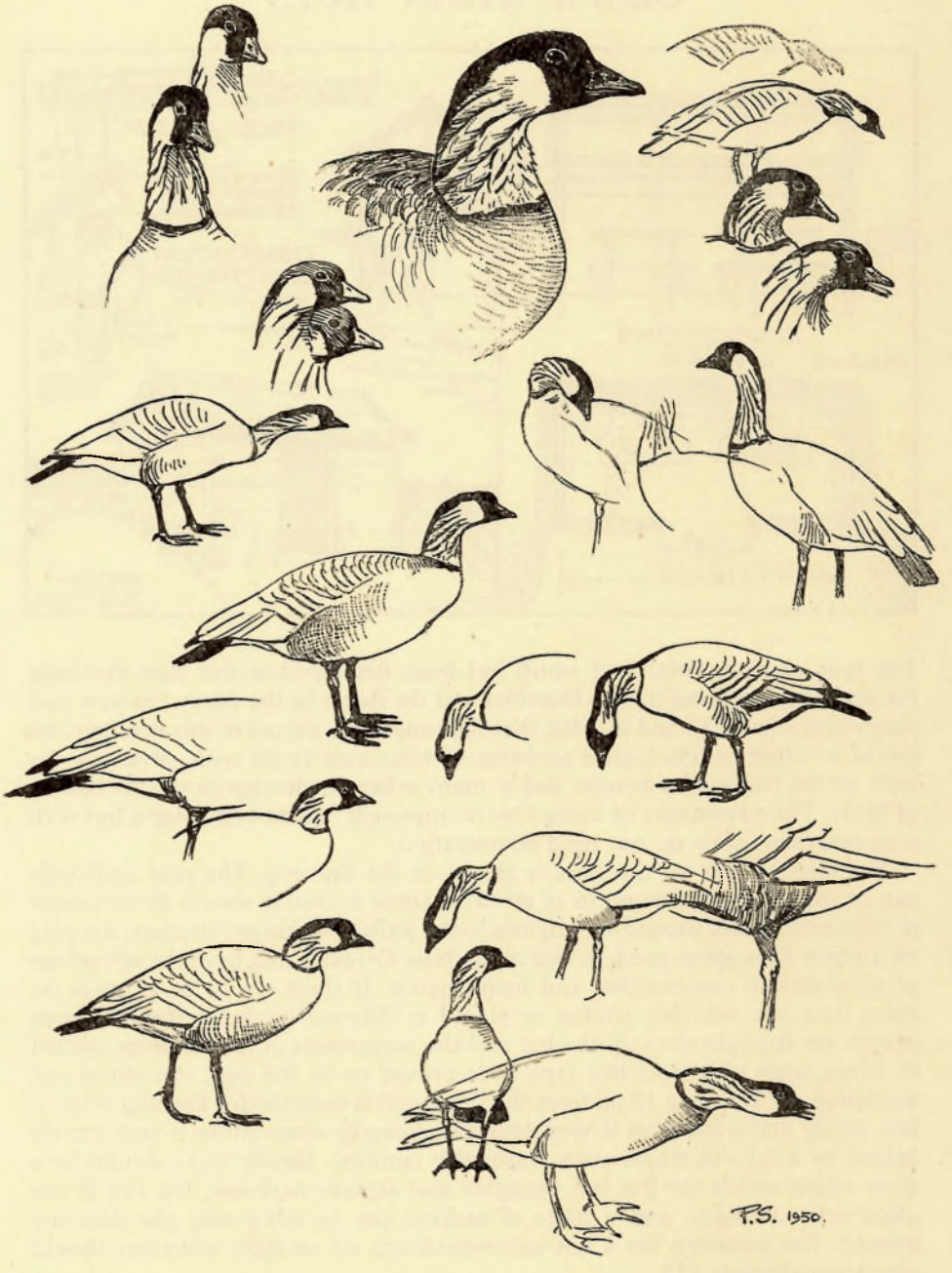


Ne-Ne or Hawaiian Goose

WATERFOWL COLLECTION

THE enclosures at the New Grounds have been improved during the winter by the construction of a series of pools and paddocks in the lower half of the Big Pen which will enable the birds to be grouped in a more satisfactory manner.

The Trust's great comparative collection of live waterfowl has been considerably improved during the past year. Sixteen new species or subspecies have been added, bringing the total to 119 forms and more than 700 individuals.

By far the most important addition is the magnificent pair of Ne-nes or Hawaiian Geese (*Branta sandvicensis*) brought back by our Curator, Mr. John Yealland, as a gift to the Trust from Mr. H. C. Shipman, of Keaau, Hawaii. Only 22 other specimens of this striking bird are known to exist and even the most optimistic estimates indicate that the present world-stock cannot exceed 40 individuals. Apart from the Ivory-billed Woodpecker (*Campephilus principalis*) it is therefore perhaps the world's rarest living bird.

The Trust's pair arrived on 22nd April and have settled down well. They are quite tame and will take food from the hand. For a bird with only half-webbed feet, they are rather unexpectedly aquatic and swim frequently on the Orchard Pond. It is, of course, hoped that they will breed.

The Koloas or Hawaiian Ducks (*Anas wyvilliana*) presented by Mr. Paul Breese of Honolulu Zoo, and brought back with the geese by our Curator, are also very rare birds, the world stock being estimated at 300.

The Yellowbill (*Anas undulata*) brought back by Mr. G. M. Durrell from the Cameroons is of exceptional interest and may ultimately prove to belong to a hitherto undescribed race. If not it will extend the range of the Abyssinian Yellowbill (*A. u. rupelli*) which it most nearly resembles by some 2,000 miles.

The Council wishes to record its great gratitude for the generosity of the many people who have presented birds (not all of whom are mentioned in the lists which follow) for the improvement and development of the Trust's collection. The collection is, of course, still far from complete, and a list of those species which are particularly needed will be found on page 42.

NEW SPECIES

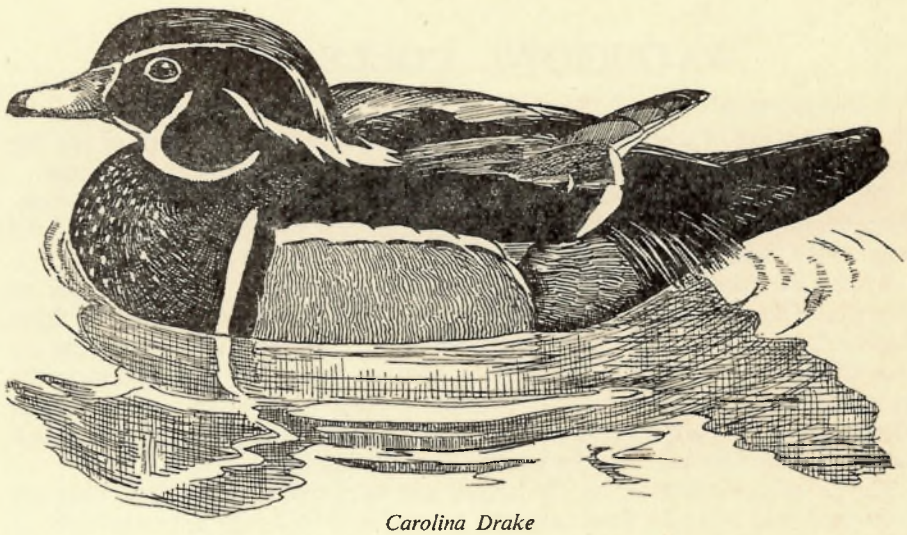
The new species which have been added are:

JAVAN WHISTLING DUCK (*Dendrocygna javanica*).—Eight sent from California as a gift from a member, Mrs. W. Gladwyn, of Santa Barbara.

EASTERN BEWICK'S OR JANKOWSKI'S SWAN (*Cygnus columbianus jankowskii*).—A pair in exchange from Leckford.

PERRY RIVER WHITE-FRONTED GOOSE (*Anser albifrons*[1] subsp.).—A pair captured by the Director on the R. Kennet (a tributary of the Perry River), N.W. Territories, Canada, when flightless during the summer of 1949. See p. 60.

[1] The geographical races of *A. albifrons* are not yet fully understood. These Perry River birds are not identical with the Tule Goose of California, but it seems doubtful whether this large western form should ever have been identified with *A. a. gambelli*, described originally by Hartlaub in 1852 from two specimens whose localities are given as 'Texas' and 'Southern United States.' It may prove necessary to find a new scientific name for the Californian bird. Meanwhile the Perry River birds appear to resemble Hartlaub's original *A. a. gambelli*. They are evidently larger than the typical North American White-fronted Goose, recently separated from the European form by Todd as *A. a. frontalis* (Condor. Vol. 52, No. 2, pp. 63–68. 1950). The vernacular name Perry River White-fronted Goose is therefore only provisional until the taxonomy can be clarified.



Carolina Drake

NE-NE OR HAWAIIAN GOOSE (*Branta sandvicensis*).—A pair presented by Mr. H. C. Shipman of Keaau, Hawaii, and brought back by the Curator after his visit to Hawaii to advise on the Ne-ne Project (see p. 54).

RED-BACKED RADJAH SHELDUCK (*Tadorna radjah rufitergum*).—Two females, hand-reared, in exchange from Leckford.

ANDEAN CRESTED DUCK (*Lophonetta specularioides alticola*).—A pair, hand-reared, in exchange from Leckford.

FALKLAND ISLAND FLIGHTLESS STEAMER DUCK (*Tachyeres brachypterns*).—A female brought back in the *John Biscoe* by Dr. W. J. L. Sladen from the Falkland Islands. Unfortunately it did not survive.

AFRICAN RED-BILLED PINTAIL (*Anas erythrorhyncha*).—A pair, the male in exchange from the Zoo, and the female, in exchange from Leckford.

NEW ZEALAND BROWN DUCK (*Anas chlorotis*).—A female in exchange from the Zoo, by permission of Mr. Sidney Porter, who brought the bird originally from New Zealand.

KOLOA OR HAWAIIAN DUCK (*Anas wyvilliana*).—A pair presented by Mr. Paul Breese, Director of Kapiolani Park, Honolulu, and brought back by the Curator after visit to Hawaii.

CAMEROON YELLOWBILL (*Anas undulata* subsp.)[1].—A drake brought back from the Indop Plain, Bamenda Province, British Cameroons, by Mr. G. M. Durrell and purchased by the Trust.

CAPE SHOVELER (*Anas smithi*).—A drake and two ducks hand-reared from Mr. M. D. J. Wocke in Cape Province. Unfortunately the male died within a few hours of arrival. Both females died almost a year later from a form of dropsy.

[1] The plumage of this bird is as dark as that of the Abyssinian race *A. u. rupelli*, but the body-colour is less warm and the bill is even paler and more lemon-yellow than the typical form, *A. u. undulata* (instead of being darker and more orange-yellow as in *rupelli*). The slightly raised portions of the base of the culmen seem to be a little more prominent in this bird. No specimens of the species from the Cameroons can be traced in any museums, and in the absence of further examples, it would not seem justifiable to describe a new race from the single specimen, especially upon a character so subject to variation as the colouring of the soft parts. Nevertheless the yellow-billed duck from the Cameroons may ultimately prove to be a new subspecies.

SOUTHERN POCHARD (*Netta erythrophthalma*).—Four drakes and five ducks from Mr. M. D. J. Wocke in Cape Province.

RING-NECKED DUCK (*Aythya collaris*).—Two females, hand-reared, from the Delta Waterfowl Research Station, Manitoba.

SOUTH AMERICAN COMB DUCK (*Sarkidiornis melanotos carunculatus*).—A female as a gift from Falcon Arts Inc. of New York.

EUROPEAN GOLDENEYE (*Bucephala clangula clangula*).—A female, wild-caught at Peakirk, Northants, as a gift from Mr. D. Dandridge, of Walton, Peterborough.

AMERICAN GOLDENEYE (*Bucephala clangula americana*).—A female, hand-reared, from the Delta Waterfowl Research Station, Manitoba.

IMPORTANT ADDITIONS

In addition to the new species, a number of important specimens were received of species already represented in the collection. These included:

WHITE-FACED WHISTLING DUCK (*Dendrocygna viduata*).—Ten as a gift from Falcon Arts Inc. of New York.

BEWICK'S SWAN (*Cygnus columbianus bewickii*).—A female, wild-caught in Holland, in exchange from the Rotterdam Zoo.

CACKLING GOOSE (*Branta canadensis minima*).—Eleven, wild-caught in California, as a gift from U.S. Fish and Wildlife Service.

SWAN GOOSE (*Anser cygnoides*).—A pair of young birds, hand-reared in Hamburg Zoo, as a gift from the Duke of Bedford.

BEAN GOOSE (*Anser arvensis arvensis*).—A pair of young birds, hand-reared in Lapland, and brought back as a gift by Dr. Basil Morson. These birds are very tame and have been allowed to fly since growing their flight feathers in July.

LESSER SNOW GOOSE (*Anser cærulescens hyperboreus*).—Twelve, wild-caught in California, as a gift from U.S. Fish and Wildlife Service.

ROSS'S GOOSE (*Anser rossii*).—Six captured when flightless by the Director on the Perry River and River Kennet, N.W. Territories, Canada during the summer of 1949. See p. 60.

ORINOCO GOOSE (*Neochen jubatus*).—Two females as a gift from Falcon Arts Inc., of New York.

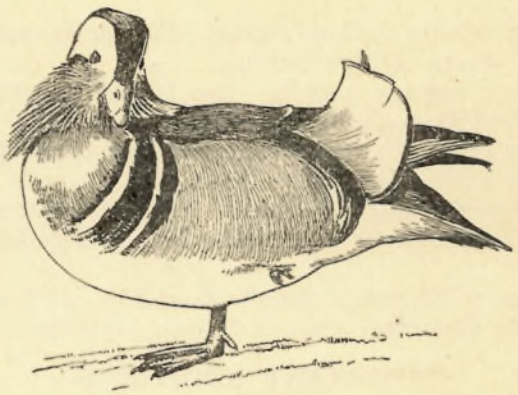
(We were most unfortunate to lose the old female unexpectedly during the winter. She was a pre-war bird and laid two clutches of infertile eggs each year. A mate was procured just before the breeding season, but she did not immediately take to him, and the eggs were again infertile. Later in the summer, however, she became very friendly with the male and had she lived until the spring it is almost certain that a hand-reared strain of these birds would once more have been established in Europe.)

RUDDY-HEADED GOOSE (*Chlöephaga rubidiceps*).—A breeding pair in exchange from Mr. Noel Stevens, of Walcot Hall, Shropshire.

CHILOË WIGEON (*Anas sibilatrix*).—Three brought back from the Montevideo Zoo by Dr. W. J. Sladen, in the *John Biscoe*. These provide much needed fresh blood.

ARGENTINE RED SHOVELER (*Anas platalea*).—A female (which has paired with our single drake, the only other in Europe) in exchange from the Bronx Park Zoo, New York.

EUROPEAN EIDER (*Somateria mollissima mollissima*).—Twelve young birds, hand-reared, from Colonel W. V. Lumsden, of Sluie, Banchory.



Mandarin Drake

LIST OF BIRDS IN THE COLLECTION

MAGPIE GOOSE (*Anseranas semipalmata*)
PLUMED WHISTLING DUCK (*Dendrocygna eytoni*)
BLACK-BILLED WHISTLING DUCK (*Dendrocygna arborea*)
JAVAN WHISTLING DUCK (*Dendrocygna javanica*)
WHITE-FACED WHISTLING DUCK (*Dendrocygna viduata*)
RED-BILLED WHISTLING DUCK (*Dendrocygna autumnalis* subsp.)
COSCOROBA SWAN (*Coscoroba coscoroba*)
BLACK SWAN (*Cygnus atratus*)
MUTE SWAN (*Cygnus olor*)
BLACK-NECKED SWAN (*Cygnus melanocoryphus*)
WHISTLING SWAN (*Cygnus columbianus columbianus*)
BEWICK'S SWAN (*Cygnus columbianus bewickii*)
EASTERN BEWICK'S SWAN (*Cygnus columbianus jankowskii*)
WHOOPER SWAN (*Cygnus cygnus cygnus*)
CANADA GOOSE (*Branta canadensis canadensis*)
GREAT BASIN CANADA GOOSE (*Branta canadensis moffitti*)
WESTERN CANADA GOOSE (*Branta canadensis occidentalis*)
TUNDRA CANADA GOOSE (*Branta canadensis leucopareia*)
LESSER CANADA GOOSE (*Branta canadensis parvipes*)
RICHARDSON'S GOOSE (*Branta canadensis hutchinsii*)
CACKLING GOOSE (*Branta canadensis minima*)
BARNACLE GOOSE (*Branta leucopsis*)
DARK-BELLIED BRENT GOOSE (*Branta bernicla bernicla*)
LIGHT-BELLIED BRENT GOOSE (*Branta bernicla hrota*)
PACIFIC BLACK BRANT (*Branta bernicla nigricans*)
RED-BREASTED GOOSE (*Branta ruficollis*)
NE-NE OR HAWAIIAN GOOSE (*Branta sandvicensis*)
SWAN GOOSE (*Anser cygnoides*)
YELLOW-BILLED BEAN GOOSE (*Anser fabalis fabalis*)
TUNDRA BEAN GOOSE (*Anser fabalis rossicus*)
PINK-FOOTED GOOSE (*Anser brachyrhynchus*)
WHITE-FRONTED GOOSE (*Anser albifrons albifrons*)
GREENLAND WHITE-FRONTED GOOSE (*Anser albifrons flavirostris*)
PERRY RIVER WHITE-FRONTED GOOSE (*Anser albifrons* subsp.)
LESSER WHITE-FRONTED GOOSE (*Anser erythropus*)

GREYLAG GOOSE (*Anser anser anser*)
EASTERN GREYLAG GOOSE (*Anser anser rubrirostris*)
BAR-HEADED GOOSE (*Anser indicus*)
EMPEROR GOOSE (*Anser canagicus*)
BLUE SNOW GOOSE (*Anser cærulescens cærulescens*)
LESSER SNOW GOOSE (*Anser cærulescens hyperboreus*)
GREATER SNOW GOOSE (*Anser cærulescens atlanticus*)
ROSS'S GOOSE (*Anser rossii*)
RUDDY SHELDUCK (*Tadorna ferruginea*)
SOUTH AFRICAN SHELDUCK (*Tadorna cana*)
AUSTRALIAN SHELDUCK (*Tadorna tadornoides*)
NEW ZEALAND SHELDUCK (*Tadorna variegata*)
RED-BACKED RADJAH SHELDUCK (*Tadorna radjah rufitergum*)
COMMON SHELDUCK (*Tadorna tadorna*)
EGYPTIAN GOOSE (*Alopochen ægyptiacus*)
ORINOCO GOOSE (*Neochen jubatus*)
ABYSSINIAN BLUE-WINGED GOOSE (*Cyanochen cyanopterus*)
ASHY-HEADED GOOSE (*Chloëphaga poliocephala*)
RUDDY-HEADED GOOSE (*Chloëphaga rubidiceps*)
UPLAND GOOSE (*Chloëphaga picta picta*)
BARRED UPLAND GOOSE (*Chloëphaga picta dispar*)
CEREOPSIS GOOSE (*Cereopsis novæ-hollandiæ*)
ANDEAN CRESTED DUCK (*Lophonetta specularioides alticola*)
MARBLED TEAL (*Anas angustirostris*)
CAPE TEAL (*Anas capensis*)
VERSICOLOR TEAL (*Anas versicolor versicolor*)
PUNA TEAL (*Anas versicolor puna*)
AFRICAN RED-BILLED PINTAIL (*Anas erythrorhyncha*)
SOUTHERN BAHAMA PINTAIL (*Anas bahamensis rubrirostris*)
CHILEAN PINTAIL (*Anas georgica spinicauda*)
COMMON PINTAIL (*Anas acuta acuta*)
CHILEAN TEAL (*Anas flavirostris flavirostris*)
COMMON TEAL (*Anas crecca crecca*)
AMERICAN GREEN-WINGED TEAL (*Anas crecca carolinensis*)
BAIKAL TEAL (*Anas formosa*)
FALCATED TEAL (*Anas falcata*)
AUSTRALIAN GREY TEAL (*Anas gibberifrons mathewsi*)
CHESTNUT-BREASTED TEAL (*Anas castanea*)
NEW ZEALAND BROWN DUCK (*Anas aucklandica chlorotis*)
MALLARD (*Anas platyrhynchos platyrhynchos*)
KOLOA OR HAWAIIAN DUCK (*Anas wyvilliana*)
FLORIDA DUCK (*Anas fulvigula fulvigula*)
LOUISIANA MOTTLED DUCK (*Anas fulvigula maculosa*)
BLACK DUCK (*Anas fulvigula rubripes*)
AUSTRALIAN GREY DUCK (*Anas superciliosa rogersi*)
SOUTH AFRICAN YELLOW-BILL (*Anas undulata undulata*)
ABYSSINIAN YELLOW-BILL (*Anas undulata rupelli*)
CAMEROON YELLOW-BILL (*Anas undulata* subsp.)
PHILIPPINE DUCK (*Anas luzonica*)
GADWALL (*Anas strepera strepera*)
EUROPEAN WIGEON (*Anas penelope*)

American Wigeon (*Anas americana*)
Chiloë Wigeon (*Anas sibilatrix*)
Blue-winged Teal (*Anas discors*)
Cinnamon Teal (*Anas cyanoptera cyanoptera*)
Garganey (*Anas querquedula*)
Argentine Red Shoveler (*Anas platalea*)
Common Shoveler (*Anas clypeata*)
Red-crested Pochard (*Netta rufina*)
Rosybill (*Netta peposaca*)
Southern Pochard (*Netta erythrophthalma*)
Canvasback (*Aythya vallisneria*)
European Pochard (*Aythya ferina*)
Redhead (*Aythya americana*)
Ring-necked Duck (*Aythya collaris*)
Tufted Duck (*Aythya fuligula*)
Lesser Scaup (*Aythya affinis*)
Common Scaup (*Aythya marila marila*)
Brazilian Teal (*Amazonetta brasiliensis*)
Maned Goose (*Chenonetta jubata*)
Mandarin Duck (*Aix galericulata*)
Carolina Duck (*Aix sponsa*)
Indian Comb Duck (*Sarkidiornis melanotos melanotos*)
South American Comb Duck (*Sarkidiornis melanotos carunculatus*)
Muscovy Duck (*Cairina moschata*)
European Eider (*Somateria mollissima mollissima*)
Barrow's Goldeneye (*Bucephala islandica*)
European Goldeneye (*Bucephala clangula clangula*)
American Goldeneye (*Bucephala clangula americana*)
Red-breasted Merganser (*Mergus serrator*)
Goosander (*Mergus merganser merganser*)
North American Ruddy Duck (*Oxyura jamaicensis jamaicensis*)

HYBRIDS

It has been decided to make a special study collection of hybrid waterfowl. It is evident that there is much to be learned of the relationships within the group by this means. The inheritance of certain characters such as behaviour and voice can be studied in the living birds and may be expected to add considerably to our knowledge, not only of the systematics, but also perhaps of the ethology of the whole group.

The following hybrids can now be seen at the New Grounds :

Andean × Upland Goose.
Greylag × Barnacle Goose.
Ross × Redbreasted Goose.
Lesser Snow × Blue Snow Goose.
Rosybill × Red-crested Pochard
Chile Pintail × Red-crested Pochard
Chile Pintail × Bahama Pintail
Cape Teal × Tufted Duck.
Chile Teal × Carolina.

The Trust is anxious to acquire any hybrids whose parentage is precisely known and will be grateful to any breeders who may be able to help in the matter.

OBTAINING NEW BIRDS

The Trust's collection can be improved considerably by the co-operation of Members in various parts of the world. Birds can be sent fairly easily these days, either by air or by sea. We shall be most grateful to anyone who can obtain any of the species shown in the lists which follow—ideally three pairs of each kind.

If you can help, this is what you should do :

(1) Arrange for the catching of adult birds or well-grown young, or the collecting of absolutely fresh eggs, or alternatively, if they can be put under a hen or in an incubator within 24 hours, of eggs a few days from hatching. Of these adult birds are much the most satisfactory.

(2) Write to tell us about it, so that we can arrange for import permits and other formalities.

(3) Obtain small light boxes to hold preferably not more than two and ideally one bird in each compartment. A suggested design for such a box is shown in the diagram.

Each bird must have access to a small tin containing food and water, and this container should be able to be filled from outside without opening the box. It should have very little water, as if it slops over and wets the birds they may die. If possible it should be contrived that the birds cannot foul the containers. This can be done either by siting the container above the level of the birds' tails or preferably in such a position that the birds put their heads out between bars in order to feed and drink. Care must be taken that a bird cannot get its head caught by a tapering space between such bars.

For a long journey the box should have a floor of small mesh wire-netting on which the birds stand and keep themselves clean and dry, with a removable tray underneath it for cleaning. This is not normally necessary for an air journey. For short air journeys stout cardboard boxes are quite satisfactory.

All boxes should have good ventilation but not too much light. It is desirable that only one side should be open; other spaces in the structure can be covered by an inner lining of sacking.

Sawdust should be used in boxes which do not have a netting floor. Neither hay nor straw should be used as these have to be removed at the port of arrival owing to special restrictions against animal diseases.

(4) Send the birds off—geese and big ducks can go by sea, smaller ducks and all diving and spiny-tailed ducks by air—addressed to The Severn Wildfowl Trust, Slimbridge, Gloucestershire, via Coaley Junction. Besides the address the outside of the box should have :

(i) A notice saying "Live Birds. Urgent".

(ii) The Licence No. (The number will be sent to you by us.)

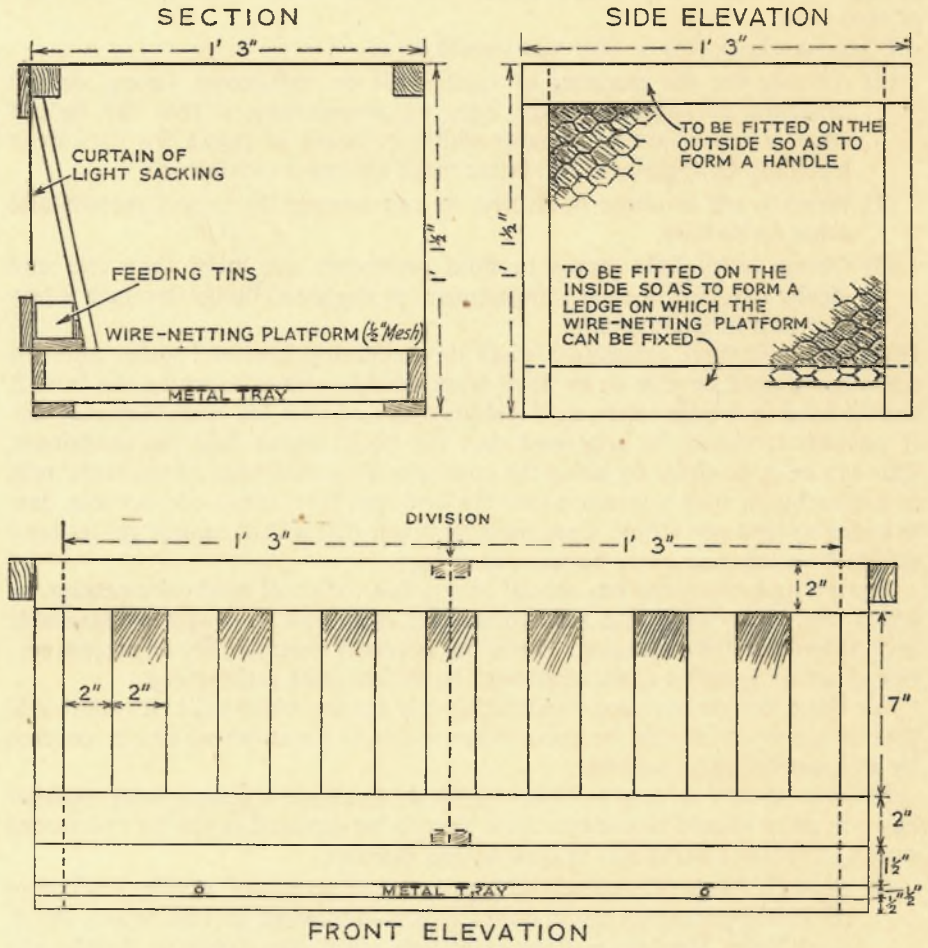
(iii) A notice giving instructions for feeding if the journey is more than a week.

(iv) A small bag of food[1] (grain of some kind for most species) attached to the box for replenishing the containers during the journey.

The birds should be sent as soon as possible after catching. They can manage without food for 4–5 days (but need water) and with food most species can quite easily get through a journey of several weeks.

[1] For a sea journey it is customary for birds to be placed in the care of the Ship's Butcher. The food in the bag may be augmented by lettuce and bread, and a note to this effect should be included in the instructions.

TRAVELLING BOX

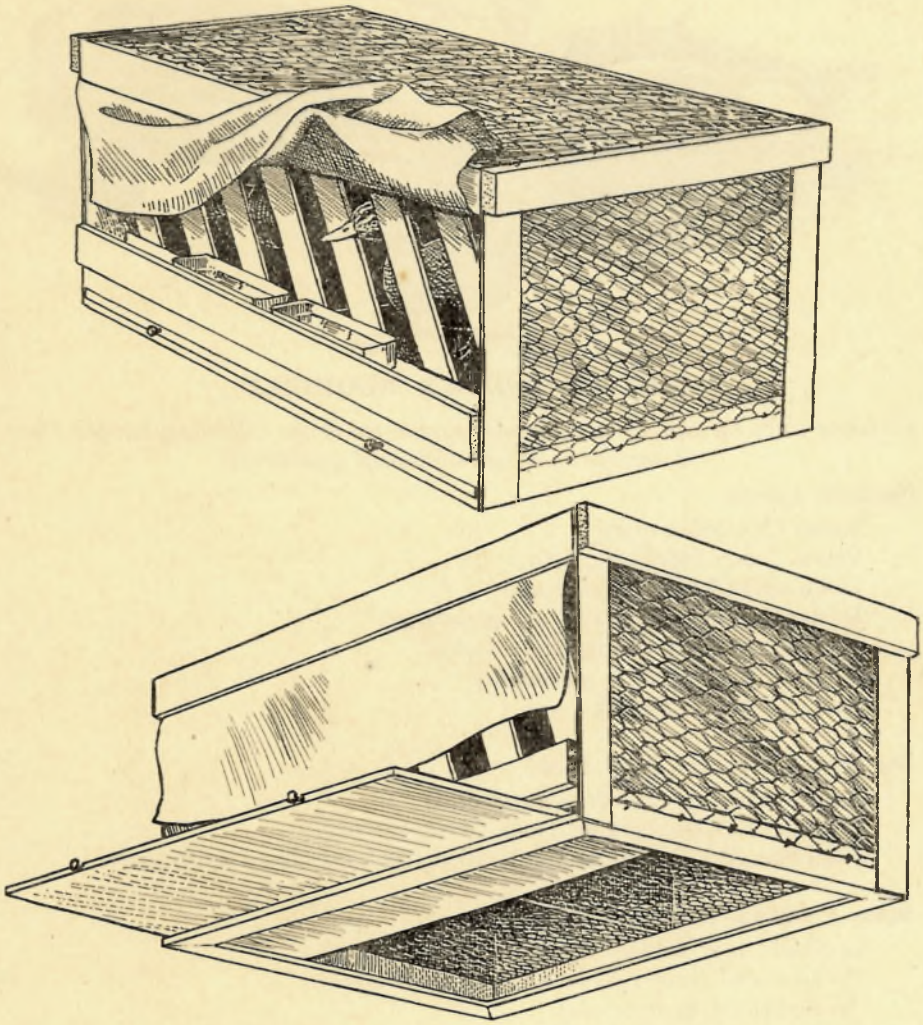


Divisions of compartments to be made of ½ in. mesh wire-netting.

Doors not necessary. Top corners of wire-netting and sacking may be left unfastened and fixed after the birds are put in.

Edges of front slats to be rounded and any sharp points on the wire-netting formed by the galvanising to be removed.

Wire-netting (1 in. mesh of thin gauge) and sacking to be put on the *inside* of framework.

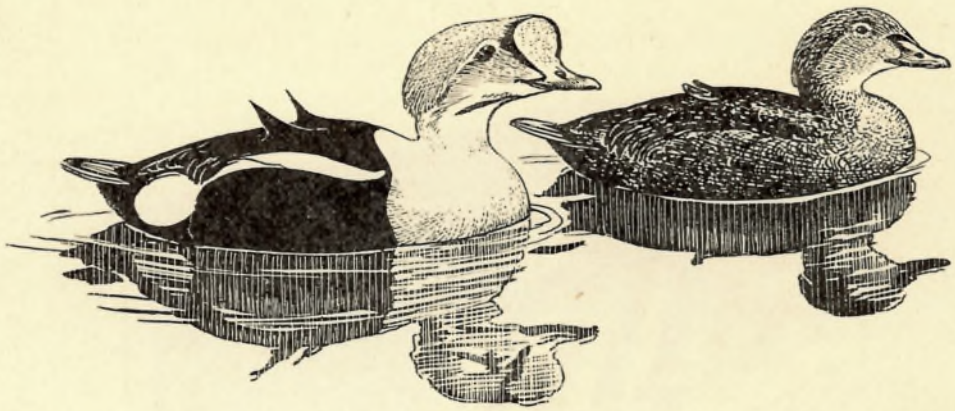


Dimensions shown are suitable for a box of two compartments each large enough for two ducks of Mallard size for five days.

Tray to be made of thin aluminium or aluminium alloy if possible.

It is advised that geese should travel singly and ducks not more than two in each compartment.

Large and small ducks should not be packed together.



King Eiders

LIST OF SPECIES REQUIRED

(In many cases the Species are already represented in the collection, but the Trust is anxious to obtain additional specimens)

Northern Europe

Scoter (*Melanitta nigra*)
Velvet Scoter (*Melanitta fusca*)
Goldeneye (*Bucephala clangula*)
Harlequin Duck (*Histrionicus histrionicus*)
Long-tailed Duck (*Clangula hyemalis*)
King Eider (*Somateria spectabilis*)
Smew (*Mergus albellus*)

Southern Europe and Near East

Red-breasted Goose (*Branta ruficollis*)
White-eye or Ferruginous Duck (*Aythya nyroca*)
White-headed Stifftail or Spiny-tailed Duck (*Oxyura leucocephala*)

India, Pakistan, Burma and Ceylon

Spotbill (*Anas pœcilorhyncha*)
Pink-headed Duck (*Rhodonessa caryophyllacea*)
White-eye (*Aythya nyroca*)
Pygmy Goose or Cotton Teal (*Nettapus coromandelianus*)
Comb Duck or Knob-bill (*Sarkidiornis melanotos*)

East Indies and Malaya

Spotted Whistling Duck (*Dendrocygna guttata*)
Wandering Whistling Duck (*Dendrocygna arcuata*)
Radjah Shelduck (*Tadorna radjah*)
Salvadori's Duck (*Anas waigiuensis*)
Spotbill (*Anas pœcilorhyncha*)
Grey Duck (*Anas superciliosa*)
Pygmy Goose or Cotton Teal (*Nettapus coromandelianus*)
Green Pygmy Goose (*Nettapus pulchellus*)
White-winged Wood Duck (*Cairina scutulata*)

China and Japan

Swan Goose (*Anser cygnoides*)
Middendorf's Bean Goose (*Anser fabalis sibiricus*)
Eastern Bean Goose (*Anser fabalis serrirostris*)
Lesser White-fronted Goose (*Anser erythropus*)
Falcated Duck or Bronze-capped Teal (*Anas falcata*)
Baikal or Formosa Teal (*Anas formosa*)
Spotbill or Grey Duck (*Anas pœcilorhyncha zonorhyncha*)
Eastern Scaup (*Aythya marila mariloides*)
Baer's Pochard (*Aythya baeri*)
White-eye or Ferruginous Duck (*Aythya nyroca*)
Mandarin Duck (*Aix galericulata*)
Pygmy Goose or Cotton Teal (*Nettapus coromandelianus*)
Chinese Merganser (*Mergus squamatus*)

Africa

Fulvous Whistling Duck (*Dendrocygna bicolor*)
Red-billed Pintail (*Anas erythrorhyncha*)
Hottentot Teal (*Anas punctata*)
Black Duck (*Anas sparsa*)
Cape Shoveler (*Anas smithi*) (*Spatula capensis*)
Pygmy Goose or Cotton Teal (*Nettapus auritus*)
Hartlaub's Duck (*Cairina hartlaubi*)
Comb Duck or Knob-bill (*Sarkidiornis melanotos*)
Maccoa Duck (*Oxyura jamaicensis maccoa*)
White-backed Duck (*Thalassornis leuconotus*)

Madagascar

Bernier's Teal (*Anas bernieri*)
Meller's Duck (*Anas melleri*)
Madagascar White-eye (*Aythya innotata*)
Pygmy Goose or Cotton Teal (*Nettapus auritus*)
White-backed Duck (*Thalassornis leuconotus*)

Australia

Magpie Goose (*Anseranas semipalmata*)
Wandering Whistling Duck (*Dendrocygna arcuata*)
Plumed or Eytons Whistling Duck (*Dendrocygna eytoni*)
Radjah Shelduck (*Tadorna radjah*)
Australian Shelduck (*Tadorna tadornoides*)
Chestnut-breasted Teal (*Anas castanea*)
Australian Shoveler (*Anas rhynchotis*)
Freckled Duck or Monkey Duck (*Stictonetta nævosa*)
Pink-eared Duck (*Malacorhynchus membranaceus*)
Australian White-eye (*Aythya australis*)
Australian Pygmy Goose (*Nettapus coromandelianus albipennis*)
Green Pygmy Goose (*Nettapus pulchellus*)
Blue-billed Duck (*Oxyura jamaicensis australis*)
Musk Duck (*Biziura lobata*)

New Zealand

Paradise Duck (*Tadorna variegata*)
Brown Duck (*Anas aucklandica chlorotis*)

Auckland Island Flightless Teal (*Anas aucklandica aucklandica*)
Campbell Island Flightless Teal (*Anas aucklandica nesiotis*)
New Zealand Shoveler or 'Spoonbill' (*Anas rhynchotis variegata*)
Blue or Mountain Duck (*Hymenolaimus malacorhynchos*)
New Zealand Scaup or 'Black Teal' (*Aythya novæ-seelandiæ*)
Auckland Island Merganser (*Mergus australis*)

North America

Trumpeter Swan (*Cygnus cygnus buccinator*)
Emperor Goose (*Anser canagicus*)
Ring-necked Duck (*Nyroca collaris*)
Lesser Scaup (*Aythya affinis*)
King Eider (*Somateria spectabilis*)
Spectacled Eider (*Somateria fischeri*)
Steller's Eider (*Somateria stelleri*)
American Scoter (*Melanitta nigra americana*)
White-winged Scoter (*Melanitta fusca*)
Surf Scoter (*Melanitta perspicillata*)
Harlequin Duck (*Histrionicus histrionicus*)
Old Squaw (*Clangula hyemalis*)
American Goldeneye (*Bucephala clangula*)
Bufflehead (*Bucephala albeota*)
Hooded Merganser (*Mergus cucullatus*)

South America

Orinoco Goose (*Neochen jubatus*)
Andean Goose (*Chloëphaga melanoptera*)
Upland Goose (*Chloëphaga picta picta*) (Eastern Race)
Ashy-headed Goose (*Chloëphaga poliocephala*)
Ruddy-headed Goose (*Chloëphaga rubidiceps*)
Kelp Goose (*Chloëphaga hybrida*)
Crested Duck (*Lophonetta specularioides*)
Steamer Duck (*Tachyeres pteneres*)
Flying Steamer Duck (*Tachyeres patachonicus*)
Bronze-winged Duck (*Anas specularis*)
Puna Teal (*Anas versicolor puna*)
Silver Teal or Grey Teal (*Anas versicolor versicolor*)
Southern Silver Teal (*Anas versicolor fretensis*)
Sharp-winged Teal (*Anas flavirostris oxypterum*)
Andean Teal (*Anas flavirostris*)
Argentine Red Shoveler (*Anas platalea*)
Ringed Teal (*Anas leucophrys*)
Brazilian Teal (*Amazonetta brasiliensis*)
Comb Duck or Knob-billed Duck (*Sarkidiornis melanotos carunculatus*)
Brazilian Merganser (*Mergus octosetaceus*)
Argentine Ruddy Duck (*Oxyura vittata*)
Rusty Lake Duck or Peruvian Ruddy Duck (*Oxyura jamaicensis ferruginea*)
Masked Duck (*Oxyura dominica*)
Black-headed Duck (*Heteronetta atricapilla*)
Torrent Duck (*Merganetta armata*)

BREEDING SEASON

The summer of 1949 produced excellent weather for rearing waterfowl and the breeding season was the most successful we have had so far. Once again, however, the results from the shipment of eggs from Iceland were disappointing. The main burden of rearing operations fell upon the Curators, Mr. John Yealland and Mr. S. T. Johnstone, who gave their usual conscientious care to this arduous task.

Eggs were obtained from 45 species and subspecies. (Last season's total was 27 species and subspecies.) Details of the breeding of birds in the collection are shown in Table X.

Once more a small number of eggs was sent to Dr. H. B. Cott at Cambridge for his research into the palatability of eggs.

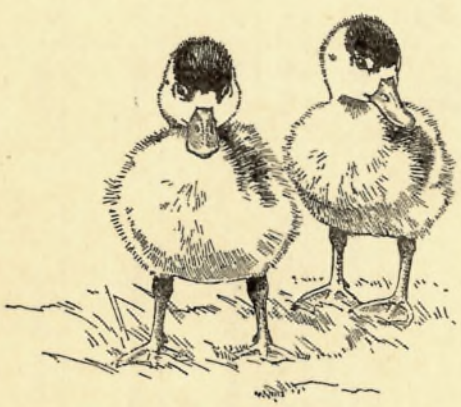
In addition the following young were reared from eggs sent from Iceland and elsewhere :—

18 Tufted Duck
5 Red-breasted Merganser

A total of 310 young birds (41 goslings and 269 ducklings) was reared, of 37 different kinds, excluding some 60–70 Mallard reared by their own parents in the pens and decoy. Last season's figure was 147 young birds of 17 kinds, excluding 150 Mallard reared as call ducks.

Apart from a few impure specimens of some of the local races of the Mallard (Spotbill, Australian Grey Duck, etc.), the only hybrids which were raised were three specimens of Chile Teal × Carolina. These are a drake and two ducks, and the male bird is a most handsome creature, with a rich suffusion of chestnut red on breast, flanks and tail coverts. It was noted that the incubation period of the hybrids was 30 days. (That of the Chile Teal—the male parent—is 25–26 days, and of the Carolina 29–30 days.)

The crosses between the Swan Goose male and the Domestic Chinese Goose which had been mated back to their father did not breed in 1949, but have both laid in April 1950. It is hoped in one more generation to produce something scarcely distinguishable from the true wild Swan Goose. The importance of this strain is much reduced since the gift of a splendid pair of pure bred wild goslings from the Duke of Bedford. Before this it had been thought that the two pure males at the New Grounds were the only Swan Geese in Europe. It now appears that there is a wild breeding stock at the Hagenbeck Zoo in Hamburg.



Shelducklings

TABLE X

HATCHING AND REARING

Species	Breeding Pairs	Date of First Egg	Eggs	Taken by Vermin	Infertile	Broken by Hen	Addled	Dead in Shell	Hatched	% Hatched of Eggs Laid	Crushed or killed by Hen	Taken by Vermin	Reared	% Reared of Eggs Hatched	Remarks
Great Basin Canada Goose	1	17.4.49	5	—	4	—	—	—	1	20%	—	—	1	100%	—
Tundra Canada Goose	2	16.4.49	23	—	19	—	—	—	4	17%	—	—	4	100%	—
Barnacle Goose ..	2	2.7.49	6	—	3	—	—	—	3	50%	—	—	2	67%	One destroyed after swollen tibio-tarsal joint failed to respond to penicillin
Bar-headed Goose ..	2	28.4.49	9	—	—	—	—	1	8	89%	—	—	6	75%	One suffering from apparent strained leg muscle. Improved but relapsed later and was destroyed
Emperor Goose ..	1	27.4.49	12	1	3	—	2	2	4	33%	—	—	4	100%	One died after being reared. Cause not ascertained
Blue Snow Goose ..	1 +1 ♀	10.5.49	14	2	2	—	—	—	10	71%	—	2	6	60%	—
Greater Snow Goose	2 +1 ♀	2.5.49	20	—	9	—	1	—	10	50%	—	2	3	30%	One died from epilepsy. One ♀ bred here in 1947. Five eggs laid, three hatched; all rather weakly and small. Only survivor after two weeks killed by hawk

Ross's Goose ..	2 +1 ♀	5.5.49	17	—	10	—	3	—	4	23%	—	—	2	50%	Male bred here in 1947 is father of one reared gosling. One gosling died from tuberculosis in one lung; the other had not assimilated yolk
Ruddy Shelduck ..	1	13.4.49	11	—	10	—	—	—	1	9%	—	—	—	0%	Died soon after hatching
New Zealand Shelduck	1	13.4.49	7	—	6	—	—	—	1	14%	—	—	1	100%	—
Common Shelduck ..	Brought as eggs		29	—	—	1	—	—	28	96%	—	1	18	64%	One killed by Mallard. For total add those brought as ducklings
Egyptian Goose ..	1	3.3.49	13	—	2	—	—	1	10	77%	—	—	9	90%	One strangled in hen's feathers. (Another clutch reared by the parents is shown in Table II)
Orinoco Goose ..	1	18.3.49	19	—	19	—	—	—	—	0%	—	—	—	—	—
Upland Goose ..	1	1.4.49	9	—	9	—	—	—	—	0%	—	—	—	—	—
Cereopsis Goose ..	1	12.2.49	2	—	1	—	—	—	1	50%	—	—	—	0%	Died on 8th day. Yolk not assimilated
Cape Teal	1	2.4.49	4	—	3	1	—	—	—	0%	—	—	—	—	—
Puna Teal	1 +1 ♀	10.4.49	14	—	5	—	—	6	3	43%	3	—	—	0%	No clutch larger than three
Bahama Pintail ..	2	12.5.49	16	—	2	—	—	—	14	88%	—	—	9	64%	Two subsequently killed by Sparrow Hawk
Common Pintail ..	?	14.5.49	21	—	6	—	2	4	9	43%	2	2	3	33%	One died from tuberculosis. Two killed by Mallard
Chilean Pintail ..	1?	15.4.49	16	2	7	—	—	3	4	25%	—	—	2	50%	—
Chilean Teal	1 +1 ♂	16.5.49	2	—	—	2	—	—	—	0%	—	—	—	—	Plus 3 × Carolina

TABLE X—*continued*

Species	Breeding Pairs	Date of First Egg	Eggs	Taken by Vermin	Infertile	Broken by Hen	Addled	Dead in Shell	Hatched	% Hatched of Eggs Laid	Crushed or killed by Hen	Taken by Vermin	Reared	% Reared of Eggs Hatched	Remarks
Black Duck	1 +1 ♀	21.3.49	36	—	6	2	1	2	25	69%	—	—	11	44%	One ♀ laid three clutches. Plus 2 × Mallard and one reared by parents. Total of hatched inclusive of hybrids
Florida Duck ..	1	29.4.49	7	—	3	—	—	—	4	57%	—	—	2	50%	One defective—very small sized
Mottled Duck ..	1	20.4.49	12	—	2	—	—	3	7	58%	—	—	5	71%	Plus 1 × Mallard
Spot-bill	1	17.3.49	31	—	5	1	1	7	13	42%	1	—	3	23%	Plus 4 × Mallard. Four eggs left with parents
Australian Grey Duck	1	18.4.49	16	—	2	—	—	1	10	62%	—	—	4	40%	Plus 2 × Mallard (three eggs left with parents)
African Yellow-bill ..	3	19.3.49	29	—	10	1	2	5	12	41%	1	—	3	25%	One killed by goose. Plus 2 × Mallard
Gadwall	1 +1 ♀	27.5.49	18	—	—	—	—	—	15	83%	—	—	8	19%	Four escaped. Plus three young left with parents (one reared)
Wigeon	2 (3?)	20.4.49	23	—	4	—	1	7	10	43%	—	—	6	60%	One died from tuberculosis
American Wigeon ..	2	15.5.49	34	9	8	—	1	7	9	26%	1	—	8	89%	—
Chiloë Wigeon ..	?	9.4.49 (?)	34	—	12	—	—	4	18	53%	—	2	12	67%	—
Blue-winged Teal ..	1	21.4.49	18	—	1	1	—	—	16	89%	—	—	5	31%	These proved to be hybrids between Blue-winged and Cinnamon Teal

Cinnamon Teal ..	4 (?)	27.4.49	40	—	14	—	—	1	25	63%	2	1	2	8%	—
Garganey	1	23.5.49	7	—	2	—	2	1	2	29%	—	—	1	50%	—
Shoveler	2	2.5.49	20	—	1	—	—	—	19	95%	—	—	12	63%	Five died the first night, possibly on account of some disturbance
Red-crested Pochard	5 +3 ♀	31.3.47	63 (+11)	—	35	1	1	3	34	56%	1	1	14	41%	Eleven eggs given to Mr. G. Goodhart. Plus 3 × Common Pochard
Rosy-bill	3 (?)	2.5.49	44	—	20	—	1	2	21	48%	3	—	14	67%	—
Common Pochard ..	1	9.5.49	9	—	—	—	—	—	5	56%	—	—	2	40%	Plus 3 × Red-crested Pochard
Red-head	2	3.6.49	15	—	—	—	1	1	13	87%	—	—	10	77%	—
Tufted Duck	2 (?)	12.6.49	12	—	8	—	1	—	3	25%	—	—	2	67%	Plus 16 reared from eggs laid elsewhere
Scaup	1 (?)	7.5.49	—	—	—	—	—	—	—	—	5	—	3	—	—
Carolina		25.3.49	341	—	110	3	33	45	161	47%	—	—	72	46%	Only one Carolina laid third clutch. Two killed by Mallard. A number of weaklings, many not assimilating yolk (one of these surviving 26 days). Plus 3 × Chilean Teal. Fertility of second clutches very low, e.g., Eggs 48, clear 21, addled 16, dead in shell 1, hatched 10
Mandarin		22.3.49	Eggs not identifiable with certainty owing to similarity and indiscriminate laying in one another's nests. Not more than 12 Mandarin eggs are known to have been laid of which four hatched									3	2		
Red-breasted Merganser	1 ♀	5.6.49	4	—	1	3	—	—	—	0%	—	—	—	—	Plus five reared from eggs from Iceland
Ruddy Duck	1	12.6.49	5	—	—	—	—	1	4	80%	—	—	—	0%	Two had not assimilated yolk and two died from congestion of lungs

TABLE XI

EGGS LEFT WITH PARENTS

Species	Eggs	Taken by Vermin	Infertile	Addled	Dead in Shell	Hatched	% Hatched of Eggs Laid	Reared	% Reared of Eggs Hatched
Egyptian	8	—	1	—	—	7	87%	4	57%
Black Duck	6	—	1	—	—	5	83%	1	20%
Spot-bill	3	—	—	—	—	3	100%	—	0%
Grey Duck	2	—	1	—	1	—	0%	—	—
Gadwall	3	—	—	—	—	3	100%	1	33%
	BROUGHT AS DUCKLINGS								
Shelduck	—	—	—	—	—	13	—	9	69%

FULL-WINGED BIRDS

A pleasant feature of the collection is the ever-increasing number of birds which now have the free use of their wings. As a result during the year the following species could be seen on the wing at the New Grounds:—

Fulvous Whistling Duck (*D. bicolor*)
Grey-breasted Whistling Duck (*D. a. discolor*)
Javan Whistling Duck (*D. javanica*)
Coscoroba Swan (*C. coscoroba*)
White-fronted Goose (*A. a. albifrons*)
Greylag Goose (*A. a. anser*)
Greater Snow Goose (*A. c. atlanticus*)
Blue Snow Goose (*A. c. cærulescens*)
Barheaded Goose (*A. indica*)
Pintail (*A. acuta*)
Gadwall (*A. s. strepera*)
Mallard (*A. p. platyrhynchos*)

In the course of the next winter this list will be augmented by the following species, which are either those at present feather-cut, or species likely to be reared during the summer:

White-faced Whistling Duck (*D. viduata*)
Dark-bellied Brent Goose (*B. b. bernicla*)
Barnacle Goose (*B. leucopsis*)

Swan Goose (*A. cygnoides*)
Bean Goose (*A. f. fabalis*)
Emperor Goose (*A. canagica*)
Wigeon (*A. penelope*)
Shoveler (*A. clypeata*)
Carolina Duck (*A. sponsa*)
Bahama Pintail (*A. bahamensis*)

WILD BIRDS IN THE PENS

So many are the degrees of wildness and tameness among the wildfowl at the New Grounds that the situation is often bewildering to any newcomer. There are all stages between the wild flocks of White-fronts which never seem to lose any of their wildness, and the hand-reared pinioned birds which feed from the hand. In between are the two categories of full-winged birds, the hand-reared ones described in the previous paragraph and the wild-bred birds which have taken up with the tame ones in the pens, and have become as confiding as they are. There is also the point at which these mix, where the offspring of hand-reared full-winged birds have been brought up outside the enclosures and brought in later by their parents. To this last category belong a large proportion of the Mallards to be seen flying in and out of the pens.

But in spite of this confusing mixture, there is a particular satisfaction in seeing truly wild-bred birds which have settled down in the pens and come up to feed with the rest.

During the past year the following wild birds have come into the pens:

WHITE-FRONTED GOOSE (*A. a. albifrons*).—A single bird in late March and early April 1950.

CANADA GOOSE (*B. c. canadensis*).—A party of five which arrived on 27th March and remained until 13th April.

PINTAIL (*A. acuta*).—Up to 25 regularly in the pens and over 40 on 5th February.

TEAL (*A. crecca*).—A few in the Orchard and Rushy Pen and quite tame. Probably the same as those of last year.

MALLARD (*A. platyrhynchos*).—Some of those in the Rushy Pen at times have undoubtedly been wild.

GADWALL (*A. strepera*).—A pair, the female one of the two which spent the previous season in the Big Pen.

WIGEON (*A. penelope*).—Up to 15 regularly. Two drakes exceptionally tame, and one which remained through last summer.

GARGANEY (*A. querquedula*).—A pair in the Rushy Pen, 7th April, 1950.

SHOVELER (*A. clypeata*).—One or two occasionally in Rushy Pen. A male frequently in second Decoyside Pen during April 1950.

POCHARD (*A. ferina*).—A drake in Rushy Pen at end of December.

COOT (*F. atra*).—Up to nine in Rushy Pen in February. Only two were seen there during the previous season.

MOORHEN (*G. chloropus*).—A dozen or more regularly in the Pens, especially in the Rushy, where they have become fairly tame and will feed unconcernedly at about 20 yards. It is interesting to note that they do not become tame and confiding as ducks and geese do.

PATHOLOGY

The Trust is greatly indebted to Mr. D. Nelson, Veterinary Surgeon to the Trust for the work he has undertaken. By an unfortunate oversight his name was omitted from the Second Annual Report. We are also most grateful to Mr. C. S. Adams and Mr. T. Spence for the veterinary services which they have rendered, and to Miss P. A. Clapham of the I.C.I. Game Services, Fordingbridge, for the bacteriological investigations and post-mortem examinations which she has made.

There has been a small number of deaths in the collection, but it is interesting to note that only in very few cases do the causes appear to be similar. Nothing in the nature of an epidemic has occurred.

Parasites

Only one death, a Barnacle Goose, was traced to Gizzard Worm (*Amidostomum anseris*), which caused some trouble in the previous year. Several birds apparently suffering from an infestation of this parasite were cured by treatment with Phenothiazine.

Tapeworms (*Hymenolepis* sp.) were found in the intestines of a Ruddy-headed Goose, but were not thought to have been the cause of death.

An infestation of small leeches (not identified) appeared to be the cause of death of the Steamer Duck (*Tachyeres brachypterus*). They were removed by a solution of brine, but too late to effect a cure.

Diseases

Two Emperor Geese and a Barnacle were lost as a result of infection of the respiratory system. In one case a *Diplococcus* was isolated.

Some deaths have been caused by a growth in the liver and other diseased conditions of that organ. Others have been caused by pneumonia, although in most cases it seems that this disease assails only birds whose condition has been previously reduced by some other cause.

A Barnacle gosling had finally to be destroyed after infection and swelling of the tibio-tarsal joint which failed to respond to treatment with penicillin. This showed a condition very similar to 'Housemaid's Knee', and the organism *Corynebacillus arthropyogenes* was isolated.

BEHAVIOUR

The Trust was visited by Dr. Konrad Lorenz, the distinguished Austrian ethologist in August 1949. Plans were made for him to spend a period of several weeks studying the behaviour of the Dabbling Ducks during the spring of 1950, but his visit had to be postponed. Dr. Lorenz was much interested in the case of the male Blue Goose which became attached to the kennel-type nesting-box and suggested that the box should be left during the winter in order to observe any seasonal changes in the bird's behaviour. This was done and the bird joined up with others of its own species in the autumn. But early in February he once more showed interest in the box. As the spring advanced he defended the box, albeit not very courageously, as he always retreated behind the box on being approached.

The Lesser White-front described in the Second Annual Report (p. 34) which previously showed a fixation for our keeper, Mr. Cameron, has now been

moved from the Orchard Pen to the first Decoyside where he has taken up with a female Canada Goose of the race *B. c. moffitti*, to which he is now firmly paired. It may be remembered that prior to his attachment to the brooder and Mr. Cameron in the summer of 1947 the bird had been paired with a female Tundra Goose (*B. c. leucopareia*). It is therefore 2½ years since he has been in the same enclosure with any of the races of Canada goose, but he immediately joined the Canada although a different race and size from his earlier mate.

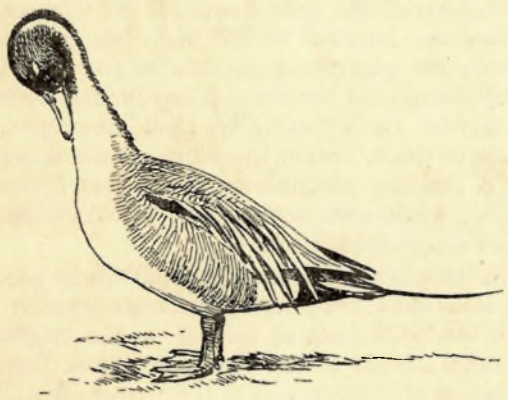
A male Grey-breasted Whistling Duck (*D. a. discolor*) has become attached to a Greylag. Both birds are full-winged and always fly in company. The Whistling Duck has recently become extremely aggressive, and on one occasion almost killed a White-fronted goose, twice his own size.

PREENING STUDIES

By arrangement with Bristol University, Mr. F. McKinney has begun a series of studies at the New Grounds which he intends to extend over a period of two years. He has contributed the following note for this Report which describes the scope of the problems he is setting out to solve:—

The study of preening and bathing activities appears to have been largely neglected by students of bird behaviour. The literature contains many references to these subjects and many artists have drawn birds in preening postures, but there seems to have been no detailed analysis of these important activities.

The main movements involved in preening are familiar to anyone who has watched birds, but there are many problems relating to these movements which still remain to be solved. What is the extent of individual, sexual and specific differences in these movements? Is there an orderly sequence of movements, and if so, what is its significance?



Pintail Drake

The feathers of most birds do not grow from all parts of the body but are arranged in definite restricted 'feather-tracts'. It has been suggested that birds preen along these tracts, though differences in preening-movements have yet to be correlated with the differences which do occur in the pattern of the feather-tracts in the various groups of birds.

Are preening-movements inherited or learned? When does the young bird first preen? Does the young bird use typical preening-movements before it develops the adult feather-tracts? These questions have already been answered

for a few species of birds, but a comparative study of a number of species of the same group should furnish new and important data.

One of the most interesting features concerns the circumstances under which these activities occur. Are they regular after sleeping or after feeding or at any particular time of the day? In the *Anatidæ*, moreover, there occurs what has been termed 'false-preening' and 'false-bathing'. Many of the true preening- and bathing-movements are used by the birds as part of the display, or after a disturbance, and probably under a variety of other conditions.

These are some of the problems which it is hoped to study during the next two years. The *Anatidæ* as a group are very suitable for an analysis of these activities and the collection at the New Grounds offers an ideal opportunity for a study of this kind.

RESEARCH FACILITIES

The Council is anxious that the facilities for scientific research offered by the Trust's collection and installations at the New Grounds should be put to the fullest possible use. The studies now being undertaken deal with only a few of the many scientific problems presented by this group of birds. The Trust will welcome the opportunity of helping students to undertake special studies connected with the *Anatidæ*.

THE NE-NE PROJECT

AT THE invitation of the Board of Commissioners of Agriculture and Forestry of the Territory of Hawaii, the Trust has taken an active part in the attempt to save the Ne-ne or Hawaiian Goose from imminent extinction. Only 24 individuals are known to survive. Mr. John Yealland, our Curator, went to Hawaii early in the New Year and returned on 3rd May. His passage across the U.S. was made possible by the generous assistance of two Members—Mrs. Carll Tucker and Mrs. Gladwin—and the journey was further facilitated by the U.S. Fish and Wildlife Service. The Council feels that this project, although a new departure, falls without doubt within the scope of the objects for which the Trust was formed. A practical contribution to the preservation of a vanishing species is a matter of world-wide significance. Mr. Yealland contributes the following note on his successful mission:—

In the wild state the Hawaiian or Sandwich Island Goose (*Branta sandvicensis*) occurs and, so far as is known, has always occurred entirely on the island of Hawaii, and except for a few isolated records on the neighbouring island of Maui, not on the other islands of the Sandwich group. During the first four months of 1950 only five wild birds, two of them young ones, were seen, and it seems unlikely that there are more than 12 or 15 others.

In captivity on Hawaii there are a further 17 and outside Hawaii only the pair presented to the Trust by Mr. Shipman, who has kept a flock at Keaau, near Hilo, since 1918. Thus it seems that the world stock in April 1950 is between 24 and 40 birds.

The diminution of the Ne-ne—its native name—from an estimated 25,000 less than a century ago, is known to be due to several causes, the chief of which has been their destruction by the islanders for food, particularly during the flightless moulting period, when they are easily run down.