ; tail black ; legs and bill lead colour.

Female—General plumage brown, light on the sides, chestnut on the breast ; bill and legs lead colour.

Young—"Male in first plumage resembles adult female, but darker ; white tips of greater wing-coverts tinged with fulvous ; under surface of body pale fulvous, spotted with brown" (Dresser).

Egg—Pale creamy white, smooth, long and pointed.

May—June. Incubation, probably twenty-one to twenty-five days.

HOTTENTOT TEAL.

(*Querquedula punctata*. *Querquedula Hottentota*.)

There are some well-stuffed specimens of this little bird in the British Museum, but I am not aware that it has ever been offered in the European Markets. I have no doubt that if there were a demand it would be easily obtainable, as quantities may be trapped in Southern Africa, more especially in the Orange Free State. More slender in shape, it is somewhat less in size than our Common Teal.

Male—Top of head dark brown ; cheeks and chin pinkish cream ; throat, breast, and under parts fawn colour, spotted with brown ; wings dark brown ; wing feathers metallic green, with white and black wing-bar ; bill purplish red, black at the base ; legs greenish yellow ; eye reddish yellow.

Female—Similar to the male, but smaller and plumage lighter.

Young—No information.

Egg—Dirty greenish white.

CAPE TEAL.

(Querquedula capensis.)

This Teal, which, as its name implies, is a native of Southern Africa, was brought home by Dr. Smith, by whom it has been figured in his "Work on South African Zoology." As is the case with all the waterfowl of South Africa, very little can at present be learned respecting its habits. It is not included by Mr. Sclater in his "List of the Anatidæ," I cannot therefore say if it is a true species, or *Querquedula punctata* modified by age and locality.

Male—Head ashy gray, streaked with dark marks; lower part of neck and breast of the same colour, profusely dashed with short bars of reddish brown, giving the plumage a scaly appearance; feathers of back dark reddish brown, each feather edged with lighter shade; wing-bar brilliant green, edged with a black and white band; throat white; shoulders gray; legs reddish; wing-coverts, quills, and tail blue slate; bill crimson, edges and base black.

Female—Similar to male, but smaller.

Young—No information.

Egg—Dirty greenish white. Probably June—September.

RAFFLES' TEAL.

(Querquedula cyanoptera. Petrocyanea rafflesi.)

As yet unknown in our bird markets, this exquisite Teal, sometimes known as the "Cinnamon Teal," is well worth the attention of importers. Mr. Eyton states that it is extremely common in the west of South America, and that he had received specimens from Chili, from which place it was first

brought home by Captain King. Baird, Brewer, and Ridgway refer to the bird as frequenting Western America, and as a casual visitor in the north eastern regions. The British Museum possesses the specimen from which my notes are taken, therefore there may possibly be some variation in the colour of bill and legs, as compared with the living bird. In Jardine and Selby's "Illustrations of Ornithology," attention is drawn to the curious dilatation of the bill in this bird, which seems, as well as its colouring, to point to some affinity between this beautiful duck and the Shovellers.

Male—Head, neck, and breast rich chestnut glossed with violet ; crown of head dark brown ; back feathers tipped with black ; wing coverts bright light blue ; wing-bar metallic green ; flight and tail feathers black ; eye orange ; feet and legs orange ; bill black.

Female—Similar to female of *Querquedula discors*, the authors above mentioned stating that it is difficult to distinguish between the ducks of these two varieties.

Young—No information.

Egg—Buffy white ; eight to nine. June.

BRAZILIAN TEAL.

(*Querquedula Brasiliensis*.)

This pretty Teal, first obtained from Pará, in Brazil, during the spring of 1864, bred in the Zoological Gardens in 1878, it also formed part of the celebrated collection at Knowsley. It is largely distributed over the east and south of America where it inhabits marshy districts. Bonaparte states that it is common in south-east Brazil, and in the P.Z.S. (1876) it is stated to be more abundant in Paraguay than

near Buenos Ayres, being usually seen in pairs, but also sometimes in flocks of twenty, associating with other ducks. It is said to moult in May, and nest in August. The British Museum possesses stuffed specimens of this Teal which would, alive, be a desirable acquisition to our fancy waterfowl. Mr. Jamrach states that the value is from £3 to £4 the pair, but it is very rarely offered for sale. Mr. Eyton observes upon the singular formation of the wind-pipe in this Teal, differing, he states, from that of *Querquedula crecca* in being more oblique as regards the bulbous enlargement.

Male—Upper body brown, feathers edged with brighter tint; throat gray; back, small wing-coverts, and tail rich velvet black; flanks gray; large wing-coverts and bar beautiful metallic green; two outer wing quills black; bill and legs brilliant red.

Female—Similar, but much less brilliant; bill brown, with a red patch at the base; legs black.

Young—No information.

Egg—Greenish white. June—August.

BIMACULATED DUCK OR CLUCKING TEAL.

(*Anas bimaculata*. *Querquedula glocitans*.)

This handsome bird was for many years considered a true species, being known as the "Clucking Teal," not only to Pennant, Selby, Bewick, and Latham, but to Gould, Macgillivray, Morris, and more modern writers. It is now well established that this handsome hybrid is the offspring of the Mallard and Teal, but as it is always possible that specimens may be offered for sale, descriptions of the male and female are appended.

Male—Head, cheeks, and throat glossy green ; crown and nape chestnut brown, deepening into purple black ; between the bill and eyes and below the ear, two large oblong patches of chestnut brown ; upper breast chestnut, spotted with black ; back ashy gray, tinged with yellow, pencilled with undulating black lines ; sides and flanks the same ; wing-coverts brown ; flight feathers dark brown ; wing-bar green margined with white ; abdomen yellowish white ; bill yellowish gray ; feet dark brown ; eye brown.

Female—Head and neck, chin, throat, and upper breast pale buff streaked with darker ; sides and flanks yellowish brown ; abdomen and lower part of sides white ; wings brown ; wing-bar greenish blue and black ; legs yellowish orange—in one female belonging to Mr. Tomes of Weston, 1846, bluish gray ; bill brownish olive ; eye brown.

Young—No information.

Egg—No information.

GENUS *SPATULA*.

Five species compose this Genus, which are distributed over Europe, Australia, South America, South Africa, and New Zealand. None of the foreign varieties have yet been imported alive.

As the name of the Genus implies, these birds are distinguished by their broad spoon-bill. The plumage is varied and brightly coloured. All of the foreign Genus have spotted breasts, and differ, according to Mr. Seebohm, in other important respects from their European ally. The undescribed variety is *Spatula variegata* from New Zealand, of which an account, with illustration, is given in Sir W. Buller's work on the "Birds of New Zealand."

COMMON SHOVELLER.

(Spatula clypeata.)

This singular duck is easily recognized by its wide spoon-shaped bill, which it employs in sifting the mud, in search of the small insects which form the greater portion of its food. It is not common in Britain, being occasionally observed in the east and south counties during the winter: in Ireland occurring somewhat more frequently. Examination of the bill of the Shoveller explains the reason for its peculiar construction. The curious curtain of bristles hanging from the upper mandible acts as a strainer through which the water runs, while with its tongue the bird retains the small insects which flow in as it skims the surface with the broad bill in search of food. Shovellers are usually seen in flocks of from five to fifteen during the autumn, and breed in various parts of Ireland. The nest is of dry grass, and is usually placed on a solid tussock in the middle of a marsh. It is a good flyer and rapid swimmer, but owing to the smallness of its foot, a very indifferent diver. The price is from £1 to £2 the pair.

Male—Head and neck green; throat black; breast and great wing-coverts white; rest of wing blue, with brown quills; wing-bar green; tail brown, and pointed; bill brownish black; legs orange; eye bright orange.

Female—Brown of various shades; wing-coverts blue.

Young—In down, olive, with brown and yellow patches; easily recognizable by the wide bill. In first feather, like female, but young males show the blue wing-coverts; legs and feet flesh colour; bill pale pinky brown.

Egg—Yellowish, spotted with pale green; ten to twelve. June—July. Incubation, three weeks to twenty-five days. "Twenty-two to twenty-three days" (Naumaun).

Nest Down—"Neutral brownish gray, pale centre, white tips" (Seebohm).

CAPE SHOVELLER.

(Spatula capensis.)

This variety of broad-billed duck has not yet been imported alive into our collections, nor is there any specimen in the Zoological Gardens. From Messrs. Layard and Sharpe's work on the "Birds of South Africa," we learn that it is rarely seen in the neighbourhood of Cape Town, or on the Eastern frontier, but that it is more generally met with in the interior of the Colony, where it is known as the "Slop." Little is reported of its habits or nidification, but they are probably very similar to those of the ordinary variety.

Male—Head gray, finely spotted with dark brown; upper body brown, with a greenish gloss, each feather bordered with white, giving to the bird a scaly appearance; wing feathers brown, with a broad bar of azure blue, white, and metallic green; bill black; legs orange red; eye yellow.

Female—Similar, but less bright.

Young—Head, neck, and body more rusty than the adult; shoulder-coverts pale brownish red, glossed with grayish blue; no distinct white speculum; bill light reddish brown, greenish at sides.

Egg—Pale greenish yellow.

AUSTRALIAN SHOVELLER.

(Spatula rhynchotis.)

This bird is also known as the "New Holland Shoveller," and I am indebted to Mr. Gould's "Birds of Australia" for the whole of my notes on this variety. Although ranging widely from east to west, the habitat of this species, so far as it is yet known, is confined to the southern portion of Australia. Fresh-

water rivers, creeks, marshes, lakes, and pools, both near the coast, and in the interior of the country, are the situations in which the Australian Shoveller is to be found. It feeds on aquatic plants, shelled mollusca, and water insects. Its flesh is little if at all inferior to that of the Australian Wild Duck: consequently it is frequently shot and eaten by the settlers. Like most of its tribe, it assumes a richer dress at one season than at another, that of the spring or pairing time being much the finest; at other times the male is so much like the female, which undergoes no change of plumage, as scarcely to be distinguishable from her.

Male—Crown of the head and the space surrounding base of bill brownish black; throat and breast chestnut brown, blotched with black; on either side of face, between the bill and the eye, a broad lunar-shaped line of white, bounded posteriorly by speckles of black; head and neck gray, with greenish reflections; all the under surface very dark chestnut brown; back brownish black; wing-coverts black, largely tipped with white; under surface of the wing white; tail dark brown; irides bright yellow; bill dark purplish black, the under mandible clouded with yellow; legs and feet yellow.

Female—Head and neck buff, striated with dark brown, the latter colour predominating on the crown of the head and back of the neck; all the upper surface dark brown, each feather margined with whitish brown; the wings as in the male, but the colours and markings much less brilliant and decided; all the under surface mottled brown and buff.

Young—In down, clouded with brown and yellow (Trans. New Zealand Inst. 1870).

Egg—Creamy white, tinted with green; ten to thirteen. November. Incubation, about four weeks.

SPOTTED SHOVELLER OR SOUTH-AMERICAN
SHOVELLER.

(*Spatula platalea. Rhynchaspis maculatus.*)

This beautiful bird received its descriptive name *Spatula maculatus* from Mr. Gould, on account of the characteristic black spots with which the entire plumage is adorned. Very little is known respecting this species, which is found, according to Azara, both in Paraguay and Buenos Ayres, as also in the Central Provinces of Chili, where it is fairly abundant. "Mr. Darwin obtained his specimen of this Shoveller from the Rio de la Plata, whence also the one figured in Jardine and Selby's 'Illustrations of Ornithology' was procured by Mr. Gould. A female of this species in Salvin and Godman's collection was obtained in the Falklands by Leconte, when he went to obtain living sea-lions in 1867." (P.Z.S., Sclater and Salvin on Neotropical Anatidæ, 1876.) Mr. Eyton held a theory that this bird was the female of the New Holland or Australian Shoveller (*Spatula rhynchotis*), and that the specimens previously described as being the female and young of that bird were in reality young males (Synopsis on the Anatidæ; Eyton)—an opinion which is now completely disproved.

Male—Ground colour of plumage reddish yellow, shading into brown upon the head; entire plumage thickly spotted with round black spots; under parts chestnut brown; rump, tail-coverts, and scapulars glossy black; chin white; shoulders and smaller wing-coverts grayish blue, terminating in a broad white band; wing-bar brilliant green; bill very dark brown; legs and feet yellow; eye yellow (Jardine and Selby, "Illustrations of Ornithology").

Female—No information.

Young—No information.

Egg—No information.

GENUS *MALACORHYNCHUS*.

(*Malacorhynchus membranaceus*.)

MEMBRANACEOUS DUCK.

This Genus contains but one example, of which no specimen has as yet been imported alive. It is an inhabitant of Southern Australia, where it is known to the Colonists as the "Soft-billed" or "Pink-eyed Duck."

Both sexes are alike, the ground colour of the plumage being a clear gray, transversely striped throughout with dark brown; a pink spot is placed behind the eye, the bill and legs are brown, the former very broad and spoonlike in shape, furnished with a full, deep, fleshy membrane. Nothing is known of its nesting habits, and to Gould's "Birds of Australia" we owe the little information which exists respecting this curious Shoveller, which must not be confounded with *Hymenolæmus malacorhynchus*.

GENUS *METOPIANA*.

The beautiful bird forming the single representative of this Genus has been placed both among the *Anas* and *Fuligula*, to which latter it is undoubtedly allied, as was proved by Mr. Garrod's examination of the larynx (P.Z.S. 1875). The most recent classification has, however, placed it as a separate Genus.

ROSY-BILLED DUCK.

(*Metopiana peposaca*. *Fuligula peposaca*. *Anas peposaca*.)

For ten years previous to the autumn of 1886 there had been no importation of these beautiful birds, the Zoological Society of London having purchased some at that time which have since bred almost yearly. In 1876 about twenty-seven couples arrived, when many were sold at £25 the pair, but are happily now procurable at £4 10s. to £6. Although a little shy, the Rosy-bill will breed freely, being an exception to the general rule and proving very hardy even when exposed to several degrees of frost. Mr. Jamrach states that the tame-bred specimens excel the wild ones in beauty, the bill being intensified in colour, and having more cere on the upper mandible. The Rosy-bill is a native of South America, being brought from Chili and Patagonia. The beautiful waxy-looking rose-coloured bill renders it a striking object on the water, and it has the advantage of not undergoing the variation of plumage common to so many varieties, which, like the Mandarin and Carolina, present a somewhat shabby appearance during the summer months.

The P.Z.S. (1876) gives a short account of this bird communicated by various writers. It is said to be common on the Parana, and Mr. Hudson obtained specimens near Buenos Ayres. There is very little on record respecting the natural history of this species, though it is mentioned casually in most catalogues of collections, and by German and Spanish authors. Mr. Sclater (P.Z.S. 1868) states "that this bird has a large bulbous expansion in the windpipe." "This," Mr. Garrod writes, "I have found in all the male specimens I have examined. There is also some dilatation of the consolidated rings which go to form the lower portion of the trachea: this is to be observed on both the right and left sides, the box being

connected with the latter only. In the female no box is developed. The trachea narrows slightly above the syringeal box." From my own observation of this species I am inclined to think that it is liable to some bronchial affection which impedes its respiration, seeming to suffer acutely when driven, and to gasp and wheeze in a remarkable degree when alarmed. Mr. A. H. Garrod in his paper "On the trachea of certain Ducks," P.Z.S. 1875 (from which I have already extracted several observations), points out that the windpipe of this bird is constructed on the same type as that of the Common Pochard (*Fuligula ferina*) and Crested Pochard (*Fuligula rufina*), being mostly composed of membrane.

Male—Head and neck metallic purple and peacock blue; breast violet blue of various shades; back and sides brown, with blue reflections paling into ash; flanks gray, finely pencilled with black; wing-bar metallic green, bordered with white and black; under parts gray and white; bill bright rose-pink, with crimson protuberance at the base; eyes rosy scarlet; feet dark orange.

Female—Head and upper body chestnut, fading to fawn; edge of shoulders white; sides and breast chestnut brown; under parts yellowish white; bill dull slate-colour; eye orange brown, with red tinge; legs dark orange.

Young—In feather, has the head dark brown; back of neck, back, and rump blackish; tail and throat brown; chest and abdomen whitish, splashed with brown; bill and legs lead colour.

Egg—Round, rather small, and of a dirty white colour. July—September. Incubation, twenty-eight or thirty days.

Nest Down—Very dark brown, nearly black; long dark tips.

SUBFAM. VI. FULIGULINÆ.

In this Subfamily are comprised the following Genus:—*Fuligula*, *Hymenolæmus*, *Clangula*, *Cosmonetta*, *Harelda*, *Heniconetta*, *Camptolæmus*, *Somateria*, *Lampronetta*, *Ædemia*, *Tachyeres*.

GENUS *FULIGULA*.

The Pochards and Scaup Ducks are both members of this Genus. They frequent the sea shores, feeding on small mollusca, weed, and minute fishes; all are skilful divers, descending, according to Dr. Brehm, to a depth of fifty or sixty fathoms in open water. The *Fuligula* are migratory and gregarious; the males which are considerably larger than the females, and usually different in plumage, collecting into flocks by themselves after incubation has commenced, and assuming for some months a sober garb. The bill is high at the base; the wings moderate in length; the tail short and flexible; the feet large and broadly webbed, the hind toe lobated. As a rule the eggs of this Genus are numerous, more round in shape than those of the True Ducks, and have a green, or greenish gray tint. The Pochards frequent most of the countries of the Globe, and have been divided into fourteen recognized species, several of which have not yet been imported alive. These are as follows:—*Fuligula collaris* (Ring-necked Duck); *Fuligula affinis* (American Scaup Duck); *Fuligula mariloides* (Chinese Scaup Duck), of which three females only have been identified; *Fuligula Americana* (American Pochard); *Fuligula valisneria* (Canvas-backed Pochard); *Fuligula capensis* (White-eyed Cape Pochard), of which one female was purchased by the Society at the Knowsley sale in

1851; *Fuligula Nationi* (Nation's Pochard); *Fuligula Australis* (Australian White-eyed Pochard); *Fuligula novæ Zealandiæ* (New Zealand Scaup), of which no living example has yet been received in Europe.

COMMON OR RED-HEADED POCHARD.

(*Fuligula ferina*.)

The male of this bird, which is often called the "Poker," Red-head Poker," or "Diver," while the duck is known as the "Dun Bird," is a winter visitor to Great Britain, arriving in autumn and leaving in spring, flying in flocks of from ten to a thousand. Sir Ralph Gallwey states that he has even seen as many as five thousand collected together after a gale. They are common on the inland lakes of Ireland, but seldom nest there. Pochards are distributed over Europe, part of Africa, and North America, where Audubon states he has shot them, and found their stomachs crammed with tadpoles, small lizards, snails, and on occasion with acorns and beech-nuts. They are caught in decoys in Ireland, and in our own Fen country, thousands being sent to the London markets, where they may be purchased in March at £1 to £1 10s. the couple. On Lord Walsingham's estate in Norfolk the Pochard breeds during May and June, in company with the Gadwall and other ducks, returning yearly to the same locality for nesting.

Male—Head and upper neck beautiful chestnut red; upper breast velvet black; back and sides delicate pale gray, finely barred with black; under parts white; wings and tail of different shades; bill gray, with black tip and base; eye reddish orange.

Female—Head and neck brownish gray; body and wings gray; eye reddish brown; bill black; upper breast dark reddish brown; legs and feet gray blue, with broad black webs.

Young—At first resembles female, obtaining some change with the first autumn moult; the change in colour of feathers going on by slow degrees afterwards. Dr. Henry mentions that the black on the breast of the young males does not make its appearance until the second year.

Egg—Grayish green; both ends rounded; eight to twelve. April—May. Incubation, twenty-eight or thirty days.

Nest Down—Small; delicate uniform pale brownish gray.

RED-CRESTED POCHARD.

(*Fuligula rufina*. *Branta rufina*.)

This beautiful bird, known to dealers as the "Indian Pochard," was first acquired by the Zoological Society in 1874, being presented by Sir Edward Buck, others following in 1876. We are fortunate in now being able to purchase a pair of these birds at from £3 to £5, the price having been known to rise as high as £30 when first introduced, their quaint appearance and undoubted rarity rendering them well worth the amateur's attention. This pochard was first shot in England, according to Mr. Yarrell, in 1818, since which time several other stragglers have been killed in different localities; on one occasion a flock of eighteen being seen on the Thames near Erith. Its range is extensive, being found in various parts of Europe, Africa, and Asia, Mr. Hume stating that flocks of thousands occur on the great inland lakes of India. The nest of this bird is usually placed near water, or in marshy districts, and is a mat of rushes and dry weed, the young leaving the parents about the end of June. *Fuligula rufina* has not yet bred in the Zoological Gardens, although hybrids have occurred between this pochard and the Rosy-bill Duck. It has, however, been reared on the

Continent, among the successful amateurs being M. Achille Roffay, of Angers, and I have myself bred it in Buckinghamshire, setting the eggs under a hen, and rearing the young in a wire coop on grass.

Male—Head, cheeks, and throat bright clear chestnut, the crown feathers long and full, forming a silky crest which the bird erects when excited ; breast and abdomen velvet black ; shoulder, wing-bar, and flanks white ; wings ash gray and brown ; bill and eyes bright scarlet ; legs red orange. During the moult resembles the female, but is identified by the greater redness of the bill and feet.

Female—Head and neck brown ; crest less developed ; upper body bay ; breast and flanks brownish yellow ; eyes reddish chestnut ; legs and feet reddish brown.

Young—In down, upper body dark olive brown ; cheeks and under body yellowish white ; a dark line from behind eye to ear ; bill brownish above, yellowish flesh colour below ; legs and feet dark olive ; eye brown. In first feather, similar to female. In the young male the bill is red, with white tip ; back light brown ; wing-coverts grayish brown ; head and neck pale chestnut ; eye bright red ; legs and feet orange, with black webs.

Egg—Bright green, occasionally greenish brown ; much rounded ; five to eleven. April—June. Incubation, twenty-six days.

Nest Down—Dark brown ; grayish white centres.

SCAUP DUCK.

(Fuligula marila.)

The Scaup Pochard, which is plentiful on our shores in the winter, disappearing again about April, is seen in large flocks, and seeks its food, which consists of water animals and insects, by diving. These birds are met with both in fresh and salt waters, to which latter they resort when the fresh waters are frozen, and may be seen feeding on mussels, cockles, and other shell fish. Their proper breeding places are the Arctic Regions, but they have been known to nest in our Eastern counties near large rivers and extensive marshes. The "Mussel Duck," as it is often termed, is distributed throughout North America, Northern Africa, India, and Russia, as well as in other countries. It is awkward on land, but an excellent diver, owing to the broad-webbed hind toes, remaining immersed for a considerable time.

Male—Head and neck black; upper body grayish white, finely pencilled with black; wing dark brown; wing-bar and sides white; bill and legs lead coloured; eyes yellow.

Female—General plumage brown, a white line round base of the bill extending on to the cheeks; eye yellow; bill lead colour, tipped with black; legs and feet bluish lead.

Young—In first plumage resemble female; the colours more indistinct.

Egg—Greenish white; ("clay buff"—Yarrell); ("yellowish brown"—Morris); long and slender; eight to ten. May. Incubation, about twenty-five days.

Nest Down—"Dark brown, without white tips, but with obscure white centre. Size of Mallard" (Seebohm).

TUFTED SCAUP.

(Fuligula cristata.)

The Tufted Pochard, or "Black Widgeon" as it is sometimes called, is an inhabitant of the Northern Regions, being found in the high latitudes of North America, and coming to us from Lapland, Norway, and Sweden, on its way to the warmer climates of Italy, Spain, and corresponding countries. It is a plump, round bird, swimming somewhat low in the water, and but seldom captured in decoys, on account of the ease with which it escapes by diving. It breeds in most of the counties of England, depositing its eggs in a roughly composed nest, usually near inland waters. The Tufted Duck has since 1831 been an inhabitant of the Zoological Gardens, where in 1849 it hybridized with the White-eyed Duck, the produce continuing to breed until 1861 (P.Z.S., 1880). Mr. Yarrell refers to a cross between a Carolina drake and a female Tufted Duck, at the same time mentioning that there exists in the Belfast Museum, a bird which was shot near Downpatrick, being apparently a hybrid between the Tufted Duck and the Pochard. Sir Ralph Payne Gallwey states that a thousand have been seen collected together in Belfast Loch, one of its breeding places, as also in all the country watered by the Shannon.

Being very hardy, as well as highly ornamental, it is a desirable addition to any collection, the young being easily reared under bantam hens. The following notes are from the pen of a practical ornithologist of Sussex, Mr. J. H. Verrall, well-known for his spirited appeal on behalf of the Wild Fowl of the Lewes Pells:—

"The Tufted Duck is polygamous in the domesticated state, but is not quarrelsome, and several pairs may be kept together. They commence to make arrangements for nesting in April—building on the ground amongst nettles and dwarf plants, making a very small nest in which they lay from

six to eight eggs, very large for the size of the bird, being nearly as large as the egg of the Common Duck. The young are hatched in three weeks, and follow their mother immediately. They will eat bread freely, and dive as soon as hatched, searching for shell-fish, &c., amongst the weeds; they also feed on the green weed which is found floating on ponds. The mother always keeps guard over them when on the water. They are very careful of their young, and are at times rather quarrelsome with other Ducks, but are friendly with females of their own species. They grow very fast, being nearly as large as the parents when two months old. They should be pinioned when a month old by taking the first joint off one wing, with a sharp knife or a pair of pruning scissors. They do not breed until two years old."

The Tufted Scaup is not often procurable, the market value being about 30s. to 35s. a couple.

Male—Head (which is furnished with a long pendant crest), neck, and breast, glossy violet black; upper body, wings, and tail brownish black; under parts pure white; wing-bar white; eye bright yellow; bill and legs bluish black. In summer plumage, brown; white parts yellowish.

Female—Reddish brown; crest small; breast yellowish white; wing-bar white; legs and feet grayish black, paler than in the male; bill brownish black, the adjacent feathers yellowish; eye yellow.

Young—In down, dingy black. First feathers resemble the female; head dark brown, without crest at first; upper part of breast brown, white below; whitish feathers at base of bill; wing-bar indistinct.

Egg—Buff, very round; eight to thirteen. May—June. Incubation twenty-one to twenty-four days.

Nest Down—"Grayish black, without pale tips, obscure pale centres. Smaller and darker than that of Pochard" (Seeböhm).

CANVAS-BACKED DUCK.

(*Fuligula valisneria*.)

This celebrated American pochard much resembles our common *Fuligula ferina*, but is greatly superior in size, in length and breadth of bill, and is considerably heavier, weighing, according to Wilson and Bonaparte, over three pounds when in good condition, and measuring two feet in length by three feet in extent, whereas the British pochard weighs something under two pounds. It is reckoned most excellent eating, and is captured in large quantities for the table, both in the United States and in Russia. American ornithologists state that it arrives in the United States, from its breeding quarters in the North, about October, frequenting the large rivers, where it feeds upon the *valisneria*, a plant somewhat resembling small celery as to the root, and producing a long grass-like blade four or five feet in length. Of this plant the Canvas-back is passionately fond, and so nutritious is it that they grow fat, and are eagerly sought for by sportsmen, from one to three dollars (4s. to 12s.) being not uncommonly paid for them. This pochard is often decoyed by baiting traps with grain, Wilson relating that when a ship laden with wheat was wrecked on the coast not far from Philadelphia, the grain floated out in vast quantities, and that in a few days the whole surface of the bay was covered with ducks, unknown to the people of that quarter. I believe the Canvas-back has never been offered for sale alive in this country; we must therefore still regard it as a desirable acquisition.

Male—Back gray, pencilled with narrow black lines; under parts white; head and upper neck red; lower throat and breast black; bill and legs brownish black; eye red.

Female—Head, neck, and breast reddish brown; under parts white; bill and legs brown; eye red.

Young—No information.

Egg—"Pale blue, with olivaceous tint; shell smooth, thin, and brittle; nearly oval." (E. A. Samuel's "Birds of North America.")

WHITE-EYED DUCK.

(*Fuligula nyroca*. *Nyroca leucoptalmus*.)

This pochard is an occasional visitor to England during the winter and early spring, breeding in the northern latitudes during the summer. Captain Shelley states that he has seen the White-eyed Pochard in flocks of many thousands together on the lakes of Lower Egypt, where the birds rose with a running flight when disturbed, striking the water very rapidly with their feet, and making a noise in so doing which could be heard at a distance of two miles. A gentleman writing to Mr. Dresser from Poland describes the White-eyed Duck as frequenting ponds, lakes, and sluggish rivers, where the banks are overgrown with herbage and bushes; the female placing her nest upon a tussock at the very edge of deep water, into which she slips noiselessly when alarmed, diving to a considerable depth. The flesh is reckoned good, and is much sought after in the autumn, when the birds are fat. This duck feeds chiefly upon vegetable substances, which, like other pochards, it seizes at some distance below the water. Specimens have been shot in this country, but they have not bred pure in our Zoological collection, though hybrids have occurred. I have noticed that when enraged or excited, the eye of the *Nyroca* flashes into greater whiteness, the pupil contracting visibly. Young birds do not attain the pearl-like iris until their second moult, having previously a clouded appearance. The White-eyed Duck is occasionally offered for sale at from £2 to £3 the couple.

Male—Head, neck, and upper breast brilliant foxy red ; chin white ; throat encircled by a black ring ; back, wings, and tail dark brown ; abdomen white, extending to the sides ; tail coverts and below the tail chestnut ; wing-bar white ; bill and legs lead colour ; iris white. During the summer the male loses his brilliancy of plumage, resembling the female.

Female—Similar to male, but colours less pure ; chin dusky white ; collar absent ; eye smoky pearl.

Young—In down, crown of head and upper body dark brown ; cheeks and front parts clear buffy yellow, with a slight line of whitish across the wing. In first feather, duller than female ; less chestnut ; white portions spashed with brown ; eye grayish white.

Egg—Yellowish green, occasionally pale buff, very round ; seven to twelve ; "creamy brown ; nine to fourteen" (Seebohm). May—June. Incubation, twenty-two to twenty-four days.

Nest Down—Small ; very dark brown, paler at the root, mixed with a few brown feathers.

NEW ZEALAND SCAUP.

(*Fuligula novæ Zealandiæ.*)

I am indebted to Sir Walter Buller's work for the slight information offered on the subject of this rare bird, which is stated to be freely distributed over New Zealand, frequenting inland lakes and rivers in parties of four and five. It is weak on the wing, but an expert diver ; being very fearless and easily tamed, it would be acceptable to the fanciers of this country. The nest of grass lined with down, is placed almost into the water, the duck on leaving the nest covering her eggs with dripping weed from the lake.

Male—Head and neck black, with a purple green gloss ; back and upper wings green ; breast and sides two shades of chestnut ; wing-bar white ; eyes yellow ; bill lead colour, with white spot at lower base of mandible ; feet brown.

Female—Various shades of brown ; broad white band at base of upper mandible ; white wing-bar.

Young—Thick down, pale brown and white ; upper mandible reddish brown, under one yellow.

Egg—Rich dark cream colour ; rather large ; five to seven. March.

GENUS *HYMENOLÆMUS*.

This Genus is represented, as at present ascertained, by one single species.

BLUE DUCK.

(*Hymenolæmus malacorhynchus*.)

This rare bird was represented in 1876 by a single specimen presented to the Zoological Society of London, by the Acclimatization Society of Melbourne, but unfortunately only lived a short time. In May, 1884, two other pair were received from the Acclimatization Society of Canterbury, New Zealand. It is fully described in Sir W. Buller's work on "The Birds of New Zealand," to which I am indebted for the following information. It is stated to inhabit the mountain streams in which that country abounds, and is usually found near the torrent heads, allowing itself to be approached without evincing signs of fear. Although possessing the large feet and lobed hind toe of the Pochards it seldom dives, usually swim-

ming with the current. The nest is placed occasionally in a burrow, but is also found hidden among the luxuriant ferns and flowering plants, which, as Sir W. Buller observes, lend to the country its peculiar beauty and luxuriance. The eggs, usually five in number, are hidden in the soft down with which the duck covers them. The food of the Blue Duck appears to consist chiefly of soft larvæ, the stomach of many specimens examined being found to be full of the worms of the caddis, which abound in the pebbly creeks, all divested of their coatings, a fact clearly proclaiming the use of the fleshy membrane with which the bill is furnished.

Male—General plumage, pale slate blue, darker on the upper parts; crown of head and upper wing-coverts glossed with greenish; breast spotted with dark chestnut; eyes bright yellow; bill white horn colour, tipped black; legs and feet dark brown.

Female—Smaller but similar; less chestnut on breast; less gloss on upper body.

Young—In down, upper body dull green; under parts white; wings and sides brownish; legs and feet pinky yellow; bill horn colour, pinkish at the tip. In first feather general plumage lighter than adults; under parts whitish; head and nape ashy brown; breast indistinctly spotted with brown.

Egg—Greenish cream colour; four to five. September—November.

GENUS *CLANGULA*.

Three species compose this Genus, distinguished by their small size, beautifully varied plumage, and their extraordinary power of diving; they are all inhabitants of the Northern Regions, the most rare being *Clangula islandica* (Barrow's Golden Eye) from Iceland and Arctic America, which is not known in captivity, and therefore undescribed.

GOLDEN-EYED DUCK.

(*Clangula glaucion*.)

This is a charming little bird, and one but rarely seen in collections of waterfowl. There are, however, some specimens on the ornamental water in St. James's Park, where I believe they have bred. It is a winter visitant, but never appears in large numbers, being generally seen in companies of three to five. Sir Ralph Gallwey remarks of this bird that the wings are so large and stiff in proportion to the size of its body, that the sound they make in beating the air resembles a distant whistle, a peculiarity which has given it the name in Ireland of "Whistle-wing," or "Rattle-wing." A smaller variety of the Golden-eye (about fifteen inches long) is common in North America, where it breeds in the highest latitudes. It is an expert diver, and, like the British variety, disappears under the water at the approach of danger. These birds frequent both fresh and marine waters, preferring the former during the breeding season. The price is from £2 to £3 the pair.

• **Male**—Head and upper neck green, with a large white spot below the eye, which is of a bright golden yellow; upper body black; under parts white; bill lead colour; legs orange, with black webs.

Female—Head and upper body brownish slate; yellowish line round the top of bill; other points similar to male, but colours less defined.

Young—Similar to female, but less white in first feathers, attaining full plumage after the third moult.

Egg—"Bright grayish green; smooth and glossy" (Seebohn); "greenish" (Morris); eight to thirteen. End of May—June.

Nest Down—"Pale delicate lavender gray, with obscure paler centres" (Seebohm).

BUFFLE-HEADED DUCK.

(*Clangula albeola*. *Fuligula albeola*.)

This pretty little bird, about the size of a Teal, is common in America, where it is also termed "Buffalo-headed Duck," on account of the disproportionate size of that organ, "Butterball," "Marionette," or "Spirit Duck"; this last term being so applied with reference to the rapid way in which it vanishes at the approach of danger. It is occasionally found among our winter visitants, having been shot in this country on rare occasions, Sir R. P. Gallwey chronicling its arrival in Ireland on one occasion, in company with several Golden-eyes. Audubon states that it is a hardy bird, and may be seen swimming among the floating ice on the Ohio, diving in search of food. The name of "Butter-ball" is descriptive of its excessive fatness at certain seasons of the year, although the flesh is not very highly esteemed. Latham describes this species as nesting in trees near the lakes of Hudson's Bay about June. Its food consists of small shell-fish, shrimps, and aquatic insects, and the voice has a weak croaking sound.

Male—Head and neck rich greenish purple; a white band extending from eye to eye round the back of the head; back and upper body black; throat, breast, and under parts white; wing white and black; bill short, bluish lead colour; feet yellowish red; eye brown.

Female—Brown, with white spot each side of head; under parts white; bill dusky; feet bluish; considerably smaller than male.

Young—In first feathers, resembling female.

Egg—Yellowish white; "greenish gray" (Seebohm); seven to nine. June.

GENUS *COSMONETTA*.

This Genus contains but one example, closely allied to the preceding.

HARLEQUIN DUCK.

(*Cosmonetta histrionica*. *Fuligula histrionica*.
Histrionicus torquatus.)

The brilliant and eccentric colouring of this bird has earned for it the fanciful name by which it is known. Allied to the *Fuligula*, it has by modern ornithologists been placed in the Genus *Cosmonetta*. Wilson and Bonaparte state that it is very rare on the coasts of the Middle and Southern States of America, and is more usually seen in New England, where it is called the "Lord," while at Hudson's Bay it is known as the "Painted Duck." It is an occasional visitor to the shores of Great Britain, resembling the Scaup Duck in its manner of feeding. It is stated by Mr. Seebohm that the Harlequin breeds in Siberia from May to July, depositing its

white eggs in a tuft of grass near rapid flowing torrents, in which water it dives with great ease, progressing below the surface for a considerable distance. The food of the Harlequin consists chiefly of minute shell-fish, molluscs, and marine insects, together with the tender shoots of waterplants and other vegetables. This bird has not yet, as far as I know, been kept in captivity, and it would be an interesting experiment, were they procurable, to set the eggs under hens and endeavour to rear the young birds.

Male—Head, neck, and upper body grayish blue ; a white patch in front of the eye and behind the ear ; a white band down the sides of the throat, and a narrower collar of white round the neck ; from the eye to the back of the neck a double line of bright chestnut and white, edged with black ; front of breast light gray blue, bordered with a white and black band ; sides light red ; bill slate gray ; legs and feet brownish blue ; eyes hazel ; wing and tail dark brown.

Female—Brown, two white patches on the face ; under parts mottled with white.

Young—In down, brown above, white below, a white spot each side of the rump, and on the wings. In first feather, similar to female, but upper body darker, gaining the white collar after the second moult.

Egg—"White" (Seeböhm) ; "buffy green" (Morris) ; small ; six to ten.

Nest Down—"Dark gray" (Seeböhm).

GENUS *HARELDA*.

The Long-tailed Duck is the only duck comprised in this Genus.

LONG-TAILED OR ICE DUCK.

(*Harelda glacialis*.)

The name of "Sea-Pheasant," by which this bird is known in some parts, is deservedly bestowed on account of the enormous length of the tail feathers. It is a winter visitor to Great Britain, being seen pretty regularly on the East Coast, where it arrives during the early autumn. Its breeding place is in the northern latitudes, where it exists in large flocks in Greenland, Iceland, and Sweden. In those countries it is killed in large numbers by the peasants, the flesh being salted for food. The Long-tailed Duck, which is about the size of a widgeon, is described by Mr. Seebohm and Mr. Harvie-Brown as being tame and easy to approach, especially during the breeding season. In Ireland it has been shot several times, Sir Ralph P. Gallwey states that on one occasion fifty were seen feeding at the entrance to the Moy Estuary. Its food consists of shell-fish and insects which it obtains by diving. Mr. Seebohm describes the nest as a hollow in the grass, lined with down, containing from six to seven eggs, and situated some way from the water near inland seas and large lakes. These birds undergo considerable changes of plumage during the year, for a full description of which I must refer the reader to the standard works on ornithology.

Male—Winter plumage. The top of head, upper neck, back, and throat white; cheeks gray with blackish brown patch over each ear; back and breast with wings brown of various shades; abdomen and wing-coverts white; tail much elongated

black ; legs lead colour ; beak rose colour, tip and base black ; eye yellow. In summer plumage, the male has the crown, forehead, and sides of the head brown ; neck and breast black ; upper back black, splashed with white.

Female—Head and neck grayish white ; upper breast reddish brown ; back, wings and tail dark brown ; abdomen white ; legs and feet grayish green, with black webs.

Young—In down, “upper parts chocolate brown, a small spot of white under the eye and on the cheeks ; throat and under parts whitish ; bill and feet dusky greenish” (Audubon). In first feather, young male, head and part of neck whitish, mottled with brown ; upper body brownish black variegated with chestnut ; scapulars short, brownish red ; a band of reddish brown at lower fore-part of the neck ; under body grayish white.

Egg—Greenish buff, both ends rounded ; size of small bantam’s egg ; and it is said when quite fresh of an apple-green tint ; six to ten. May—June.

Nest Down—Pale brown ; small.

GENUS *CAMPTOLÆMUS*.

Camptolæmus labradoricus (Labrador Duck). Mr. Sclater states that this now extinct bird of Arctic America, has probably never been captured alive.

GENUS *HENICONETTA*.

Some slight difference between the Steller's Eider Duck and the True Eiders have caused it to be placed in the above Genus, of which it is the only species.

STELLER'S EIDER DUCK.

(*Heniconetta stelleri*. *Somateria stelleri*.)

This rare duck can scarcely be regarded as a British bird, there being no evidence to prove that it has ever been shot in this country, though the specimen now in the British Museum is said to have been killed near Yarmouth in 1830. Steller's Eider breeds in Northern Russia, and very little is known respecting its habits. The traveller and ornithologist Middendorf, obtained eggs during July from nests constructed deep in the moss in the Arctic regions, and describes it as gregarious except during the breeding season. Its food consists principally of shell-fish, and it is never seen inland.

Male—About the size of the Widgeon. Head white, green patch between bill and eye, and on nape of neck; throat encircled with a glossy black and green band; back lustrous violet black; wings white, with blue, green, and white markings; breast chestnut; bill slate gray, paler at the tips; legs brownish gray; eye light brown.

Female—Resembles other Eiders, but with wing-bar of blue, edged with white.

Young—"Resembles female, but without black on abdomen" (Seeböhm).

Egg—Pale yellowish green; seven to nine. June—July.

GENUS *SOMATERIA*.

The Eiders are placed first by Dr. Brehm as the largest and most beautiful of the true divers, and are essentially marine birds, never being found inland; they are strong on the wing, flying close above the surface of the sea. Their food is obtained by diving, which they are able to swallow under water, and consists of various sorts of shell-fish. They breed in colonies, incubation lasting about a month. Any of the *Somateria* may be easily identified as belonging to that genus, even by the inexperienced fancier, from the fact that some part of the head in each is green, and the bill long and strong, placed high into the forehead. The birds of this genus are inhabitants of the Northern Hemisphere, where they breed from May to July, being strictly monogamous. The nest is roughly constructed of grass, seaweed, and similar materials heaped together, in which are placed from six to eight round eggs, generally green or white. The young are hatched on the twenty-sixth day, being able to swim and dive, the mother taking them immediately down to the sea. Five species of Eiders are known to ornithologists, of which four are unknown in captivity—*Somateria stelleri* (Genus *Heniconetta*); *Somateria fischeri* (Genus *Lampronetta*); *Somateria V. nigrum* (Black Eider), and *Somateria spectabilis* (King Eider Duck).

COMMON EIDER OR ST. CUTHBERT'S DUCK.

(*Somateria mollissima*.)

These birds, of which specimens have been shot at times in Great Britain, and which furnish the celebrated down, are distributed over the highest latitudes of Europe and America. They breed in May, June, and July, upon the sea coasts, occurring in great quantities in Greenland, Iceland, Norway,

and adjacent countries. They have on rare occasions been known to nest in the islands off the coast of Northumberland. The northern shores of Russian Siberia, and the corresponding latitudes of North America are also the breeding places of the Eider. In Iceland these valuable birds are protected, coops and shelters of various kinds being provided as nesting places, each of which is immediately taken possession of by a pair of Eiders, who excavate a slight bason and thickly line it with fine seaweed and down from the mother's breast. Should her nest be robbed of this down, she will continue to pluck herself till quite naked, after which the drake is compelled to find the necessary lining. On the bare rock the nests are placed so close together, that it is not easy to avoid trampling upon the young and eggs, the parents exhibiting the greatest fearlessness, not only allowing themselves to be handled in defence of their nest, but administering sharp bites upon the legs or hands of those who interfere with their proceedings. The amount of down found in one nest is stated to weigh about three quarters of an ounce, yet its elasticity is such, that when shaken out this quantity will fill the crown of a hat, the price obtainable being about ninepence an ounce, or twelve shillings a pound; the amount yielded by one female being reckoned at about a quarter of a pound during the breeding season, the price having been known to rise as high as twenty shillings per pound. Much interesting information respecting the habits of these birds is afforded us, among others, by Audubon, Pennant, and an amusing work by Sir J. W. Hooker, entitled "Journal of a tour in Iceland." That these birds are capable of domestication is evinced by the fact that specimens have existed for several years in the Zoological gardens of London. They are easily tamed, and will eat grain and other food.

Male—Crown of head velvet black, divided by a white

line; nape of neck emerald green; upper body yellowish white; breast rich buff; tail blackish brown; legs greenish yellow; eyes brown; bill of a remarkable formation, commencing high up in the forehead and forked in the base, olive green; lower breast and abdomen black, the white saddle feathers curved and falling over the wing; weight five to six pounds.

Female—Light brown edged with black; tail and wing feathers darker; bill and legs blackish green; eyes brown.

Young—In down, ashy brown above, whitish below; feathers similar to female, assuming full plumage only at the third year.

Egg—Olive green; four to six; size of those of Wild Goose; May—June; incubation three to four weeks.

Nest Down—Grayish brown, lighter in the centre.

KING EIDER DUCK.

(*Somateria spectabilis*.)

This Eider Duck is smaller than the common variety, and in one respect differs from it, being occasionally found on the fresh water lakes of North America; but it has been very rarely seen in the British Isles, specimens having been shot in 1813, 1832, 1855, 1868, 1869, and on a few other occasions. In general habits it resembles *Somateria mollissima*.

Male—Crown of head and nape bluish gray; cheeks below eye, greenish; neck and upper back white; under body black; back black; shoulder white; large white spot on sides behind legs; bill deep red; formation of bill differs from the Common Eider, the fork of the upper mandible spreading

like a spoon on each side of the forehead; legs yellow; eye yellow.

Female—Closely resembles *Somateria mollissima*, a simple method of distinction between the two varieties being that in the female King Eider, the tip of the frontal ridge of feathers is exactly on a line with the nostrils, whereas in the Common Eider Duck, the nostrils are placed considerably below the termination of the feathered ridge.

Young—In down resembles the Common Eider, but may be distinguished by the conformation of the bill. In first feather resemble the female, with a few dark lines on the throat. Full plumage is not acquired till the fourth year.

Egg—Dusky green; rounded; "greenish gray" (Seebohm); four to six.

Nest Down—"Closely resembles that of Common Eider" (Seebohm).

GENUS *LAMPRONETTA*.

The most recent classification has placed Fischer's Eider in the above Genus, of which it is the sole representative.

FISCHER'S EIDER DUCK.

(*Lampronetta fischeri*. *Somateria fischeri*.)

This remarkable duck is as yet unknown in captivity. We are, therefore, indebted for the knowledge we possess of its habits, to those naturalists who have studied it in its native haunts; the best account we possess being that of Messrs. Bird, Brewer, and Ridgway, who treat of it in their well-known work on the "Birds of North America." From this we learn

that Fischer's Eider, or as it is often called, the "Spectacled Eider," inhabits the coast of Alaska and the islands adjacent. We are informed that this Eider breeds only in the marshes lying between the island of St. Michael and the Mainland, where it constructs its nest on a tussock just above water level, of an oval shape lined with dry grasses. A nest discovered by Mr. Dall, contained two small eggs of a brownish olive colour, which were embedded in down from the breast of the parent bird. During the months of July and August, Fischer's Eider is killed in large quantities by the Esquimaux who knock the birds down with clubs, as that being the moulting season, they are unable to fly. The skins are used as caps, which are further ornamented with the velvety green plumage of the heads.

Male—Head yellowish green, the eye surrounded by a large white spot, two crescent shaped marks before and behind it, of glossy black; the remainder of head and neck white. Lower body plumbeous drab; back yellowish white; bill orange; eye dark hazel; feet and legs brown.

Female—Dark brown with black bars; head black; eye markings similar to male, but indistinct; head and neck light grayish buff.

Young—The young of this species may be distinguished from the other Eiders by the peculiar formation and feathering over the base of bill, and by the indication of the spectacle mark round the eyes.

Egg—Olivaceous brown; two to three.

NOTE.—It is proper to remark that the authors above quoted state that the bill of the Fischer's Eider changes after death to a light reddish colour, and that the eyes of all the specimens collected by Mr. Dall were dark brown or hazel, and not blue as has been asserted.

GENUS *ÆDEMIA*.

The birds included in this Genus are remarkable for their dark plumage and brightly-coloured bill, with a protuberance at the base ; the males do not undergo any summer change of plumage. They are marine in their habits, and breed within the Arctic circle, coming inland only for that purpose. The food of the Scoters consists chiefly of small molluscs, which they are able to swallow under water, together with insects, worms, and vegetable substances. Their flight is rapid, and they are expert divers, remaining submerged for long periods. The *Ædemia* are usually seen in large flocks, the males keeping by themselves after incubation has commenced. The eggs, usually six in number, are placed in a nest of sedges and moss lined with down, being buff or creamy white in colour.

Five species of *Ædemia* are enumerated by Mr. Scater in his "List of the Anatidæ," of which only two have been represented in the Zoological Gardens, the habits of these birds rendering them difficult of domestication.

The undescribed varieties are *Ædemia Americana* (American Scoter), and *Ædemia velvetina* (American Velvet Scoter), both from Northern America, but not yet known in captivity.

COMMON SCOTER OR BLACK DUCK.

(*Ædemia nigra*.)

This winter visitant to the British Isles, which is about the size of the Mallard, is easily recognizable, being the only entirely black duck which frequents our shores. During the greater part of the year it inhabits the estuaries or open sea, where it may be seen diving or swimming in parties of from

three to four together, and devouring vast quantities of mussels and other bivalves. It breeds in the Arctic regions during the summer, where ten thousand are recorded by Mr. Seebohm to have been seen in one flock, and places its large untidy nest, lined with down, on the shore of some sea or lake. The mother conveys her young on her back when swimming.

Male—General plumage black ; inside of wings gray ; thick bill, with protuberance at the base, black, with an orange patch enclosing nostrils ; legs lead colour ; eye dark brown.

Female—Brownish black ; large whitish patch on throat ; bill entirely black, without tubercle ; legs lead colour.

Young—In first feather, similar to female.

Egg—Grayish buff ; occasionally fawn white, dashed with stone colour, one end pointed ; six to ten. May—June.

Nest Down—"Dark gray" (Seebohm).

VELVET SCOTER.

(*Ædemia fusca.*)

These birds are distinguishable from the Common Scoter by a white wing-bar and a white spot round the eye, as also by their superior size. They are sometimes seen on the eastern coast of Scotland in large flocks, and are also met with in Ireland. Their habits and breeding closely resemble those of the Common Scoter. They are difficult to acclimatize, although one specimen of *Ædemia fusca* has been known in the Zoological Gardens.

Male—Velvety black plumage, with white wing-bar ; white crescent below the eye ; bill orange, with black tubercle ; feet red ; eyes red, occasionally yellowish white ; legs red, tinged with orange. Weight about three pounds.

Female—Upper plumage blackish brown ; under parts gray, with brown splashes ; two white spots on face ; bill and eyes dark ; feet red.

Young—When in down, “may be distinguished from the Common Scoter by a white wing-spot” (Seebohm). In first feather closely resemble female.

Egg—Grayish cream ; “cream colour, tinged with green” (Morris) ; may be distinguished from *Ædemia nigra*, both ends being rounded ; six to ten. June—July.

Nest Down—“Brownish gray. Larger than Common Scoter” (Seebohm).

SURF SCOTER.

(*Ædemia perspicillata*.)

These ducks have but rarely been killed in Great Britain, being peculiar to America, where they are found upon the sandy beaches. Their food, like that of their congeners, consists of small shell-fish, for which they may be seen diving during the winter. They breed within the Arctic circle during the months of May, June, and July ; their nesting habits are identical with those of the other Scoters, the broods varying from six to ten in number, and flying on their own account about the end of October.

Male—Black, a patch of white on the forehead and nape of neck ; bill orange yellow, with a knob or patch of black each side at the base, edged with orange ; legs orange ; eyes yellowish white.

Female—Dusky brown ; bill dark olive ; feet brown.

Young—In first feather resemble female, but have some whitish feathers on back of neck.

Egg—Grayish buff ; four to seven. June—July.

GENUS *TACHYERES*.

The singular Logger-head Duck is the sole representative of this Genus, resembling in its habits the Scoters, but exhibiting marked divergences in point of appearance.

LOGGER-HEAD DUCK.

(*Micropterus brachypterus*. *Tachyeres cinereus*.)

This remarkable bird, first discovered by Pedro Sarmiento at the Falkland Islands in 1582, is found in the Straits of Magellan and in Chili, where by Captain Cook they were called "Race Horses, on account of the great swiftness with which they run on the water," and by later travellers as "Steamer Hacks." From the little information that exists regarding its habits, we learn that the wings, which are small and weak, are only used by the bird as paddles as it passes over the surface of the sea, at a rate of from twelve to fifteen miles an hour. It is unable to fly, but is a most expert diver, coming many yards away from the sportsman, rendering it most difficult to shoot. Mr. Darwin states as his opinion that the wings are moved alternately instead of together. Dr. Cunningham, who studied it in its native country, says it breeds along the coast of the Falkland Islands, and that the nest can always be discovered by watching for the male bird, which invariably swims up and down in front of it. The Logger-head subsists upon crabs and other shell-fish, which it breaks open with its powerful bill. The skull of this variety is so strong that Mr. Darwin had difficulty in cracking one with his geological hammer. The breeding season is in the early autumn, the young averaging six to eight in number. Dr. Cunningham speaks of the *Micropterus* as a "gigantic duck," stating that it weighs thirteen pounds and over. This native

concurs with Mr. Darwin in his opinion that in their first year the young ones have the power of flight, which departs from them as they grow older.

Male—Upper body gray; breast and abdomen yellowish; wing-bar white; a patch beneath and above the eye whitish; bill orange yellow tipped with black; legs and feet dark yellow.

Female—Similar; feet and bill black; in some specimens the feet and bill are yellow, probably a variation depending on age.

Young—Bill black; throat and scapulars yellow brown; feet yellow brown.

Egg—"Cream colour; large; four to five." December ("Natural History of the Strait of Magellan," Dr. Cunningham



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