ORNAMENTAL WATERFOWL

HON. ROSE HUBBARD

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ORNAMENTAL WATERFOWL.

ORNAMENTAL WATERFOWL :

A PRACTICAL MANUAL

ON THE

Acclimatization of the Swimming Birds,

With references to two hundred species,

BY

HON. ROSE HUBBARD

("HENWIFE"),

Author of "Table Poultry," etc., etc.

SECOND EDITION.

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TO
HERBRAND ARTHUR RUSSELL, XI. DUKE OF BEDFORD, K.G.,
PRESIDENT OF THE ROYAL ZOOLOGICAL SOCIETY OF ENGLAND,
WHO HAS DONE SO MUCH TO PROMOTE THE
ACCLIMATIZATION OF FOREIGN WATERFOWL,
THIS MANUAL ON THE SWIMMING BIRDS
IS INSCRIBED BY
THE AUTHOR.

P R E F A C E

*I*T was in consequence of having experienced the necessity for some book of reference on the subject of Ornamental Waterfowl which should serve both as a means of identification of the various species imported into this country, and at the same time provide hints as to their breeding and acclimatization, that I ventured eighteen years ago to present to the public the following pages.

The expense of most of the standard ornithological publications decided me on attempting to combine all that could be learnt on the subject in a handy volume, to which has been added the practical experience of Foreign and English fanciers, in the hope that it may find a place among the many works of a similar character on the subject of Poultry, Pigeons, and Cage Birds.

In order to ensure accuracy of description, every species has been carefully identified when possible, either by the living bird, or by study of the skins which are accessible in Museums, bearing in mind the deterioration in colour of bill and feet, which is almost always present in preserved specimens.

I have endeavoured to follow the arrangements of the sub-families of the Anatidæ as adopted by Count Salvadori in his Catalogue of Birds in the Collection of the British Museum, thus securing a complete list of every identified species of Swan, Goose, and Duck, descriptions being appended to those which have either been acclimatized in this country or are likely to be imported, affording a guide to the identification of any rare specimen shot in the British Isles. It is not possible in a Handbook of this size to give full details of each of the two hundred and two birds

enumerated, and I would refer readers desirous of further information to the splendid collection of Ornithological works in the Library of the Zoological Society.

As on the former occasion, the present edition has had the benefit of revision by Professor Bowdler Sharpe, LL.D., F.L.S., etc., and by Dr. Seth-Smith, F.Z.S., M.B.O.U., to whom I owe a sincere debt of gratitude.

For much kind assistance in the preparation of this Handbook, both in its first and second editions, I have to thank those who have corresponded with me on the subject, including Dr. Sclater, the late Mr. Seebohm, Rev. H. Macpherson, Mr. Jamrach, Mr. Harting, Mr. F. E. Blaauw, the Comte de Montlézun, the Rev. Hubert Astley, the Duchess of Bedford, together with many others.

The addition of a Glossary of Terms, and some excellent Illustrations by Mr. Frohawk, will, I hope, render the present edition more complete than its predecessor, and for the errors which may no doubt be found in the book, I would ask the indulgence of my readers, as circumstances have compelled me to dictate (instead of myself writing) the whole of the present volume.

I desire to acknowledge my indebtedness to the numerous Standard Authors and Scientific Works, both English and Foreign, which have furnished me with material for my little Handbook. I trust that quotations have in every case been properly acknowledged, and would present my apologies for any instance where this tribute may have been inadvertently omitted.

ROSE E. HUBBARD.

November, 1907.

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Errata.

- Page 46. After *Cygnus atratus* add *Chenopsis atratus*.
- Page 110. Fourth line from top.—For “*Nettion*” read “*Nettium*,” and wherever the word occurs subsequently.
- Page 160. Seventh line from top.—For *N. gibberifrons* read *gibberifrons*.
- Page 197. Genus *Hymenolæmus* included in error will be found under Subfamily X.
- Page 208. Sixth line from top.—After “moult” insert “it.”
- Page 209. Fourth line from top.—Instead of “chin white with spot” read “chin with white spot.”
- Page 210. “Brown duck of South Africa” instead of “*Fuligula Brunnea*” read “*Fuligula capensis*.”
- Page 211. Seventh line from top.—Instead of “Anderson” read “Andersson.”
- Page 221. Fifth line from bottom.—Instead of “Blauuw” read “Blaauw.”
- Page 225. Top of page, first line.—Instead of “six species of *Ædemia* are enumerated by Dr. Sclater in his ‘List of the *Anatidæ*’” read “six species of *Ædemia* are enumerated by Salvadori in his ‘Catalogue of Birds.’”
- Page 226. Second line from top.—Instead of “white spot round the eye” read “white ring round the eye.”
- Page 231. Second line from bottom.—Instead of “five species of Eider are known—of which three are unknown in captivity” read “four species of Eiders are identified—of which three are unknown in captivity.”
- Page 239. Seventh line from top.—Instead of “*Salvadorina waiginensis*,” read “*Salvadorina waigiensis*.”

ORNAMENTAL WATERFOWL.

Part I.

CHAPTER I.

MANAGEMENT.

THERE is no reason why English amateurs should not be as successful as their French neighbours in the breeding and rearing of Ornamental Waterfowl. There is sufficient capital, and sufficient knowledge among our countrymen, to enable them to pursue successfully a study, which is both a delightful and instructive recreation, and may be made a remunerative business. For whatever reason the study of Waterfowl has been so greatly neglected by English fanciers, it is certain that for one breeder of these birds in England, there are fifty on the Continent. Belgian and French journals teem with advertisements offering for sale every variety of so called "fancy" ducks and geese bred by the advertisers themselves, not purchased from the dealers as imported to sell again. These advertisers are in many cases commercial men, not even necessarily proprietors of any considerable extent of land, but in many instances

shopkeepers, who arrange small ponds and artificial tanks in their little gardens, where they may keep half a dozen pairs of small ornamental ducks, finding among their pets a pleasant diversion after business hours, and a profitable sale for the young birds, at prices varying from 30 to 160 francs a couple.

I am acquainted with one amateur who yearly offers for sale young birds of his own breeding, not only from Carolinas, Mandarins, Spotted bills, Bahamas, "Paradise" ducks, Indian Pochards, but from the shy Sheldrake, White-eyed Nyroca, Rosy-billed ducks, three or four different sorts of Teal; and from geese of several kinds, including the rarer Magellanic, Sandwich Island, and Maned Bernicles.

Hundreds of young Mandarins and Carolinas may be bought during the autumn months at from 25 to 35 francs per pair, in Belgium, and the North of France, while the English supply is mainly restricted to our large dealers and a few fanciers who breed for exhibition. Why should this be so? How many persons are there not to whom the acquisition of a pair of Mandarins, Carolinas, or other ornamental ducks would open out a new vista of interest and delight! A pair of Mandarins will live happily, and even breed, if kept clean, in a wire enclosure 6 ft. square, and I have heard of their doing so in a coop with a boarded floor only half that size, and with no other water than that contained in a wooden tub! Many amateurs are deterred from keeping ducks by the belief that they require a large run, and a considerable amount of water in order to prosper, instead of which the success of our continental friends proves that as a matter of fact it is easier to house ducks in a confined space than to keep poultry under the same conditions. The floor of a duck run, if very limited in extent, is more easily kept clean

when the greater portion, especially the part near the water tank, is tiled or bricked, which is thus easily washed down, and obviates the unsightly appearance of bare earth reduced to mud by the constant paddling of the birds.

In most cases there will probably be at the disposal of the waterfowl fancier a small enclosure, where grass and gravel may be rendered accessible to the birds, conditions which are naturally much more conducive to their welfare than those which are attached to the restricted areas alluded to above.

Where the fancier has a choice of locality there will not 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 drop of from 2 ft. to 4 ft. from the edge to the level of the water. The water is about five feet deep in the centre, decreasing to about two at the lower end. The sun shines, during the greater part of the day, on the south and west banks, which comprise a strip of grass 50 ft. long by 6 ft. wide, a considerable portion 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 Burney, 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 1½ in. boards. Of these good kennels may be made, with sides 12 in. high, and of inside length 18 in., and width 13½ 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 6ft. long by 4 ft. 6 in. high, formed of two heads and two horizontal bars, pierced with 18 vertical ½ 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 ¾ 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, which, in the breeding season especially, like 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, either by conducting a stream through iron pipes, or by conveying rain water from the gutters of a neighbouring building. In my own case this 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 molluscæ 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 Cond'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 *Anatide*, a list of which, by the courtesy of Mr. Hinton, the keeper

of the Waterfowl, I am able to append, the names of those which have bred being printed in italics :—*Black Swan*, *White Swan*, *Chinese Goose*, *Bernicle Goose*, Sebastopol Grey lag, Brent Goose, Bean Goose, White-fronted Goose, *Egyptian Goose*, Canada Goose, Magellanic Goose, Hybrid Goose, *Common Sheldrake*, Australian Sheldrake, *Ruddy Sheldrake*, *Carolina*, *Mandarin*, *Spotted Bill*, *Chilian Pintail*, Gadwall, Common Pintail, Shoveller, Tufted Duck, *Muscovy Duck*, *Call or Decoy Duck*, Australian Duck, *Black Indian Duck*, *Wild Duck*, *Hybrid Ducks* of various kinds, Golden-Eye *Pochard*, *Wigeon*, Garganey, Teal, Coot, *Moorhen*, *Porphyrio*, (Blue Water Hen), *Dabchicks*, (or Grebes), Black-backed Gull, *Herring Gull*, Black-headed Gull, Stork, &c.

There are also Herons, Pelicans, and Penguins ; the Spoon-bills have now died out, but there still remain Pea-fowl of various sorts with Gold and Silver Pheasants.

At the time of my visit (July) I was shown 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, the keeper 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 kept 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 Black Swans, 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 New Holland *Cereopsis* occupy a small islet where they spend a 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 rejected by the satiated birds, 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 Sheffield, and at Clifton, near Bristol, where the Pintail, Golden Eye, Pochard, Diver, and many other species enjoy liberty on a charmingly laid out piece of water surrounded with turf and shadowing trees.

As Mr. 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 1852. The same may be said of the fine collection of waterfowl maintained by the late Lord Lilford in Northamptonshire.

One of the most extensive and comple private collections of swimming birds is that at Woburn Abbey, where the present Duke of Bedford (President of the Zoological Society) has assembled a most representative stock of all the imported ducks and geese, as well as of those which are indigenous to this country, acres of water, fields, and marshes being devoted to these birds, which breed in complete freedom under the most favourable auspices.

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 acquisition and acclimatisation of 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, chicory, 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 Wigeon, 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 chicory, 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 well 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 species, among them the Eastern White-eyed Duck, Andaman Teal, Lesser Snow-Goose, Muller's Tree Duck, American Wigeon, and others.

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 tablespoonsful of grain ; birds the size of a Spotted-bill, three tablespoonsful ; the large Australian or Variegated Shieldrake, three to four ; while the small varieties of geese, such as the Magellanic 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 species and seizes its food under water as do the *Fuligulæ*, or belongs, like the Shoveller, to the surface-feeding ducks. 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 described in the following pages.

CHAPTER III.

BREEDING.

Quietude 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 kind 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 wollen 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. I found the little Sultan hen or a Japanese bantam the best mother to incubate the eggs of the small and rare ducks, such as *Nyroca* and *Fuligulae rufinae*, being good sitters, and permitting free handling without taking fright.

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 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, or 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 when swallowed whole by young ducklings they 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 species may be successfully reared in the manner familiar to farmers' 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, 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, ants eggs, slugs, meal worms, maggots, &c., if the amateur be fortunate enough to breed either the preceding species or any of the Scoters and Eider Ducks.

If the pond be cemented all over it is well to supply duck weed, and pans of bottom mud and small gravel.

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 habits of waterfowl, and will tend to lessen the difficulty which undoubtedly exists in the acclimatisation 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 mal-nutrition necessarily resulting in the death of the bird. Whenever 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*y 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 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 impaction 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 Chilean wigeon, 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. A hot iron should not be used, not only because of the additional pain it causes to the bird, but also 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." 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 operators 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 birds 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 unacquainted with each other 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 from 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 II.

SUBFAM. I. 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 Swans 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 one which is not yet known in captivity being *Cygnus davidi* (Père David's Swan), a species inhabiting Northern China, which Dr. Sclater states to be as yet only known by a single specimen at Pekin, and which Count Salvadori has not yet satisfactorily identified.

WHOOPEE 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 a 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 the latter, 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 the Mute Swan. The Zoological Society possesses Whoopers, which bred from 1839 to 1842, but have not done so of late years, Dr. Sclater stating that they cannot by any means be considered free breeders in confinement.

A few pairs come annually into the English market, realising from £4 to £5 a couple.

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 ; iris hazel. No knob on bill.

Female.—Similar, but somewhat smaller.

Young.—Upper parts greyish-brown ; under surface dirty white ; bill and legs yellowish-pink.

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

BEWICK'S SWAN.

(*Cygnus bewicki*. *Cygnus minor*).

Bewick's Swan, although discovered nearly a hundred years ago, was considered by Pallas, the Siberian traveller and naturalist, to be a small variety of *Cygnus musicus*. It was, however, 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, 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 arriving in the valley of the Yenesai, within the Arctic circle, in Siberia, 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, 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 Seebohm's work that it resembles that of the Whooper, the eggs being somewhat smaller.

Concerning Bewick's Swan, Mr. F. E. Blaauw writes to the "Ibis," in January, 1904, as follows :—

"Of Bewick's Swan (*Cygnus bewicki*) I have not bred any yet, but in October, 1902, a young bird of the year, which had been winged on the Zuiderzee was brought to me. I had therefore opportunities of observing its juvenile plumage and its changes of plumage. The colour of the feathers was of a nearly uniform brownish-grey, of a lighter shade than in a young

Trumpeter Swan. The bill was flesh coloured, blackish at the point, with a few black spots near the front, and lighter at the sides in front of the eyes. The legs were grey. By the following March the bill had become black, with a few flesh coloured spots. The parts of the beak which in the adults are yellow, were now well defined and nearly white zones. The legs and feet were blackish. The grey plumage was at that time much intermixed with white. When a year and a half old, the bird was like an adult, except that the neck had still some grey spots, as is the case with a young Trumpeter Swan of the same age."

In March, 1888, a specimen was shot in Lotting Fen, the leg being broken in the thigh, and consequently it was captured alive. The bird weighed 22 lbs., and measured from extremity to tip of wing, 8 ft. 4 in.

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 grey, under parts whitish; iris orange; bill paler in colour than adult.

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

AMERICAN WILD SWAN.

(*Cygnus columbianus*. *Cygnus ferus*).

This bird is entirely white, and breeds in the most northerly parts of America, being an occasional visitor to North Britain.

Three of these Swans were obtained by the Zoological Society in the month of June, 1903.

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 Paris.

In a paper addressed to the "Ibis," for January, 1904, Mr. F. E. Blaauw writes of the species as follows :—

" My pair of Trumpeter Swans (*Cygnus buccinator*) bred again this season. Six eggs were laid, and six Cygnets were hatched. The Cygnets are white with a grey tinge on the back. The cere is covered with pure white down. The bill is flesh-coloured, with a dark tip, and the legs are also flesh-coloured. The down of these Cygnets is very short and dense, quite different from the longer and more fluffy down of the Cygnets of *Cygnus nigricollis* and *Cygnus atratus*. The result is that the Cygnets look much smaller in comparison. A conspicuous feature is the long neck, which is carried very stiff and upright. At the age of about six weeks the first feathers appear, and the birds then begin to grow very quickly. The first feathers are brownish grey, without any markings as a rule, but one of this year's birds is remarkable for having transverse markings on the shoulders, and greater wing-coverts. After the birds are feathered the bills gradually acquire the black colour, the black beginning at the point and at the forehead, and gradually increasing. Later, the middle part, which is still pink, gets spotted with black, and in the course of the February following the first summer the whole of the bill usually becomes quite black. The legs by that time have also gradually darkened into dusky grey, which becomes black after the birds are a year old. About March white feathers begin to replace the grey plumage, and when a year and a half old the birds are quite white, except for some fine grey spots which are still visible on the back of the neck and on the head. *Cygnus buccinator* never carries its Cygnets on its back as *Cygnus nigricollis*, and some of the other Swans are apt to do."

This Swan breeds in its wild state in the interior of North America, the skins being exported in large quantities from Hudson's Bay. Messrs. Baird, Brewer, & 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—Audubon says thirty-eight pounds, he having kept one alive for several years, and 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; plumage greyish-white.

Egg.—Four in number, of a chalky-white colour. May—July. Incubation, thirty-six days. "Whiteish yellow, dashed with fawn colour" (Bull, Soc. Nat., Sept., 1884).

POLISH SWAN.

(*Cygnus immutabilis*).

This bird derives its name from the persistence of the white plumage, the Cygnets being white in first feather. It was first identified by 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, 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 several generations.

Male.—Plumage white; a very small black tubercle on the bill, which is orange with the edges and tip black; feet yellowish-grey; iris brown.

Female.—Similar.

Young.—White; bill flesh-colour; feet ash-coloured. “Reddish buff down, on losing which they were pure white” (Lord Lilford, Nov. 14th, 1888).

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

BLACK-NECKED SWAN.

(*Cygnus nigricollis*).

These magnificent birds are the most striking of the Swan tribe, and are natives of South 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,

but have not 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. He 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 species 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 upper side; feet dark pink.

Female.—Similar.

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

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

COMMON OR MUTE SWAN.

(*Cygnus olor*).

This variety is the best known of all the Swans, 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. The birds 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 black tubercle at the base.

Female.—Similar to male, but smaller.

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

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

BLACK SWAN.

(*Cygnus atratus*).

This bird is not quite so large as the Mute Swan, and is more slender in build. 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 had 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, an nearly five inches long. In this country *Cygnus atratus* has 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.—Greyish-white in down.

Egg.—Pale green, with brownish patches ; four to eight in number. 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, where they 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. The Zoological Society of London possesses specimens purchased in 1884.

A London dealer was offering these birds at £20 the pair in September, 1888.

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 fine rosy pink, with whitish tip ; feet and legs pinkish red.

Female.—Similar.

Young.—No information.

Egg.—Whitish. October.

SUBFAM. II. ANSERANATINÆ

GENUS *ANSERANAS*.

Only one species of this Sub-family and Genus exists, of which the principal characteristics are stated by Dr. 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 possess 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;" and the bird is also described and figured by Gould in his "Birds of Australia," vol. vii.

The Semi-palmated Goose is an inhabitant of Australia, where it frequents the swampy districts of the eastern 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 Dr. 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, 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, being imported in considerable numbers, but have become scarce of late. They may be obtained occasionally at from £6 to £10 a pair.

Male.—Bill, 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 in number ; somewhat small ; September.

SPUR-WINGED GOOSE

(*Plectropterus gambensis*).

SUBFAM. III. PLECTROPTERINÆ.

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.

SPUR-WINGED OR GAMBIAN GOOSE.

(*Plectropterus gambensis*).

This formidable bird, from ten to fifteen pounds in weight, is an inhabitant of North-West Africa, and is easily recognised 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, *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 eggs 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, Cromwell Road. 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 being of a reddish colour; eye very large, dark brown.

Female.—Similar to male, but smaller, and the knob on the bill not so large.

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 in number. July—August.

Nest Down.—Ashy-grey.

KÜPPELL'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 Dr. Sclater. 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. Dr. 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." There are also stuffed specimens in the British Museum. This bird is occasionally procurable at from £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. Cunyngham, Commanding H.M. Forces at Cape Town in 1876. These birds were identified as a separate species by Dr. P. L. Sclater, 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 Dr. 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.

The specimen which I had on my own pond was an adult female, and was identified at its death and added to the Cromwell Road collection.

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.

SHOA SPUR-WINGED GOOSE.

(*Plectropterus scioanus*).

This bird is very similar to the black variety, and about the same size. It has not been imported alive into this country.

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* 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 weighing 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; some are also pure white, and occasionally a kind of beautiful slaty-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 adorns the head. Specimens of *Cairina moschata* received by the Zoological Society in 1851 and 1880, from Paraguay, exhibited very marked distinctions from our domesticated birds. It is a fatal bird to introduce in a mixed collection, as it hybridises willingly with most of the other varieties.

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 in number. 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, late 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 in number. April—May. Incubation, twenty-eight to thirty days.

Nest Down.—Pure white.

GENUS *SARCIDIORNIS*.

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

**BLACK-BACKED GOOSE OR COMB-DUCK,
INDIAN WATTLED 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 in appearance 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; it breeds in that country during the months of July and August. The Zoological Society of London possesses living birds, first acquired in 1876, and the stuffed specimens in the British Museum convey a very fair idea of the singular appearance of this bird during life.

Male.—Stands 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 the 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 bluish lead-colour; upper mandible black with bluish tip; lower mandible pinkish. The general plumage resembles that of adults, but lacks the protuberance on the bill, and the black portions are less glossy; eye dark brown.

Egg.—Whitish; six to seven in number. July–September.

**AMERICAN BLACK-BACKED GOOSE OR COMB-DUCK.
AMERICAN WATTLED 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 species, 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 Wattled Duck. There is also a good deal more black upon the sides and flanks, than in the Indian form.

**AFRICAN BLACK-BACKED GOOSE OR COMB-DUCK.
AFRICAN WATTLED DUCK.**

(*Sarcidiornis africana*).

Dr. 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. The two forms are considered to be identical by Count Salvadori in the "Catalogue of Birds."

They occasionally come into the market at prices from £4 to £5 each.

In a paper addressed to the "Ibis," of January, 1904, Mr. F. E. Blaauw writes as follows :—

"I kept a pair of the African Comb-Goose (*Sarcidiornis africana*) for many years without their showing any signs of breeding. Last summer, however, I saw the birds mate repeatedly, and the female began to wander about restlessly in search of a suitable nesting place. As she was pinioned, and quite unable to fly, I was not a little surprised to find her one day in one enclosure, and another day in a second, although the wire netting partitions which surrounded them were quite six feet high. The only explanation is that she must have climbed the fence, as she could certainly not have gone through it. In some of the enclosures there are hedges of *Thuja*, with a wire netting fence two feet high in front of them, to prevent the geese getting underneath. The female finally decided to make her nest under one of these hedges. To get there she was seen to jump upon this two feet high fence, balance herself on the thin top and plunge into the hedge. She scraped a little round depression in the soil under the evergreens, and then laid her eggs, accomplishing her jumping feat each time that she wanted to go in or out to her nest. Unfortunately she did not care to sit, so that we had to put her eggs under a bantam hen. I am sorry to say, however, that they did not hatch, but proved to be unfertile. The eggs are yellowish white, and rather more pointed at one end than the other."

GENUS *ASARCORNIS*.

WHITE-WINGED WOOD-DUCK.

(*Asacornis scutulata*. *Casarca leucoptera*).

The bird, formerly classed as a Sheldrake, is now acknowledged to be allied to *Sarcidiornis*, and Salvadori gives it a genus to itself as *Asarcornis*. It greatly resembles the Black-backed Goose, but is devoid of comb.

Five birds arrived in this country in 1905, and fetched £20 the couple. Specimens are also included in the collection at Woburn Abbey, but I am not aware if the sex of these has been determined.

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 Wolf's "Zoological Sketches," a coloured plate 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 *RHODONESSA*.

One duck represents this genus, of which the habitat is N. Eastern 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 was made by Mr. Jamrach in 1889, and Mr. Cross in 1897, when they introduced several pairs which sold readily at from £40 to £60 the couple, finding purchasers chiefly upon the Continent. 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 by Stephens, 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*. The voice resembles that of the Common Pochard.

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; iris 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 *PTERONETTA*.

HARTLAUB'S TEAL.

(*Pteronetta hartlaubi*. *Querquedula hartlaubi*).

The single species comprising this genus is an inhabitant of Equatorial Africa, and may be shortly described as having

the head and neck black, and the body chestnut; with a black bill, crossed with a yellow stripe, and brown legs. It is exceedingly rare, and has not yet reached this country alive.

GENUS *NETTOPUS*.

This genus comprises four species of diminutive Bernicles, few 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 albipennis* (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, not so large as our Teal, 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 attends 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" (*Tadorna variegata*).

Two examples of the Indian Pigmy Goose were presented by Mr. Frank Finn, on March 22nd, 1897. Many attempts have previously been made to introduce this bird into Europe, but without success, and these were the first specimens that have reached the Society's Gardens alive.

The same year between twenty and thirty pairs were imported by Mr. W. Jamrach and Mr. W. Cross at a fancy price; they deteriorated so rapidly in confinement that the value came down to £1 a pair. Nearly all of these imported died, and Mr. Jamrach observes that they rarely live more than a month in confinement. It is to be hoped that the specimens secured by the Zoological Society may prove more hardy.

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, resembling the female.

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

GENUS *ÆX*.

Two well-known examples comprise this genus, *Æx sponsa* (Summer Duck) from North America, known among amateurs as the "Carolina Duck," and *Æx 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.

(*Æx galericulata*).

This exquisite little bird is one of the oldest favourites among English fanciers, being the species most common at poultry shows, where it often competes in the same class with the Carolina Duck. 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 Eastern Siberia, 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 Mandarin 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, buck-wheat, and a little hemp, and permitting the bird perfect liberty (within limits) on a small pond. It 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.

Some animal food, such as shred liver or maggots, should be supplied where the birds are kept in confined spaces. Mr. J. W. Wick, in September, 1888, saw a Mandarin Drake pick up a dead field-mouse, and after shaking it into a pulp, swallow it whole, showing the natural craving for flesh-food in some form.

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 grey and brown ; shoulders and wings greenish-brown ; head and neck light grey ; 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 in number. May—July.
Incubation, twenty-six days.

Nest Down.—Delicate pale grey perfectly uniform.

CAROLINA DUCK.

(*Æx 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.

Mr. Elwen A. Capen states that *Æx sponsa* “often occupies the same nest for many consecutive years, and if robbed of its eggs, will, after a few days’ deliberation, lay a second set.”

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 grey ; 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 in number. May—June. Incubation, twenty-three to twenty-six days, varying with the climate.

Nest Down.—Pale ashy-brown.

SUBFAM. IV. 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. It is strictly confined to Australia.

CEREOPSIS GOOSE.

(*Cereopsis novæ hollandiæ*. *Cereopsis australis*).

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 were 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.

The traveller, Labillabière, says the first specimens he saw in Australia were so tame that they allowed themselves to be taken in the hand, but became wilder. The Comte de Montlezun tells me that these birds used to be reared in large numbers in the farms of New Holland, the flesh being appreciated; but this was gradually discontinued, as their savage character proved them unfit to associate with other birds.

But 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 Sydney 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-grey; 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 in number. March—May. Incubation, thirty-five days.

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

An extinct type of a species apparently allied to the *Cereopsis* has been discovered in New Zealand, but of greatly superior size. This genus and species are catalogued by Salvadori, as *Cnemionis*.

SUBFAM. V. ANSERINÆ.

GENUS *CHEN*.

Included in this section Count Salvadori places the following genera :—*Chen*, *Anser*, *Cygnopsis*, *Philacte*, *Branta*, *Nesochen*; all of which are closely allied, the genera differentiating chiefly, in the strength or weakness of the bill; its length, and the position of the serrations which are present upon the upper mandible.

BLUE-WINGED SNOW GOOSE

(*Chen caerulescens*. *Anser caerulescens*).

The Zoological Society of London obtained specimens of this Snow Goose for the first time in August, 1884, and again in 1895, but I am not aware of the sexes. It appears very difficult, where the Blue Snow Goose is kept with *Anser Hyperboreus*, to prevent the two varieties from crossing. The Duchess of Bedford, writing from Woburn Abbey, states that *Anser caerulescens*—

“Have bred here, but they always cross with the white. There is a flock of eleven flying about here now.”

It has been confounded with the young of *Anser Hyperboreus*, a slight resemblance existing. Mons. de Montlezun says the adults are very similar to *Bernicla canagica*, and that they are extremely wild, inhabiting the great bays of the extreme north, being found in Spitzbergen, the North of Russia, and Siberia.

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.

Mr. F. E. Blaauw, of Gooilust, 'Sgraveland, Hilversum, Holland, writes as follows :—

“ In former years I have repeatedly bred young birds from a male of the Blue Snow Goose (*Chen Cærulescens*) and a white female of (*Chen Hyperboreus*), when the results of the union have invariably been Blue Snow Geese, and not specimens intermediate in plumage between the two forms. This year a pair of these Blue Snow Geese (the result of a mixed union) has bred, and the result has been a brood of four young, all recognisable at once as true Blue Snow Geese.

“ The young of the blue form are quite different from the white, being of a dark olive-green, darkest on the back and on the head, which is almost black, throat white. The first plumage is slaty-grey throughout, being darkest on the head, which becomes white in the adult stage. The largest wing-coverts have slightly lighter edgings. The first moult of this bird generally takes place in the end of October, and with it the white feathers of the head appear. At the same period the bill and legs gradually begin to become pink, instead of being dark as they were up to that time.”

The Comte de Montlezun, in writing about these geese, describes the adults as extremely wild. One or two couple usually arrive in London yearly, and are retailed by the great importers at from £6 to £8 a pair.

Male.—Head and upper neck white, with reddish tint ; upper body greyish-brown ; rump and wings pearl-grey or ashy-blue ; wing feathers black and grey ; 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 reddish.

SNOW GOOSE.

(*Chen hyperboreus*. *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 plumages at different ages—a theory which is now definitely 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.

Mr. F. E. Blaauw, in the "Ibis," of January, 1904, writes as follows :—

"My old pair of Snow Geese (*Chen hyperboreus*) which I have had since the year 1888, bred again last Spring. They sat on three eggs only, but I believe that the nest had been robbed of part of its contents by a pair of cranes. It was, as usual, full of down, and was situated under a bush near the edge of the pond. In about four weeks the three eggs were hatched. The young of this Goose when in down is grey, darker on the back and lighter on the under side. The head is yellow, with a dark mark on the occiput. The bill and legs are black. These birds grow very rapidly, much more quickly than the young of the Bernicles and their allies. The first plumage is extremely beautiful, especially when the feathers are just appearing between the still conspicuous patches of down. The birds then look as if they were clad in unburnished silver. Later, much of the delicate beauty of the colouration fades, and the plumage may then be described as follows :—General colour, silver grey (with a very slight brownish tinge), darkest on the back and hind part of the neck, and nearly white on the breast and belly. There is a dark mark on the occiput which is also observable in the downy dress. Each of the darker grey feathers of the back has a white edging, varying in width. The tail feathers are white, with a grey spot in the centre. The large flight feathers are black, although the black is not so intense as it is in the adult bird. The bill and legs, which are black in the goslings, soon become brighter. The bill gradually passes from black to pink. The legs, however, first change from black to yellowish grey or greenish, and to pink afterwards. In October the first white feathers begin to appear, and the birds gradually assume the white plumage of the adult."

Male.—Fore part of head yellowish; remainder of plumage pure white; primaries black; large wing-coverts pale grey; bill red, the edges blackish, deeply dentated; legs and feet red; eye brown.

Female.—The same.

Young.—In first plumage, upper-parts greyish-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.

THE LESSER SNOW GOOSE.

(*Chen Nivalis*. *Anser Nivalis*).

Four specimens of the Lesser Snow Geese from North America were purchased in August, 1901, and placed in the duck paddocks of the Zoological Society's Gardens, Regent's Park.

ROSS'S SNOW GOOSE.

(*Chen Rossii*. *Anser Rossii*).

This elegant little Goose, which is distributed all over Antarctic America and coming south in winter to California, is thus described by Hearne in his “Journey to the Northern Ocean” :—

“This delicate and diminutive species of the Goose is not much larger than the Mallard Duck. Its plumage is delicately white, except the quill-feathers, which are black. The bill is not more than an inch long, and at the base is studded round with little knobs about the size of peas, but more remarkably so in the male. Both the bill and the feet are of the same colour with those of the Snow Goose. This species is very scarce at Churchill River, and I believe are never found at any of the southern settlements, but about two or three hundred miles to the north-west of Churchill I have seen them in as large flocks as the Common Wavy or Snow Goose. The flesh of this is exceedingly delicate, but they are so small that when I was on my journey to the North I ate two of them one night for supper.”

It is not much larger than an ordinary duck, an adult male usually weighing under 3lbs.

It was first acquired by the Zoological Society in May, 1903, together with a pair of small Alaska Geese (*Bernicla minima*). This Goose has been successfully bred by several

continental amateurs, but not, I believe, as yet in our Zoological Gardens.

In a paper addressed to the "Ibis" for April, 1903, Mr. F. E. Blaauw writes :—

"At a Meeting of the British Ornithologists' Club, on March 20, 1901 (See Ball B.O.C. xi., p. 55), I exhibited an egg of the rare Ross's Snow Goose (*Chen Rossii*), laid in captivity by a solitary female kept by me at Gooilust. A year later, through the courtesy of Dr. Heck, of Berlin, I received a second specimen of this species, which fortunately proved, as I hoped it, to be a male. The birds soon paired, and in the beginning of May, 1902, the female made a nest under a bush in her enclosure. The nest was, as is usual with Geese, a small depression in the soil, lined with dry grass and grass roots. Towards the end of the month the female began to lay, and on the 30th, when the full complement of five eggs had been deposited, she began to sit.

"So far, everything had gone as is usual with Geese, but on the 21st of June, in the morning—that is after 21 days' incubation—I was much astonished to find that the young had already been hatched. Although I had bred Geese of very different sizes, from the large *Chlapgha magellanica* to the small *Bernicla jubata*, and of very different genera, I had never experienced a shorter time than 28 days as the term of incubation. Probably *Chen Rossii* breeds very far up in the north, where the summers are short and the vegetation short-lived, so that the whole process of propagation of the species has only a restricted time for completion. This may explain why this species has the advantage of a week over the other kinds of Geese.

"The goslings are of a yellowish gray, darker on the upper side and lighter below, and have, what makes them most conspicuously beautiful, bright canary-yellow heads, with the most delicate greyish sheen over them, caused by the extremity of the longer down-hairs being of that colour. The bill is black, with a flesh-coloured tip. A little spot in front of each eye is also blackish. The legs are olive-green. Three of the goslings were as described above, but two of them had the part white which in the others was yellow.

"Although the goslings soon began to feed and grew very rapidly at first, I soon observed that one after the other got something wrong with its breathing organs, and to my great disappointment they died successively, so that the last was found dead a fortnight after they had been hatched. All that I can add is that, as is usual with goslings, the intensity of the colouration gradually diminished as they got older, and in particular the brightness of the yellow of the head and the depth of the black in front of the eyes

slowly diminished, so that even when a week old the delicate glory of it had largely disappeared.

“The gosling of *Chen Rossii* differs from that of *Chen hyperboreus* chiefly in having a shorter and comparatively higher bill, and in the want of a blackish stripe over the head, which is present in *Chen hyperboreus*. The gosling of *Chen hyperboreus* is also darker, especially on the back, and of a more olive-green colour, while the down is less dense.”

In the “Ibis” for January, 1904, Mr. F. E. Blaauw writes as follows :—

“I bred Ross’s Snow Goose (*Chen Rossii*) in 1902, as already described in the *Ibis* (1903, p. 245) but lost the goslings after about a fortnight. In 1903 the female laid eggs again, but they were unfortunately destroyed by vermin, so that I am not yet able to describe the first plumage.”

Male.—Snowy-white, with black wing feathers ; bill dull reddish, with a white tip ; feet and legs brick colour.

Female.—Similar.

Young.—Greyish-white ; bill and feet dusky-brown.

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 nine known species of this genus, of which the following have not yet, as far as I know, been introduced alive:—*Anser ferus*, *A. rubrirostris*, *A. albifrons*, *A. gambeli*, *A. erythropus*, *A. fabalis*, *A. serrirostris*, *A. brachyrhynchus*, *A. indicus*.

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 <, led by an old gander, but it is said to fly lower in foggy weather. 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. Mr. Alfred Cocks, in answer to a query as to whether these pink-footed geese breed on the Continent of Europe, says:—

“So far as I have seen they go only to the extra-continental countries of Spitzbergen, Norway, and Zembla; as I shot an adult in Iceland in August, probably there as well. Both they and the Brent are in very large quantities in Spitzbergen during the summer. The eggs are laid a good way up the sloping shore-sides, and the quills are all moulted within

ERRATUM.

On page 80 line 10, read (instead of as printed):—There are nine known species of this genus:—*A. ferus*, *A. rubrirostris*, *A. albifrons*, *A. gambeli*, *A. erythropus*, *A. fabalis*, *A. serrirostris*, *A. brachyrhynchus*, *A. indicus*, of which the following three have not yet, as far as I know, been domesticated:—*rubrirostris*, *gambeli*, *serrirostris*.

a few days, and fall at a lower level of the shore edge. The geese (and tiny goslings), while quite unable to fly, can meanwhile take very good care of themselves, thanks to their running powers."

I do not think that up to the present it has bred in the Zoological gardens.

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 in number; heavier than those of any other British species. April—May. Incubation, four weeks.

Nest Down.—Whitish-grey.

RED-BEAKED GOOSE.

(*Anser rubrirostris*).

This species is very similar to the preceding, but somewhat larger, with a flesh-coloured bill, almost scarlet at the root.

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-grey, 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; eyelid reddish-grey.

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 in number. 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, is a great addition to our list of fancy waterfowl, though rarely offered to amateurs. 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. Mr. Seebohm exhibited before the Zoological Society, a skin of this Goose shot in Sep-

LESSER WHITE-FRONTED GOOSE
(*Anser erythropus*).

tember, 1886, on the coast of Northumberland, being the first recorded visit of this variety to our Islands. It was a young female in its first plumage, and without the white forehead. The Zoological Society of London appear to have only acquired four specimens since May, 1852, and I do not find any record of it having bred in the Gardens. Mr. Jamrach imported seven pairs between 1901 and 1902, which found ready purchasers at £20 the couple.

Male.—Head and neck reddish-brown; top of head, part of face, and throat white; wings bluish-gray; tail dark grey, 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 in number. 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.

M. Huet, Assistant Naturalist to the Natural History Museum of France, succeeded, after six years, in hatching two of these birds in 1888, and they have also bred in the zoological collections of Antwerp and Berlin, while a large number of eggs were laid by the Geese at St. Stephen's Park, Dublin, but I am not aware that any young were reared.

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-grey; 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 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.

BEAN GOOSE.

(*Anser fabalis*. *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 Grey-lag Goose, being like that species an extremely shy bird. It is common in Hudson's Bay, and commits great depredations in the fields of wheat and other crops.

In Russia the Bean Goose arrives in enormous flocks of several hundreds, 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 in number. May—June. Incubation, four weeks.

Nest Down.—Pale grey.

GENUS *CYGNOPSIS*.

CHINESE GOOSE.

(*Anser cygnoides*).

There are two varieties of this handsome Goose, the Grey, 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, during the breeding season, anything disturbed my geese, or if greatly excited, the bird took to the water, and, elevating the tail and the hinder parts, submerged its throat and breast, and proceeded 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, grey, 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 in number. March and September. Incubation, four weeks to thirty-two days.

GENUS *PHILACTE*.

This genus is known only by one species.

(*Philacte canagica*, *Bernicla canagica*, Emperor Goose).

This bird was named by a Russian author (Sevastianoff), being a Latin form of "Kamschatka," North Asia and North-West America. Mr. Blaauw states that a *Canagicus* has never been imported alive.

GENUS *BRANTA*.

The members of this group are distinguished 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.

Eight species of Brent Geese are enumerated by Salvadori as follows:—*Branta canadensis*, *B. hutchinsi*, *B. occidentalis*, *B.*

minima, *B. leucopsis*, *B. bernicla*, *B. nigricans*, *B. ruficollis*. Some of the above appear to be almost identical, and the variations in colour or size which has caused them to be separately distinguished, seems to be due mainly to their geographical distribution.

COMMON BERNICLE.

(*Branta leucopsis*. *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. Fore-head, 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 grey, 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-grey 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 ; six to ten in number. April and May. Incubation, a month.

Nest Down.—Whitish-grey, with a lavender tinge.

CANADIAN GOOSE.

(*Branta canadensis*. *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 number, in a semi-domesticated condition in most of the countries of Europe, the Duke of Bedford, the Earl of 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.

Some of my birds inter-bred with the Egyptian Geese, producing a singularly ugly hybrid of an ashy-grey colour, exhibiting a broad white band round the breast, which inherited to the full the unamiable characteristics of *Chenalopex*.

Canadian Geese can generally be procured at 12s. 6d. to 15s. each, being largely imported and bred in this country.

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 in number. April—May. Incubation, thirty days.

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

HUTCHINS' GOOSE.

(*Branta hutchinsi*. *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, £20, and £40 per pair at different periods, while specimens of this goose were received by the Zoological Society in 1860 and 1886.

Male.—Head and neck brownish black, white crescent-shaped patch each side of the neck, meeting under the chin; upper body bluish grey, 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 in number (Baird, Brewer, Ridgway). Probably March—May. Incubation, about thirty days.

BRENT OR COLLARED GOOSE.

(*Branta bernicla*. *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. I have kept in my own small collection a pair of these birds, but one died from an insufficiency of grass. All geese require a large amount of grass, and cabbage leaves do not appear to constitute a satisfactory substitute, particularly to newly-captured birds, nor is it easy to supply this want during hard winters. Some geese will eat hay, but not all; it might be worth while to try ensilage.

Male.—Head, neck, and breast with the quills and tail black; back, lower breast, and upper belly dark grey, edged with lighter; wings grey; 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 in number. June. Incubation, thirty to thirty-three days.

RED-NECKED OR RED-BREASTED GOOSE.

(*Branta ruficollis*. *Bernicla ruficollis*).

This rare Arctic Goose is not often procurable, 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

RED-BREADED GOOSE

(*Brenta ruficollis*).

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 Seebohm, thousands are sold at two-pence each. The bird is strikingly beautiful, and well worth the attention of amateurs. 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. 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. The Zoological Gardens of Amsterdam possessed specimens captured in 1883 or 1884, during a severe storm in the North-west, on the Island of Texel, Holland. Mr. Jamrach imported some specimens in 1903, which commanded a high price. The best information we have regarding this bird in captivity is furnished by Mr. Blaauw, of Gooilust, Holland, who writes as follows:—

"This is one of the rarest waterfowl ever seen in captivity. In the "Bulletin of the British Ornithologists' Club," cxxviii., Mr. Sclater expresses as his opinion that the female bird, received in the Zoological Gardens of Regent's Park, in 1858, is the only one ever exhibited in captivity in the British Islands. In Holland, five or six specimens have been exhibited in the Zoological Gardens of Amsterdam ever since its foundation, and at the present time one single specimen is living at Gooilust.

"All these birds have occasionally been caught in this country (Holland), and I do not believe any have ever been imported either from

their breeding quarters in the lower valleys of the Off and the Venesay or from their winter quarters on the Caspian Sea.

“My own specimen was caught on January 26th, 1906, in this country, and was in immature plumage. At the present moment it is in full adult plumage, and a most beautiful creature.

“Red-breasted Geese do well in captivity, and if a true pair could be had together there seems to be no reason why they should not breed. The plumage of the female is similar to that of the male, but the female is slightly smaller. In the immature bird the black is replaced by brown, and the rich chestnut colour by chestnut buff, while the white markings and black edgings are either absent or not clearly defined.”

If any amateur succeeds in breeding *Branta ruficollis* it will probably be this enthusiastic amateur, who has had the good fortune to rear most of the rare Bernicles, keeping each pair in a separate little run of its own, furnished with shrubs and a pond.

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 greyish-white; throat dark brown; neck, ears, and upper part of the breast rich chesnut 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 in number; “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.

GENUS *NESOCHEN*.

This genus comprises only one species, which is of limited range, being strictly confined to the Sandwich Islands, where it lives on the volcanic lava-crusted hills of the Hawaiian group, in company with the still more rare Emperor Goose (*Philacte*).

SANDWICH ISLAND GOOSE.

(*Nesochen sandvicensis*. *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 to £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.

In a paper addressed to the "Ibis" for January, 1904, Mr. F. E. Blaauw writes respecting the Sandwich Island Geese (*Nesochen sandvicensis*), a species which has become extremely rare in Europe of late years :—

"These birds laid eggs in 1903, and were kept at Gooilust in a small grass-grown enclosure, with plenty of shrubs and a wooden shed in it. As they are not happy in the frost and snow, I have them shut up in the shed

every night after winter has set in. One good result of this arrangement is that the birds usually build a nest in the hay which covers the floor, and this makes it possible to protect them and their eggs from the cold weather that often prevails at the early season when they are accustomed to lay. Last February five eggs were laid. These were all hatched, and during the whole time of incubation the male was constantly on the watch beside the female, running with great fury at everyone who came near.

“The goslings are of a dark olive-green, darker on the head and back, and whitish on the under parts. The tips of the wings are nearly white, the bill and legs black. These birds grow very quickly, so that at the age of about nine weeks the wings have to be cut to prevent them from flying away. The immature plumage is very much like that of the adults, but the general tone is more grey than yellow, and all the black or brown markings are less clearly defined. The curious spiral ridges in the neck-feathering are already visible in the young bird. The yellow of the neck is greyish black, and is darker in the young males, so far as my experience goes.”

“At the end of July the young birds began to moult, and in about six weeks had acquired the adult plumage, the flight-feathers being retained as in other young waterfowl until the following year. Of this particular brood of five, I had the misfortune to lose three when they were only half-grown. A very cold night seems to have been the cause of their death.”

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 in number. April—May. Incubation, one month.

SUBFAM. VI. CHENONETTINÆ.

GENUS *CHLOEPHAGA*.

Salvadori enumerates three genera under this heading :—*Chloëphaga*, *Cyanochen*, and *Chenonetta*. Under *Chloëphaga* we find six species: *C. magellanica*, *C. poliocephala*, *C. rubidiceps*, *C. melanoptera*, *C. hybrida*, and *C. inornata*, all of which, I believe, have been known in captivity.

MAGELLAN OR UPLAND GOOSE.

(*Chloëphaga magellanica*. *Bernicla magellanica*).

The importation of this Goose is much more extensive than formerly—one dealer alone having recently received 121 pairs. They may be procured at from £6 to £8 a pair, that being less than a third of the price which they formerly commanded. 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 species 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 acquire nearly 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) depatched 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, placing the nest by preference under a low bush hidden by tufts of herbage ; being also reared with great facility on the Continent.

M. de Montlzun, 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 grey 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 grey, and the markings less distinct.

I had my birds for two years before they showed any signs of breeding, when, about the beginning of April, the goose became very excited, began to utter a peculiar chattering cry, and to play with straws and flower stalks, like a second Ophelia, at which time, unfortunately, both the male birds evinced signs of strong affection for her, and she walked about proudly, with a gander on either side, while the remaining goose stood, drooping and neglected, in the corner. The birds now became so savage that we were compelled to separate the best pair from the rest of the flock, and to place them in a little run, with access to the water, near which they constructed a rough nest, depositing five or six creamy-white eggs with a greenish tinge.

M. H. de la Blanchère states that this Bernicle will mate with the true Geese, and even with the larger species of Ducks, but that their offspring is incapable of reproduction. I have found it, except in the nesting season, 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 Goose 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 grey, 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 the upper part of the neck ashy-brown, below greyish-white, barred with dark brown ; thighs and under-parts white ; bill black ; legs blackish-blue.

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

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

CHILIAN GOOSE.

(*Chloëphaga hybrida*. *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, by purchase from M. Weissaupt, but the female unfortunately dying soon afterwards, the male was mated with a female Upland Goose (*Chloëphaga magellanica*) which produced a pair of young birds exhibiting in the male the characteristic stripes on throat and under body of *C. 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 *C. magellanica*.

It is an inhabitant of Central Chili, and is 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 marked distinction between the males of *C. magellanica* and *C. dispar* consists in the black bars on the breast and under-body of the latter.

In a paper addressed to the "Ibis," of January, 1904, Mr. F. E. Blaauw, writing on the Black-Banded Goose (*Chloëphaga dispar*), says:—

"A pair of these birds at Gooilust laid six eggs, which were all hatched. In the goslings of this species the differences in colour correspond with those of *Chloëphaga magellanica*, but are intensified. Some of the goslings are most brilliantly marked with black and white, whilst others are almost entirely black. These striking colours, however, soon fade, so that after the goslings are a week old, much of their brilliancy is gone."

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 *Chloëphaga magellanica*.

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

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

ASHY-HEADED OR CHESTNUT-BREASTED GOOSE.

(*Chloëphaga poliocephala*. *Bernicla poliocephala*).

This rare Goose 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, and another pair were deposited in June, 1883. It is some time since any were offered for sale, when they realised £8 to £10 a pair.

It inhabits the South of Magellan, the Falkland Islands, and Chiloe. Captain Abbot only saw three specimens during a three years' stay in the Falkland Islands, and supposes these came from the coast of Patagonia. M. Leconte brought one skin only. Phillips and Landbeck call it *Bernicla chiloensis*, and state that it is common in that island, where it breeds. 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 has been bred on the Continent by M. Courtois, and other amateurs.

Of the Ashy-Headed Goose, Mr. F. E. Blaauw writes to the "Ibis," of January, 1904, as follows:—

"It is certainly the finest, but also the most delicate, of all the Geese that I have had in my garden. The best way to ensure success with this species is to give a constant supply of cabbage, besides grass and grain. With care I have managed to keep it since 1890, having only once had to procure a fresh importation of two males. At the present time I am the happy owner of an old pair, three young pairs, and an odd male. The female of my breeding pair laid five eggs last spring, from which four goslings were hatched. One of these died, but the remaining three have been doing well, and are now in their first moult. The goslings in down are uniform in colour, unlike those of the foregoing species. They have dark grey markings on the back of the head and neck, on a whitish-grey ground. Their first plumage resembles that of the adults, but is much less brilliant. The breast is brownish, and striped all over with blackish lines. The white of the belly is also less in extent. They begin their first moult in October, but seldom finish it until the following spring."

Male.—Head and upper part of neck ash-grey, 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 colouring absent.

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

RUDDY-HEADED GOOSE.

(*Chloëphaga rubidiceps*. *Bernicla rubidiceps*).

This Bernicle, native of the Falkland Islands, is both hardy and ornamental, doing well in captivity, the value being about £10 10s. the couple. 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 in its wild state, 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.

We owe the greater part of our information respecting the breeding of this Bernicle in captivity to Mr. F. E. Blaauw, who, writing in the "Ibis," January, 1904, says :—

"The Ruddy-headed Goose (*Chloëphaga rubidiceps*) is the smallest of the South American group, but thrives well under domestication. I

obtained my first male of this species—an imported bird—in 1886, and at the same time I procured a female from the Gardens of the Zoological Society of London. From this pair I have had numerous broods, and, unless I am very much mistaken, all the Ruddy-headed Geese now in Europe have descended from them. The old male, which is now mated to one of his daughters born in 1887 (his original mate having died six years ago) has been in my park for seventeen years, but nevertheless gave me this spring a brood of three young birds, which have done well, and are now moulting,

“The goslings of this species are marked with dark grey on a ground of whitish-grey, and are the least conspicuously coloured of any of the group. The first plumage of this Goose also resembles that of the adults, except that the ground-colour as well as the markings are less clear and well defined. Thus for example, the white of the wing is mixed with grey, and the glossy-green wing-bar is altogether absent. The legs, which at first are black, get their yellow markings when the gosling begins to acquire its feathers. The young birds begin to moult at the end of September, generally completing the change before the New Year,”

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 died out for some years.

At the present moment the “List of Animals” reports nine living specimens in the Gardens, of which two were presented by Mr. Blaauw, and two bred in the Menagerie in June, 1895.

Male.—Head, throat and breast sandy-red, finely barred with a darker shade; shoulder white; back and wings ashy-brown; wing-bar brilliant green, edged with white; under parts light red; bill dark brown, or black; 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.

(*Chloëphaga melanoptera*. *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 ; grey 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.

PAINTED GOOSE.

(*Chloëphaga inornata*. *Bernicla picta*).

This bernicle inhabits Central and Southern Chili, and has a distribution very similar to that of *Chloëphaga magellanica*. Both sexes greatly resemble *C. magellanica*, but the male has the black bands of a more intense black, and more numerous ; while the female lacks the reddish tinge on the head and upper part of the neck, these portions being of a dull grey.

GENUS *CYANOCHEN*.

One species is as yet the only representative of this genus.

BLUE-WINGED GOOSE.

(*Cyanochen cyanopterus*).

This bird inhabits Abyssinia, and is very small, the total length not being over twenty-five to twenty-six inches. The British Museum includes some stuffed specimens, but it has not yet been imported alive.

Male.—Head and neck ashy-grey, with paler edges; lower back and tail coverts bluish-grey; shoulders plumbeous-blue; the wing crossed by a black and metallic green bar edged with white; bill and feet blackish; eyes brown.

Female.—Similar to male.

GENUS *CHENONETTA*.

This bird is by Salvadori awarded a special genus, of which it is as yet the only known type.

MANED GOOSE.

(*Chenonetta jubata*. *Bernicla jubata*).

Mr. A. J. Campbell, in his "Nests and Eggs of Australian Birds," states that the nest of *C. jubata* is placed "within a hole or hollow spout of a tree, usually standing in or near water, the place containing the eggs being lined with greyish-white down, lightest coloured in the centre and on the tips of each particle."

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 "Wood Duck" and "Hawkesbury Duck," being very plentiful on that river, and breeding in hollow trees. 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 Mr. Blaauw, M. Roffay, of Angers, M. E. Courtois, of Paris, M. de Montlézun, and others, who have by the exercise of talent and perseverance, succeeded in breeding not only this species, 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.

In a paper addressed to the "Ibis," January, 1904, Mr. F. E. Blaauw writes :—

"Proceeding to the Maned Goose (*Chenonetta jubata*), I must allow that I have not yet had complete success with this bird. A year ago one of my females laid two eggs in April, dropping them about without making any nest. These two eggs were placed under a common hen, and, after twenty-eight days of incubation, were hatched. Unfortunately, the hen killed both the goslings. They were, so far as I could judge from the mangled bodies, of a nearly uniform dark grey colour."

Writing to me in 1907, Mr. Blaauw reports :—

"Since publishing my paper in the "Ibis," January, 1904, I have had complete success with this species.

"In the spring of 1905 a female laid nine eggs in a hollow tree stump, and all the eggs hatched. The young in down have the crown of head, neck, and whole of the upper-side light slatey-grey; throat, sides of head, foreneck, and whole of under-surface whitish; a dark line runs from the base of the bill through the eye to the neck, and a second one of the same colour over the cheeks parallel to the first one; over the shoulder is on each side a whitish transverse streak, and white also is a spot on each side of the tail; the legs are grey, as also is the bill, which has a brown tip. When two weeks old the birds were about half grown, and the feathers began to appear on the shoulders and flanks. The legs at this age turned into a greenish colour. At three weeks the tail feathers appeared, and the pin feathers were growing all over the body, so that in a short time the birds became wholly feathered. The legs now also turned into a bluish colour. The first plumage resembles that of the adult female, but the dark markings are not so well defined.

"In the second half of the summer the birds began to moult, and in autumn were undistinguishable from the old birds."

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 grey, pencilled with wavy black lines; centre of abdomen and under tail-coverts glossy-black; shoulder and upper wing-coverts reddish-grey; wing-bar green and white;

bill olive brown ; eyes, legs, and feet dark brown. Total length about 20 inches.

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.—Ashy-grey in down.

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

SUBFAM. VII. ANATINÆ.

The genera included in this sub-family are the Tree Ducks (*Dendrocygna*), Spur-winged Geese (*Chenalopex*), Shel-drake (*Tadorna*), Sheldrakes of the Old World and Australian Regions (*Casarca*), True Ducks (*Anas*), Teal (*Nettion*, *Euenetta*, *Chaulelasmus*, *Pæcilonetta*, *Elasmonetta*, *Nesonetta*), Teal of the Northern Hemisphere and Neotropical Regions (*Querquedula*), Wigeon (*Mareca*), Pintail (*Dafila*), Shoveler (*Spatula*), *Malacorhynchus*, *Marmaronetta*, *Stictonetta*, *Heteronetta*, which have not received English equivalents.

GENUS *DENDROCYGNA*.

The Tree Ducks constitute a genus comprising nine species, 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 grey and brown of various shades, some spotted with white.

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

WHITE-FACED TREE DUCK

(*Dendrocygna viduata*).

feeders and gregarious, living in large flocks, and 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.

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 numbers 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 species 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.

(*Dendrocycna 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 Wigeon, 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. 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 become most bewitchingly tame, and will follow their keeper anywhere, running at a great rate on their long red legs, or rising off the water with a flapping motion, and skimming over the surface like coots even when pinioned, assisting them-

selves with an occasional spring from the surface of the water with their feet.

Their long-drawn whistle is often repeated when they are excited or hungry, and can be heard for considerable distances.

Writing of this bird, H. H. Smith, in his "Brazil and the Amazons," says :—

"Birds are numerous about the river and its lakes. The young are pretty, plushy things, quite active and vigorous. Once the men shot at an old duck, missing her, but cruelly wounding some of the little ones about her. The mother only swims off a few yards, calling pitifully, but bravely holding her ground as we come up ; the father appears from the woods and echoes her cries. I think even our Indians are struck with remorse, for they do not molest the birds further."

I find that 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.—In down, yellowish-dun.

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

Nest Down.—Long ; centre ashy-grey, 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 this form is easily distinguished from *Dendrocygna autumnalis* by the upper portion of the back being grey instead of chestnut, while the breast is of the same colour. It inhabits the northern parts of South America.

The specimens of *Dendrocygna discolor* in the Zoological Gardens were presented by Mr. E. Harper, in July, 1905, and are new to the collection. Presumably these are the same species which were received by the Zoological Society in 1874, and at that time differently named.

This Tree Duck, called by Buffon “the Whistler with the red beak and yellow nostrils,” is found in Columbia and Guiana, together with parts of Peru and Brazil, and is stated by Sclater and Salvin to be distinguishable at a glance from the Central American form, by its grey upper-back and chestnut-brown lower part. In this southern form also, the breast is grey instead of chestnut as in *D. autumnalis*.

BLACK-BILLED TREE DUCK OR WHISTLING DUCK.

(*Dendrocygna arborea*).

This Tree Duck inhabits the West Indies and Bahama Islands, 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 great 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 hollow trees, the parent bird feigning lameness in order to decoy the intruder 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 has an extended range, being found in the South United States, Tropical South America, Tropical Africa, Madagascar, the Indian Peninsula, and Burma, arriving in Mexico and California, at the close of the wet season, where, according to Colonel Grayson, it is seen 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, this bird dodges 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 been 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 or excited, 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 in number. July—August. Incubation, about four weeks.

SMALL INDIAN TREE DUCK OR WHISTLING DUCK.

(*Dendrocygna arcuata*).

Dendrocygna arcuata inhabits the Indo-Malayan Islands, the Celebes, Moluccas, New Guinea, Australia, and Oceania; it is essentially of a migratory habit, travelling 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. In 1907 a dealer informed me that large numbers of these birds arrived at Marseilles, and were selling as low as 5s. a pair. 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, greyish-buff ; head pale-brown ; bill and legs dark.

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

EYTON'S TREE DUCK.

(*Dendrocycna eytoni*).

This bird, distinguished in Eyton's Synopsis as the "Brown Slender-legs," was named by Gould as a testimony to the value of Eyton's services to ornithology. It is stated to be common on the north-west coast of Australia, where it may be seen in < shaped flights resembling those of the Wild Goose. It is easily identified by its peculiar whistle, which 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. The Zoological Society, in 1867, received from Dr. Bennett, of Sydney, a couple, which have not bred in the Gardens, and another specimen was purchased in June, 1889.

Male.—Upper parts greyish-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.

SPOTTED OR MULLER'S TREE DUCK.

(*Dendrocycna guttulata*. *Dendrocycna guttata*).

This Tree Duck, which averages about 17 inches in length, was first introduced alive to English amateurs by Mr. Jamrach in 1888, from the Celebes; it is an inhabitant of the Moluccas and New Guinea, and completes the list given by Messrs. Sclater and Salvin of the known varieties of Tree Duck, all of which have now been imported alive. I transcribe from Count Salvadori's "Catalogue of Birds" the following description:—

“Male.—Upper part of the head dark brown; a black line along the hind-neck; back and wings dusky-brown; the feathers of the back, scapulars, and wing-coverts edged with pale brown; lores brown; superciliary stripe, sides of the head, and upper part of the neck greyish, with dusky cross-lines, giving a mottled appearance; chin and throat uniform whitish; lower part of the neck dusky, with white spots; rump brown; upper tail-coverts black, the basal one broadly barred with white; upper breast rufous-brown, each feather with a white spot at the tip; lower breast and abdomen whitish, with faint dusky lines across; feathers of the flanks with large white round spots, the longer feathers are almost barred with black; under tail-coverts whitish, with black bars; quills brown; tail almost black; bill black; tarsi and feet ashy, more or less tinged with reddish; ‘irides brown or chestnut’ (D’Albertis).

“Female.—Similar, but rather smaller.”

It is worthy of remark that in the illustration to Count Salvadori's "Catalogue of Birds," *D. guttulata* is represented with the bill red instead of black, and that the feet and legs of the bird are of the same reddish colour.

LARGER TREE DUCK OR WHISTLING DUCK,

(*Dendrocycna javanica*).

This Duck, like the preceding, is as yet rather uncommon. It is found throughout most parts of India, Ceylon, and Java,

and is twice the size of *Dendrocycna arcuata*, which it resembles in plumage, but is distinguishable by its greater size, and the white band crossing the tail-coverts. Jerdon states that these birds are called Whistlers in India from their sibilant cry, which their Hindustani name of "Sillee" also signifies. They are found in flocks of various size, frequenting the smaller reedy and grassy tanks. Their flight is heavier than most of the ducks, 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 earlier specimens in the Zoological Gardens, obtained in 1867 from the Société d'Acclimatation in Paris, were believed to have been received from Madagascar, and other specimens have since been added.

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 in number. July. Incubation, twenty-eight to thirty days.

GENUS *CHENALOPEX*.

This small genus resembles somewhat in colour the Sheldrakes, and in form the Geese; the birds are of a reddish colour, resembling that of a fox, from which they are often termed Foxy Geese.

EGYPTIAN GOOSE.

(*Chenalopex Ægyptiacus*).

The Egyptian Goose, as its name implies, is a native of Africa, extending from Egypt to the interior of the Cape Colony southwards, and repairing northwards to the neighbouring countries of Europe. Burchell states that he met with *Chenalopex Ægyptiacus* at the Zak River, "which he frequently saw in the Colony in a domesticated state." 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 "Life of Birds," states that the young birds are passionately fond of locusts, but do not eat fish. 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. 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, it will turn round in the hand and grip the 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. I found that two male birds of this description will fight to the death, pursuing each other with shrieks of rage, biting fiercely, striking out with their powerful claws till the blood runs, the victor finally standing on his antagonist's back, seizing him by the neck, and literally drowning him by keeping his head under water.

Still, as may often be remarked, the male and female are tenderly attached, and the former will return to his mate after a sanguinary encounter with an enemy, and, raising his body almost erect, will puff out his breast, and stretching wide his long wings, will dance round her with a singular gobbling cry, evidently indicative of victory and triumph.

These birds appear to depend less upon vegetable food than the True Geese or Bernicles, and will thrive well on barley

thrown into water, with occasionally a little maize and buckwheat.

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 grey with black markings ; under parts reddish-yellow ; breast and abdomen light fawn colour with a large chestnut 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 grey 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.—Greyish-white or buffy-white ; thick shelled, round and smooth ; four to eight in number. February—March. Incubation, four weeks.

Nest Down.—Short, uniform pale mouse grey.

ORINOCO GOOSE.

(*Chenalopex jubatus*).

This species must not be confounded with the Australian Wood-duck (*Chenonetta jubata*), sometimes improperly styled “Maned Goose,” the bird now under consideration being allied to the Egyptian Goose, and like it, armed with a knob on the wing. 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.

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."

Nattera obtained eight specimens in one day in Guiana, and found grains and seeds in the stomach.

Mr. Blaauw has kindly given me the following particulars, and writes :—

"I have also repeatedly bred Orinoco Geese (*Chenalopex jubatus*), and have kept the species since 1887.

"These beautiful birds, which are interesting not only from their splendid plumage, but also by their curious antics, are not hardy; that is they cannot stand frost. If kept inside in frosty weather they do extremely well, and live for many years in captivity. Besides grain and green food they want a good supply of animal food (worms or meat chopped finely), and I have found that without this animal food the eggs are not fertilised.

"The general colour is a buffish-white. A blackish-brown band runs from the bill to the end of the tail, there is a round spot of the same colour over the ears, transverse band over the wings, and one more backward. Between the blackish and the white parts there is a rufous edge. The bill and legs are black.

"The young birds are very active and easy to rear. They feed principally on duck-weed, bread crumbs, and ants' eggs, and gradually take grain when they get older. The first plumage is a weak washed-out copy of the dress of the adults. Very soon after they are full grown, they begin to moult, and before the winter they have assumed adult plumage. At that time the legs have also acquired the red colour, but the red is not so intense as in old birds."

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 $1\frac{1}{2}$ feet.

Female.—Upper parts greyish-brown; wings and tail

darker ; under parts whitish ; bill and legs dark brown ; slightly smaller than male.

Egg.—Creamy-white ; five to ten in number. May. Incubation, four weeks.

GENUS *TADORNA*.

The birds of this genus somewhat resemble geese in build ; 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 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 short. The Sheldrakes are remarkable for the formation of the 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 two species of the Genus, one of which, *Tadorna rajah* (Rajah Sheldrake), has not formed part of the Zoological Society's Collection.

COMMON SHELDRAKE.

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

This species 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 orna-

mental 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 a deserted rabbit-burrow.

This disposition on the part of the Shelduck is well known to the natives of Holland, who prepare for the birds tunnels to lay in, taking the eggs as they are produced. 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 Sheldrake 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 a diving bird, my own Sheldrake invariably "went under" when pursued or alarmed, and would progress for some distance below the surface of the pond with great ease. Like all members of the genus, Sheldrakes 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 may 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 greyish-brown ; chin and front of neck white ; wings brown, under surface white ; beak and legs flesh colour.

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

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

RAJAH SHELDRAKE.

(*Tadorna rajah.*)

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 this Sheldrake in the British Museum, but the delicate colour of the bill and legs is naturally wanting in the stuffed specimens. A few pairs of these beautiful birds were imported between 1900 and 1904, the prices obtainable varying from £12 to £20.

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

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.

GENUS *CASARCA*.

Four species are included in this genus, their range being confined to the old world and Australian region, all of which have been domesticated.

RUDDY SHELDRAKE.

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

This handsome bird is known by a variety of names, in India, it being the "Brahminy Duck" or "Rajah," and in this country "Ruddy Goose" and "Collared Duck." It inhabits the south and south-eastern parts of Europe, and parts of Asia and North America, breeding in Algeria, Palestine, and Southern Russia. Dresser states that in its habits the Ruddy Sheldrake 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 Sheldrake, its nesting habits vary, as it will incubate equally on the bare ground, in fissures of cliffs, or in hollow trees. The Ruddy Sheldrake have hybridized in the Zoological Gardens with the Egyptian Goose, the progeny proving very handsome, and continuing to breed *inter se*. I found them to be early breeders, and hardy, producing a nest full of eggs during the heavy snows of March, 1888. The Ruddy Sheldrake is fairly plentiful in the market and can be obtained at from 40s. to £4 a pair.

RUDDY SHIELD-DUCK
(*Casarca rutila*).

It is worthy of remark that the numerous instances recorded in the weekly papers of the slaughter of Ruddy Sheldrakes during the autumn points to the escape from various public or private Collections of these birds.

It was noted in "The Field," of September, 1902, that nearly thirty birds were stated to have been observed in Ireland. It is most deplorable that these beautiful creatures should be ruthlessly exterminated instead of some endeavour being made to induce them to remain where they settle.

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 greyish 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 in number. April—June. Incubation, twenty-eight to thirty days.

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

VARIEGATED SHELDRAKE.

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

This bird, known in the trade as "Paradise Duck," "White-headed Sheldrake," and "Dissimilar Sheldrake," is a native 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 Sheldrake named as being the finest of the eight species of ducks 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 Sheldrake from the smaller Ducks 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 realised £20 a couple. This Sheldrake 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 contrasting tints of the iron-grey 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 Sheldrake, 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 gentleman 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 are entirely feathered, the upper body being reddish, variegated with grey on the back and wings ; at sixty days old they are able to fly, but the sex is 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 grey, 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 at six months, up to which time she wears the black cap of her male parent ; 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 *Casarca casarca*. 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 in number. May—June. Incubation, thirty days.

Nest Down.—Uniform pale ashy-brown, centres whitish.

AUSTRALIAN SHELDRAKE.

(*Casarca 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 Sheldrake. 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 Sheldrakes, being somewhat pugnacious.

A few pairs were imported in March, 1892, and ten years later a trapper arrived from Australia with about 100 couple. One of our great dealers told me that at first they sold for £20 a pair, but gradually the price declined to 40s. Mr. Blaauw has kept them in Holland for several years, but has not succeeded in making them breed, though they are hardy birds, Mr. Blaauw having had a male since 1889.

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 in number. September. Incubation, thirty days.

WHITE-FRONTED SHELDRAKE, OR GREY-HEADED DUCK.

(*Casarca cana.* *Tadorna 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, and died 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," and 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. Simons, writing to the "Ibis," 1887, states that this Sheldrake is not plentiful in the Orange River Colony, appearing to nest on the ground at some distance from water, often 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 between the thighs. Our only information upon this bird is collected by Dr. Sclater in the P.Z.S., 1864, a short notice by Messrs. Layard and Sharpe in their "Birds of South Africa," and in Stark and Slater's "Fauna 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 species.

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 Sheldrakes owing to their unfrequent occurrence.

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 grey ; 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, slightly smaller.

Young.—No information.

Egg.—Creamy-white ; eight to ten in number.

GENUS *ANAS*.

According to Salvadori seventeen species are distinguished as belonging to this genus. The species of *Anas* as yet unIntroduced alive are as follows :—*A. wyvilliana*, *A. laysanensis*, *A. fulvigula*, *A. maculosa*, *A. diazi*, *A. aberti*, *A. luzonica*, *A. zonorhyncha*.

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 OR MALLARD.

(*Anas boscas*).

The proper distinction in the many names by which this bird is known, is to apply the term "Mallard" to the male only, his mate being properly the "Wild Duck." *Anas boscas* 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 in large flocks, when it falls a prey to sportsmen 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. 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. Dr. 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 greyish-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 grey 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 in number. March—May. Incubation, twenty-eight days.

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

AYLESBURY DUCK.

(*Anas boscas var*).

The well-known variety, known as the Aylesbury Duck, takes its name from the town in Buckinghamshire, where it is bred in large numbers 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, a process tending to whiten the bill.

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 boscas var.*).

The origin of the name “Rouen Duck” 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 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 greyish-brown, edged with white ; vent velvet-black ; abdomen pale-grey ; sides grey, 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 in number. Incubation, four weeks.

PEKIN DUCK.

(*Anas boscas var*).

Originally from China, the Pekin Duck was 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 it resembled the Aylesbury, a likeness in which the experienced eye of the amateur however detected disparities. In plumage it is 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 boscas var*).

The handsome black Duck, known as the Cayuga 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 colour.

Female.—Similar to male ; curled tail feathers absent.

Young.—When hatched, blackish, with buff patches.

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

DECOY OR CALL DUCK.

(*Anas boscas var.*)

Poultry shows recognise two sorts of so-called Decoy Ducks, the white and the grey, the name having originated with the old practice of using tame ducks in a decoy (Dutch “Kooi”) to attract wild ones. The grey 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 grey 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 (Grey).—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 (Grey).—See Mallard and Rouen Duck.

Female (White).—Same as male.

Young (Grey).—Yellow with dark splashes.

Young (White).—Yellow.

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

EAST INDIAN DUCK.

(*Anas boscas var*).

The so-called East Indian Duck does not owe its origin to India, as would be inferred from the name, being known also as “Labrador” and “Buenos Ayres” Duck. There is little room for doubt that it was originally bred from the Mallard. It is 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 ducks, 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 in number. 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 there. It is stated by Dr. Sclater to have been first received in 1850, breeding well for fifteen years, and also producing hybrids with the common Wild Duck. It has also bred for many years at Woburn Abbey.

In the wild state, the period of incubation is from the

last of April to the early part of June, and the nest is placed on the ground, in the grass or rushes in the neighbourhood of ponds, pools, or streams, in meadows, and sometimes swamps. It is a large and neatly arranged structure of weeds and grass, nicely hollowed, lined with down and feathers from the breast of the bird. Specimens of the breed can usually be obtained at about £1 a pair.

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 in number. 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 common, as also in 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. Dr. 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 boscas* 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 in number. June (in Europe). Incubation, twenty-eight to thirty days.

YELLOW-BILLED DUCK.

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

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, and there are specimens on the waters at Woburn Abbey. It is a native of South Africa, where it is called the "Yellow-billed Teal," and is, according to Layard and Sharpe, migratory, being usually seen in pairs, and breeding in considerable numbers among rushes and rocks at the lake of Vogel Vley; the 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 nesting season in Africa is October. This bird greatly resembles

in general appearance *Nettion oxypterum*, but the general plumage is somewhat darker, and the wings a trifle shorter than the former.

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; eye red; “bright brown” (Oates).

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 in number. May—June. Incubation, twenty-seven to twenty-nine days.

SPOTTED-BILLED DUCK.

(*Anas pæcilorhyncha*).

This is another of those species 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. The sexes resemble each other so closely that I have known prizes to be given in a show to two drakes as a pair. Careful observation shows the feathers on

the back of the drake to be more pointed and a shade darker than those of the duck ; the feet and legs are of a more brilliant orange, and the reddish-yellow patches on the bill considerable brighter in colour. 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, and my own birds laid in April, one nest containing twelve eggs, of which six produced young ; the second batch of eggs was laid in May, and these I had the misfortune to lose, the young being taken at a few days old by my great enemies the rooks, which also seized my young chickens, of which I one year reckoned a hundred and eighty-five that they had taken. The rooks at first came after the meal with which the young birds were fed, and by degrees they took to eating the chickens themselves. I noticed that in the beginning they would tear open the unfortunate little bird's crop, in order to obtain the soft food, which they would then carry to their young ; but after a time they found a duckling or chicken was edible, and they would convey it, still living, to their nests. The Ducks do not like being seen when engaged in nesting, so I found it necessary to place boughs of larch and fir, and other trees, along the inside of the wire netting, to make a natural cover for them.

Male.—Slatey-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.

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 twelve in number. April—May. Incubation, four weeks.

Nest Down.—Small, dark brown, obscure white centres.

CRESTED CHILIAN DUCK OR BROWN-BELLIED CHILIAN PINTAIL.

(*Anas cristata*. *Dafila pyrogaster*).

This South American bird has been identified by Messrs. Sclater and Salvin as *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 Chilean Pintail 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 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, who states the bird inhabits the mountains near Lima, in Central Peru. The Zoological Gardens received two live specimens in April, 1887, from the Falkland Islands, presented by Frederick E. Cobb, C.M.Z.S., this species being

then new to the Society's collection of waterfowl, since which it has bred freely.

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.

Egg.—Brownish-white; five in number. October—November.

MELLER'S DUCK.

(*Anas melleri*).

This bird, which inhabits Madagascar, was presented to the Zoological Society by W. H. Sharland, Esq., in April, 1894. Dr. Sclater gives the following note with reference to this bird:—

“In the ‘Proceedings’ of this Society for 1863, I have given a list of mammals and birds collected by Dr. C. Meller during his journey up to Antananarivo. I there included a species of Duck, of which two examples were obtained in the marshes near Analamazotra, under the name of *Dafila erythrorhyncha* (Gm.) My attention having been again called to this bird through meeting with fresh specimens in the collection of the Royal Institution at Woolwich, lately obtained in Madagascar by Mr. J. Caldwell. I have been induced to re-examine it. On comparing it with the fine series of Anatidæ in the British Museum, I find it is certainly not *Dafila erythrorhyncha*; indeed it is very little like that species. As it is moreover not in the British Museum, and cannot be associated with any other species mentioned by Hartlaub in his work on the ‘Birds of Madagascar,’ I believe I am justified in considering it as probably new to science. I propose to call it therefore after its discoverer.”

Hybrids, between Meller's Duck and the Mallard, were bred at the Zoological Society's Gardens in 1904.

The following description is abridged from Salvadori's catalogue :—

Male.—General colour reddish ; the feathers brown in the middle, edged with reddish ; speculum glossy- green, bounded each side by two velvety-black bands ; under-wing coverts white ; bill black ; iris sienna-brown ; feet fleshy colour (Sclater). Total length about 21 inches.

Female.—Apparently similar to the male.

Young.—Has a redder tinge, almost rusty, on the edges of the feathers of the lower parts.

MIRROR DUCK.

(*Anas specularis*).

This beautiful bird, with its richly-coloured coppery-red wing-bar changing to green, and conspicuous white cheeks and neck, has only recently been imported alive into this country, specimens having been received by the Zoological Society, in May, 1881.

It inhabits the Magellan Straits and the southern parts of Chili, and is, so far as we yet know, an exclusively Western species. According to Phillippi and Landbeck it is common from the Straits of Magellan as far north as Valdivia, but is rare in the Central Provinces of Chili.

I give the following abridged description from Salvadori's "Catalogue of Birds."

Male.—Head and neck brown, but with a large spot on the sides of the face, chin, and middle of the throat, white, spreading on the sides of the neck ; back glossy brown-black, with the edges of the feathers pale brown ; lower back uniform glossy brown black, changing into olive-brown on the upper tail coverts ; under parts pale rufescent ; sides and flanks with

brown-black spots ; wings black, with a green lustre ; speculum on the secondaries coppery-red ; under wing-coverts glossy-black, the greater ones dark grey ; axillaries white ; tail above brown-black, with a green lustre ; below greyish-brown ; bill black ; “legs red” (King).

Female.—Similar to the male, but duller.

Young.—In down, upper parts brown ; under parts, sides of the head, a band on the posterior edge of the wing, joining another on the sides of the back, and a spot on each side of the rump whitish ; a brown band from the eye to the occiput, and a second one across the cheeks (*Mus. Turin*).

RARE DUCK.

(*Anas sparsa*).

This bird, also called the Black Duck, inhabits South and East Africa, and according to Layard and Sharpe, in their “Birds of South Africa,” is solitary and shy in its habits, frequenting rivers, under the banks of which it conceals itself during the day. It is scarce, but generally distributed. “In Natal,” says Mr. Ayres, “we seldom find more than two of these birds together ; they frequent the rocky streams in the interior of the country, and are by no means plentiful. In the moulting season we have shot them so denuded of feathers that they could not fly a yard, and depended for their safety on diving, and hiding under the banks, at which they are very expert, and it is difficult to frighten them from their hiding places.” The name “Black Duck” seems to be a misnomer, as the colour appears to be of a dusky-brown throughout. Sir John Kirk states that the breeding season is in the early spring, and that the young birds may be obtained in March.

The following description is taken from Salvadori's "Catalogue of Birds."

Male.—General plumage dark sepia-brown, the head and upper neck lighter, having the feathers edged with whitish ; the feathers of the under parts with narrow pale edges ; scapulars and tertials with one, two, or three whitish-buff bars, interrupted by the shaft ; wing-speculum metallic green with a blue gloss, bounded anteriorly by two bands on the last row of the wing-coverts, one white subterminal, and the other on the tip velvety-black ; posteriorly the speculum is bounded by a black subterminal band and a terminal one white ; under wing-coverts white, mixed with black ; axillaries white ; tail-feathers, upper and under tail-coverts almost black, with whitish bars, oblique on the tail-feathers ; "irides dark chestnut ; bill yellow on the edges and at the base, broadly black on the culmen and on the nail ; feet orange, webs black" (*Antinori, Ragazzi*).

Female.—Similar to the male, but somewhat smaller.

Young.—No information.

Egg.—Cream colour ; about five in number.

GENUS *EUNETTA*.

A single type known as the Javan or Falcated Teal is comprised in this genus, being almost entirely confined to Eastern Asia and Japan, breeding in Siberia, and migrating to the south in winter.

FALCATED TEAL.

(*Eunetta falcata*).

Eunetta falcata, although classed as a Teal, is superior in size to the generality of these birds. It is very rare in private

collections, though the Zoological Society of London possessed specimens, presented and exchanged in 1892. It is known in India as the "Bronze Cap."

Male.—Crown of head deep chestnut, shaded with bronze, green, and purple; upper part of neck and throat white, with a blackish-green collar; the breast and body mottled and pencilled with pale grey, white, and black; the saddle feathers extremely long and abundant, falling over the tail feathers like those of some gallinaceous birds; wing-coverts grey and white, alar speculum, glossy-green; bill greenish-black; feet lead grey; eye brown. Total length, 19 inches. In undress plumage the male resembles the female.

Female.—Resembles the Gadwall female, with the exception that the wing-bar is black and the feet grey, and the upper mandible entirely dark, whereas in the female Gadwall it is pale throughout with a dark stripe down the centre.

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* (Coues's Gadwall), from the Fanning Islands, in the Pacific Ocean, has not yet been brought alive to Europe.

GADWALL.

(*Chaulelasmus streperus*).

The Gadwall or Grey Duck may be considered as a regular winter visitor in limited numbers, and common in 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. Mr. Harting informs me that a few pairs stay on in spring, and in parts of Norfolk, where specially protected, as on the meres about Thetford, they nest every year. They also breed in hundreds at the seat of the Duke of Bedford, flying from lake to lake undisturbed by sportsmen. The Gadwall at first sight 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. It 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 grey and chestnut-red; wing-bar black and white; tail grey; 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 in number. April—May. Incubation, about four weeks.

Nest Down.—Small; similar to that of the Mallard; “white tips scarcely perceptible” (Seeböhm).

GENUS *MARECA*.

Three species of Wigeon are comprised in this genus. *Mareca americana* has been imported, and was bred last year in England.

The Wigeon are closely allied to the Pintails, both genera 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 Wigeon 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 Wigeon do not attain adult plumage until the spring following their birth.

COMMON WIGEON.

(*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 Wigeon 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 Wigeon 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, live Wigeon 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 grey, 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-grey ; back, shoulders, and rump dark grey, indistinctly pencilled with black ; wing-coverts bluish-grey ; 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 greyish-brown ; wings and tail dark brown ; legs and bill dark grey-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 in number. 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 WIGEON.

(*Mareca americana*).

This handsome bird may be viewed as the American type of our common Wigeon. It arrives in the United States at

WIGEON
(*Mareca pinelope*).

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, Audubon stating that it often frequents the ploughed fields in the Southern States, especially after heavy falls of rain. Morris records the shooting of a male bird in Belfast Bay, during the February of 1844, and it was also identified by the late Mr. Bartlett from among a number of Common Wigeon exposed for sale in Leadenhall Market, about five years previously; a few have been met with in this country in winter. This bird presents characteristics both of the Wigeon and Pintail, exhibiting the bill of the former, and the characteristic long tail feathers of the latter. It has been bred by Mr. St. Quentin at Scampston Hall, in Yorkshire, also I believe at Woburn Abbey.

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 in number. May—June. Incubation, about twenty-four days.

CHILOE WIGEON.

(*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 genus, and has for about fifty years been known in England. It 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. Dr. Sclater states that this beautiful Duck was first described by the traveller and naturalist, Azara. It is very plentiful in the vicinity of Buenos Ayres, where numbers are sold in the market, but 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. 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 stimulating buck-wheat, and even a little raw meat pulled into strings. A very fine bird in my possession was found dead, choked, with the tail of a field mouse protruding from its bill, a fact affording proof that the bird craves for animal food. The Chiloe Wigeon 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 in number. May—July. Incubation, twenty-five to twenty-eight days.

Nest Down.—Dark brown; very short white tips.

GENUS *NETTION*.

The birds comprising this genus have a cosmopolitan range, and 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 Teals feed on vegetables, mollusca, insects, and worms, frequenting lakes, marshes, and rivers, and are rarely seen by the sea coast. Excellent swimmers, 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.

In the above are included fifteen species, the Bimaculated Teal (*Anas glocitans*) taking its place as a well-established hybrid, and not a distinct species, although it is often classified separately. *Nettion formosum*, Baikal Teal; *N. crecca*, Common Teal; *N. carolinense*, Carolina Teal; *N. castaneum*, Chestnut-breasted Duck; *N. gibberifrons*, Muller's Duck; *N. albigulare*, Andaman Teal; *N. bernieri*, Bernier's Duck; *N. capensis*, Cape Wigeon; *N. flavirostris*, Yellow-billed Teal; *N. oxypterum*, Sharp-winged Teal; *N. andium*, Andean Teal; *N. georgicum*, Georgia Duck; *N. punctatum*, Hottentot Teal; *N. brasiliense*, Brazilian Teal; *N. torquatum*, Ringed Teal; of these the following are not known in captivity:—*N. castaneum*, *N. bernieri*, *N. andium*, *N. georgicum*, *N. punctata*, *N. brasiliense*, *N. torquatum*.

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.

BAIKAL OR JAPANESE TEAL.

(*Nettion formosum*. *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, quoting Pallas, 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.

Other specimens were purchased between May, 1889 and 1898¹ but although the Zoological Society had twenty birds of both sexes in the Gardens, none of them have, as yet, bred. There is a beautiful illustration of the male bird, life size, in "Fauna Japonica," by Tennwick and Schlegel.

Mr. Harting informs me that in January, 1906, an example of this teal was taken at Southminster, Essex, in a decoy, belonging to Mr. Sewell of Tollingham Hall. This in all probability was an escape from some zoological or private collection.

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 grey 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 in number. June—July. Incubation, twenty-eight days.

COMMON TEAL.

(*Nettion crecca.* *Querquedula crecca.*)

This bird being greatly esteemed for the table, is much in request on its arrival on our shores in winter. 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 dark down, may be found during April and May in many districts in England, commonly in Dorset, Hants, and Sussex, nor is it to be discovered without close search, 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 creamy-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, with a short, soft 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 ashy-grey 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 first two months, 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 ten in number. May and June. Incubation, three weeks.

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

BIMACULATED DUCK OR CLUCKING TEAL

(HYBRID).

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

This handsome bird, known as the "Clucking Teal," was for many years considered a distinct species. It is now established by many ornithologists that it is a hybrid of Mallard and Teal. The chief peculiarity of this bird appears to be its clucking cry, which is loud and harsh, and repeatedly uttered by the drake.

Dr. Middendorff discovered it in 70 North Lat. on the Boganida River ; and Dr. Radde tells us that it arrives early in S.E. Siberia.

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-grey, tinged with yellow, pencilled with undulating black lines ; sides and flanks the same ; scapulars long and pointed ; wing-coverts brown ; flight feathers dark brown ; wing-bar green, margined with white ; abdomen yellowish-white ; bill yellowish-grey ; 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-grey ; bill brownish-olive ; eye brown.

Young.—No information.

Egg.—"They are somewhat larger than those of the Garganey ; their colour is a pale greyish-green, very like that of the eggs of the Mallard" (Taczanowski). "Bluish-yellow in colour" (Middendorff).

AMERICAN GREEN-WINGED TEAL.

(*Nettion carolinense*. *Querquedula carolinensis*).

This species is the American representative of our Common Teal, and is an exceedingly rare visitor to our coast. An excellent coloured illustration may be found in vol. vii. of the late Lord Lilford's Work on Birds.

"Mr. Howard Saunders exhibited an adult male specimen of the American Green-winged Teal (*Querquedula carolinensis*), the property of

Mr. H. Nicholls, Kingsbridge, South Devon, shot out of a flock (perhaps of Common Teal) at the mouth of the Dart, December 23rd or 24th, 1879. The white crescentic band in front of each wing (the chief specific characteristic) was fully defined. Dr. Edmund Elliott writes (in giving an account of the occurrence) that it was the only British killed example which had been publicly examined; but a male had been recorded as having been shot near Scarborough, November, 1851, and it was stated that another was killed in Hampshire nearly 50 years ago. Up to the present time this species was not known to have been introduced on any ornamental waters in Great Britain or the Continent." (P.Z.S., December 4th, 1888).

Male.—Very similar to *Nettium crecca*, but the pencilling finer; on the lower neck there is a crescentic band of white; in post-nuptial plumage the male somewhat resembles the female; bill black; feet plumbeous grey; eye brown.

Female.—Similar to that of *Nettium crecca*.

Young.—The same.

Egg.—Whitish-yellow; six to eleven in number.

CHESTNUT-BREASTED TEAL.

(*Nettium castaneum*. *Anas punctata*).

This bird, also known as "Chestnut Wigeon," is an inhabitant of Australia, and one which should not fail to be secured by the amateur when offered for sale, which is, however, but seldom, the price being usually about £4 the pair. Gould, in his 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 Tasmania. 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 Teal, which have not yet bred.

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 leg 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 in number. September. Incubation, probably about a month.

SLENDER TEAL, MÜLLER'S DUCK, OR SUMATRA TEAL.

(*Nettion gibberifrons*. *Querquedula gibberifrons*).

Now classed by the Zoological Society of London as a Teal, this slim and agile bird is easily recognisable by the narrowness of its build.

It is an inhabitant of Sumatra, Australia, and New Zealand, and 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 ; speckled head ; no white ring round eye ; wing-bar white.

Female.—Similar.

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

ANDAMAN TEAL.

(*Nettion albigulare. Querquedula andamanensis*).

This species has hitherto only been found on South Andaman Island, where it is a permanent resident. It has not been observed on the North Andaman, the Cocos, or the Nicobar Islands. It was supposed by Lord Tweeddale to be identical with *N. gibberifrons* of Java, Timor, Flores, and Celebes, but Salvadori has separated the two species.

"The Andaman Teal is not a common bird, and is generally found either in flocks or in pairs frequenting both salt water and fresh, sometimes hiding amongst the mangroves in creeks during the day, and feeding on freshwater pools or in rice fields at night. The nest was found by Captain Wimberley." (Blanford's Fauna of Brit. India Birds, vol. iv.)

This Teal was received by the Zoological Society in June, 1903, and bred during the years 1905 and 1906.

Those who cannot see the bird in the flesh will find a good illustration in the British Museum "Catalogue of Birds," vol. 27, plate ii.

Mr. Frank Finn, who has had an opportunity of studying this bird in captivity, describes it as follows:—

"This is the largest of the genus, but has proportionately the smallest wings; its bill is also short, like that of the Clucking Teal. The sexes are alike. The colour is a mottled brown, very dark, almost chocolate in fact. The throat, fore-neck, and a ring round the eyes are white, as is a patch in front of the wing-bar, which is velvet-black with a longitudinal bronze-green streak in the middle, and a narrow lower border of white formed by the white edging of the first secondary.

"The white on the head shows a tendency to spread, and in one Indian Museum specimen, a fine male, extends all over the face; possibly this is a matter of age, as old birds get white at the root of the beak. Young birds have no white round the eye. The bill and feet are blue-grey and the eyes reddish-brown or red.

"Unlike most of the ducks of this section it perches freely, and is active both on land and water."—("How to know the Indian Ducks," p. 90.)

Male.—Upper part of head very dark brown, almost uniform, passing below the eye into the white of the lower cheeks, chin, throat, and fore-neck ; round the eye is a ring of white feathers, much broader in some specimens than in others ; upper parts, wings, and tail dark brown, the edges of the dorsal feathers and scapulars slightly paler ; alar-speculum formed by the outer web of the secondaries ; these are velvety-black, except two or three, the seventh to the ninth, in the middle, which are greenish-bronze, all except the last two or three tipped with buffy-white, the first broadly bordered with the same ; greater secondary coverts also white or buff ; lower parts from the neck dull brown with broad pale edges to the feathers.

Female.—The same, except that the bronze of the speculum is more coppery in the female. Bill greenish to plumbeous lilac ; nail black ; irides reddish-brown ; legs and feet greenish-blue to plumbeous (Hume).

Egg.—Cream-coloured, close-grained, and smooth. July—August.

CAPE TEAL.

(*Nettion capense*. *Querquedula capensis*).

This Teal, which, as its name implies, is a native of Southern Africa, was brought home by Sir Andrew 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 has as yet been learned respecting its habits.

Male.—Head ashy-grey, 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 a lighter shade ; alar-bar brilliant green, edged with a black and white band ; throat white ; shoulders grey ; legs

reddish ; wing-coverts, quills, and tail blueish slate colour ; bill crimson, edges and base black.

Female.—Similar to male, but smaller.

Young.—No information.

Egg.—Dirty buffish-white. Probably June—September.

YELLOW-BILLED OR CHILIAN TEAL.

(*Nettion flavirostre.* *Querquedula flavirostris.* *Querquedula creccoides*).

This Teal, which is a native of Antarctic America, is found in Argentina, Chili, and Patagonia, and was first acquired by the Zoological Society in October, 1871, since which time the collection has been augmented by several other specimens.

I extract from Sclater and Hudson's "Argentine Ornithology," the following :—

"In the southern part of the Argentine Republic this is one of the commonest species, and is almost invariably found in every marsh, stream, and pool of water on the pampas. It is resident, and usually goes in flocks of from a dozen to thirty individuals. It has a rapid flight, and is restless, lively, and extremely pugnacious in its habits. When a flock is on the water, the birds are perpetually quarrelling. They are also highly inquisitive, and I have often shot them by first showing myself to the flock, and then standing or sitting still, when they would soon come wheeling about, flying in very close order. They quack and chatter in a variety of tones, and the male has also a clear whistling note in the love-season. The nest of this Duck is always made at a distance from the water, sometimes as far as one or two miles. It consists of a slight hollow in the ground under a thistle-bush or tussock of long grass, and is lined with dry grass and a great deal of down, which is increased in quantity during incubation."

On ornamental waters it is distinguishable from other Teal by the brilliant gamboge-yellow bill, the only Duck with which it may be confounded being *Nettion oxypterum*, identification of which may be based upon its superior size, and longer bill, with the deeper chestnut-coloured shoulders.

Male.—Above pale slaty-brown; whole head barred across with narrow blackish bands; middle of back rufescent, with the centres of the feathers black and narrowly margined with brownish ochraceous; rump paler; a broad alar-speculum black, with a margin of ochraceous above and below, and a bronzy-green blotch in the centre; wing-feathers slaty, the margins of the secondaries on each side pale rufous; abdomen whitish, breast and belly distinctly spotted with black; bill yellow; culmen and tip black; feet horn colour.

Salvadori describes it thus:—

“**Male.**—Head and upper part of neck greyish-brown, thickly barred with narrow blackish bands; lower back, wings, and upper tail-coverts uniform greyish-brown; breast and under-parts whitish, the former more or less tinged with reddish; upper wing-coverts brown grey; under wing-coverts brown grey, but the central ones and axillaries white; tail brown grey; ‘bill wax-yellow, with culmen and nail black; iris carmine (or wood-brown, Durnford); feet grey blue’ (Phillipi).” (Abridged from Catalogue of Birds, vol. xxvii).

Female.—Similar, but duller and somewhat smaller.

Young.—Duller, and markings on head and breast less distinct, especially on the latter.

Egg.—Reddish cream colour; five to seven in number. Sclater and Hudson (“Argentine Ornithology”).

SHARP-WINGED OR MEYEN'S TEAL.

(*Nettion oxypterus*. *Querquedula oxyptera*).

Very similar to the Yellow-billed Teal. This bird inhabits Peru and Chili, and has not, I believe, as yet, formed part of any living Zoological Collection. The wings are long and pointed; the beak narrow and somewhat long, of a yellow colour with black centre streak; the general colour a pinkish-buff, mottled with darker shade; legs lead colour; flight feathers long, reaching to tip of tail; eye ruby red.

HOTTENTOT TEAL.

(*Nettion punctatum*. *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 not 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 colour ; 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 buffish-white.

BRAZILIAN TEAL.

(*Nettion brasiliense*. *Querquedula brasiliensis*).

This pretty, diminutive, slim Teal, first obtained from Pará, in Brazil, during the spring of 1864, bred in the Zoological Gardens in 1878, and long previously 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 said 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. This Teal would be a desirable acquisition to our fancy waterfowl, and

Mr. Jamrach states that the value is from £3 to £4 the pair, but it is very rarely offered for sale. Eyton comments 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.—Above brown; head more rufous; lower back, tail, and lesser wing-coverts black; wings brownish-black; outer webs of the inner primaries and the secondaries shining bronzy-green; broad tips of the outer secondaries white, divided from the green colour by a black band; beneath paler, washed on the breast with rusty-red; throat whitish; belly slightly banded with brown; bill blackish; feet red; whole length 15·5 inches; wing 7·0; tail 3·0; hab. South America.

“This richly-coloured Teal, which is widely extended in S. America, from Guiana down to the Straits of Magellan, is usually met with in pairs near Buenos Ayres, although as many as five or six are sometimes seen together. In habits it is a Tree Duck, preferring watercourses in the neighbourhood of woods, and is frequently seen perched on horizontal branches. The flight is slow and with the wings very much depressed, as in a duck about to alight on the water; and the beautiful blue, green, and white speculum is thus rendered very conspicuous. The note of the male in the love season is a long plaintive whistle, singularly pure and sweet in sound, and heard usually in the evening.” (From “Argentine Ornithology,” Sclater and Hudson).

Male.—Upper body brown, feathers edged with brighter tint; throat grey; back, small wing-coverts, and tail rich velvet black; flanks grey; 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 brownish-purple, with a red patch at the base; legs reddish.

Young.—No information.

Egg.—Buffish-white. June—August.

GENUS *DAFILA*.

Three species of Pintail are comprised in this genus, all of which are known in captivity.

In their habits and general characteristics the Pintails resemble the Wigeon, but are immediately to be identified by the singular elongation (in the males) of the two central tail feathers.

THE PINTAIL.

(*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 long sharply-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, where 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 he 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 Zoological Gardens and also by amateurs, the parents being pinioned birds. A pair of Pintails 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 grey, 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-grey; bill light slate colour.

Young. — When newly hatched, 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 that of the duck.

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

CHILIAN PINTAIL.

(*Dafila spinicauda*. *Dafila oxyura*).

South American species of Pintail is that 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, when eight birds were purchased from Mr. Weisshaupt, and in their Gardens it has bred freely ever since. In the "Proceedings of the Zoological Society" for that year are 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 by Dr. Burmeister that the birds obtained from the East Argentine Republic, and those from Chili and Peru, were two allied species. The Chilean Pintail is nearly as large as the Carolina Duck, but though fanciers endeavour to procure it as small as possible for exhibition, 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 Chilean 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,

CHILIAN PINTAIL
(*Dasula spinicauda*).

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 price 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 in number. April and August. Incubation, twenty eight to twenty-nine days.

Nest Down.—Pale mouse-grey.

EATON'S PINTAIL.

(*Dafila eatoni*).

This rare species was first procured, during the expedition of the "Challenger," from Kerguelen Island in 1874, and named after its discoverer. The total length of the bird is about 17 inches, of which the two central tail feathers occupy six.

Adult Male.—Head and upper neck brown, pencilled with darker; a narrow white band across the front of the throat;

back and upper wing-coverts brown, the latter edged with paler ; sides and flanks barred black and white ; wings greyish-brown ; speculum bronze-green, bounded anteriorly by a reddish-brown band, and posteriorly by a black and white one ; tail brown grey : central tail feathers black ; bill lead coloured ; feet, in dried specimen examined, same colour.

Female.—Similar to female of Common Pintail, but smaller. Head reddish-grey ; brown wing bar ; lustreless.

Young.—Similar in down to *Dafila acuta*.

GENUS *PÆCILONETTA*.

The three Pintails included in this genus are found in Southern America and Southern Africa.

BAHAMA PINTAIL.

(*Pæcilonetta bahamensis*. *Dafila bahamensis*).

The Bahama Pintail or Ilathera 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. These birds are fairly 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 Regent's 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. I have found this Pintail liable to attacks of lameness, and it is necessary to guard against rheumatism by

giving them a sparred bench, about two inches from the ground, as their bed. The young ducklings will thrive well on dry meals and bread crumbs floated in a shallow pan of water.

Male.—Crown of head, back, and tail brown, the scapulars edged with a lighter shade; cheeks, chin, and throat white; breast greyish-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 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 in number; two broods in the year. I noticed that the second nest of eggs were slightly darker than the first. May—August.

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

GALAPAGOS ISLAND PINTAIL.

(*Pacilonetta galapagensis*).

Salvadori states that this bird is very similar to the preceding species, but with the white cheeks speckled with brown. It has not yet been imported alive.

RED-BILLED PINTAIL.

(*Pacilonetta erythrorhyncha*. *Dafila erythrorhyncha*).

It is to be hoped that this pretty African Pintail may become better known to amateurs. In the Zoological Gardens it bred the year after purchase, but then died off; but new specimens have since been obtained. It is known also as the "Crimson-billed Duck," or "Red-billed Teal," and is common in South Africa, where, according to 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. It somewhat resembles the Bahama Pintail, but is larger, and the wings and tail are more blunt than in *Dafila bahamensis*. 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.

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 wind-pipe, resembling a bladder, which is absent in the female, a fact noted by Mr. Frank Oates, in his work on South African travel.

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

Young in down. Resemble the nestlings of other Teal with a pink bill.

Egg.—Creamy-white; six to ten in number. June—July.

GENUS *ELASMONETTA*.

This genus comprises one type, *Elasmonetta chlorotis*, of which the total length is about 18 inches, the female being about an inch less. It has not been imported alive, and is confined to the New Zealand Islands.

BROWN DUCK.

(*Elasmonetta chlorotis*. *Anas chlorotis*).

This elegant little Duck is distributed all over New Zealand; it is a nocturnal feeder, and hides itself among the waterside vegetation during the day, making a peculiar sniffing noise when searching for food, but the sound is not unmusical.

Buller says :—

“It is a very indifferent flier, but swims well and dives with facility. When shooting on a lake near Tiakitahuna, in the upper Manawatu, some years ago, I came upon a flock of sixty or more of these birds; instead of taking wing when closely followed, they swam towards the shore, and then forming into a line they hurried forward in a very impetuous manner, keeping close under the banks of the lake, and uttering a low confused twitter.”

It chooses a dry and quiet place for its nest, which is formed of dry grass.

Male.—According to Salvadori, the head and upper part of the neck are brown, the crown glossy with a chestnut tinge; sides of the occiput and nape glossed with metallic green; throat more or less whitish; upper parts brown, the edges of the feathers paler greyish-brown; on the interscapular region the feathers are finely waved with black and rufous lines, the outer scapulars black on the outer web, waved with black and chestnut lines on the inner ones; lateral upper tail-coverts black, glossed with green on the outer webs; a white collar separates in front the brown of the upper from the lower part of the fore-neck, which is chestnut shading into pale reddish

on the breast and abdomen; flanks waved with rufous and black lines; under tail-coverts black, at the base of them on each side a white patch; wings brown; speculum black, metallic green on the upper part; tertials externally rufescent; under wing-coverts brown, the inner one, with the axillaries, white; tail brownish-black, with narrow rufescent edges to the feathers; "irides black; bill bluish-black; the pectination of the upper mandible yellowish-brown; feet dull slatey-grey" (Buller).

Female.—Head and upper portion of neck brown, the crown darker, each feather edged with rufous; sides of the head and throat with darker streaks; lower part of neck behind and rest of upper surface dark brown, each feather margined with rufous; lower parts rufous brown, each feather largely centred with brown; abdomen paler; sides and under tail-coverts darker; wings as in the male, but the upper wing-coverts with narrow rufous edges; tail brown; "bill greyish-brown; legs pale yellowish-brown" (Buller).

Young in down, "covered with thick soft down, blackish-brown, with lighter markings on the upper surface; chin and under parts yellowish-brown" (Buller).

Egg.—Dark cream colour, slightly greasy in surface; five to eight in number.

GENUS *NESONETTA*.

Only one species of this rare and nearly extinct Duck is known, its chief peculiarity being the exceedingly short wings, which are quite useless for flight. A specimen was deposited in the Zoological Gardens in 1895. The bird from which my notes are taken is in the British Museum.

AUCKLAND ISLAND DUCK.

(*Nesonetta aucklandica*).

Adult Male.—General plumage dark brown, with green iridescent gloss; breast and under-surface whitish; abdomen and sides crossed with reddish-black bars; wings too short to cross, and reaching only to about the root of the tail; bill and legs dark brown; iris brownish-black. The size of this extraordinary little bird is about that of a small pigeon. Salvadori remarks that it is very nearly related to *Elasmonetta chlorotis*, having the same markings and colours, but lacking the well-developed wings of that species.

Female.—Much smaller than male, without the greenish lustre on head; wings browner, without metallic lustre, and with smaller white and red band. Total length about 14 inches.

GENUS *QUERQUEDULA*.

The birds comprising this genus differ from the True 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 Teal feed on vegetables, mollusca, insects, and worms, frequenting lakes, marshes, and rivers, and are rarely seen by the sea coast. Excellent swimmers, 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.

Five species of Teal are enumerated by Salvadori, of which the following have not been imported alive : *Querquedula puna*, *Querquedula discors*.

THE BRILLIANT TEAL.

(*Querquedula versicolor*. *Cyanopterus fretensis*).

This Teal was received for the first time by the Zoological Society of London, in April, 1902, when a pair were purchased off the Zoological Society at Antwerp. Their English appellation of "Grey" is hardly descriptive of the bird, which is known in Paraguay as the "Three-coloured Duck," and is catalogued by Vieillot as the Brilliant Teal. Mr. Jamrach writes that this Teal is plentiful at times, being disposed of by him at £6 the couple.

Q. versicolor inhabits Paraguay, Argentina, Patagonia, and Chili, Sclater and Hudson stating that it is most abundant in the Argentine Republic, especially in the southern portion, living in large flocks, and recognisable by its strongly-marked bill, and prettily variegated blue-grey plumage.

Male.—Grey, crossed with narrow black bands ; top of head smoky-brown ; abdomen whitish ; wings greyish-brown, with bar of greenish-purple outlined with white ; flanks barred black and white ; bill black, with an orange blotch from the nostril downwards ; feet brown ; feathers under eye and sides of head reddish-fawn ; breast spotted with black.

Female.—Similar to male, but all the colours more subdued.

PUNA DUCK.

(*Querquedula puna*).

This fine Teal was identified by Messrs. Sclater and Salvin from specimens in the Museum of the Jardin des Plantes at Paris, and in the Berlin Museum. It inhabits Peru and Bolivia, at the highest level above the sea. It is stated that *Q. puna* is a very well marked species, hardly to be confounded with any other member of the family. Although apparently nearly allied to *Q. versicolor*, it is "readily distinguishable by its larger and uniformly coloured bill, blacker head, whiter throat, and by the finer markings above and on the flanks."

GARGANEY TEAL.

(*Querquedula circia*).

This Teal has a wide distribution, breeding not only in Asia but in the fens of our eastern and south-eastern counties. It is said to be rare in Scotland, and to be even more uncommon in Ireland. The 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 author 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 down the neck, by which this bird may always be known; chin black; throat and breast yellowish-brown; upper surface brownish-grey, with green reflections, each feather margined with darker; wings pale blue grey; scapulars long, pointed, and black, with a central stripe of white; abdomen white; sides white, pencilled with black; feet brown; bill black; iris bluish-brown.

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

Young.—Dark brown down, two yellow-white patches on each side of rump; dark eyebrow; under surface yellowish-white. First feathers like female but redder.

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

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

WHITE-FACED TEAL.

(*Querquedula discors*).

This Teal, well named by Latham "White-faced" on account of the broad crescentic band in front of the eye,

extending round the chin, inhabits North America in general, but chiefly the Eastern Provinces, where it is esteemed as game, the flesh being delicate and tender. On the Guatemalan Lakes it is found in great numbers.

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.

"The nest is made on the ground, in a thick patch or tussock of grass usually in meadows, the border of ponds or streams and swampy places. It is composed of soft pieces of grass and weeds, lined with down and feathers from the breast of the bird" (Davie).

These birds were to 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.

Mr. Harting informs me that examples are reported to have been shot in Yorkshire and Cambridgeshire, as well as at Drumlanrig in Dumfriesshire.

Mr. Jamrach states that between 1900 and 1904 he imported from thirty to forty pairs, which were offered at £3 the couple; but that they are scarce at the time of writing; I do not find any record of their acquisition by the Zoological Society, and I have not heard of their being bred in this country.

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 this Teal and the Raffles Teal are 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 blackish slate colour ; feet yellow ; tail pointed, and extending a couple of inches beyond the wings.

Female.—Head and neck dusky slate colour ; markings on back and belly less distinct ; no white crescent on the face. The female greatly resembles that of *Q. cyanoptera*, but is somewhat smaller, with the bill narrower.

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 *Q. crecca*, but a trifle more yellow ; six to thirteen in number. May—June.

CINNAMON TEAL, RAFFLES'S TEAL.

(*Querquedula cyanoptera*. *Petrocyanea rafflesi*).

This bird, as its English name implies, is readily distinguished by the rich cinnamon brown of its general plumage, which, with the blue shoulder, renders it unmistakable. It is as yet very little known in our bird markets.

Sclater and Hudson state that this Teal has an exceedingly wide distribution in America, being found from California in the Northern Continent down to the Straits of Magellan and the Falkland Islands in the south. Its fine, strongly contrasted

colours give it a very handsome appearance—the wings being clear greyish-blue, the body deep maroon-red, the feet vivid yellow, beak black, and iris gold-colour. On the Pampas it is common and almost invariably seen in pairs at all seasons.

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. Five specimens were purchased by the Zoological Society between 1884 and 1893, but there is no record of their having bred in the Gardens.

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

Female.—Head and neck dusky-brown, darker on the crown, each feather bordered with whitish-buff ; these colours prevail all over part of back and breast, with pale brown edges broad and conspicuous ; wing-coverts dull light blue ; speculum metallic greenish ; feet yellowish-brown.

Male.—General plumage red ; top of head black ; middle of back and scapularies streaked with black ; lesser wing-coverts blue ; wing-speculum green, margined above with white ; primary wing-feathers black, secondaries flammulated with white and buff ; bill black ; feet yellow.

Female.—Above blackish, feathers margined with whitish ; beneath dirty-white, variegated with brown ; throat white, with blackish freckles." ("Argentine Ornithology," Sclater and Hudson).

The authors above mentioned state that it is difficult to distinguish between the Duck of this species and that of *Q. discors*.

Young.—No information.

Egg.—Buffy-white ; eight to nine in number. June.

GENUS *SPATULA*.

In this genus are four species, which are distributed over Europe, Australia, South America, South Africa, and New Zealand. None of the exotic species have yet been imported alive.

As the name of the genus implies, these birds are distinguished by the formation of the bill. The plumage is varied and brightly coloured. All of the foreign species have spotted breasts, and differ, according to Mr. Seebohm, in other important respects from their European ally. *Spatula variegata* is described and figured in Sir W. Buller's work on the "Birds of New Zealand."

COMMON SHOVELER.

(*Spatula clypeata*).

This singular Duck is easily recognised by its wide spoon-shaped bill, which it employs in sifting the mud in search of the small animalculæ and worms, which form the greater portion of its food. Although not so common in this country as many other wild Ducks which visit us in winter, it has of late years increased, owing to protection, and now breeds in several counties. Examination of the bill of the Shoveler explains the reason for its peculiar construction. The curious

fringe of bristles depending from the upper mandible acts as a strainer through which the water runs, while with its tongue the bird retains the food which it takes in as it sifts the water with the broad bill. Shovelers are usually seen in flocks of from five or six to a dozen during the autumn. 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.

Mr. Blaauw tells me that he has found the Common Shoveler a free breeder on his ponds, but the young ones are a little delicate, so that it takes a liberal supply of ants' eggs to rear them. I found the Shoveler an omnivorous feeder, and when thoroughly domesticated, by no means confining itself to surface feeding, but gorging on soaked grain and rootling about in the muddy banks of the pond, with an occasional dip below much after the manner of the Pochards.

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

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

Young.—In down, olive, with brown and yellow patches ; easily recognisable 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 in number. June—July. Incubation, three weeks to twenty-five days. "Twenty-two to twenty-three days" (Naumaun).

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

CAPE SHOVELER.

(*Spatula capensis*).

This species of broad-billed Duck has not yet been imported alive into this country, nor is there any specimen in the Zoological Gardens. From Dr. Bowdler Sharpe's edition of Layard's "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 our more familiar species.

Male.—Head grey, finely spotted with dark brown ; upper body brown, with a greenish gloss, each feather bordered with white, giving to the bird a scaley appearance ; wing-feathers brown, with a broad bar of azure blue, white, and metallic green ; bill black ; feet 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 greyish-blue ; no distinct white speculum ; bill light reddish-brown, greenish at sides.

Egg.—Pale greenish-yellow.

AUSTRALIAN SHOVELER.

(*Spatula rhynchotis*).

This bird is also known as the "New Holland Shoveler," and I am indebted to Gould's "Birds of Australia" for my notes concerning it. Although ranging widely from east to west, the habitat of this species, so far as is yet known, is confined to the southern parts 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 Shoveler 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 grey, 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 ; 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.

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

SOUTH AMERICAN OR SPOTTED SHOVELER.

(*Spatula platalea*. *Rhynchaspis maculatus*).

This beautiful bird received its descriptive name *Rhynchaspis maculatus* from 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. "Darwin obtained his specimen of this Shoveler from the Rio de la Plata, whence also the one figured in Jardine and Selby's 'Illustrations of Ornithology' was procured by 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." (Sclater and Salvin on Neotropical Anatidæ, P.Z.S., 1876).

Eyton held a theory that this bird was the female of the New Holland or Australian Shoveler (*Spatula rhynchotis*), and that the specimens previously described as being the female and young of that bird were in reality young males (see his Synopsis of the Anatidæ)—an opinion which has since been 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 greyish-blue, terminating in a broad white band; wing-bar brilliant green; bill very dark brown; feet yellow; eye yellow (Jardine and Selby, "Illustrations of Ornithology").

Female.—No information.

Young.—No information.

Egg.—No information.

GENUS *MALACORHYNCHUS*.

This genus contains but one species, 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."

MEMBRANACEOUS DUCK.

(*Malacorhynchus Membranaceus*).

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

"Although this is by no means a common bird in any part of Australia that I have visited, it is very generally distributed over the southern latitudes of that country, and it also occasionally visits Van Diemen's Land; its occurrence, however, is very irregular, the shortness or duration of the intervals being evidently influenced by some peculiarities of the season. Shallow freshwater lagoons seem to be its favourite places of resort, hence in New South Wales during the rainy season, when the flats and hollows are temporarily filled with water, giving life to myriads of the lower animals, upon which this Duck feeds, its presence may almost at all times be looked for, while on the other hand it is seldom to be met with during the opposite periods or seasons of drought. As this bird has never yet been seen out of Australia, or even on the northern shores of that country, we may reasonably suppose that towards the interior it finds situations suited to its existence, and where it doubtless breeds; but respecting this portion of its economy no particulars whatever have yet been ascertained. No one of the tribe that I have observed in a state of nature presents a more elegant or graceful appearance than this little Duck, which is generally seen in small companies of from six to twenty in number, swimming over the placid lagoons and

betraying so little fear and shyness on the approach of man, as to present a singular contrast in this respect to the other members of the family. Its peculiarly light plumage renders it very buoyant on the water ; its flight is very powerful, and it passes through the air with great quickness, like the Green-necked Duck and Shoveler, with both of which species it is frequently found in company. The sexes are so perfectly similar that they are not to be distinguished with certainty ; the male, however, is generally the larger of the two." (From Gould's "Birds of Australia.")

"It may be described as dark above and light coloured underneath, where are numerous dark-brown fasciæ, the markings being narrow or broad as the case may be. The somewhat broad bill is greenish or bluish-grey, eyes reddish-brown, and feet variable in colour from green to yellowish-brown. The bird takes its common name from a singular oblong mark of rose-pink behind the eye.

"Mr. Gregory Bateman's observation regarding the Pink-eared Duck was that it generally laid during September or October, or according to the amount of rain, depositing its eggs in the deserted stick-nests of Ibises, Herons, &c., which old structures the duck abundantly lines with down. In fact no other species of duck's nest Mr. Bateman was acquainted with contained such an abundance of down." (Campbell's "Nests and Eggs of Australian Birds.")

Male.—Size about equal to that of a Pintail ; top of head greyish-brown ; sides of head and chin whitish ; a dark line from the back of each eye passes round to the back of the neck ; neck, breast, and under-parts whitish-grey, barred with fine brown lines ; under wing-coverts white ; primaries brown, edged with white ; tail brown ; under part of body barred ; behind the red eye is a small oblong patch of bright rosy pink.

Female.—Similar to male, but somewhat smaller ; the pink spot present in both sexes.

It is worthy of remark that Eyton states that the eye spot is wanting in the female, but Salvadori remarks that he found it in all the females examined by him.

My notes are taken from the stuffed specimen in the British Museum.

GENUS *MARMARONETTA*.

This genus comprises but one species, which is distributed throughout Southern Europe, Northern Africa, and Western Asia.

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 regarded by different ornithologists as a Teal, a Pochard, and a Pintail, Gould, in his "Birds of Europe," naming it *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.

Large numbers of these birds were kept by the late Lord Lilford, some of which eventually found their way to the Duke of Bedford's Collection at Woburn Abbey, where they have bred.

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

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; short bushy crest; lower breast and abdomen greyish-white; tail and wings bluish-buff; beak and legs bluish-black; eye brown.

Female.—Similar; but paler, smaller, and with less tuft.

Young.—In down, dusky above; pale yellow beneath.

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

GENUS *STICTONETTA*.

The only bird of this genus is *Stictonetta novosa* (Freckled Duck), a native of Australia, which has not yet been received alive.

It is stoutly built, and nearly 18 inches long. There is no wing-bar ; the tail is very short, and this species appears to occupy a middle position between the stiff-tailed ducks and pochards. A pair, well mounted are in the British Museum's Collection.

It would be impossible to confound this bird with any other, the even dark brown of the plumage, equally sprinkled all over with tiny white dots of nearly the same size on head and body, rendering it unmistakable.

GENUS *HETERONETTA*.**BLACK-HEADED DUCK.**

(*Heteronetta atricapilla*).

This species is confined to Southern America, and, as its name implies, has a black head with brown body ; under-parts whitish ; the bill is stated to be blackish, and the feet brown. I have not been able to examine a skin.

SUBFAM. VIII. FULIGULINÆ.

In this Subfamily are comprised the following genera :—
Netta, *Metopiana*, *Nyroca*, *Fuligula*, *Hymenolæmus*, *Clangula*,
Cosmonetta, *Harelda*, *Heniconetta*, *Camptolæmus*, *Somateria*,
Ædemia, *Tachyeres*, *Arctonetta*.

GENUS *NETTA*.

One type comprises this genus, the well-known Red-crested Duck or Pochard.

RED-CRESTED POCHARD.

(*Netta rufina*. *Fuligula 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 Hunt ("British Ornithology") 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, where, according to Hume, 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 bantam hen, and rearing the young in a wire coop on grass.

The foster mother was quite at home with her brood, and the ducklings thrived well upon hard-boiled eggs, mixed with fine-chopped lettuce, oatmeal, and sweet curds, well pressed, finely crumbled, and given sparingly but at close intervals. As with most varieties of small fancy ducks, little earth-worms, ants' eggs, maggots, and other live animal food was daily offered to them, while a shallow dish containing pond water, with duckweed, was easily accessible.

When reared under a hen, the young ducklings should not be allowed to go to the water until they are ten days old, as I found them under these circumstances much more liable to cramp than when reared by their natural mother. I attribute this, in great measure, to the fact that when the duck is swimming with her brood the young frequently climb on her back and rest themselves, whereas without guidance they are apt to remain too long in the water, and to become entangled in the weeds, and chilled.

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 grey and brown; bill and eyes bright scarlet; legs red orange. During the moult resembles the female, but is identified by the 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 greyish-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 in number. April—June. Incubation, twenty-six days.

Nest Down.—Dark brown ; greyish-white centres.

GENUS *METOPIANA*.

This genus comprises one species, of which the range is confined to South America.

ROSY-BILLED DUCK.

(*Metopiana 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 species, which, like the Mandarin and Carolina, present a somewhat shabby appearance during the summer months, whereas this beautiful drake with the glossy black head and neck, shot with pink and peacock blue, and the startlingly rose-coloured waxy bill, remains in full dress for the greater part of the year, forming a great contrast to his mate, quietly clad in chestnut and fawn, with her bill of a dull slate colour.

A short account of this bird communicated by various writers will be found in the P.Z.S. 1876. 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," says Professor Garrod "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. Professor Garrod in his paper "On the trachea of certain Ducks," P.Z.S. 1875 (from which I have already quoted), 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 grey, finely pencilled with black; wing-bar metallic green, bordered with white and black; under parts grey 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.

GENUS *NYROCA*.

This genus includes nine species, nearly all of which have been imported alive, or are known on our coasts.

COMMON OR RED-HEADED POCHARD.

(*Nyroca ferina*. *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 both in England and in Ireland, and formerly thousands were 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, and choosing the sedges and rushes near water.

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

Female.—Head and neck brownish-grey; body and wings grey; eye reddish-brown; bill black; upper breast dark reddish-brown; legs and feet grey 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. Henny mentions that the black on the breast of the young males does not make its appearance until the second year.

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

Nest Down.—Small; delicate uniform pale brownish-grey.

AMERICAN POCHARD.

(*Nyroca americana*. *Fuligula americana*. *Aythya americana*.)

The Zoological Society of London secured five of these birds in exchange from North America, in the month of August, 1902, for the first time in the history of the Gardens; the general characteristics of the bird being generally very similar to the "Canvas-back" of the United States, like which it is common to the whole of North America. From thirty to forty pairs were imported between 1900 and 1904, selling at from £4 to £6 the couple, but they turned out a very unprofitable speculation, it being almost impossible to acclimatise them.

Male.—Eyes red; head and neck brownish-red, glossed above and behind with violaceous red, rest of neck and body behind the shoulders with lower part of back and tail-coverts black; the bill as long as the head, broad and blue, the end black; lower body white, sprinkled with grey and black; the sides, interscapulars, and scapulars finely lined with undulating black and white in nearly equal proportions, giving a general grey tint; wing-coverts bluish-grey, finely sprinkled with whitish; the speculum consisting of the ends of the secondaries hoary greyish-blue, lightest externally, and the innermost narrowly edged with black.

Female.—Head, neck, and fore part of body brownish; base of bill whitish; eye yellow.

Young.—Olive brown, indistinctly relieved by an olive yellow spot back of each wing and on each side of the rump; head and neck yellowish, no dark marks on side of head.

Egg.—"Greyish-white, with a tinge of cream colour" (Baird).

CANVAS-BACKED DUCK.

(*Nyroca valisneria*. *Fuligula valisneria*)

This celebrated American Pochard much resembles our common *Fuligula ferina*, but is 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 from 2 lb. to 2 lb. 6 oz. It is reckoned excellent eating, and is captured in large numbers for the table. 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 purchased in the market, from one to three dollars (4s. to 12s.) being not uncommonly paid for them. In America this Pochard is 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. The Canvas-back has never been offered for sale alive in this country; we must therefore still regard it as a desirable acquisition. Mr. Jamrach succeeded in bringing over a consignment of these birds from America, but they all died.

Male.—Back grey, 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.")

BAER'S DUCK ; EASTERN WHITE-EYED DUCK.

(*Nyroca baeri*. *Fuligula baeri*).

This bird, until lately unknown to our collections, is stated by Dr. Patten to have been shot on Tring reservoir, on November 5th, 1901, its skin being exhibited by the Honorable N. C. Rothschild, at a meeting of the British Ornithologists' Club, November 20th, 1901. The chronicler holds the opinion that this was a genuine wild specimen.

"On June 24th, 1906, a Baer's Duck was received from Mr. Frank Finn, F.Z.S. (of the Indian Museum, Calcutta), and presented by him along with other birds to the Zoological Society's Collection. This is the first example of this eastern Asiatic Duck which has recently been ascertained to occur in India, that has reached us. Mr. Frank Finn states that he obtained eight specimens of Baer's Pochard (*Fuligula baeri*) in the Calcutta Bazaar, on the 24th to 27th February last. Three are males, five are females, and in addition there are two living males in the Zoological Gardens at Alipore, where the remaining female has apparently recently died. This species is to be found in Eastern Siberia (whence Radde described it), China and Japan. The birds will be added to the Museum Collection, where there is already a specimen apparently of this form, numbered 1789 D in Blyth's Catalogue, but referred to the Common and nearly allied species

Fuligula nyroca" (Proceedings of the Asiatic Society of Bengal, Edited by the Hon. Secs. January to December, 1896).

"This duck is a very near ally of *Nyroca ferruginea*, but is distinguished by both sexes having the head and neck black, glossed with green in the male, but brownish and with very little gloss in the female, in which sex also the lores are rufous-brown. The basal portion of the primaries, too, in the present species is light greyish-brown, not white. In other respects the two species are similar. There is the same white speculum on the secondaries, and the same sharp division between the chestnut breast and white abdomen in the male, whilst the two pass into each other in the female 'Bill bluish, the base and nail black; irides white or pale yellow; feet lead-grey' (David). Length 18; tail 2·4; wing 8·25; tarsus 1·3; bill from gape 2. Distribution Eastern Siberia, China, and Japan. Although specimens appear to have been obtained in Bengal by Duvancel, the occurrence of this Pochard in India had been completely overlooked until Mr. Frank Finn, in February, 1896, obtained several specimens in the Calcutta Bazaar, and identified them. He then, on examining the specimens of *Fuligula nyroca*, collected by Mr. Blyth, found that one of them, which had been in the Asiatic Society's Museum since 1842, was a female of *Nyroca baeri*. I learn from Mr. Finn that in the present year (1897) this Duck has again been obtained commonly in Calcutta, so it is probable that this species has hitherto been confounded with the nearly-allied *Nyroca ferruginea*" (Blandford's Fauna of British India, vol. iv.)

Mr. Frank Finn describes this bird as follows:—

"The male has a dark glossy-green head and neck and a glossy deep bay or chocolate breast; the upper plumage and wings are deep glossy-brown, with the usual white on the quills; the under surface from the breast is white, and this extends half way up the flanks, but above passes gradually into light brown. The eyes are white or (very rarely) yellow.

"The female is like the male, but has a rust-coloured patch on each side of the face at the root of the beak ; the green of the head is less bright and is mixed slightly with rusty about the throat ; the breast is lighter, nor is its colour so sharply defined from the white belly as in the male, and there is less white on the flanks. The male in undress assumes the rusty facial patch, and gets some white mottling on the breast, and the white appears to fade at this time off the flanks of both sexes. The eyes of the female are brown, rarely grey or whitish.

"The young birds are of a dirty light brown, with wings and tail much as in the parents. The crown is blackish, and there is a rusty patch on the face as in the old female. The colour of the eyes is already quite different in the sexes even in this plumage, so it must develop early."

WHITE-EYED DUCK ; FERRUGINOUS DUCK.

(*Nyroca africana*. *Fuligula nyroca*. *Nyroca ferruginea*.
Nyroca leucoptalma).

This small Pochard is an occasional visitor to England during the winter and early spring, breeding in the more northern latitudes during the summer. Captain Shelley states that he has seen the White-eyed Pochard in flocks of many thousands 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 correspondent 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.

I never succeeded in rearing the young, although my Duck laid two batches of eggs, of which several hatched, but she nested again too soon, and the ducklings perished in the inclement English month of May.

I have to thank Mr. Blaauw, of Gooilust, for these notes respecting the White-eyed Duck :—

“This bird does extremely well on ornamental waters, and is a free breeder. The nest is usually constructed in a box either placed on a pole in the lake itself or put near the water under some bush. The number of eggs varies here (Holland) between six and eleven. I find that the best plan of rearing the young ones is to take the eggs away when they are about to hatch and place them under a bantam hen.

“The ducklings are easily reared on ants’ eggs, bread crumbs, and duckweed. This species readily produces hybrids with the Red-headed Pochards, and if a hybrid of this union is again mated with a White-eyed Duck, the offspring is scarcely to be distinguished from pure *Nyroca leucophthalma*.”

In my small collection, this pretty bird, with chestnut-red plumage, was always admired. His attachment to his mate was very marked, and I have watched him for hours, diving with his wife in the deep water, and returning to the surface with very untempting-looking mouthfuls of rotten vegetable substances. Although there is a general similarity between the male and female, his coat has a more ruddy tinge, and the chestnut of the head and neck is brighter, while his throat is encircled by a black necklace, which however disappears after the breeding

season. I also certainly found the eye of the male a clearer white than that of the duck.

Male.—Head, neck, and upper breast brilliant foxy-red ; chin white, with spot ; 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, then 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 splashed with brown ; eye greyish-white.

Egg.—Yellowish-green, occasionally pale buff, very round ; seven to twelve in number ; “creamy-brown ; nine to fourteen in number” (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.

MADAGASCAR POCHARD.

(*Nyroca innotata*. *Aythia nyroca*).

This bird is at present only known by a couple of skins. The head and neck of the adult male, together with the upper portion of the breast, are of an intense mahogany red, lower part white ; back and scapulars brown ; wing-bar white, with metallic green shading before and behind ; eye pearl white ; bill and legs bluish-grey, vent white. This species may be distinguished

from the African type by the absence of the blackish-brown collar, in having no white spot on the chin, and by the absence of the narrow white lines, and small white dots, which are present upon the back and scapulars of *Nyroca africana*.

I am unable to give any details regarding the female or young.

AUSTRALIAN POCHARD.

(*Nyroca australis*).

I have not been able to examine any skins of this species, and for description refer my readers to Salvadori's "Catalogue of Birds," vol. 27, page 350.

BROWN DUCK OF SOUTH AFRICA.

(*Nyroca brunnea*. *Fuligula brunnea*).

This bird inhabits Southern Africa, from the Cape to Angola on the west, and to Shoa on the east. It was first purchased by the Zoological Society in November, 1851, but it appears now to be extinct in the Gardens.

Layard, in his "Birds of South Africa," states that it is "a periodical visitant to this end of the Colony. I saw a pair in Zoetendals Vley in November, 1865, apparently breeding in the vast bed of rushes at the south end of the Vley."

Male.—The accompanying description is taken from Salvadori's "Catalogue of Birds," somewhat abridged:—Head and upper part of neck dark chestnut with a purple gloss; upper part of head and nape darker, almost black; lower neck black, changing to brown-black on the upper parts; breast

brown, changing to glossy greyish-brown on lower parts ; wings glossy blackish-brown, the smaller wing-coverts finely speckled with paler brown ; under wing-coverts, except the central ones, are whitish, and axillaries brown ; tail brown ; bill bluish-grey (Antinori) or lead-coloured, except the nail, which is black, as also are the legs, toes, and webs ; irides cherry-coloured (Anderson).

Female.—General colour brown, paler on the under parts ; the feathers at the base of the bill, throat, and sides of the upper parts of neck, and a band behind the eyes whitish ; wings as in the male but paler.

NATION'S POCHARD.

(*Nyroca nationi*).

The specimens examined by Salvadori he states to be hardly distinguishable from *Nyroca brunnea*, the skins having been received from South America, where they appear to have been collected in the vicinity of Lima.

GENUS *FULIGULA*.

Certain Pochards and the Scaup Ducks are both members of this genus. They frequent tidal estuaries and lakes, 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. They 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 are numerous, rounder in shape than those of the True Ducks, and of a green or greenish-grey tint. The Pochards frequent the Northern Hemisphere and the regions about New Zealand, and are divided into five recognised species, of which the following have not been imported alive :—*Fuligula nova-zealandiæ* and *Fuligula collaris*.

SCAUP DUCK.

(*Fuligula marila*).

The Scaup Duck, which is plentiful on our shores in winter, disappearing again about April, is seen in large flocks, and seeks its food, which consists of mollusca and small crustacea, 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 breeding haunts are in the Arctic Regions, but they have been known to nest, in a few instances, on certain lochs in Scotland. The "Mussel Duck," as it is sometimes 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.

The name "Scaup" is attributed by some authors to the cry which resembles a repetition of the syllables composing its name, frequently repeated and long drawn out. An old ornithologist, Willoughby, states that the broken shell fish, such as mussels, which forms the staple diet of this bird, is known as "scaup."

Male.—Head and neck black ; upper body greyish-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 ; eight to ten in number. May. Incubation, about twenty-five days.

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

AMERICAN SCAUP DUCK.

(*Fuligula affinis*. *Fulix affinis*).

This form is smaller than that of the preceding, and confined to America. The colours are, if anything, somewhat darker.

TUFTED SCAUP.

(*Fuligula cristata*).

The Tufted Duck, or "Magpie Diver" as it is sometimes called, comes to us in winter 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. In about half-a-dozen counties of England it remains to breed, 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). Yarrell has referred to a cross between a Carolina drake and a female Tufted Duck, mentioning that in the Belfast Museum there is a bird which was shot near Downpatrick, 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. Of late years it has, no doubt owing to the better protection afforded it, nested in numerous parts of Scotland, where at one time it was only an occasional visitor.

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 twenty years ago:—

“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 3cs. 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 greyish-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 in number. May—June. Incubation, twenty-one to twenty-four days.

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

NEW ZEALAND SCAUP-DUCK.

(*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 in number. March.

RING-NECKED POCHARD.

(*Fuligula collaris.* *Fuligula rufitorques*).

I have only seen a skin of this species in the British Museum Collection, believed to be a male.

The head, neck, and upper breast bluish-black, with metallic lustre ; a white spot on the chin ; round the lower part of throat a reddish-chestnut collar ; abdomen and lower breast white ; legs pale grey ; bill pale bluish-grey, with black bean ; eye yellow. The distribution of this bird is throughout the whole of North America, and as far south as the West Indies.

GENUS *TACHYERES*.

The singular Logger-head Duck is the sole representative of this genus, resembling in its habits the Scoters, though very different from them in other respects.

LOGGER-HEAD DUCK.

(*Tachyeres cinereus*. *Micropterus brachypterus*.)

This remarkable bird, first discovered by Pedro Sarminto in 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 Ducks." From the little information that exists regarding its habits, we learn that the wings, which are small and weak, are chiefly used by the bird as paddles as it passes over the surface of the sea, at the rate of from twelve to fifteen miles an hour. It is unable to fly, but is a most expert diver, coming up many yards away from the sportsman, rendering it most difficult to shoot. Darwin states as his opinion that the wings are moved alternately instead of together. Dr. Cunningham, who studied it in its native haunts, 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 species is so strong that Darwin had difficulty in cracking one with his zoological hammer. The breeding season is in the early autumn, the young averaging six to eight in number. Dr. Cunningham describes the *Micropterus* as "a gigantic duck," stating that it weighs thirteen pounds and over, while the total length is about 30 inches. This naturalist concurs with Darwin in his opinion that in their first year the young one possess the power of flight, which is lost as they grow older.

The first example of this species was received by the Zoological Society from Captain Moore, of the Falkland Islands, and we are fortunate in possessing a pair of these extraordinary

birds, which were presented to the Zoological Society's Garden's by Mr. Archibald McCall in June, 1888. The specimen in the British Museum, Cromwell Road, is a female; the soft grey plumage spotted with white, with orange bill and legs, combined with its unusual size, which is that of a small goose, instantly arresting the attention of the visitor.

Male.—Upper body grey; 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" (Cunningham), laid in December.

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.

GOLDEN-EYE.

(*Clangula glaucion*).

This is a charming little bird, and one but rarely seen in collections of waterfowl. There are, however, some speci-

mens on the ornamental water in St. James's Park, and the Zoological Gardens. It is a winter visitant to Great Britain, 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," and in the East and South of England, "Rattle-wing." A smaller species of 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 species, disappears under water at the approach of danger. These birds frequent both fresh and salt water, 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 greyish-green; smooth and glossy" (Seebohm); "greenish" (Morris); eight to thirteen in number. End of May—June.

Nest Down.—"Pale delicate lavender-grey, 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 North America, where it is also termed "Buffalo-headed Duck," on account of the disproportionate size of that organ, "Butter-ball," "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-grey" (Seebohm); seven to nine in number. June.

GENUS *HARELDA*.

The Long-tailed Duck is the only species comprised in this genus.

LONG-TAILED DUCK, 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 North and East Coasts, where it arrives during the early autumn. Its breeding place is in more northern latitudes, where, in winter, it exists in large flocks, which break up into pairs at the approach of the breeding season. The Long-tailed Duck, which is about the size of a Wigeon, is described by 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 water insects which it obtains by diving. 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 inlets of the sea and large lakes. These birds undergo considerable changes of plumage during the year.

The following information has been given to me by Mr. Blauuw, of Gooilust, Holland :—

"(*Harelda glacialis*).—I possess a young male of this species now a little over twelve months of age. The young bird was caught in the autumn of 1905. This species is very difficult to keep alive in confinement, and the present specimen is the only one I have ever been able

to keep for any length of time. I feed it on small fish, meat, bread, and buckwheat, and it is very tame and gentle."

Male.—Winter plumage. The top of head, upper neck, back, and throat white; cheeks grey 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 greyish-white; upper breast reddish-brown; back, wings, and tail dark brown; abdomen white; legs and feet greyish-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 greyish-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 in number. May—June.

Nest Down.—Pale brown; small.

GENUS *COSMONETTA*.

This genus contains but one species, 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 genus *Fuligula*, it has by modern ornithologists been placed in a separate 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 a rare visitor to the shores of Great Britain, resembling the Scaup Duck in its manner of feeding. Mr. Harting states that in several instances so-called "Harlequin Ducks" shot in this country in winter have proved to be young Long-tailed Ducks. It is stated by 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 greyish-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 grey blue, bordered with a white and black band; sides light red; bill slate grey; legs and feet brownish-

blue ; eyes hazel ; wing and tail bark brown. In moulting dress the males resemble the females, but with a whitish patch on the back part of the head.

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.—"Of a white or very pale buff colour, with a tinge of green" (Rev. F. O. Morris). "The eggs of the Harlequin are from eight to ten in number ; creamy-white, smooth in texture, and glossy" (Seeböhm).

Nest Down.—"Dark grey" (Seeböhm).

GENUS *ÆDEμία*.

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 colour. 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 Scoters 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.

Six species of *Ædemia* are enumerated by Dr. Sclater 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.

COMMON SCOTER OR BLACK DUCK.

(*Ædemia nigra*).

This winter visitant to the British Isles, which is about the size of the Mallard, is easily distinguishable from the only other 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 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, with purplish-gloss, changing into green on neck and back; under parts rusty-black; inside of wings grey; thick bill, with protuberance at the base black, with an orange patch over the nostrils; legs lead colour; eye dark brown. In Salvadori's Catalogue the description of the male is headed "Adult Female," evidently a printer's error.

Female.—Brownish-black; large whitish patch on throat; bill entirely black, without tubercle; legs lead colour.

Young.—In first feather, similar to female.

Egg.—Greyish-buff; occasionally fawn white, dashed with stone colour, one end pointed; six to ten in number. May—June.

Nest Down.—"Dark grey" (Seebohm).

VELVET SCOTER.

(*Ædemia fusca*).

This bird is distinguishable from the Common Scoter by a white wing-bar and a white spot round the eye, as also by its superior size. Large flocks are sometimes seen on the eastern coasts of Scotland and England, as well as 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 grey, 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.—Greyish-cream ; may be distinguished from that of *Ædemia nigra* by both ends being rounded ; six to ten in number. June—July.

Nest Down.—“Brownish-grey. Larger than Common Scoter” (Seebohm).

SURF SCOTER.

(*Ædemia perspicillata*).

This Duck has but rarely been killed in Great Britain, being peculiar to America, where it is found exclusively upon the sea coast. Its food, like that of its congeners, consists of

small shell-fish. It breeds within the Arctic circle during the months of May, June, and July, 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.—Greyish-buff ; four to seven in number. June—July.

AMERICAN SCOTER.

(*Ædemia Americana*).

This species is unknown in captivity, the specimens at present in museums having reached us from Nova Scotia, and other parts of North America. Its habitat is somewhat extended, breeding in the extreme north, and proceeding as far south as Japan in the winter. The descriptions which follow are taken verbatim from Salvadori's "Catalogue of Birds." The size of this Scoter is about that of the Common Wigeon, but I have not been able to examine any skins.

Male.—Similar to the male of *Ædemia nigra*, but basal half of upper mandible, including whole of knob ; "light yellow or canary-yellow, richly dyed at the sides with scarlet vermilion, deeply at and near the nostrils, and lightly towards the base ; irides deep brown ; feet dark brown, shaded with black ; webs black " (Trumbull).

Female.—Above dusky greyish-brown; the feathers of the back with paler tips; lower parts paler greyish-brown, the lighter tips broader but wanting on the posterior portions; lateral and underparts of head nearly uniform light greyish-brown, in decided contrast with dark brown of pileum and nape (Ridgway); “bill black or blackish, irregularly marked with yellow; feet warm olive brown, shaded with black on the inner side; webs black” (Trumbull).

THE TWO-SPOTTED SCOTER.

(*Ædemia deglandi*. *Melanetta velvetina*).

This species inhabits the great lakes of North-East and North America, and greatly resembles our Velvet Scoter, with the white eye-mark more pronounced, the bill higher at the base, and the feathering more extended. The edge of the bill is yellow.

Female.—Similar to that of *Ædemia fusca*.

(*Ædemia carbo*).

This species has been received from Asia, the Seebohm Collection comprising specimens from both China and Japan. It is stated to be very similar to *Ædemia deglandi*. The edge of the bill is bright red.

GENUS *CAMPTOLÆMUS*.

Camptolæmus labradoricus (Labrador Duck). Dr. 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.

(*Heniconetta stelleri*. *Somateria stelleri*).

This rare duck can scarcely be regarded as a British bird, there being no evidence to prove that more than two examples have been shot in this country. One of these, the specimen now in the British Museum, is said to have been killed near Yarmouth in 1830; the other, shot at Filey, is in the possession of Lord Scarsdale. 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, and it is never seen inland. Its food consists principally of shell-fish.

Male.—About the size of the Wigeon. 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-grey, paler at the tips; legs brownish-grey; eye light brown.

Female.—Resembles other Eiders, but with wing-bar of blue, edged with white.

Young.—"Resembles female, but without black on abdomen" (Seebohm).

Egg.—Pale yellowish-green; seven to nine in number. June—July.

GENUS *ARCTONETTA*.

The most recent classification has placed Fischer's Eider in the above genus, of which it is the sole representative.

FISCHER'S EIDER.

(*Arctonetta fischeri*. *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 Baird, 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 greyish-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 in number.

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 *SOMATERIA*.

The Eiders are placed first by 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. The *Somateria* are easily identified when it is realised that in all the species some part of the head of the male bird is pale green with a long and powerful bill, extending far back. 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 V. nigrum* (Pacific Eider), *Somateria spectabilis* (King Eider Duck), *Somateria dresseri*, and *Somateria mollissima*.

COMMON EIDER OR ST. CUTHBERT'S DUCK.

(*Somateria mollissima*).

These birds, which breed annually on the Farne Islands, off the coast of Northumberland, 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 numbers in Greenland, Iceland, Norway, and adjacent countries; the northern shores of Russian Siberia, and the corresponding latitudes of North America being 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 hollow 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 them. 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 may be found in the works of Audubon, Pennant, and Sir J. W. Hooker ("Journal of a Tour in Iceland"); as well as in Shepherd's "North West Peninsular of Iceland."

Specimens have existed for several years in the Zoological Gardens of London, eating 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 in number; size of those of Wild Goose; May—June; incubation three to four weeks.

Nest Down.—Greyish-brown, lighter in the centre.

KING EIDER.

(*Somateria spectabilis*.)

This Eider Duck is smaller than the common species, and in certain respects differ from it. It is a winter visitor from North America, and has been obtained in the British Isles on some thirty different occasions. In general habits it resembles *Somateria mollissima*.

Male.—Crown of head and nape bluish-grey ; 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 species 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-grey” (Seebohm) ; four to six in number.

Nest Down.—“Closely resembles that of Common Eider” (Seebohm).

SUBFAM. IX. ERISMATURINÆ.

The birds composing this subfamily inhabit the great lakes of Australia, Tropical America, South Africa, and in one instance South-East Europe ; they have short, spiny tails, and are possessed of extraordinary powers of diving, being known as the Lake Ducks. Four genera are enumerated by Salvadori, as composing this subfamily, *Thalassiornis*, *Nomonyx*, *Erismatura*, *Biziura*. The *Erismaturinæ* may be recognised by very marked peculiarities. The bill is higher than it is broad, the feet large, with the hind toe lobated, the outer toe equal to the middle. The wings are short, depriving these birds of any great power of flight, consequently the species have not a wide geographical range. The stiff, spiny tail feathers, which are not covered at the base by the tail-coverts, and are grooved on the under side, appear to be used both as a rudder when swimming and diving, and as a support when sitting on the ground, the legs being placed so far back that the position is penguin-like.

GENUS *THALASSIORNIS*.

(*Thalassiornis leuconota*).

One type only is at present recognised, which is confined to the Southern parts of Africa.

GENUS *NOMONYX*.

ST. DOMINGO TEAL OR SPINOUS-TAILED DUCK.

(*Nomonyx dominicus*).

This bird, which inhabits Tropical America, including the West Indies, is the only representative of the genus. As

its name, given by Latham, implies, it inhabits chiefly the Island of St. Domingo and the adjacent area.

GENUS *ERISMATURA*.

The species known of this genus are as follows : *E. leucocephala*, *E. jamaicensis*, *E. maccoa*, *E. ferruginea*, *E. æquatorialis*, *E. vittata*, *E. australis*.

The plumage is harsh and close ; the bill, flat in front and broad in the base, is tipped with a curved nail ; the wing small, with high shoulders, and a long wedge-shaped tail of eighteen feathers of extraordinary strength much pointed.

WHITE-HEADED DUCK.

(*Erismatura leucocephala*).

This species is met with in the South-Eastern parts of Europe, and has been seen both in Greece and Sardinia.

Adult Male.—Head white, with black patch on the crown ; black neck ; chestnut breast barred with black ; back, shoulders, sides and flanks mahogany-red, with narrow black lines ; tail black ; bill bluish-grey ; feet ashy-brown.

Female.—Less clear in white parts ; cheeks chestnut ; bill lead-coloured ; legs blackish.

Young.—Brownish-grey ; upper part of head and cheek dark-brown.

Egg.—Rough shelled, dingy white—June and July.

GENUS *BIZIURA*.

The curious Lobated Diving Duck of Australia, inhabiting the great inland lakes, and known as the Musk Duck, is the only representative of this genus.

MUSK OR LOBATED DUCK.

(*Biziura lobata*.)

For the little information that exists respecting this rare duck we are indebted to Gould, who treats of it as follows :—

“This singular species of duck is widely and very generally distributed over the whole of the southern countries of Australia, including Tasmania, and the smaller islands in Bass’s Straits. It frequents deep bays and inlets of the sea, the upper part of rivers, lakes, and secluded pools. More than a pair are rarely seen at one time. When surprised, instead of attempting to escape by flight, it immediately dives, and remains submerged for a great length of time, merely rising to the surface at long intervals for the purpose of breathing. Its chief food consists of mussels, leeches, and aquatic worms. In Western Australia it is said to leave the rivers in August, and take up its abode for the purpose of breeding in numerous lakes which stretch along parallel to the coast. The nest, placed either on the stump of a low tree, or on a bank two feet above the level of water, is formed of dried reeds, lined with feathers and down plucked by the bird from its own breast. The young birds, if pursued while on the water, mount on the back of the parent, which dives with them to a place of safety. During the pairing and breeding season (September and October) it emits a strong musky odour, which is often perceptible long before the bird is seen, and is retained for years afterwards in the skins of specimens killed during that particular season. Their note is extremely singular, resembling the sound caused by a large drop of water falling into a deep well ; or may be imitated by the sudden opening of the lips. There is a remarkable difference in the relative sizes of the sexes, the bulk and admeasurements of the female being not more than half those of her mate ; the male only possesses the wattle under the throat.”

The Zoological Society of London was the first to introduce specimens of these birds into Europe, having acquired two males in 1882 ; and at the time of writing I am informed that there is a specimen in the zoological collection at Berlin.

Lieut. Breton states that it is extremely difficult to shoot this bird, on account of its propensity to dive when alarmed. Mr. Jamrach imported three pairs between 1903 and 1904 at £10 a pair.

Male.—Crown of head and back of neck brownish-black, occasionally speckled with white ; remainder of upper surface, chest, and flanks blackish-brown, crossed by numerous narrow freckled bars of buffy-white ; wings and tail blackish-brown ; throat and under surface dark-brown, each feather tipped with pale buffy-white ; eyes dark brown ; bill and lobe beneath the chin greenish-black ; legs and feet dark leaden-grey.

Female.—"Similar in colour, but all the markings lighter and less distinct ; lobe beneath the chin, smaller" (Salvadori).

Young.—"In down, olive brown ; crown and nape brown ; rest of head, neck, and lower parts light buff, paler on abdomen ; lobe visible even at this stage" (Salvadori).

Egg.—Large, usually two in number ; uniform pale green or olive colour ; three inches long by two broad. September—October.

SUBFAM. X. Merganettinæ

The Torrent-Ducks of the Andes of South America, composing this subfamily are allied to the Lake-Ducks and to the Mergansers. There are three species, none of which have been introduced into living collections. They are as follows :—*Salvadorina*, *Hymenolæmus*, and *Merganetta*.

GENUS *SALVADORINA*.

(*Salvadorina waiginensis*).

This remarkable bird, named after Count Salvadori, is another of the little-known mountain-stream ducks. It is represented by a single skin in the Rothschild Collection, which was brought from the Island of Waigiou, in the Pacific Ocean. I append the description given by Salvadori :—

“Bill a little shorter than the head. Feet and legs moderately large, middle toe not quite one-third longer than the tarsus ; hind toe with small webs. Wings well developed, about one-third longer than the tail and with the second quill longest ; first and third only a little shorter. Tail very long, about five times as long as the tarsus, much pointed, and somewhat stiff, consisting of fourteen feathers. General appearance singular ; above black, barred with white.

“It seems difficult to state the nearest ally to this remarkable genus, but there is certainly no near ally among the few species of Anatidæ known to inhabit New Guinea and the adjacent islands, and it resembles more some American genera. Its varied appearance reminds one of *Nomonyx dominicus* from tropical America, which however, is totally different, having an entirely different bill, much shorter wings, stiffer tail, shorter tarsus, &c. In the length of the tail the new genus resembles the South American *Merganetta*, which, among other differences, differs by the sharp and bare spur on the bend of the wing, the narrow bill, &c. These likenesses, however, may be merely superficial, and it must be left to further investigations whether the genus *Salvadorina* should be actually placed near to these genera.”

GENUS *HYMENOLÆMUS*.

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

BLUE DUCK, SOFT-BILLED 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 swimming 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 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 in number. September—November.

GENUS *MERGANETTA*.

Six brilliantly coloured species, inhabiting the mountainous districts of Chili, Ecuador, and Peru, are comprised in the above genus, as follows :—*M. frænata*, *M. armata*, *M. turneri*, *M. garleppi*, *M. leucogenys*, *M. columbiana*.

The most salient feature in these birds is the white head with black velvet-like stripe from base of bill to back of neck, similar stripes running from behind the eye and uniting at the back of the head, where they form a broad band reaching nearly to the shoulders.

The white cheeks are intersected by a similar stripe, uniting into a black band below the chin, passing over the upper breast and widening as it merges into the plumage of the breast, which is of a ruddy brown. The scapulars, black in the centre, are broadly edged with white on both webs, being long and pointed ; speculum green ; bill bright orange ; feet reddish. There is a good illustration of these interesting birds in the British Museum Catalogue, Vol. xxvii.

SUBFAM. XI. MERGINÆ.

GENUS *MERGUS*.

The birds of this genus are easily distinguishable by the long slender body, thin neck, and large head, which is often tufted. The bill is long, slender, and sharply serrated at the edge, the upper mandible terminating in a strong hook. The plumage is thick and brightly coloured, the males undergoing an annual change; the wings are of moderate length; the tail is short, and rounded. Their flight is rapid, and they are remarkable for their powers of diving. The Mergansers belong to Northern regions, whence they migrate to Southern Europe, Asia and America. They subsist chiefly upon fish, small reptiles, shell-fish, and insects. They pair, constructing their nests both upon the ground and among the branches of low trees. The eggs are pale grey or greenish-white, eight to ten in number, incubation occupying from twenty-three to twenty-five days, the young birds when first hatched being able to dive, and subsisting upon shrimps, and other minute crustacea, which they find among the water weed.

Three genera comprise the subfamily, *Mergus*, *Lophodytes*, and *Merganser*.

THE SMEW.

(*Mergus albellus*.)

This rare winter visitor is met with occasionally during hard weather on the coast in all parts of the British Islands. It feeds on small fish and thin shelled mollusca and crustacea. On the coast of Norfolk it is known as the "Smee Duck," "White Wigeon," and "Weazel Wigeon." One specimen was observed upon the Serpentine Water in London in the early

SMEU

spring of 1907. More delicate in constitution, it comes southward in advance of the other *Mergus*, but its general habits resemble those of the rest of the genus. It is capable of domestication, specimens having been for many years in the Zoological Gardens of London. The Smew breeds in hollow trees, when the eggs, which are often concealed with down, are found lying upon a heap of rotten chips.

Male.—Head white, with a long crest, falling backwards, of the same colour, having a black patch extending over each eye and the fore part of the cheek, the hind portion of the crest being likewise black; remainder of plumage white, a black band extending over the shoulders, between the wings down the back; tail and flight feathers black; bill and legs bluish lead colour; eyes pearly white, red in some specimens. Weight about twenty-four ounces.

Female.—Throat, neck, and under parts white; head, cheeks, and back of neck reddish-brown; back and wings ashy-brown; bill and legs same as male; eye reddish-brown.

Young.—In down, head, neck, and upper body dark ash, two white spots on each shoulder, and one either side of rump; cheeks, throat, and under body white. The young in first feather resemble the female, acquiring full plumage after the second year.

Egg.—Yellowish; ten to twelve in number. May—June.

Nest Down.—"Greyish-white." (Seebohm).

GENUS *LOPHODYTES*.

ROUND-CRESTED DUCK OR HOODED MERGANSER.

(*Lophodytes cucullatus*. *Mergus cucullatus*.)

North America is the true home of this Merganser, which has, however, been occasionally killed in the British Isles. In

the United States, where it is very plentiful, it is usually seen on the lakes and fresh-water rivers diving for its food, and building either on the shore near water, or depositing its eggs in holes of trees and clefts of rocks during the months of May and June. I am not aware that there are any living specimens of the Hooded Merganser in captivity, but no doubt the treatment pursued for the other *Mergus* would be applicable to this magnificent bird, were it procurable.

Male.—Head and neck glossy-black, with a large crest of long silky feathers, which when erected exhibits a fan-shaped patch of white, the small end starting from behind the eye; back black; tail brownish-black; breast white, two velvety-black bands marking the breast on either side; wings white; flight feathers black; sides reddish-brown, pencilled with black; abdomen yellowish; bill red; eyes yellow; legs flesh colour.

Female.—Smaller than male; head, crest, neck, and back brown of various shades; throat white; under parts white; bill and legs same as male.

Young.—In down, brown above, white beneath. In first feather described by Eyton as similar to female. The young males do not attain full plumage till their third year.

Egg.—White; round; six to ten in number. May—June. Incubation three weeks (Gentry, “Birds of United States”).

Nest Down.—Very pale grey.

GENUS *MERGANSE*R.

Seven species are enumerated by Salvadori, who states that their range extends from the Palæarctic Region to Northern India, the Nearctic Region, South-East Brazil, to the Aucklands,

in the Pacific Ocean. They are *M. castor*, *M. comatus*, *M. americanus*, *M. squamatus*, *M. serrator*, *M. australis*, *M. brasiliensis*.

They frequent both inland waters and the sea-coast, flying rapidly and diving from great heights into deep water. The note is loud and harsh, often uttered as they fly around their nesting places, which are of the rudest description, often in a depression of a rock, or in a hollow scooped in the bare earth. They subsist principally upon fish with crustaceans and molluscs, and are said to pair for life.

COMMON MERGANSER OR GOOSANDER.

(*Merganser castor*. *Mergus merganser*).

These striking birds, larger in size than the Common Wild Duck, may be seen on our north-east coasts in small flocks during hard weather, but are certainly to be reckoned among the rarer of our winter visitants. They breed in the Northern latitudes, and migrate southward during the winter. They feed exclusively upon fish, the structure of the bill explaining the ease with which they procure it, the upper and lower mandibles being furnished with strong, saw-like teeth, curving inwards. They are usually to be seen engaged in fishing on the inland lakes and rivers, as well as in the tidal harbours where the water is brackish, diving with great rapidity when disturbed. A common and appropriate name is the "Saw-bill." These birds construct their nests not only upon the ground, but in the hollows of trees, employing dried grasses, moss, leaves, and small twigs, lining the interior with down. The Goosander lays from seven to twelve greyish, or greyish-white, eggs, which are incubated for a period of from twenty-three to twenty-five days, during which time the male bird remains in the vicinity of his mate. The males undergo a

summer moult, assuming for the time the female plumage, as is the case with the common mallard.

Male.—Head and neck, with crest, glossy-green ; upper body black ; breast and under-parts yellowish-white, with a pink tinge ; rump and tail grey ; wings white, with brown and black markings ; bill bright red ; eye brownish-red ; legs and feet orange.

Female.—Head, chest, and upper neck reddish-brown ; throat white ; breast yellowish-grey ; lower body ashy-white ; abdomen yellowish ; bill purplish-red, edged with black.

Young.—In first feather, similar to female, attaining full plumage in the second year.

Egg.—Creamy-white, or olive grey without spot ; round at each end ; ten to fourteen in number. April—May.

Nest Down.—“ Uniform greyish-white ” (Seebohm).

RED-BREASTED MERGANSER.

(*Merganser serrator.*)

This bird is not uncommonly met with in Great Britain, most frequently in the northern districts. The name Red-breasted Merganser is somewhat misleading, and it would be better described as Red-necked. It comes southward during the winter, and is found not only on inland streams and lakes, but on the sea-coast, where the young birds are popularly called dun-divers, a name which popularly belongs to the Pochard. They generally arrive in small flocks of from five to eight. Sir Ralph Payne-Gallwey records having seen in the winter of 1878 five to six hundred of these birds together in Cork harbour. The young males closely resemble the females

in plumage, both being much less handsome than the adult drake. The nest may often be obtained from the vicinity of the Scotch and Irish lakes, the breeding season commencing early in June. The food of this species consists of fish of various sorts, which it easily captures under water, its sharply notched bill enabling it to retain its slippery prey, which includes quantities of freshwater and sand eels; they are also very destructive to the young salmon in some parts of Ireland. During part of the summer the male undergoes a change of plumage, at which time, like the Common Mallard, it closely resembles the female. The peculiar character of their diet renders the Mergansers somewhat difficult of domestication, and I am not aware that they have ever been known to breed in captivity; at the same time the Zoological Gardens of London possess several specimens which remained in good condition upon a diet of small live fresh-water fish. I have no doubt that by degrees these birds would accept a mixture of meat biscuits and other food, or better still, small, narrow strips of tripe as Cormorants will.

Male.—Head with large soft crest and upper neck glossy green-black; top of neck white; lower part reddish-brown, spotted with black; upper body black; shoulder white, feathers broadly edged with black; flight feathers brownish-black; chest and abdomen white; bill, eye, and legs reddish-orange.

Female.—Head, crest, and upper body brown; shoulder brown; secondaries white; under parts white; bill, eye, and feet reddish-orange.

Young.—In down, dark brown on upper body, white below. In first feather similar to female, but crest shorter, and brighter in colouring.

Egg.—Creamy buff; ten to twelve in number; “olive

grey, smooth, glossy" (Seebohm); "white" (Wilson). April—June.

Nest Down.—"Pale brownish-grey, obscure pale tips and centres" (Seebohm).

Of the other mergansers enumerated, *M. Squamatus* from China, *M. Americanus* from N. America, *M. Comatus* from Central Asia, *M. Australis* (known by a few skins only), from the Auckland Islands, have not been imported alive.

These are fully described by Salvadori in his "Catalogue of Birds," together with those other species, to which (not coming within the scope of this Manual) I have only referred shortly.

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Glossary of Terms.

<i>Æx</i>	...	...	Gr.	possibly from its voice, which might be supposed to resemble the bleat of a goat.
<i>Anatidæ</i>	...	Lat.		swimming birds.
<i>Albipennis</i>	...	„		white-quilled.
<i>Anseranas</i>	...	„		goose duck.
<i>Anserinæ</i>	...	„		family (of) geese.
<i>Asacornis</i>	...	Gr. & Lat.		lean, horny.
<i>Angustirostris</i>	...	Lat.		narrow-billed.
<i>Atricapilla</i>	...	„		black-haired.
<i>Albeola</i>	..	...	„	white round.
<i>Albellus</i>	...	...	„	little white.
<i>Albatus</i>	...	...	„	white.
<i>Arcuata</i>	...	...	„	curved.
<i>Albigulare</i>	...	...	„	whitish throat.
<i>Atrata</i>	...	...	„	black.
<i>Auritis</i>	}	„		white eared.
<i>Aurita</i>				
<i>Albifrons</i>	...	...	„	white forehead.
<i>Anseranatinæ</i>	...	...	„	swimming geese.
<i>Arborea</i>	...	...	„	of the trees.
<i>Autumnalis</i>	...	...	„	autumnal.
<i>Acuta</i>	...	...	„	sharp, pointed.
<i>Buccinator</i>	...	...	„	trumpeter.
<i>Brachyrhynchus</i>	...	Gr.		short-beaked.
<i>Branta</i>	...	Lat.		Brent.

<i>Casarca...</i>	...	Russian	"Cacharka" = sea-swallow ; a name, specific or generic, of the ruddy sheldrake.
<i>Cuprea ...</i>	...	Lat.	copper-coloured.
<i>Cereopsis ...</i>	...	Gr.	wax-masked.
<i>Chen ...</i>	...	„	goose.
<i>Chenopsis ...</i>	...	Gr.	goose-faced.
<i>Cærulescens ...</i>	...	Lat.	bluish.
<i>Cinereus ...</i>	...	„	ashy.
<i>Chlorotis ...</i>	...	Gr.	greenish.
<i>Circia ...</i>	...	Lat.	circular, round.
<i>Cyanoptera ...</i>	...	Gr.	blue-winged.
<i>Clypeata ...</i>	...	„	shielded.
<i>Clangula ...</i>	...	Lat.	clanking.
<i>Carbo ...</i>	...	„	coal.
<i>Castor ...</i>	...	„	beaver.
<i>Comatus ...</i>	...	„	hairy.
<i>Cygnopsis ...</i>	...	Gr.	swan-faced.
<i>Cygnoides ...</i>	...	„	swan.
<i>Chloëphaga ...</i>	...	„	eater of grass.
<i>Cyanochen ...</i>	...	„	dark-coloured goose.
<i>Cyanopterus ...</i>	...	„	dark-blue winged.
<i>Chenonetta ...</i>	...	„	diminutive geese.
<i>Chenalopex ...</i>	...	„	goose-fox.
<i>Cana ...</i>	...	Lat.	white.
<i>Crecca ...</i>	...	Gr	creaking.
<i>Carunculata ...</i>	...	Lat.	carunculated (with small fleshy excrescences).
<i>Cucullatus ...</i>	...	„	hooded.
<i>Caryophyllacea ...</i>	...	„	a natural order of polypetalous plants, pink tribe. It also includes chickweed.
<i>Columbianus ...</i>	...	„	dove-like.

<i>Cornuta</i>	...	Lat.	horned.
<i>Castaneum</i>	...	"	chestnut coloured.
<i>Discors</i> ...	...	"	unlike, discordant.
<i>Dendrocycna</i>	...	Gr. & Lat.	tree-swan.
<i>Discolor</i>	...	Lat.	two-coloured.
<i>Dispar</i> ...	...	"	different, or unlike.
<i>Erismaturinæ</i>	...	"	the stiff-tailed divers.
<i>Erythropus</i>	...	Gr.	red-footed.
<i>Erythroryncha</i>	...	"	red-billed.
<i>Ferina</i> ...	...	Lat.	wild.
<i>Fusca</i> ...	...	"	dark, tawny.
<i>Frænata</i>	...	"	bridled.
<i>Ferus</i> ...	...	"	wild.
<i>Fabalis</i> ...	...	"	of beans.
<i>Fulva</i> ...	...	"	reddish-yellow ochre coloured.
<i>Fulvigula</i>	...	"	small, tawny.
<i>Flavirostris</i>	...	"	yellow-billed.
<i>Falcata</i> ...	...	"	sickle-shaped.
<i>Ferrugine</i>	...	"	ferruginous, reddish.
<i>Galericulata</i>	...	"	tufted, helmeted.
<i>Glaucion</i>	...	"	bluish-grey (or greyish).
<i>Gambeli</i>	...	"	of Gambel.
<i>Guttata</i> ...	...	"	spotted.
<i>Guttulata</i>	...	"	speckled.
<i>Gibberifrons</i>	...	"	humped (or high-fronted).
<i>Glacialis</i>	...	"	of the ice districts.
<i>Hyperboreus</i>	...	"	extreme northerly.
<i>Histrionica</i>	...	"	one who acts, acting.
<i>Hymenolæmus</i>	...	"	pertaining to marriage.

<i>Indicus</i> ...	...	Lat.	of India.
<i>Inornate</i>	...	,,	undecorated.
<i>Jubata</i>	}	,	maned.
<i>Jubatus</i>			
<i>Leucoptera</i>	...	Gr.	white-winged.
<i>Leucopthalma</i>	...	,,	white-eyed.
<i>Leucocephala</i>	..	,,	white-headed.
<i>Leucogenys</i>	...	,,	white-cheeked.
<i>Leucopareia</i>	...	,,	white-cheeked.
<i>Leucopsis</i>	...	,,	whiteface or mask.
<i>Larvata</i>	...	Lat.	masked.
<i>Leucoblepharon</i>	...	Gr.	white eyelid.
<i>Lobatus</i> ...	...	Lat.	lobed.
<i>Me.ancoryphus</i>	...	Gr.	black-crowned.
<i>Melanoleucus</i>	...	,,	black and white.
<i>Melanonota</i>	...	,,	black-eared.
<i>Maculirostris</i>	...	Lat.	spotted bill.
<i>Malacorhynchus</i>		Gr.	soft billed.
<i>Melanocephala</i>	..		black-headed.
<i>Metopias</i>	...		between the eye, forehead.
<i>Mariloides</i>	...	Lat.	charcoal coloured.
<i>Mersa</i> ...	...	Lat.	plunging.
<i>Minutus</i>	...	,,	small.
<i>Middendorffi</i>	...	,,	pro. name.
<i>Minima</i> ...	...	,,	smallest, least.
<i>Montanus</i>	...	,,	of the mountains
<i>Maculosa</i>	...	,,	spotted.
<i>Mergus</i> ...	...	,,	plunger.
<i>Marila</i> ...	...	Gr.	dusky.
<i>Melanoptera</i>	...	,	black wing.

<i>Marilochen</i>	...	Gr.	grey goose.
<i>Moschata</i>	...	Lat.	musky.
<i>Mollissima</i>	...	,,	very downy.
<i>Nettopus</i>	...	Gr.	pertaining to a duck.
<i>Nævosa</i>	...	Lat.	freckled.
<i>Nivalis</i> ...	..	,,	snowy.
<i>Nigricans</i>	...	,,	dusky.
<i>Nesochen</i>	...	Gr.	island goose.
<i>Olor</i> ...	...	Lat.	swan (the type).
<i>Occidentalis</i>	...	,,	western.
<i>Oxypterum</i>	...	Gr.	sharp-pointed wing.
<i>Oxyura</i>	...	,,	sharp tailed.
<i>Plectropterus</i>	...	,,	Plectrum ; a pointed instrument ; a spur ; spur-winged.
<i>Pulchellus</i>	...	Lat.	beautiful and little.
<i>Platalea</i>	...	,,	spoon-bill.
<i>Peposaca</i>	...	Gr.	ripe, flesh.
<i>Perspicillata</i>	...	,,	looking through, examining and exploring.
<i>Poliiocephala</i>	...	Gr.	greyish-headed.
<i>Pollicaris</i>	...	,,	many haired.
<i>Pæcilorhyncha</i>	...	,,	spotted beak.
<i>Pyrogaster</i>	...	,,	red-bellied.
<i>Parvirostris</i>	...	Lat.	small-billed.
<i>Pteronetta</i>	..	,,	little-winged.
<i>Phenicoptis</i>	...	,,	belonging to a Phoenix (fiery).
<i>Philacte</i> ...	...	Gr.	weeping or wailing.
<i>Querquedula</i>	...	Lat.	oak-coloured.

<i>Rhodonessa</i>	...	Gr.	rose-tinted.
<i>Ruficollis</i>	...	Lat.	red-necked.
<i>Rubidiceps</i>	...	„	red head, bi-coloured.
<i>Rutila</i> ...	...	„	red.
<i>Rufitorques</i>	..	„	red-ringed.
<i>Rossi</i> ...	...	„	of Ross.
<i>Rubrirostris</i>	...	„	red-beaked.
<i>Rhynchotus</i>	...	Gr.	beak.
<i>Spinosus</i>	...	Lat.	prickly.
<i>Scioanus</i>	...	Gr.	shaded black.
<i>Sarcidiornis</i>	...	„	caruncled bird.
<i>Scutulata</i>	...	Lat.	chequered.
<i>Sponsa</i> ...	...	„	of a spouse, in allusion to fidelity.
<i>Spatula</i> ...	...	„	spoon-shaped.
<i>Stelleri</i> ...	...	„	of Steller.
<i>Spectabilis</i>	...	„	notable, remarkable.
<i>Superciliosa</i>	...	„	appertaining to the part above eyebrow.
<i>Streperus</i>	}	„	rustling or rattling.
<i>Strepera</i>			
<i>Squamatus</i>	...	„	scaly.
<i>Serrator</i>	...	„	saw-like.
<i>Segetum</i> ...	...	„	of the cornfield.
<i>Serrirostris</i>	...	„	saw bill.
<i>Semipalmata</i>	...	„	half-webbed.
<i>Sparsa</i> ...	...	„	rare.
<i>Specularis</i>	...	„	appertaining to a mirror.
<i>Sibilatrix</i>	...	„	whistling.
<i>Torquatus</i>	...	„	collared or ringed.
<i>Urophasianus</i>	...	„	pheasant-tailed.

<i>Valisneria</i>	...	Lat.	a water-plant.
<i>Vittata</i> ...	...	„	bound with a fillet or head band.
<i>Viduata</i>	...	„	widowed.
<i>Vagans</i> ...	...	„	vagrant.
<i>Vulpanser</i>	...	„	fox-goose.
<i>Xanthorhyncha</i> ...		Gr.	yellow-billed.
<i>Zonoryncha</i>	...	„	ring-billed.