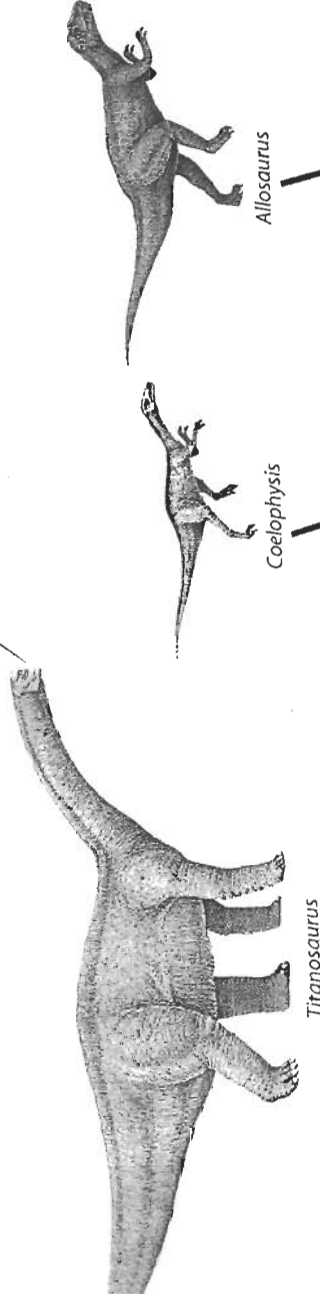
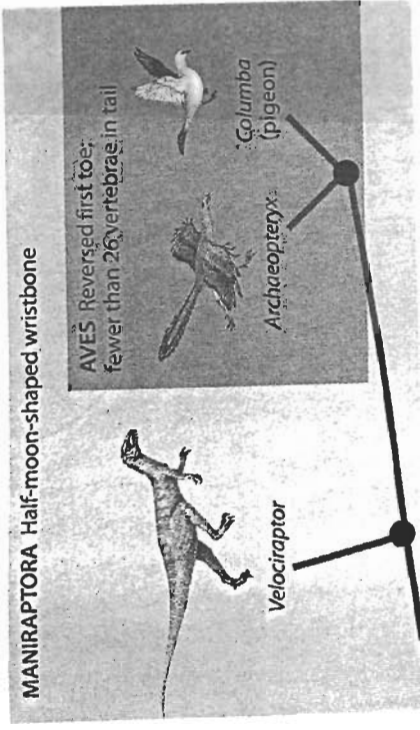
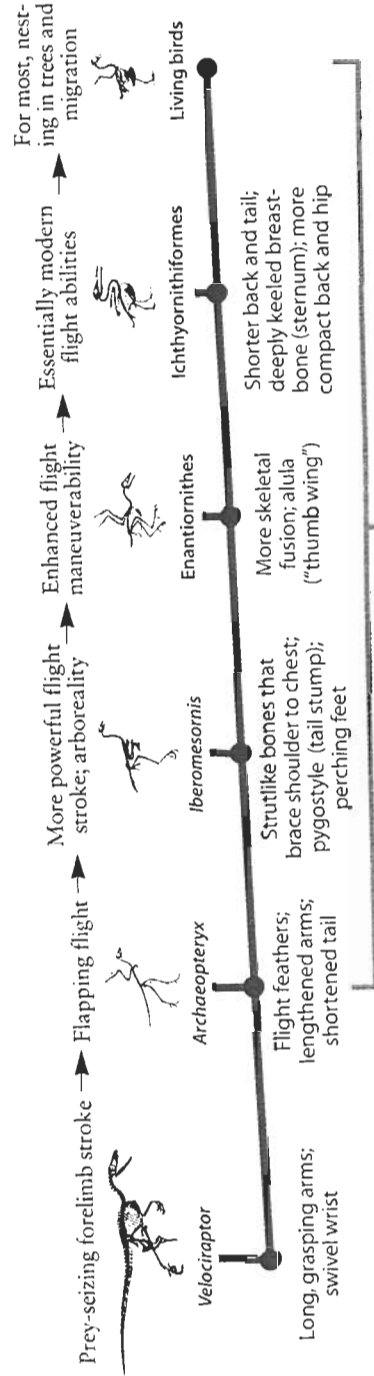


Figure 1. Cladogram showing the interrelationships of the living amniote tetrapods. A few of the features which characterize some of the subgroups are indicated.

TETANURAE Three functional toes; hollow bones



DINOSAUR LINEAGES THAT DID NOT LEAD TO BIRDS



AVES

CLADOGRAM OF BIRD EVOLUTION indicates that birds (Aves) perfected their flight stroke gradually after they first appeared approximately 150 million years ago. They became arboreal (able to live in trees) relatively early in their history, however. Some of the skeletal innovations that supported their emerging capabilities are listed at the bottom.

ED HECK

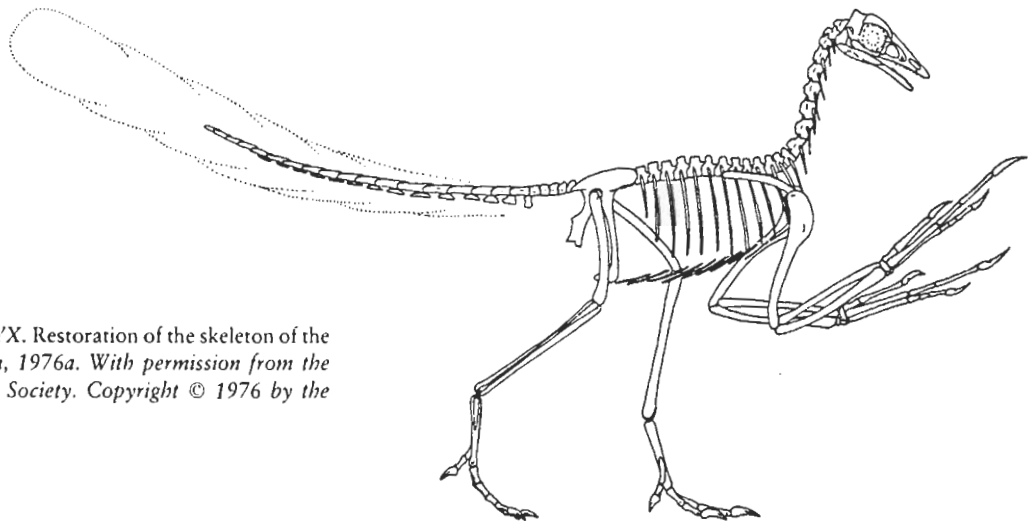


Figure 16-11. *ARCHAEOPTERYX*. Restoration of the skeleton of the Upper Jurassic bird. From Ostrom, 1976a. With permission from the *Biological Journal of the Linnean Society*. Copyright © 1976 by the Linnean Society of London.



Figure 16-20. SKELETON OF THE UPPER CRETACEOUS DIVING BIRD *HESPERORNIS*, WHICH REACHED MORE THAN 1 METER TALL. The forelimb is reduced to a slender humerus and the sternum lacks a keel. From Marsh, 1880.

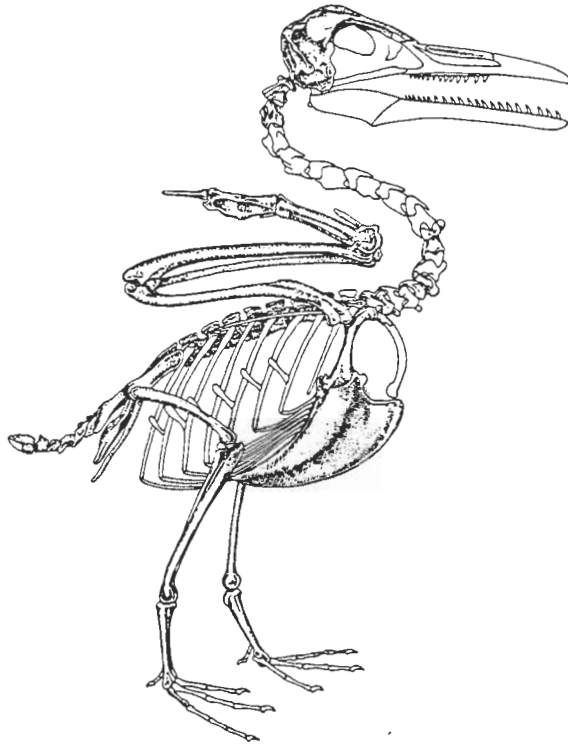


Figure 16-22. SKELETON OF THE UPPER CRETACEOUS BIRD *ICHTHYORNIS*. A well-developed keel is on the sternum. There had been some question as to whether this genus had teeth, but this fact is now firmly established. From Marsh, 1830.

(a)

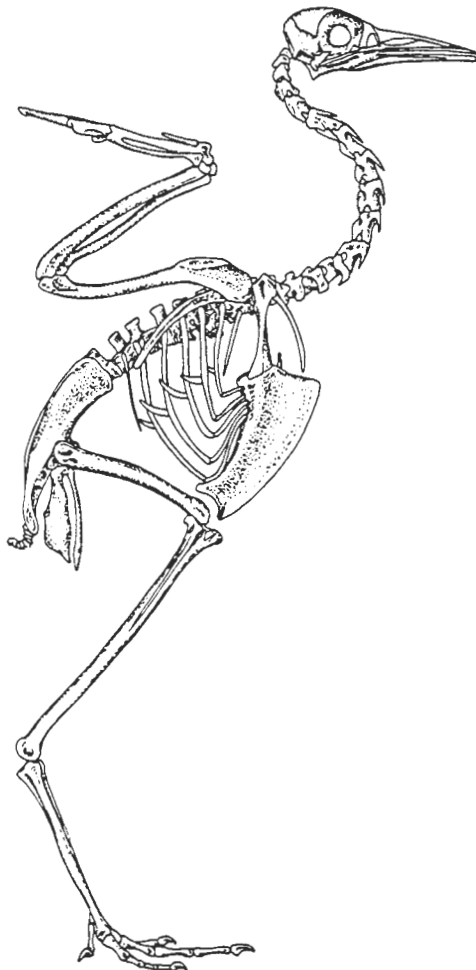


Figure 16-25. (a) Reconstruction of the skeleton of an unnamed genus from the Paleocene of Montana that has a keeled sternum but a palaeognathous palate. The tail, like that of a raven, is very short. Approximately 40 centimeters tall. Courtesy of Peter Houde. Skull in lateral and palatal views. Abbreviations as in Figure 8-3. From Houde and Olson, 1981. With permission from Science. Copyright 1981 by The American Association for the Advancement of Science.

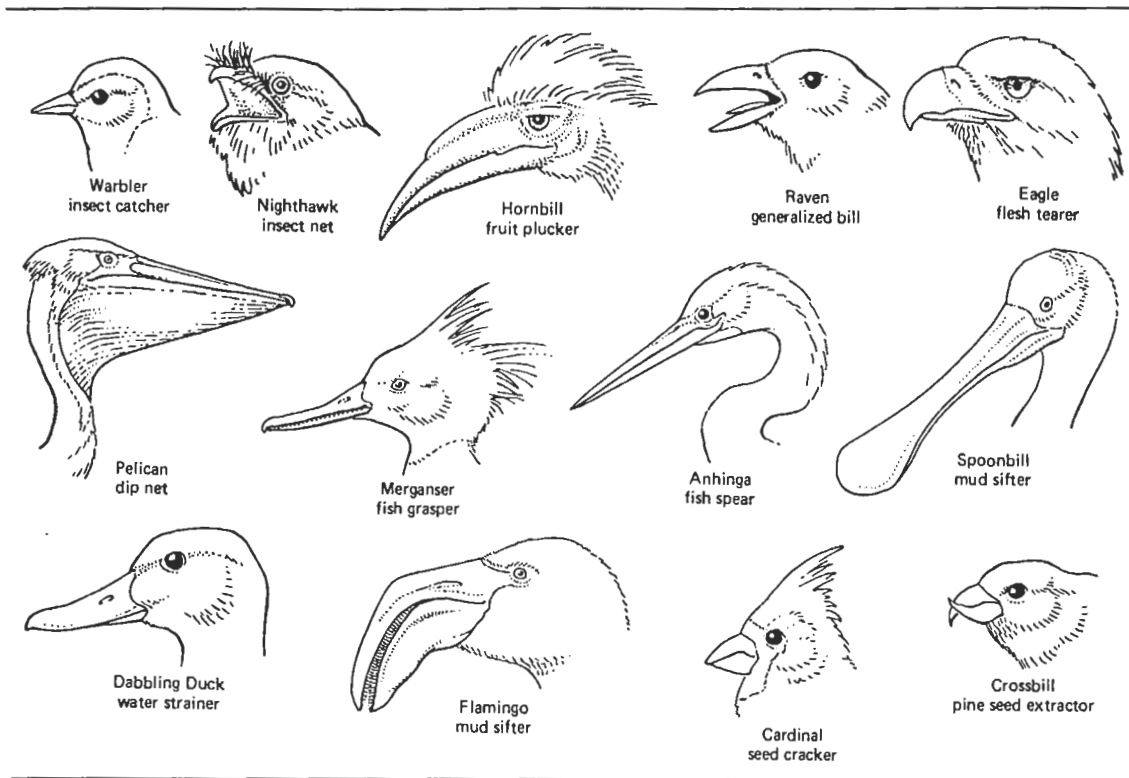


Figure 17-21. Examples of specializations of the beaks of birds.

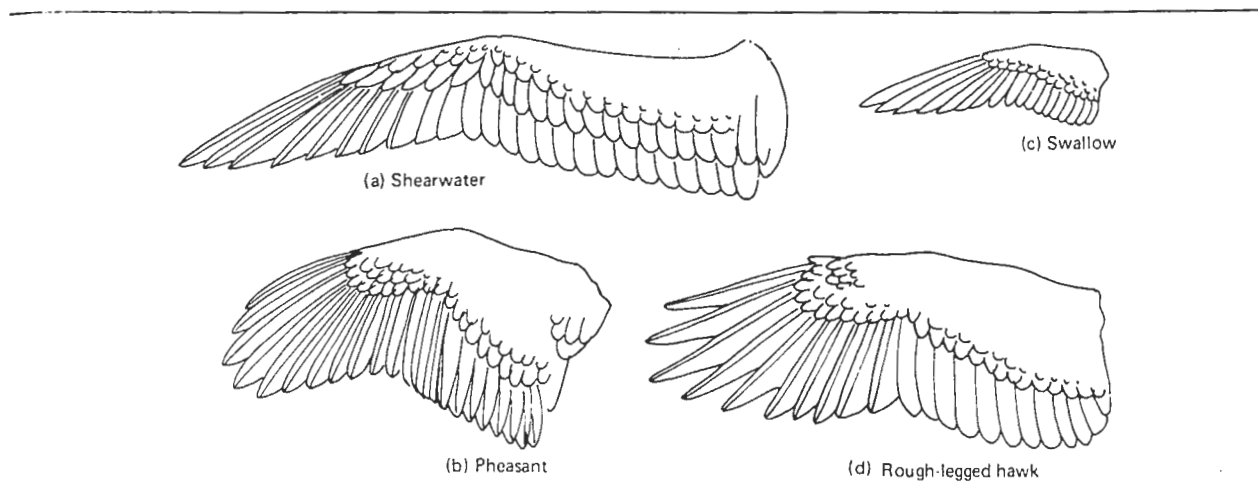
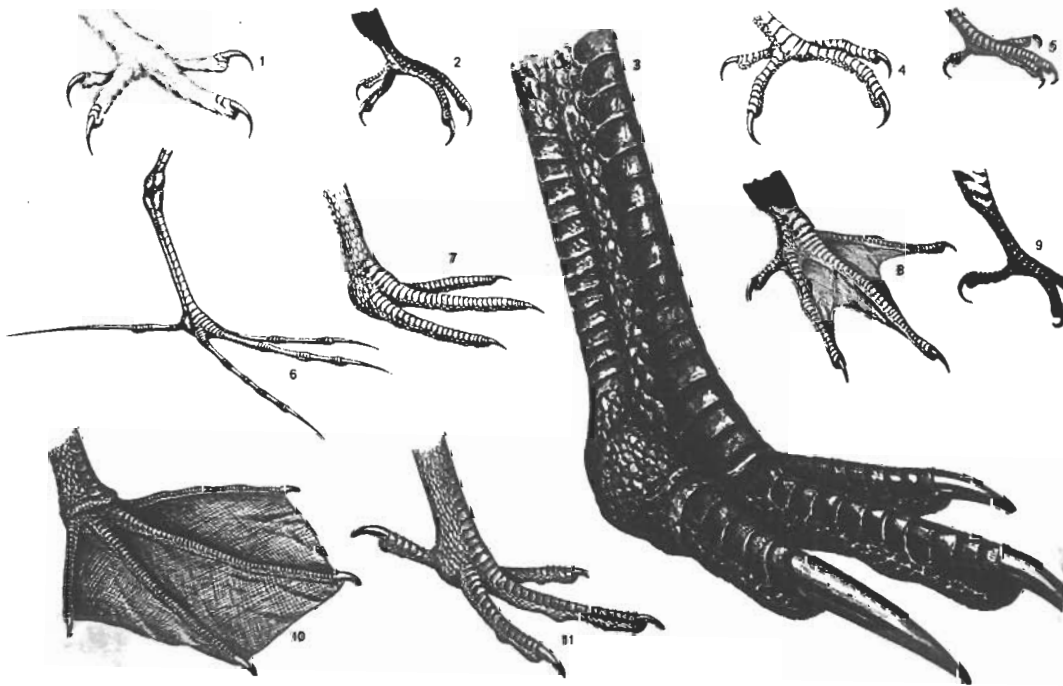
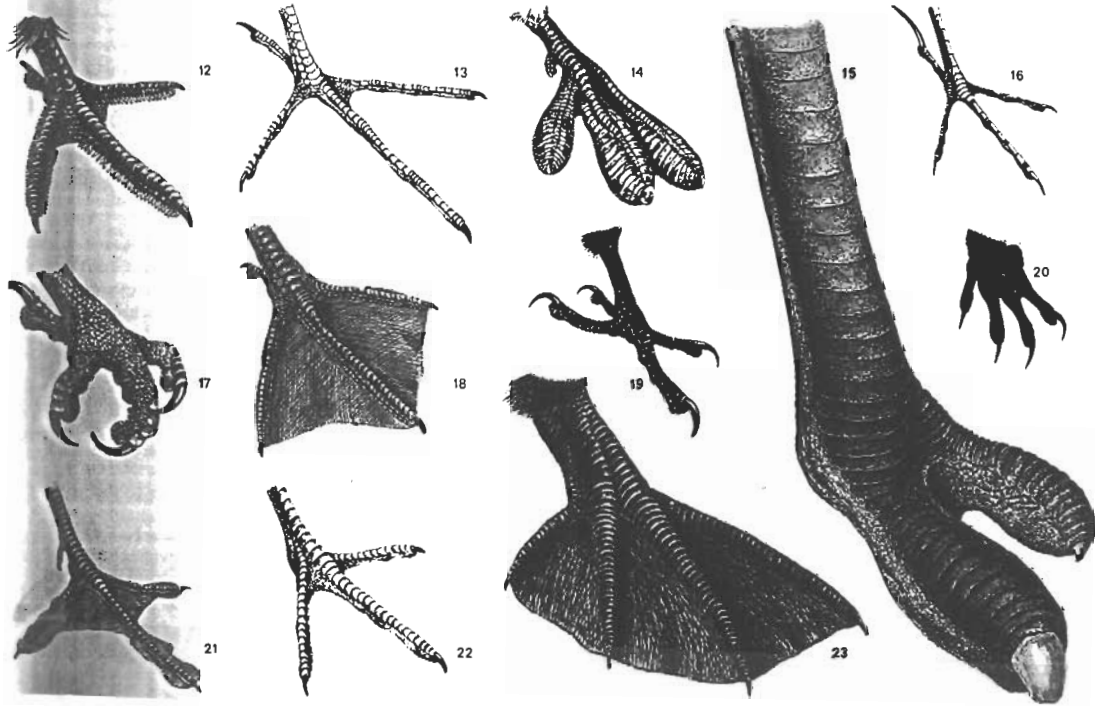
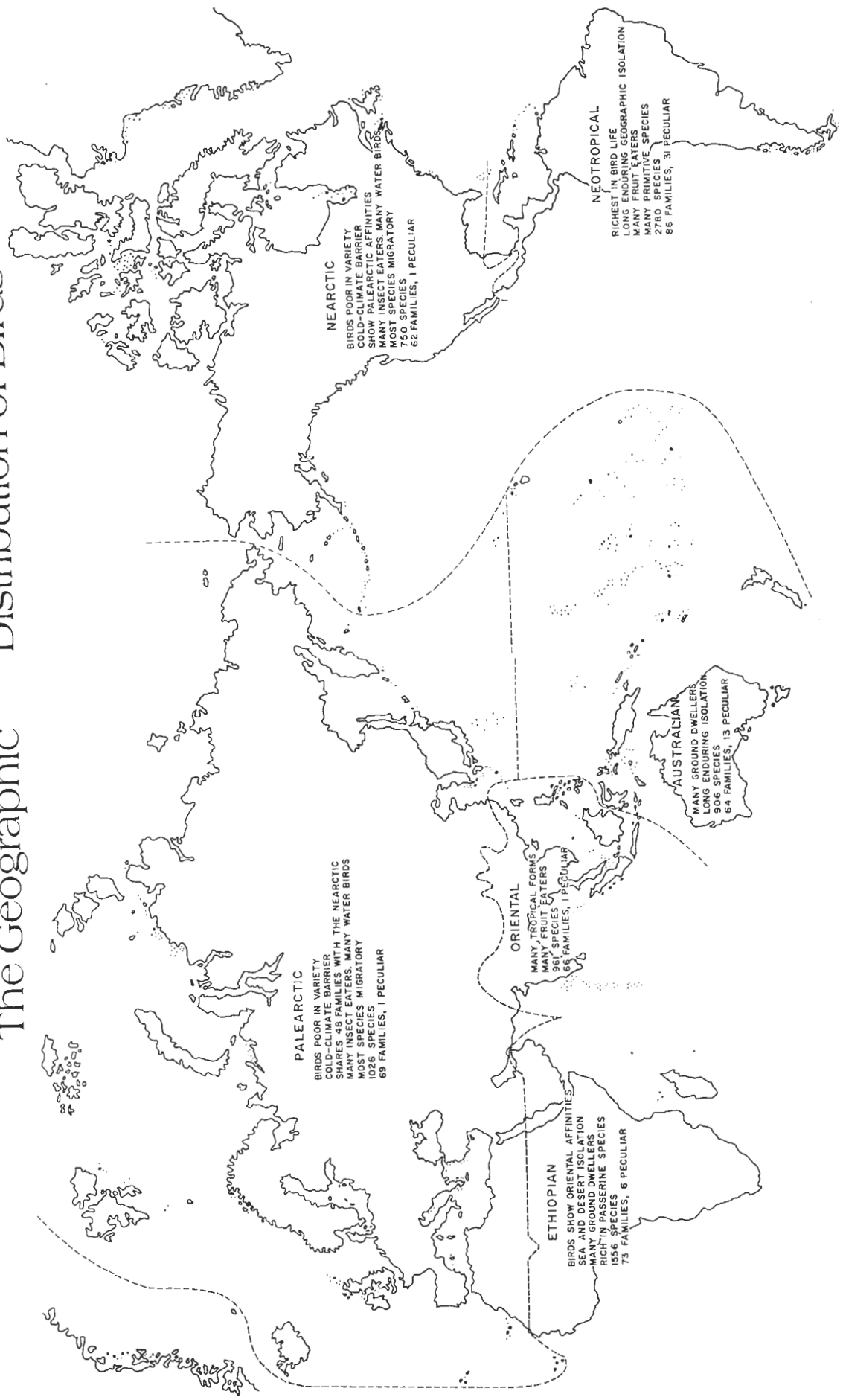


Figure 17-22. Comparison of four basic types of bird wings: (a) high aspect ratio; (b) elliptical; (c) high speed; (d) slotted.

Variety in shape of feet. (1) Screech owl *Otus asio*, (2) Cuban trogon *Priotelus temnurus*, (3) Double-wattled cassowary *Casuarus casuarus*, (4) Oriental cuckoo *Cuculus saturatus*, (5) Common kingfisher *Alcedo atthis*, (6) Northern jacana *Jacana spinosa*, (7) Common oystercatcher *Haematopus ostralegus*, (8) Great frigatebird *Fregata minor*, (9) (Northern) Three-toed woodpecker *Picoides tridactylus*, (10) Blue-footed booby *Sula nebouxi*, (11) Turkey vulture *Cathartes aura*, (12) Ruffed grouse *Bonasa umbellus*, (13) (Black-crowned) Night heron *Nycticorax nycticorax*, (14) Slavonian (or Horned) grebe *Podiceps auritus*, (15) Ostrich *Struthio camelus*, (16) Meadow pipit *Anthus pratensis*, (17) Osprey *Pandion haliaetus*, (18) Mallard *Anas platyrhynchos*, (19) Pileated woodpecker *Dryocopus pileatus*, (20) Common swift *Apus apus*, (21) Red-necked (or Northern) phalarope *Phalaropus lobatus*, (22) Double-banded courser *Rhinoptilus africanus*, (23) Common (or Great) cormorant *Phalacrocorax carbo*.



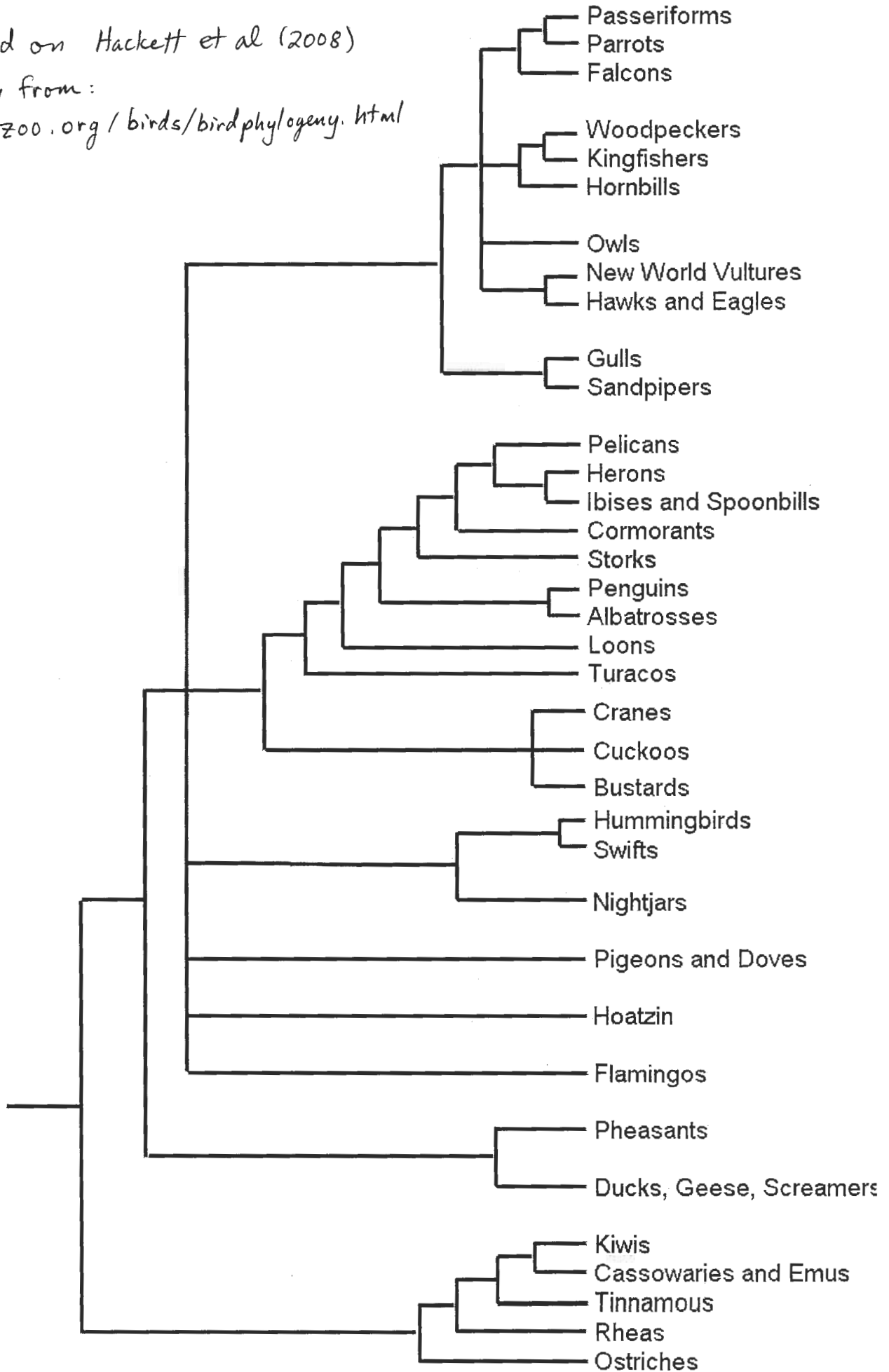
The Geographic Distribution of Birds



Based on Hackett et al (2008)

Taken from:

WhoZoo.org/birds/birdphylogeny.html





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Avian orders

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Avian Orders

Grand Tour of the Orders

Palaeognathae (the ratites and tinamous)

Tinamiformes - Tinamous
 Rheiformes - Rheas
 Struthioniformes - Ostrich
 Casuariiformes - Cassowaries
 Dinornithiformes - Kiwis

Neognathae (all other modern birds)

Podicipediformes - Grebes
 Sphenisciformes - Penguins
 Procellariiformes - Tube-nosed Seabirds
 Pelecaniformes - Pelicans and relatives
 Anseriformes - Waterfowl
 Phoenicopteriformes - Flamingos
 Ciconiiformes - Herons, Storks, New World Vultures and relatives
 Falconiformes - Diurnal Birds of Prey (no species list yet)
 Galliformes - Fowl-like Birds
 Gruiformes - Cranes, Rails and relatives
 Charadriiformes - Shorebirds, Gulls and relative
 Gaviiformes - Loons
 Columbiformes - Pigeons and Doves
 Psittaciformes - Parrots (no species list yet)
 Coliiformes - Mousebirds
 Musophagiformes - Turacos
 Cuculiformes - Cuckoos
 Strigiformes - Owls
 Caprimulgiformes - Nightjars and relatives
 Apodiformes - Swifts and Hummingbirds
 Trogoniformes - Trogons
 Coraciiformes - Rollers, Kingfishers and relatives
 Piciformes - Woodpeckers, Toucans and relatives (no species list yet)
 Passeriformes - Perching Birds (no species list yet)

Key to the Orders of U.S. Birds

Order names linked to common name examples.

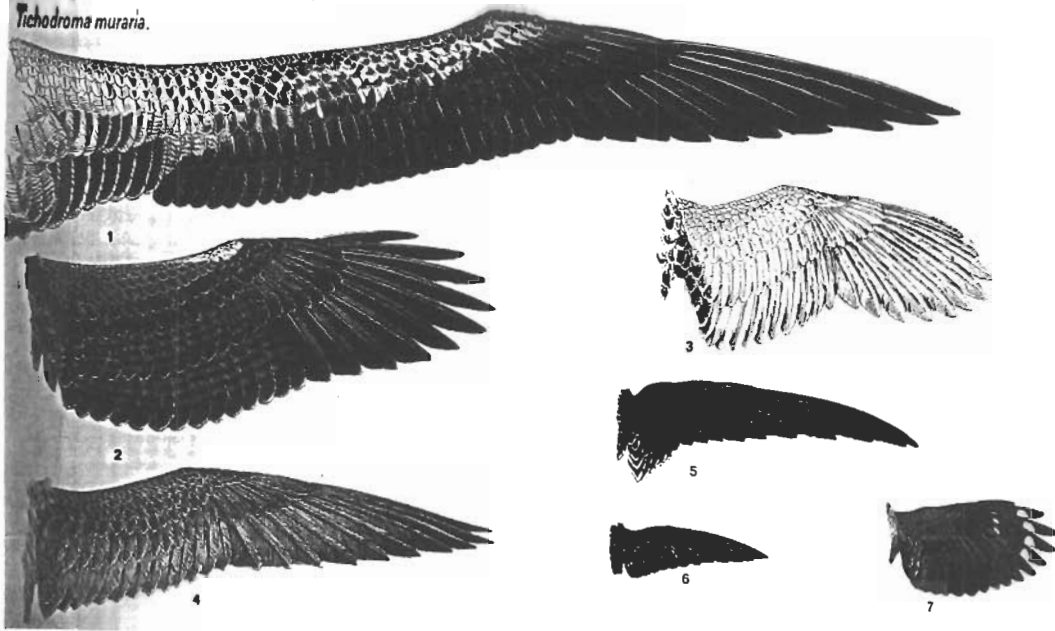
| | | |
|----|---|---|
| 1 | a. Hind toe connected to anterior toes by a web b. Hind toe absent or else not connected to anterior toes by a web | <u>Pelecaniformes</u> 2 |
| 2 | a. Nostrils located in raised tubes b. Nostrils not in raised tubes | 3 4 |
| 3 | a. Anterior toes webbed b. Anterior toes unwebbed | <u>Procellariiformes</u> <u>Caprimulgiformes</u> |
| 4 | a. With 2 anterior toes and 1 or 2 posterior toes b. With 3 anterior toes and with 1 or no hind toe | 5 9 |
| 5 | a. Outer hind toe somewhat shorter than inner hind toe b. Outer hind toe decidedly longer than inner hind toe | <u>Trogoniformes</u> 6 |
| 6 | a. Bill with a cere (swollen membrane covering the base of the upper bill) b. Bill without a cere | 7 8 |
| 7 | a. Tarsus (ankle above the toes) feathered b. Tarsus unfeathered | <u>Strigiformes</u> <u>Psittaciformes</u> |
| 8 | a. Length of tail greater than length of wing b. Length of tail less than length of wing | <u>Cuculiformes</u> <u>Piciformes</u> |
| 9 | a. Outer 2 anterior toes more or less grown together and provided with a common sole b. Outer 2 anterior toes more or less free or webbed, but without a common sole | <u>Coraciiformes</u> 10 |
| 10 | a. Tarsus much compressed laterally, its greatest depth being 2 or more times its greatest width b. Tarsus not greatly flattened laterally, its greatest depth being less than twice its greatest width | 11 12 |
| 11 | a. Anterior toes connected by full webs b. Anterior toes lobed, each with a separate web | <u>Gaviiformes</u> <u>Podicipitiformes</u> |
| 12 | a. Distance from bend of wing to tip of longest secondary much greater than distance from tip of longest secondary to tip of wing b. Distance from bend of wing to tip of longest secondary not greater than distance from tip of longest secondary to tip of wing | 13 <u>Apodiformes</u> |
| 13 | a. Hind toe inserted at same level as anterior toes; no horny frontal shield extending from bill to forehead b. Hind toe sometimes absent, if present usually inserted higher than anterior toes; or else with a frontal shield on forehead | 14 17 |

| | | |
|----|---|--|
| 14 | a. Bill strongly hooked and provided with a cere; feet and claws usually strong and adapted for tearing flesh b. Bill neither strongly hooked nor provided with a cere; feet and claws not adapted for tearing flesh | <u>Falconiformes</u> 15 |
| 15 | a. Bill, neck, legs, and toes very long; adapted for wading b. Bill usually shorter than head; neck, legs, and toes not elongated | <u>Ciconiiformes</u> 16 |
| 16 | a. Bill constricted in middle; nostrils slitlike, overhung by a fleshy flap b. Bill not constricted medially; nostrils variable | <u>Columbiformes</u> <u>Passeriformes</u> |
| 17 | a. Cutting edges of bill fringed or with serrations b. Cutting edges of bill smooth, without fringe or serrations | <u>Anseriformes</u> 18 |
| 18 | a. Feathering of forehead extending into nasal fossae; nostrils either completely feathered or overhung by a horny flap; toes unwebbed b. Feathering of forehead usually not extending into nasal fossae; nostrils usually not overhung by a flap; toes sometimes webbed | <u>Galliformes</u> 19 |
| 19 | a. Outermost primary usually as long as or longer than next primary, forming tip of wing; primaries often considerably longer than secondaries; front toes sometimes webbed b. Outermost primary considerably shorter than next primary; 2nd and 3rd primaries usually longest; primaries usually shorter than secondaries and concealed by them; anterior toes never fully webbed | <u>Charadriiformes</u> <u>Gruiformes</u> |

Orders and common name examples:

- Pelecaniformes - Pelicans and Cormorants
- Procellariiformes - Albatross
- Caprimulgiformes - Whip-poor-wills
- Trogoniformes - Trogons
- Strigiformes - Owls
- Psittaciformes - Parrots
- Cuculiformes - Cuckoos, Roadrunners
- Piciformes - Woodpeckers and Flickers
- Coraciiformes - Kingfishers
- Gaviiformes - Loons
- Podicipitiformes - Grebes
- Apodiformes - Swifts, Chimney swift, and Hummingbirds
- Falconiformes - Diurnal birds of prey - Vultures, Hawks, Eagles, Falcons, and Ospreys
- Ciconiiformes - Herons and Egrets
- Columbiformes - Doves, Pigeons,
- Passeriformes - Perching birds - The vast majority of birds in Oklahoma
- Anseriformes - Ducks and Geese
- Galliformes - Prairie chicken, Pheasants, Quail, Turkeys, and Chickens
- Charadriiformes - Shore Birds - Plovers, Killdeer, Sandpipers, and Gulls
- Gruiformes - Marsh Birds - Cranes, and American coot

The shape of the wing in birds is determined by the contrasting needs of speed and manoeuvrability. Wings built for speed tend to be long and pointed, while short broad wings make sudden changes of direction possible. (1) Wandering albatross *Diomedes exulans*, (2) White-tailed buzzard (or hawk) *Buteo albicaudatus*, (3) Willow grouse (or ptarmigan) *Lagopus lagopus*, (4) Sooty falcon *Falco concolor*, (5) Common swift *Apus apus*, (6) Rufous hummingbird *Selasphorus rufus*, (7) Wallcreeper

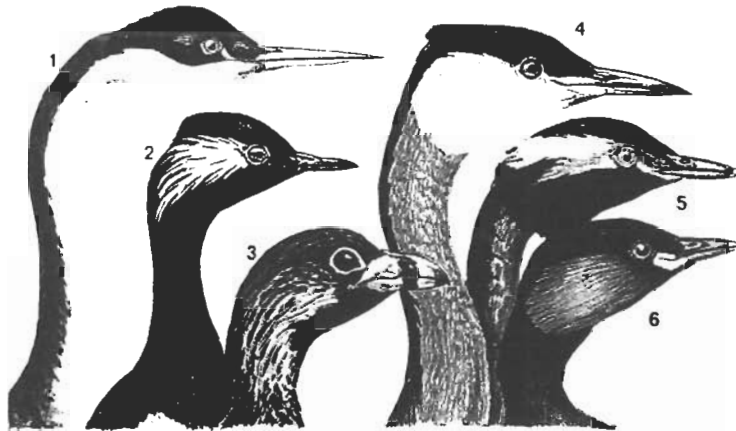


Tichodroma muraria.

PODICIPITIFORMES

Aquatic birds with elaborate courtship rituals

GREBES – *Podicipedidae*

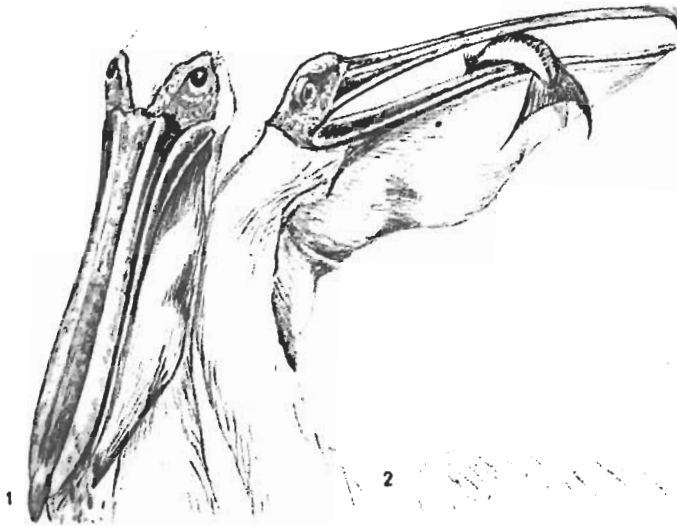


Details of the heads of members of the grebe family. (1) Western grebe *Aechmophorus occidentalis*, (2) Black-necked (or Eared) grebe *Podiceps nigricollis*, (3) Pied-billed grebe *Podilymbus podiceps*, (4) Red-necked grebe *Podiceps grisegena*, (5) Slavonian (or Horned) grebe *P. auritus* and (6) the Little grebe *Tachybaptus ruficollis*.

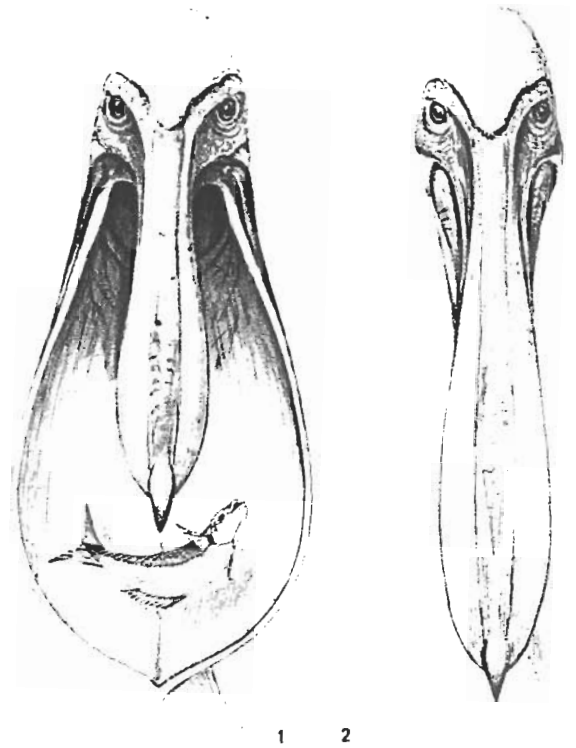
PELECANIFORMES

Large birds with webbed feet. Some fish for a living; others steal their food

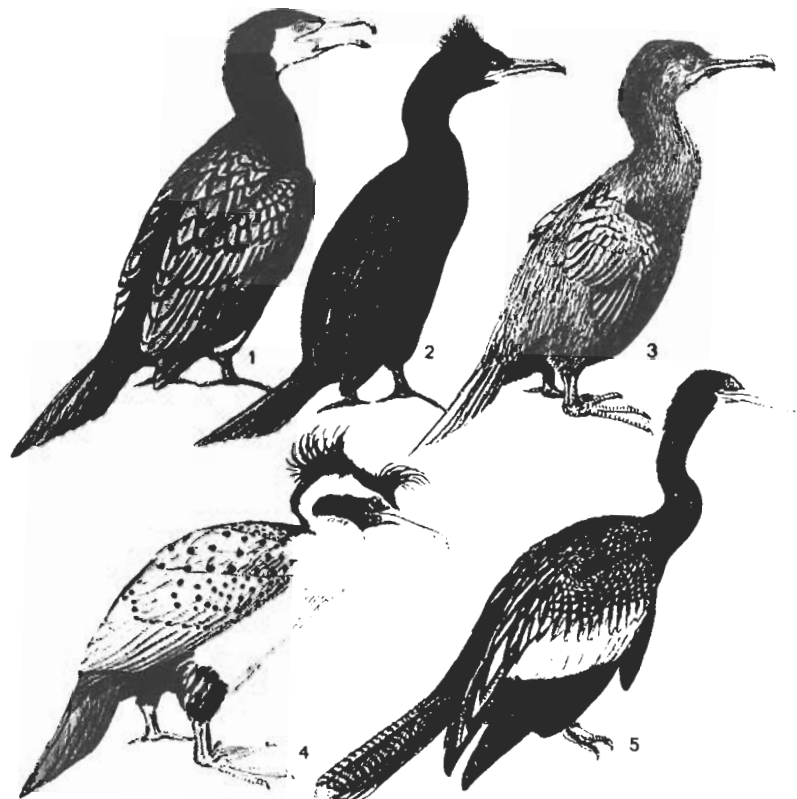
- TROPICBIRDS — *Phaethontidae*
- PELICANS — *Pelecanidae*
- BOOBIES AND GANNETS — *Sulidae*
- CORMORANTS — *Phalacrocoracidae*
- ANHINGAS — *Anhingidae*
- FRIGATEBIRDS — *Fregatidae*



The pelican's pouch is used as a scoop net. When prey has been caught, the pouch contracts (1), squeezing out water. The prey is then turned round and swallowed whole (2).



The pouch of the Great white pelican *Pelecanus onocrotalus* open (1) and closed (2). Contrary to popular belief, the pouch is used to catch fish and not to store food.



Variation of colour in cormorants. (1) Common (or Great) cormorant *Phalacrocorax carbo*, (2) Shag *Phalacrocorax aristotelis*, (3) the Galapagos Flightless cormorant *Nannopterum harrisi* and (4) Spotted shag *Phalacrocorax punctatus*. These are compared with a member of a related family, the Anhingidae, the Anhinga *Anhinga anhinga* (5).

Four herons showing size and colour variation. (1) Great white heron (or Great egret) *Egretta alba*, (2) Purple heron *Ardea purpurea*, (3) Tiger heron *Tigrisoma lineatum* and (4) Yellow-crowned night heron *Nyctanassa violacea*.

CICONIIFORMES

Fish-eating birds with long bills and necks, and long legs for wading in shallow water

HERONS AND BITTERNS – *Ardeidae*

BOAT-BILLED HERON – *Cochleariidae*

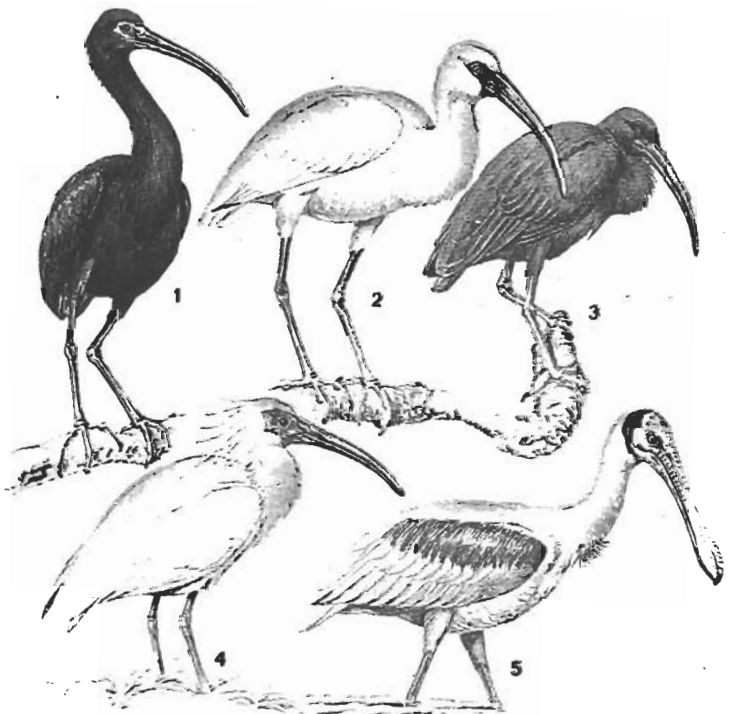
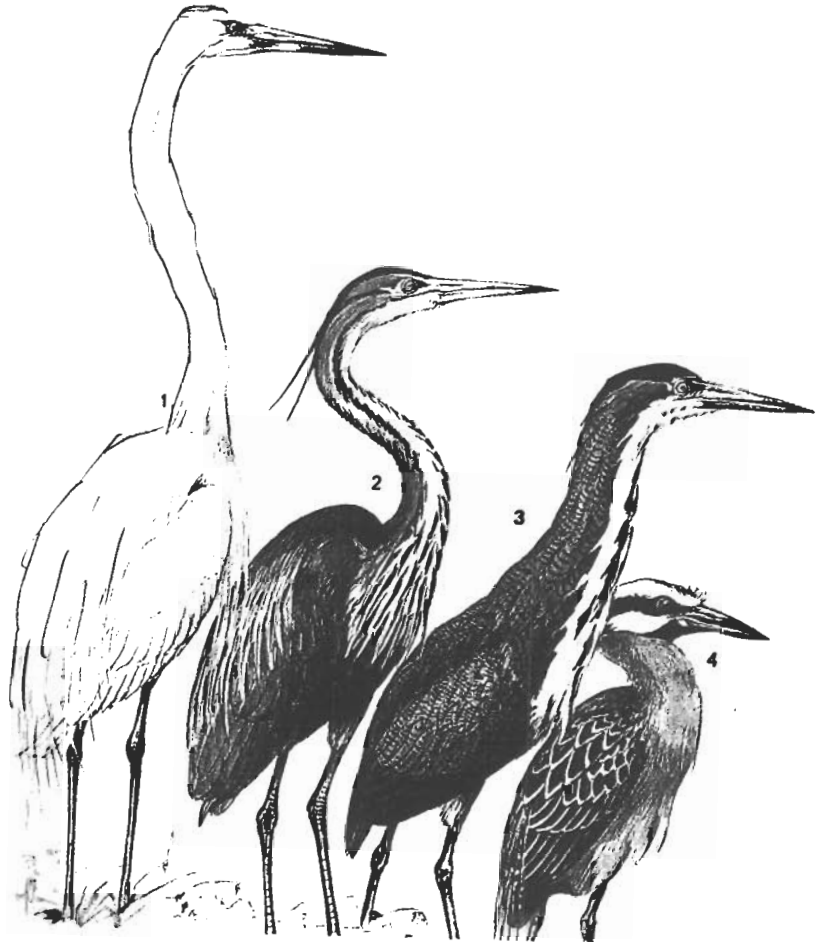
WHALE-HEADED STORK – *Balaenicipitidae*

HAMMERHEAD – *Scopidae*

STORKS – *Ciconiidae*

IBISES AND SPOONBILLS – *Threskiornithidae*

New World Vultures – *Cathartidae*

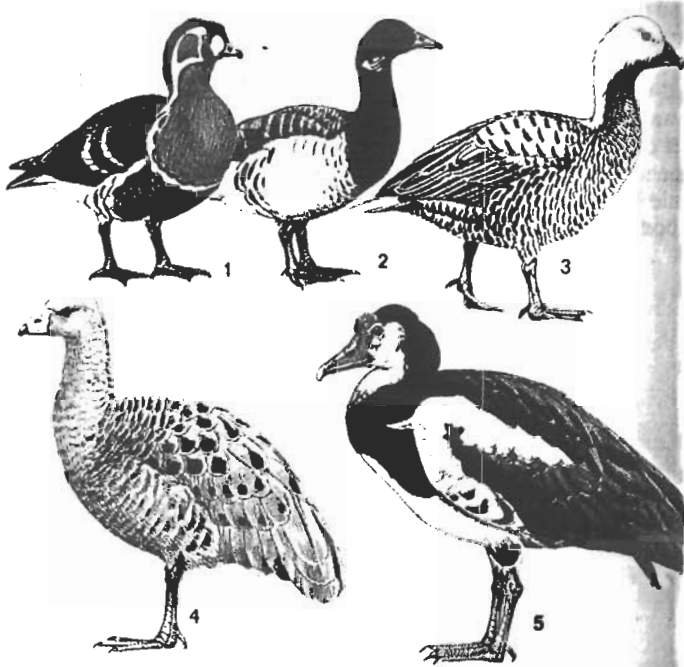


ANSERIFORMES

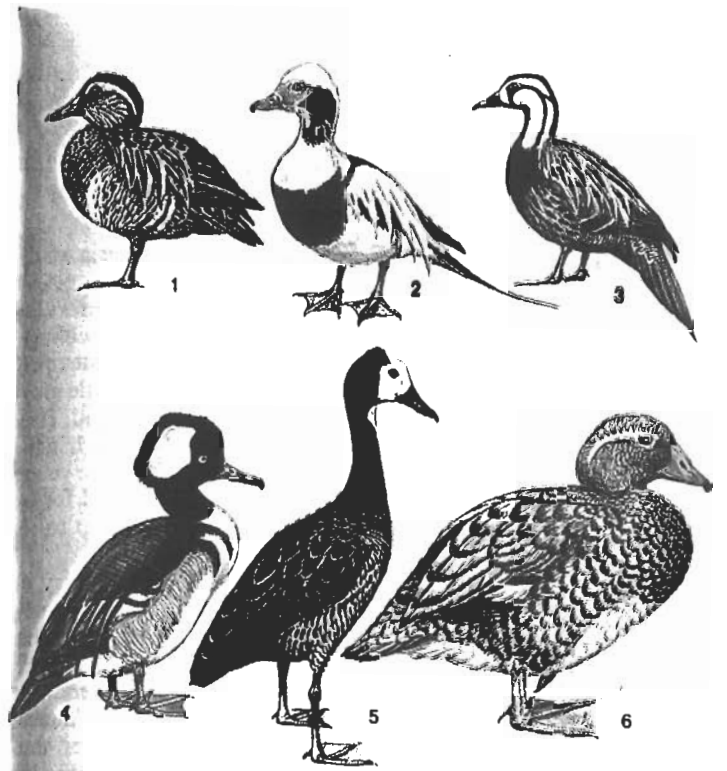
Waterfowl are gregarious birds with webbed feet.
All lay plain, unspotted eggs

SCREAMERS — *Anhimidae*

SWANS, GEESE AND DUCKS — *Anatidae*



Geese display a greater variety of plumage colours than do swans
Red-breasted goose *Branta ruficollis*, (2) Brent goose (or Brant) *B. bern*
(3) Emperor goose *Anser canagicus*, (4) Cape Barren goose *Cereo*
novae-hollandiae and (5) the Spur-winged goose *Plectropterus gambel*



Six species of duck. (1) Garganey *Anas querquedula*, (2) Long-tailed duck
(or Oldsquaw) *Clangula hyemalis*, (3) Torrent duck *Merganetta armata*, (4)
Hooded merganser *Mergus cucullatus*, (5) White-faced tree duck *Dendro-*
cygna viduata and (6) the Steamer duck *Tachyeres brachypterus*.

FALCONIFORMES

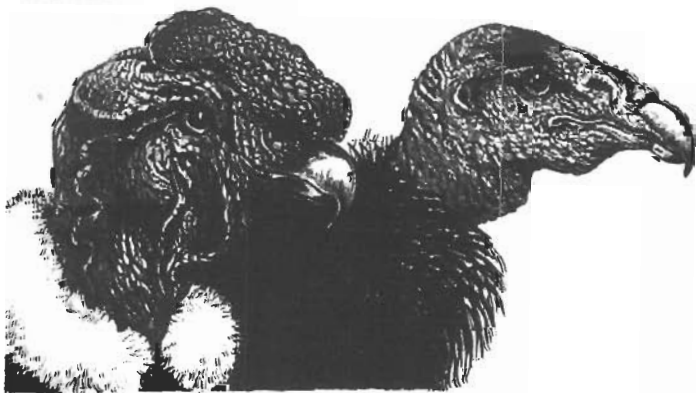
The birds of prey are a varied group. Some hunt
rodents, others eat lizards and a few snatch insects
from the air

SECRETARY BIRD — *Sagittariidae*

HAWKS AND EAGLES — *Accipitridae*

OSPREY — *Pandionidae*

FALCONS — *Falconidae*



Details of the heads of Andean condor *Vultur gryphus* (left) and the Californ-
ia condor *Gymnogyps californianus*. The head of the male Andean condor
is crowned with a fleshy caruncle.



The Red kite *Milvus milvus* (1), Hen harrier (or Marsh hawk) *Circus cyaneus*
(2) and Verreaux's eagle *Aquila verreauxi* (3).

GALLIFORMES

Game-birds are usually ground-dwellers. Many have elaborate courtship displays

MEGAPODES — *Megapodiidae*

GUANS — *Cracidae*

GROUSE — *Tetraonidae*

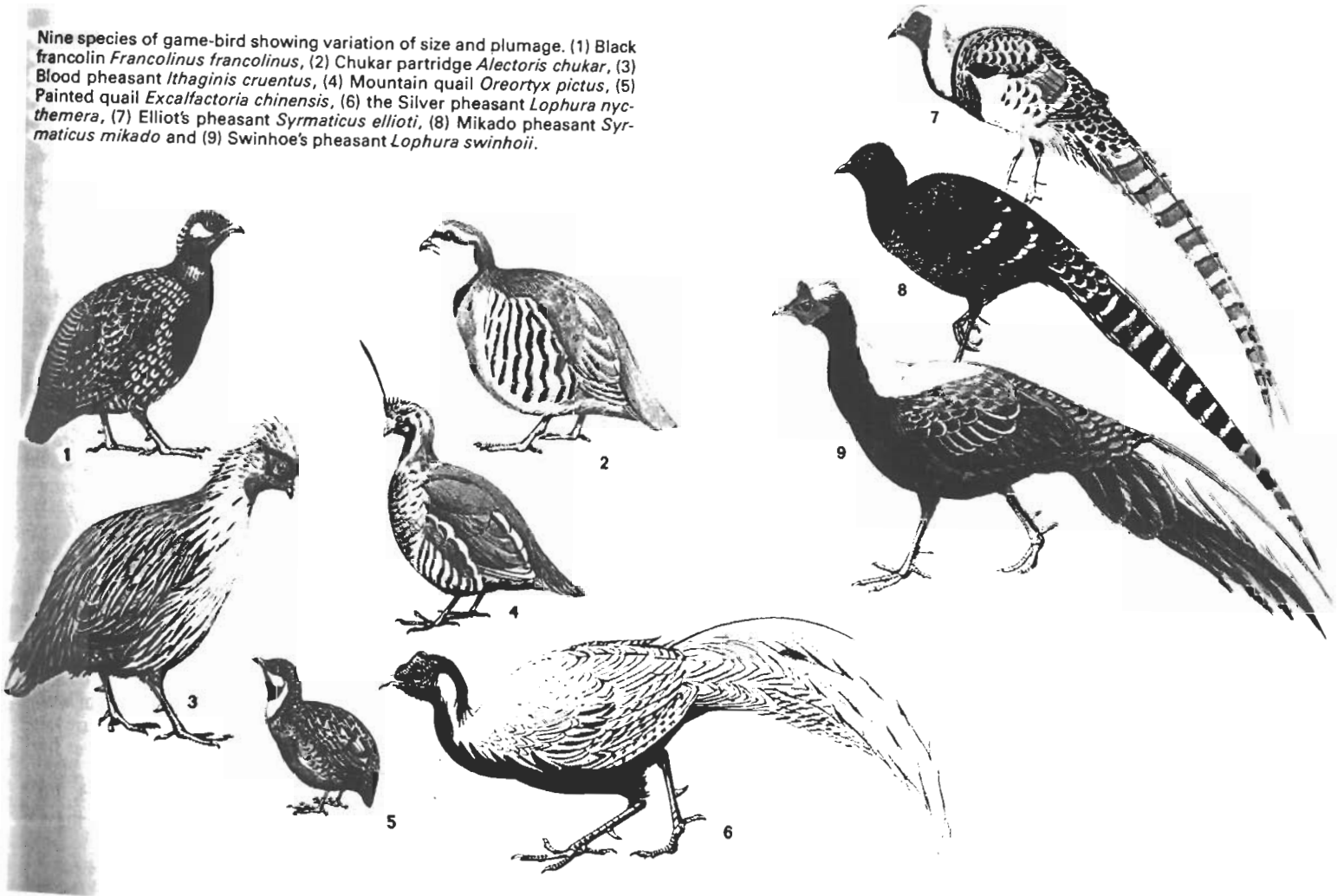
PHEASANTS AND QUAILS — *Phasianidae*

GUINEAFOWL — *Numididae*

TURKEYS — *Meleagrididae*

inac →

Nine species of game-bird showing variation of size and plumage. (1) Black francolin *Francolinus francolinus*, (2) Chukar partridge *Alectoris chukar*, (3) Blood pheasant *Ithaginis cruentus*, (4) Mountain quail *Oreortyx pictus*, (5) Painted quail *Excalfactoria chinensis*, (6) the Silver pheasant *Lophura nymthemera*, (7) Elliot's pheasant *Syrmaticus ellioti*, (8) Mikado pheasant *Syrmaticus mikado* and (9) Swinhoe's pheasant *Lophura swinhoii*.



GRUIFORMES

Ground-feeding and ground-nesting birds.
Most species rarely fly

ROATELOS — *Mesoenaidae*
 BUTTONQUAILS — *Turnicidae*
 PLAINS WANDERER — *Pedionomidae*
 CRANES — *Gruidae*
 LIMPKIN — *Aramidae*
 TRUMPETERS — *Psophiidae*
 RAILS — *Rallidae*
 SUN GREBES — *Heliornithidae*
 KAGU — *Rhynchoetidae*
 SUNBITTERN — *Eurypygidae*
 SERIEMAS — *Cariamidae*
 BUSTARDS — *Otididae*

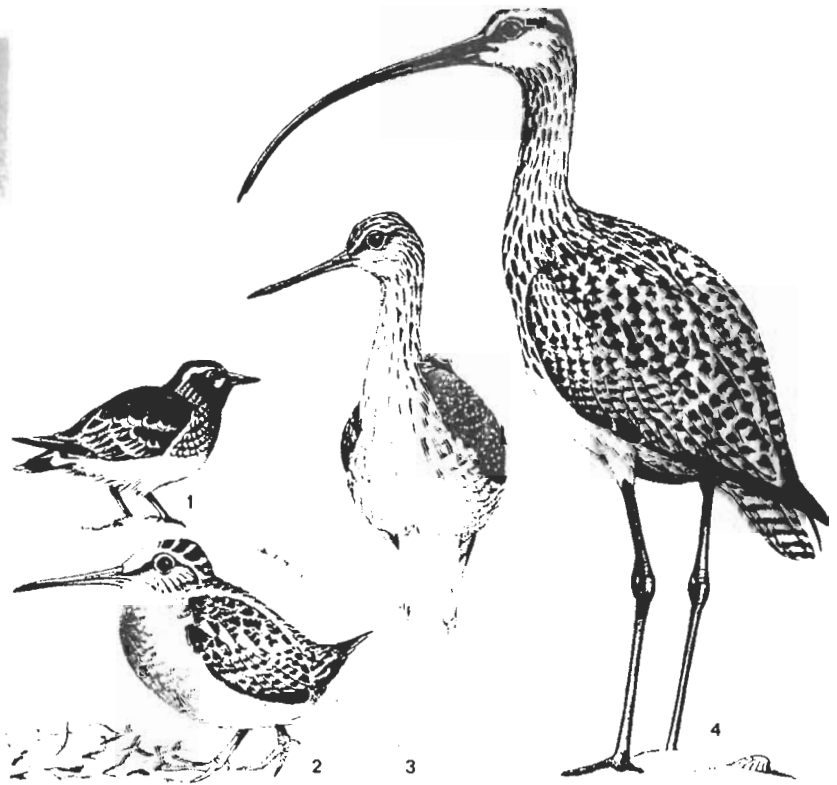


Six species of crane to show variation of plumage and relative height. (1) Whooping crane *Grus americana*, (2) Manchurian *G. japonensis*, (3) Siberian crane *G. leucogeranus*, (4) Crowned *Balearice pavonina*, (5) Stanley *Tarbotius aradisa* and (6) the Demoiselle crane *Anthropoides virgo*. An Australian brolga *Grus rubicunda* (7) is depicted to show how the neck and feet are extended in flight, and a pair of Common cranes *Grus grus* (8) are seen performing a courtship dance.

CHARADRIIFORMES

The waders and shorebirds often breed in large colonies and undergo long-distance migrations

JACANAS — *Jacanidae*
 PAINTED SNIPE — *Rostratulidae*
 OYSTERCATCHERS — *Haematopodidae*
 PLOVERS — *Charadriidae*
 SANDPIPERS — *Scolopacidae*
 AVOCETS AND STILTS — *Recurvirostridae*
 PHALAROPES — *Phalaropodidae*
 CRAB PLOVER — *Dromadidae*
 THICK-KNEES — *Burhinidae*
 PRATINCOLES AND COURSERS — *Glareolidae*
 SEED SNIPE — *Thinocoridae*
 SHEATHBILLS — *Chionididae*
 SKUAS AND JAEGERs — *Stercorariidae*
 GULLS AND TERNS — *Laridae*
 SKIMMERS — *Rynchopidae*
 AUKS — *Alcidae*



Four species of sandpiper to show variety of size and bill shape. (1) Black turnstone *Arenaria melanocephala*, (2) American woodcock *Philohela minor*, (3) Greater yellowlegs *Tringa melanoleuca* and (4) the Long-billed curlew *Numenius americanus*.

COLUMBIFORMES

The 255 species of pigeons include pink ones, blue ones and even some with spectacular crowns

SANDGROUSE — *Pteroclididae*
 DODOS — *Raphidae*
 PIGEONS — *Columbidae*



Rock dove *Columba livia* (1) is the ancestor of all domestic pigeons. Other species: (2) the Orange dove *Ptilinopus victor*, (3) Masked dove *Oena capensis*, (4) the Magnificent fruit dove *Megalopreia magnifica*.

CUCULIFORMES

Many cuckoos are nest parasites and lay their eggs in nests made by other birds

TURACOS — *Musophagidae*
 CUCKOOS — *Cuculidae*
 HOATZIN — *Opisthocomidae*



Seven species of cuckoos: (1) The Oriental cuckoo *Cuculus sarawakensis*, (2) The Great cuckoo *Cuculus gularis*, (3) The Golden-banded cuckoo *Chrysococcyx lucifer*, (4) Crested cuckoo *Cuculus cristatus*, (5) Long-billed cuckoo *Eudynamis mindanensis* and (7) the Smooth-billed cuckoo *Crotophaga sulcirostris*.

CAPRIMULGIFORMES

Mainly nocturnal birds, with long, pointed wings and gaping mouths for catching insects

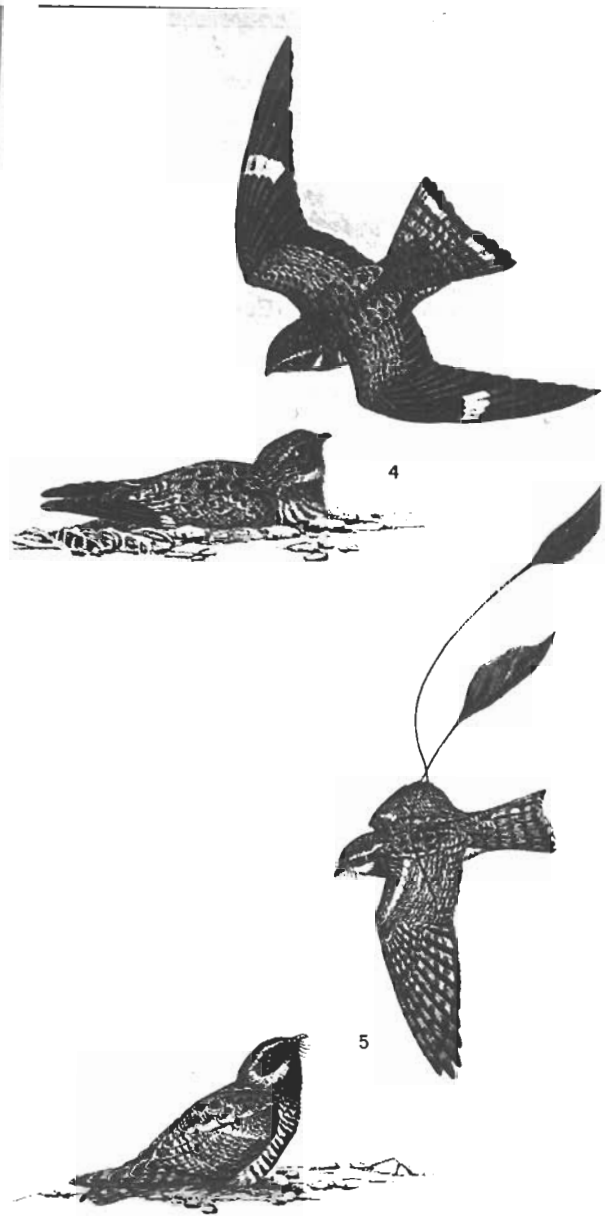
OILBIRD — *Steatornithidae*

FROGMOUTHS — *Podargidae*

POTOOS — *Nyctibiidae*

OWLET-FROGMOUTHS — *Aegothelidae*

NIGHTJARS — *Caprimulgidae*

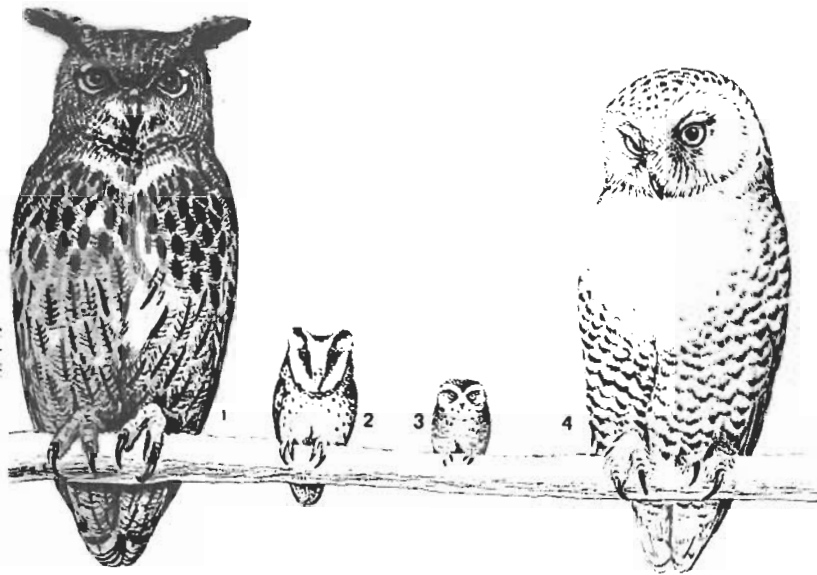


STRIGIFORMES

Usually creatures of the night, these birds of prey have a nearly soundless flight

BARN OWLS — *Tytonidae*

TYPICAL OWLS — *Strigidae*

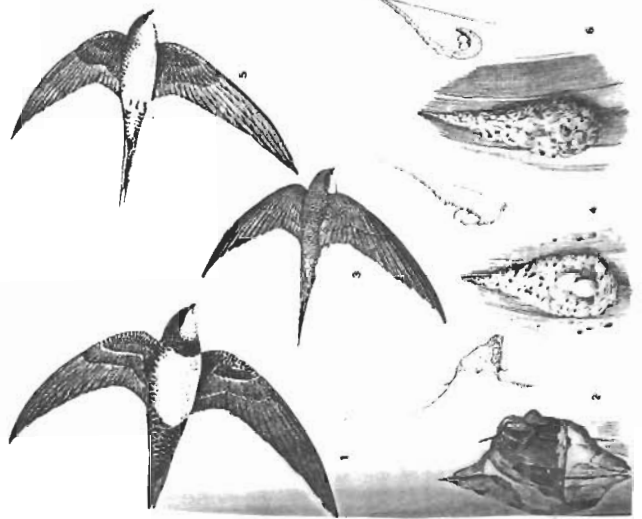
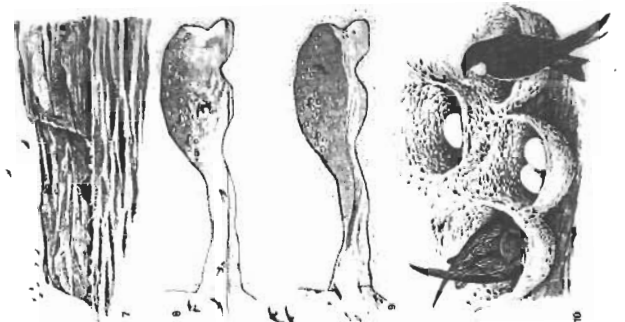
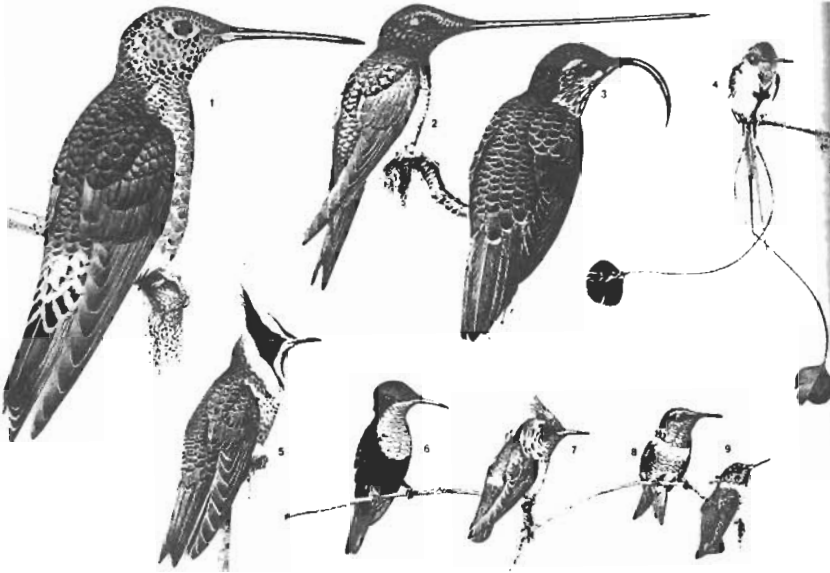


Four species of owl to show size variation. (1) The Eagle owl *bubo bubo*, (2) Oriental bay owl *Phodilus badius* (a barn owl), (3) Elf owl *Micrathene whitneyi* and (4) the Snowy owl *Nyctea scandiaca*.

APODIFORMES

Birds capable of fast and acrobatic flight on slender, pointed wings. Their feet are extremely small

TYPICAL SWIFTS – *Apodidae*
 CRESTED SWIFTS – *Hemiprocnidae*
 HUMMINGBIRDS – *Trochilidae*



PICIFORMES

Birds in which the feet usually have two toes pointing forwards and two backwards. All have specialized bills and feeding habits

JACAMARS – *Galbulidae*
 PUFFBIRDS – *Bucconidae*
 BARBETS – *Capitonidae*
 HONEY-GUIDES – *Indicatoridae*
 TOUCANS – *Ramphastidae*
 WOODPECKERS – *Picidae*



Five species of woodpecker. (1) Ivory-billed woodpecker *Campephilus principalis*, (2) Wryneck *Jynx torquilla*, (3) Arrowhead piculet *Picumnus minutissimus*, (4) Red-headed woodpecker *Melanerpes erythrocephalus*, (5) White woodpecker *Leuconerpes candidus* and (6) Great spotted woodpecker *Dendrocopos major*.

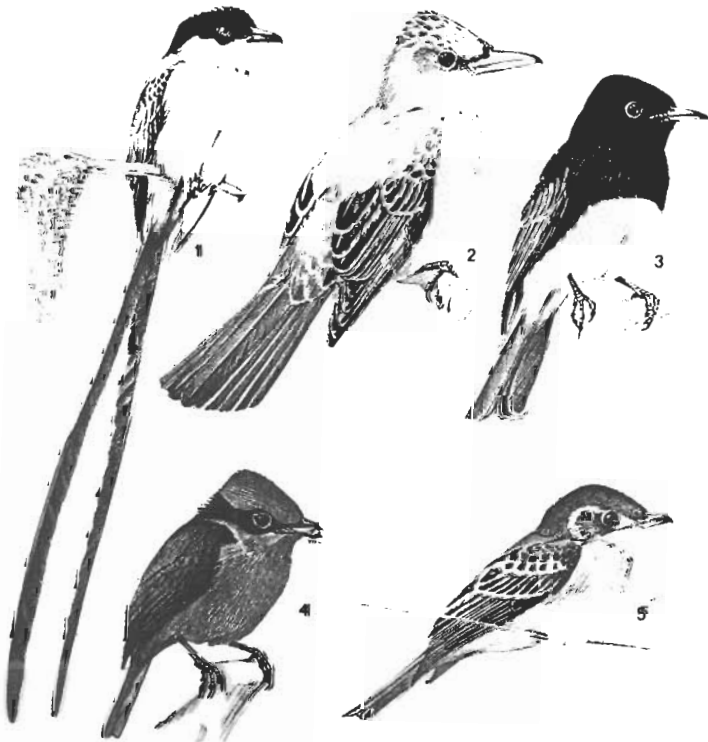
PASSERIFORMES

An order containing more than a third of all living families and over half the living bird species. The passerines are the so-called perching birds and have feet adapted to cling to branches, reeds or even man-made objects such as telephone wires, in such a way that the grip automatically tightens when the bird falls backwards. Passerines include all those birds noted for their ability to sing, and are sometimes called the 'song birds' as a result.

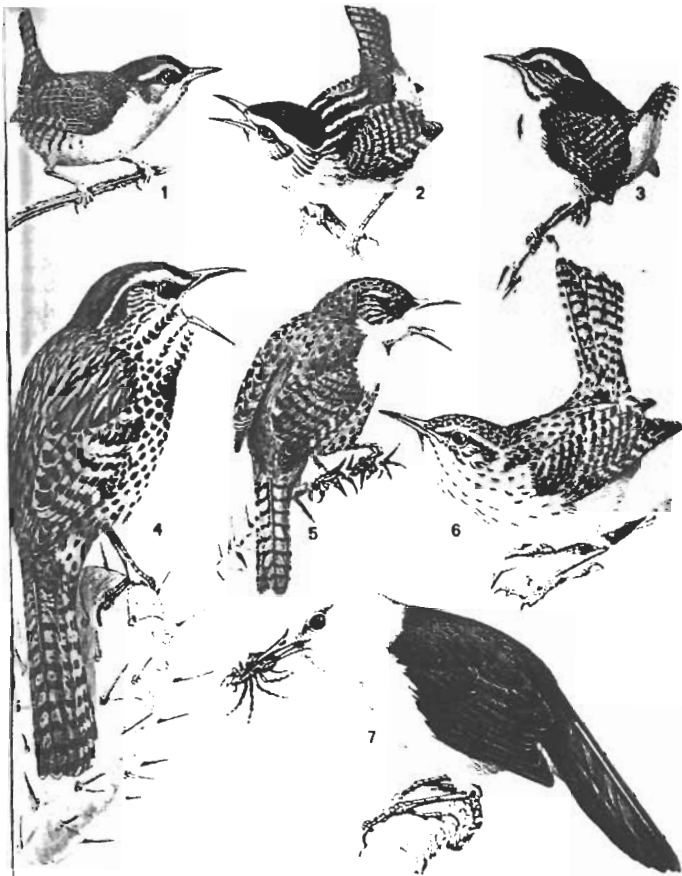
- BROADBILLS – *Eurylaimidae*
- WOODCREEPERS – *Dendrocolaptidae*
- OVENBIRDS – *Furnariidae*
- ANTBIRDS – *Formicariidae*
- ANTPIPITS – *Conopophagidae*
- TAPACULOS – *Rhinocryptidae*
- COTINGAS – *Cotingidae*
- MANAKINS – *Pipridae*
- TYRANT FLYCATCHERS – *Tyrannidae*
- SHARPBILLS – *Oxyruncidae*
- PLANTCUTTERS – *Phytotomidae*
- PITTAS – *Pittidae*
- NEW ZEALAND WRENS – *Acanthisittidae*
- ASITYS – *Philepittidae*
- LYREBIRDS – *Menuridae*
- SCRUB-BIRDS – *Atrichornithidae*
- LARKS – *Alaudidae*
- SWALLOWS – *Hirundinidae*
- WAGTAILS AND PIPITS – *Motacillidae*
- CATERPILLAR BIRDS – *Campephagidae*
- BULBULS – *Pycnonotidae*
- FAIRY BLUEBIRDS AND LEAFBIRDS – *Irenidae*
- SHRIKES – *Laniidae*
- VANGAS – *Vangidae*
- WAXWINGS – *Bombycillidae*

- PALMCHAT – *Dulidae*
- DIPPERS – *Cinclidae*
- WRENS – *Troglodytidae*
- MOCKINGBIRDS AND THRASHERS – *Mimidae*
- HEDGE SPARROWS – *Prunellidae*
- THRUSHES – *Turdidae*
- BABLERS – *Timaliidae*
- OLD WORLD WARBLERS – *Sylviidae*
- AUSTRALIAN WREN WARBLERS – *Maluridae*
- OLD WORLD FLYCATCHERS – *Muscicapidae*
- PENDULINE TITS – *Remizidae*
- LONG-TAILED TITS – *Aegithalidae*
- TITMICE – *Paridae*
- NUTHATCHES – *Sittidae*
- AUSTRALIAN TREECREEPERS – *Climacteridae*
- TYPICAL CREEPERS – *Certhiidae*
- FLOWER PECKERS – *Dicaeidae*
- SUNBIRDS – *Nectariniidae*
- WHITE-EYES – *Zosteropidae*
- AUSTRALIAN CHATS – *Epthianuridae*
- AUSTRALIAN HONEYEATERS – *Meliphagidae*
- BUNTINGS AND AMERICAN SPARROWS – *Emberizidae*
- AMERICAN WOOD WARBLERS – *Parulidae*
- HAWAIIAN HONEYCREEPERS – *Drepaniidae*
- VIREOS – *Vireonidae*
- AMERICAN BLACKBIRDS AND ORIOLES – *Icteridae*
- CHAFFINCHES AND LINNETS – *Fringillidae*
- WAXBILLS – *Estrildidae*
- TYPICAL WEAVERS – *Ploceidae*
- STARLINGS – *Sturnidae*
- OLD WORLD ORIOLES – *Oriolidae*
- DRONGOS – *Dicruridae*
- WATTLEBIRDS – *Callaeidae*
- MUDNEST-BUILDERS – *Grallinidae*
- WOOD-SWALLOWS – *Artamidae*
- BELL-MAGPIES – *Cracticidae*
- BOWERBIRDS – *Ptilonorhynchidae*
- BIRDS OF PARADISE – *Paradisaeidae*
- CROWS, JAYS AND MAGPIES – *Corvidae*

Five species of tyrant flycatcher to show the family's diversity. (1) Fork-tailed flycatcher *Muscivora tyrannus*, (2) Great crested flycatcher *Myiarchus crinitus*, (3) Black phoebe *Sayornis nigricans*, (4) Vermilion flycatcher *Pyrocephalus rubinus* and (5) Buff-breasted flycatcher *Empidonax tulvifrons*.

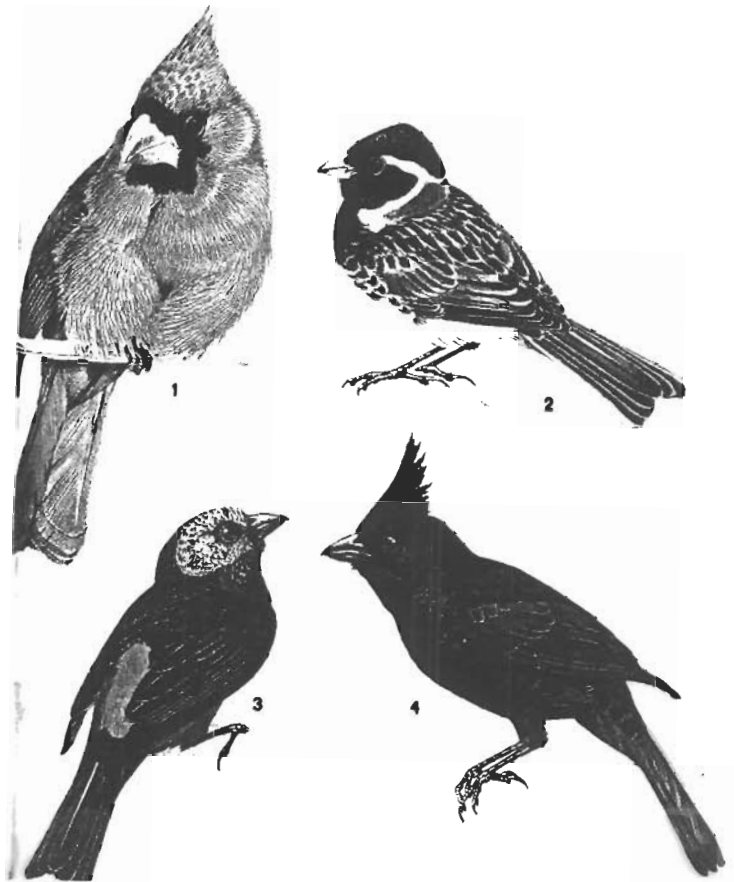


Five species of swallows. (1) Common (or Barn) swallow *Hirundo rustica*, (2) Red-rumped swallow *Hirundo daurica*, (3) Cliff swallow *Petrochelidon pyrrhonota*, (4) Tree swallow *Iridoprocne bicolor* and (5) Sand martin (or Bank swallow) *Riparia riparia*.



Most wrens have a retiring disposition and avoid coming out into the open. (1) Winter wren *Troglodytes troglodytes*, (2) Long-billed marsh wren *Cistothorus palustris*, (3) Lowland wood wren *Henicorhina leucosticta*, (4) Northern cactus wren *Campylorhynchus bruneicapillus*, (5) Canyon wren *Salpinctes mexicanus*, (6) Rock wren *S. obsoletus* and (7) White-headed wren *Campylorhynchus albobrunneus*.

Brightly coloured birds in the bunting family. (1) Cardinal *Pyrrhuloxia cardinalis*, (2) Lapland bunting (or longspur) *Calcarius lapponicus*, (3) Paradise tanager *Tangara chilensis* and (4) Crested bunting *Melophus lathami*.



Some American blackbirds and orioles. (1) Male and (2) female Boat-tailed grackle *Quiscalus major*, (3) Bobolink *Dolichonyx oryzivorus*, (4) Red-winged blackbird *Agelaius phoeniceus*, (5) Military (or Red-breasted) blackbird *Leistes militaris* and (6) Rusty blackbird *Euphagus carolinus*.

