WATCHING BIRDS

AN INTRODUCTION TO ORNITHOLOGY

Introduction

Watching Birds, an Introduction to Ornithology

SUBJECT	DESCRIPTION
"What Good Are Birds? Watching Birds & Program Introduction	• How & Why birds are studied • Birds and you
"Where Did Birds Come From & Where Are They Going" Origin, Evolution, & Flight	• Ancestry • Evolution of flight • Formation of species
"How Do You Build A Bird?" Form	• External Characters • Non feathered areas
"How Come Birds Can Fly But I Can't ?" Feathers & Flight	• Types of feathers • Feather structure • Molts and color • Aerodynamics of flight • Types of flight
"You Eat Like A Bird" Food, Feeding Habits & Digestion	• Digestive system • Feeding techniques • Food types • Metabolism
"Let's Learn About Bird Bones, Bird Brains, And Muscles" Anatomy Part I	• Skeletal System • Muscular System • Nervous system
"Birds Have Hearts And Other Interesting Parts" Anatomy Part II	• Endocrine system • Circulatory system • Urogenital System
"Can You Sing Like A Bird?" Voice	• Song • Sounds • Purpose
"Growing Baby Birds Is For The Birds" Breeding Cycle II	• Hatching • Development • Care of young • Nests

Continued

"What's Bird Migration All About?" Migration	• Origins • Conditions • Flight paths • More •
"Birds Are Everywhere You Look?" Distribution And Winter Habits	• Extremes • Factors • Range
"Are Birds Going To Survive Mankind?" Conservation	• Predation • People and birds
"How To Attract Birds Without Really Trying" Attracting & Caring For Birds	• Feeding • Water • Nesting • Planting
"So You Want To Be A Birdwatcher?" Bird Watching Basics	• field guides • optics • how to

WHY STUDY BIRDS?

- Pleasure of Hunting (without the mess)
- Collecting
- Beauty
- Camaraderie
- Curiosity
- Easily Studied – anywhere in world
- Variety
- Birds are environmental indicators
- Lifetime learning

BIRDS DEFINED

- Feathers
- Warm blooded
- Egg layers
- Flight - principle means of locomotion

ORNITHOLOGY DEFINED

- Science of Birds
- Greek & English origins of word

HISTORY OF THE STUDY OF BIRDS

- Cave Art
- Tombs
- Biblical
- Aristotle
- Francis Willoughby
- Carl Linnaeus
- United States – Catesby, Wilson, Audubon, Chapman, R.T. Peterson

CARBONATED WARBLER

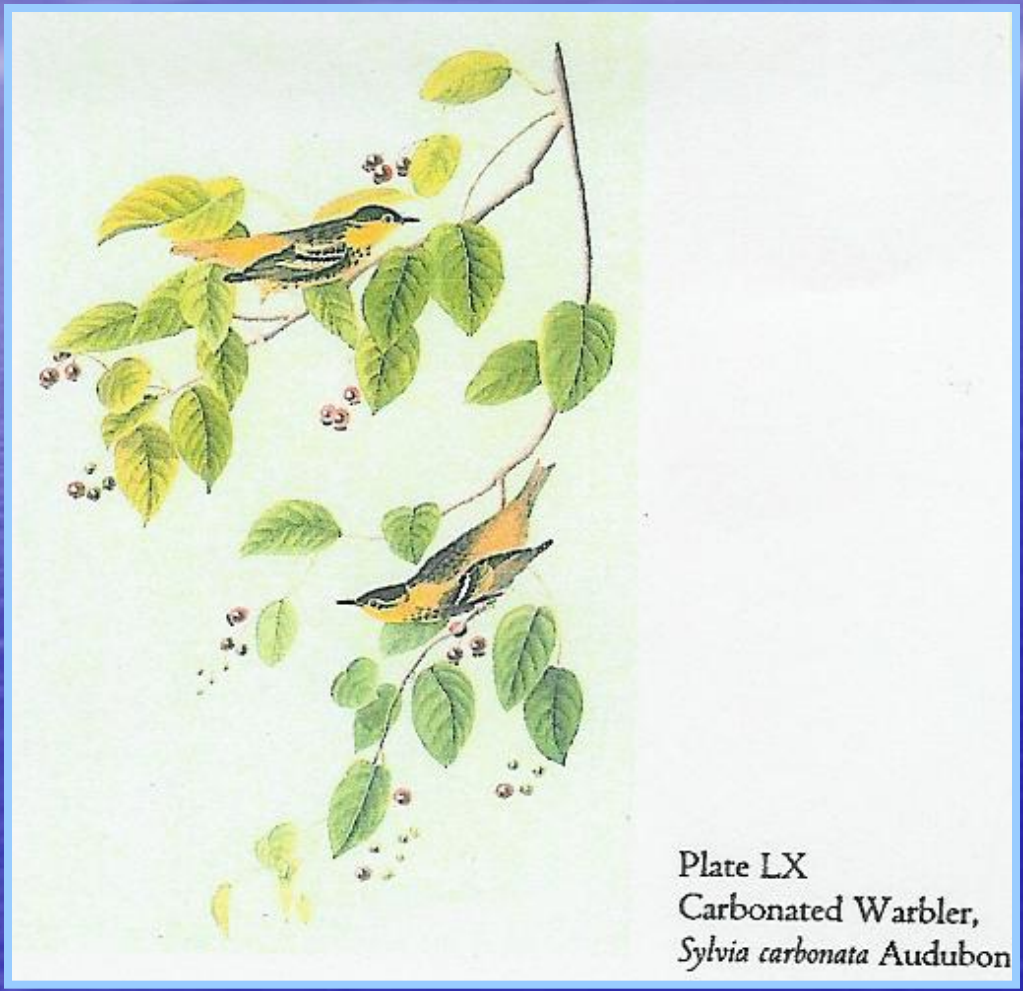


Plate LX
Carbonated Warbler,
Sylvia carbonata Audubon

UNUSUAL AMONG SCIENCES

- Opportunities for non-professional
- Margaret Nice, A.C.Bent

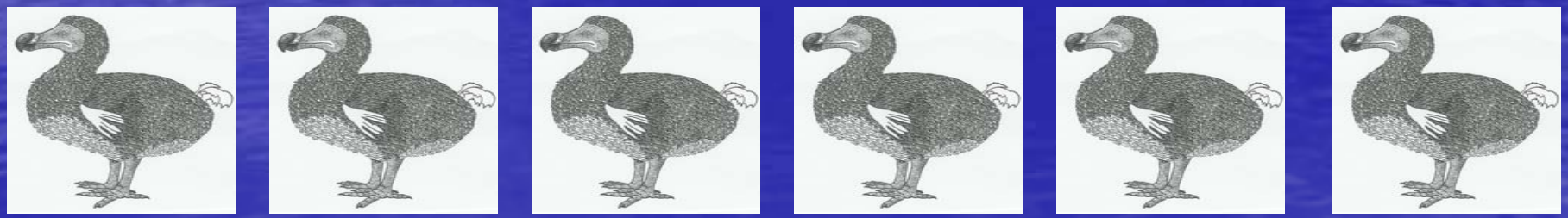
BIRDS & DISEASE

- Encephalitis
- Histoplasmosis
- Viral pneumonia
- Avian influenza

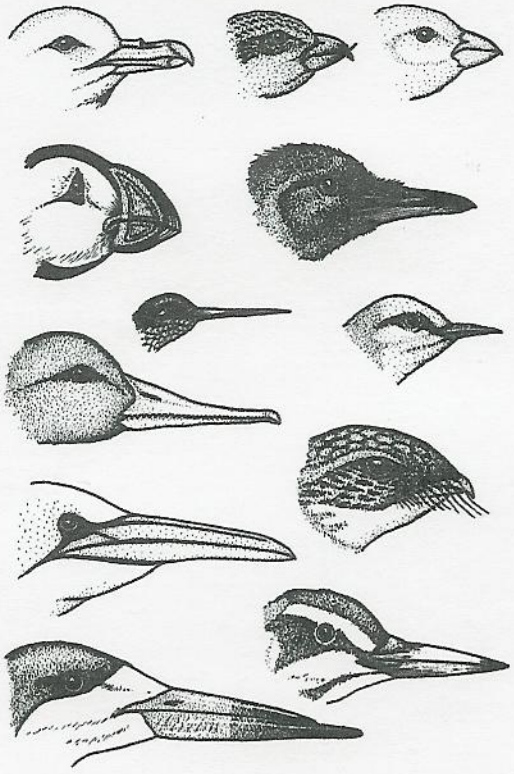
FORM

- BILL SHAPES (nostrils)
- TAIL SHAPES
- WING SHAPES
- FEET (toes & nails)
- LEGS
- PLUMAGE
- MISC. CHARACTERS

BREAK

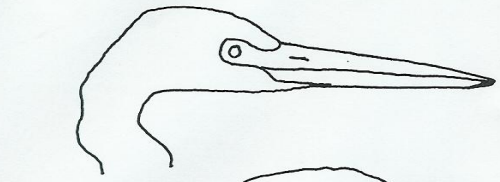


BILLS



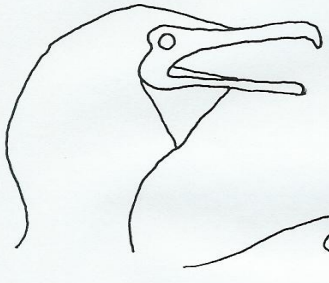
Left to right (and top to bottom): Northern Fulmar, Red Crossbill, Lesser Goldfinch, Atlantic Puffin, American Crow, Ruby-throated Hummingbird, Common Merganser, Prothonotary Warbler, Northern Gannet, Common Nighthawk, Black Skimmer, Hairy Woodpecker.

BILL SHAPES



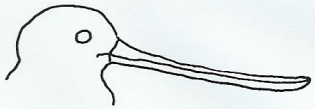
LONG: the bill is much longer than the head.

HOOKED: the upper mandible is longer than the lower, and its tip is bent over the tip of the lower.

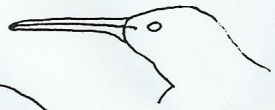


GULAR SAC: the chin, gular region, and jugulum are distended.membranous, sometimes feathered, sometimes partially feathered

ACUTE: the bill tapers to a sharp poin



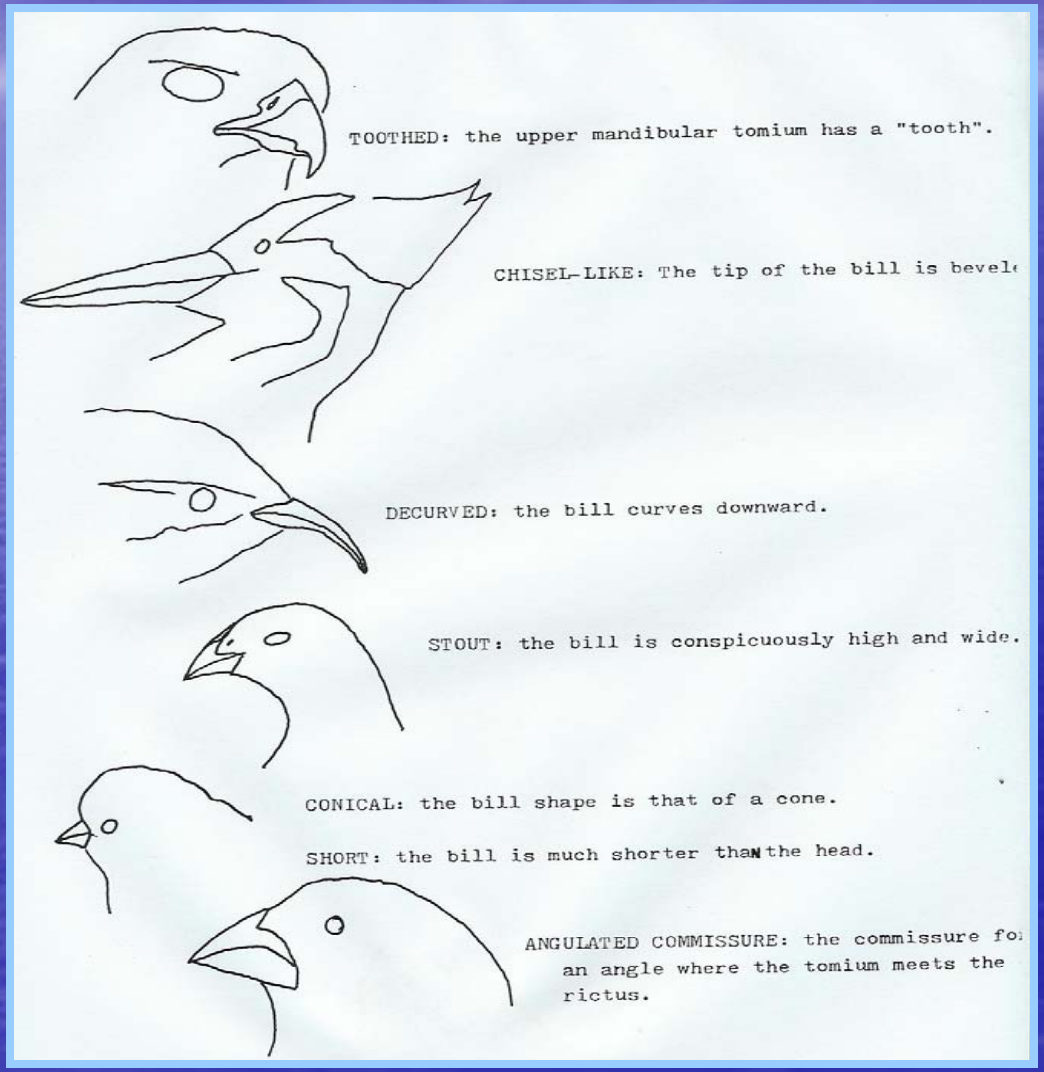
RECURVED: the bill curves upward.



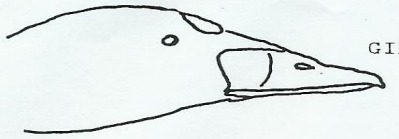
TERETE: the bill is generally circular in cross section or when viewed straight forward.

CROSSED: the tips of the mandibles cross each other.

MORE BILL SHAPES



& MORE BILL SHAPES



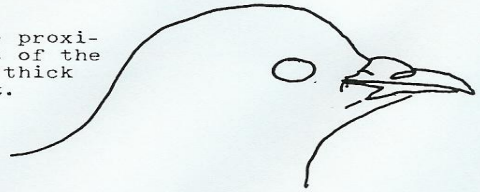
GIBBOUS: the bill has a pronounced hump.

NOTCHED: the bill has a slight nick in the tomia of one or both mandibles, usually near the tip of the upper mandible.

SWOLLEN: the sides of the mandibles are convex.

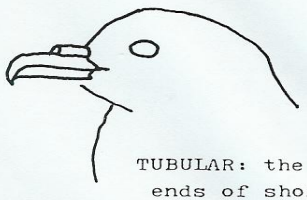
SPECIAL BILL MODIFICATIONS

CERE: the proximal part of the bill is thick and soft.



OPERCULUM: the proximal portion of the bill is soft and overarches the nostrils

NOSTRIL SHAPES



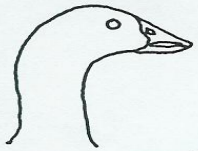
PERFORATE: the nostrils are not separated by a wall or septum.

TUBULAR: the nostrils are in the ends of short prolongations of the base of the upper mandible.

nostrils can also be shaped circular, oval, or linear.

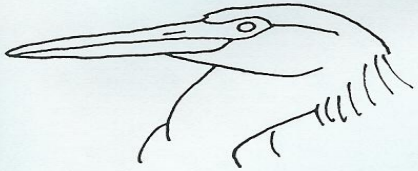
& EVEN MORE BILL SHAPES

COMPRESSED: most of the bill is higher than it is wide.

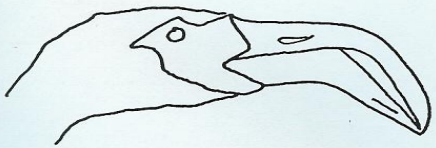


LAMELLATE: (sieve-billed) the mandibles have within their tomia tooth-like ridges.

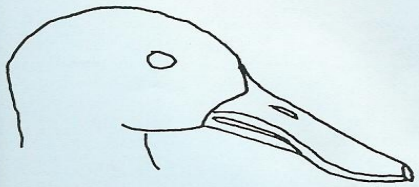
SERRATE: the bill has saw-like tomia.



STRAIGHT: the commissure is in line with the axis of the head.



BENT: the bill is deflected downward(usually) at an angle.

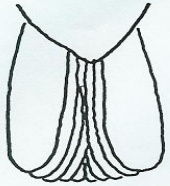


SPATULATE: the bill is much widened or depress toward its tip.

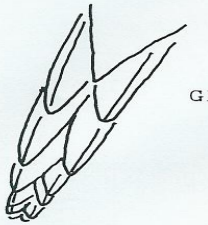
DEPRESSED: the bill is wider than high.

TAIL SHAPES

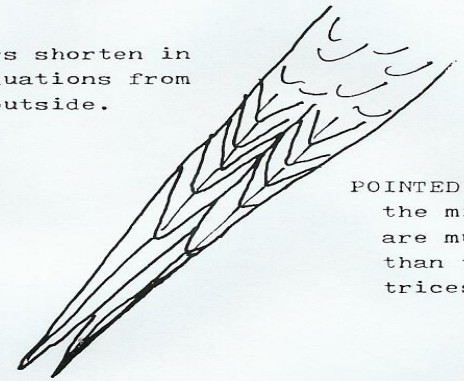
TAIL SHAPES



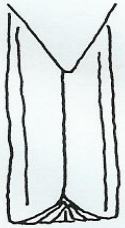
ROUNDED: the tail feathers (rectrices) are shorter successivel from the inside to the outside.



GRADUATED: the feathers shorten in abrupt graduations from inside to outside.

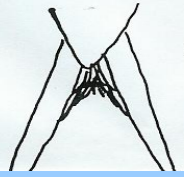


POINTED: or acute, the middle feathe are much longer than the other re trices.



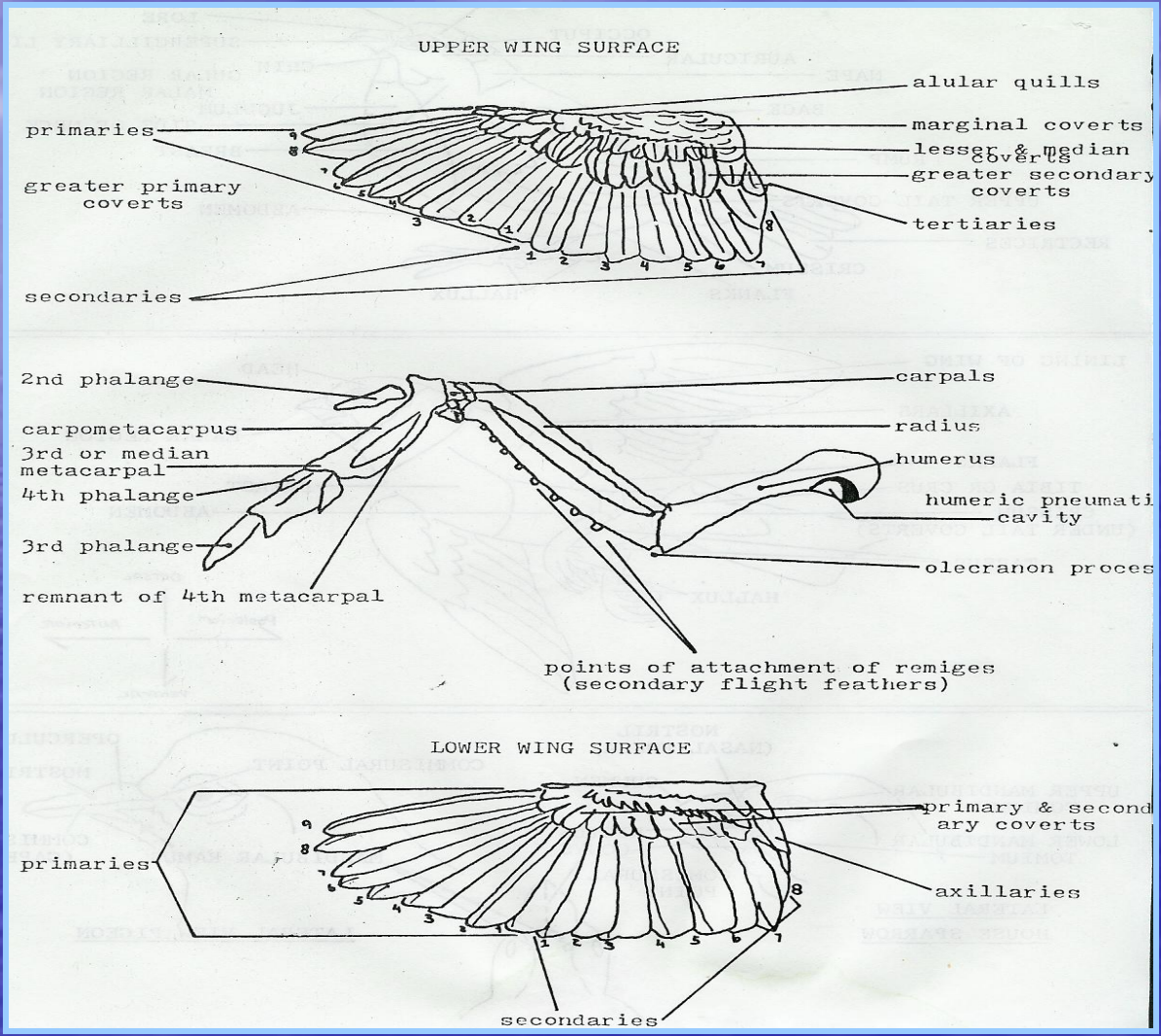
SQUARE: the rectrices are all the same length.

FORKED: the feathers increase in length successively from the middle to the outermost pair, in abrupt graduations.



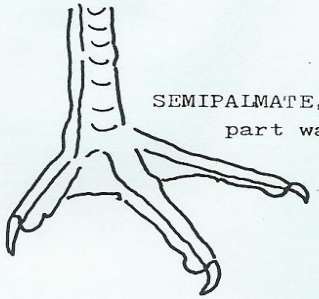
EMARGINATE: the rectrices increase in length from the middle to the outermost pair.

WINGS


UPPER WING SURFACE
alular quills
primaries
marginal coverts
lesser & median coverts
greater primary coverts
greater secondary coverts
tertiaries
secondaries
2nd phalange
carpals
carpometacarpus
radius
3rd or median metacarpal
humerus
4th phalange
humeric pneumatic cavity
3rd phalange
olecranon process
remnant of 4th metacarpal
points of attachment of remiges (secondary flight feathers)
LOWER WING SURFACE
primary & secondary coverts
primaries
axillaries
secondaries

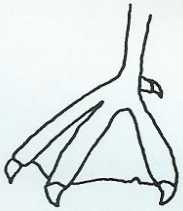
FEET SHAPES

EXTERNAL CHARACTERISTICS OF THE FEET

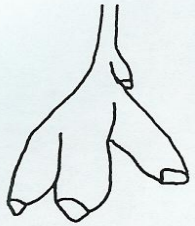


SEMIPALMATE, or half webbed: the toes are joined part way up by a small webbing.

TOTIPALMATE, or fully webbed: all four toes are connected by webbs.



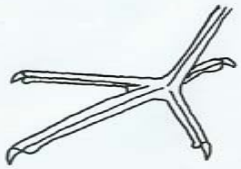
PALMATE, or webbed: the front toes are connected by webbs.



LOBATE, or lobed: a swimming foot with lateral lobes on the toes.

RAPTORIAL: the toes are deeply cleft, with strong, sharply curved nails (talons).

ARRANGEMENT OF TOES



ANISODACTYL: the hallux is behind and the other three toes are in front.

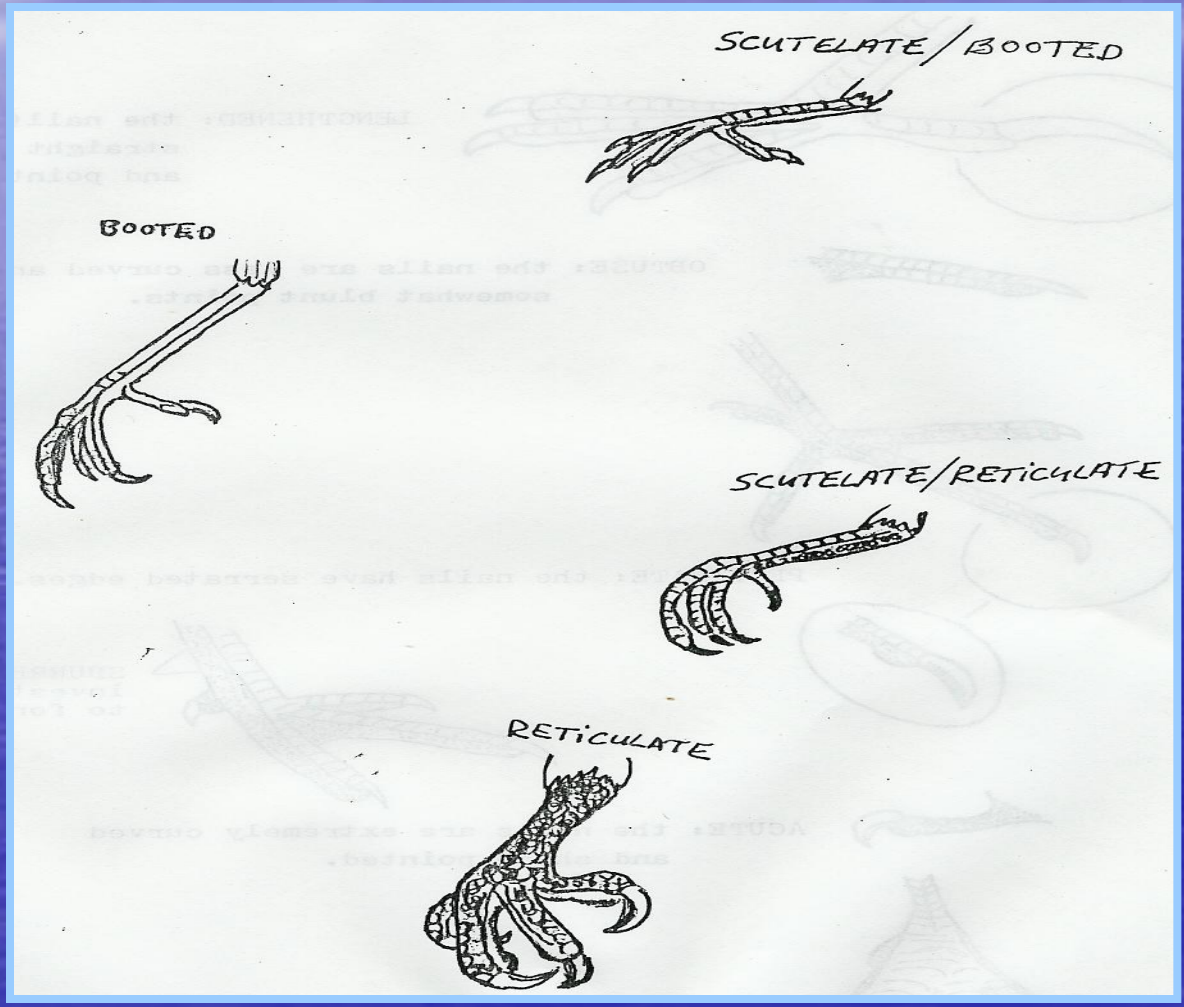
ZYGODACTYL: the toes are arranged in pairs, the second and third in front, the fourth and the hallux in back.

HETERODACTYL: the toes are arranged in pairs the third and fourth toes are in front, the second and the hallux behind.

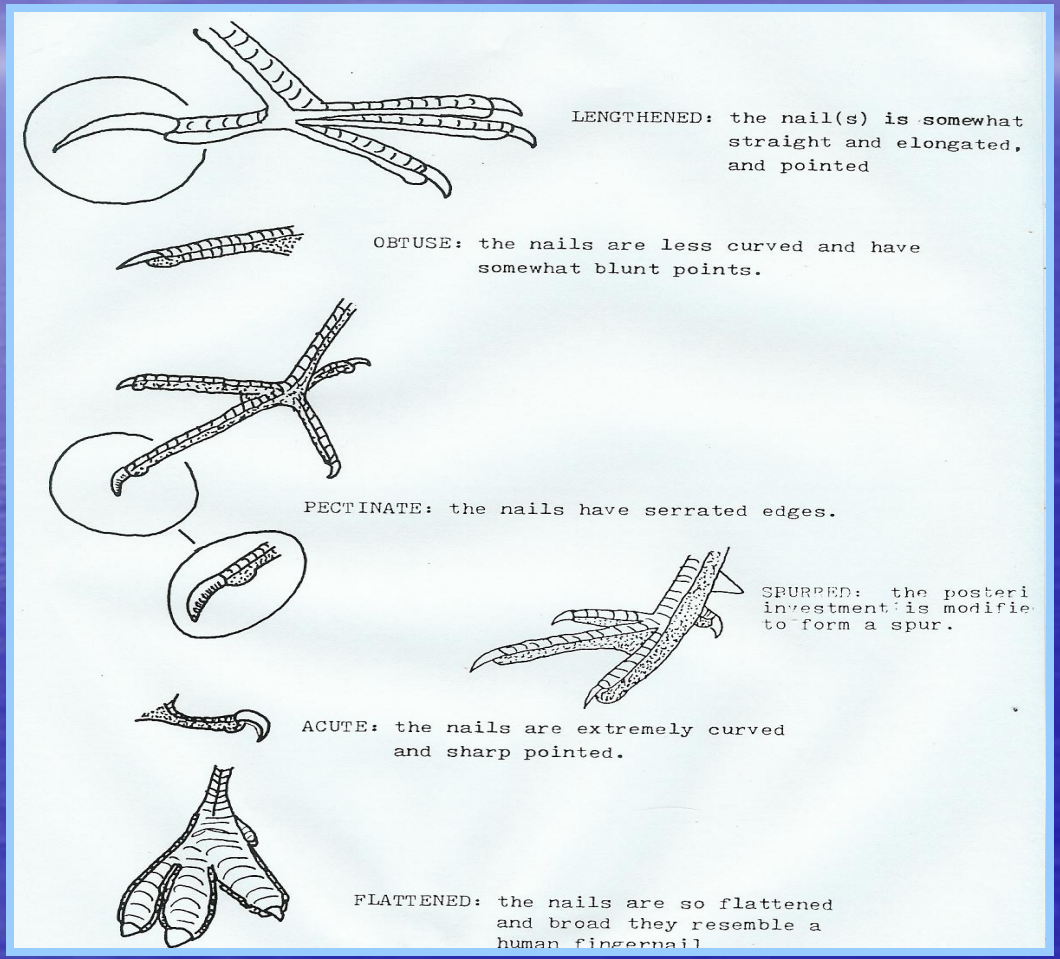
SYNDACTYL: the third and fourth toes(outer and middle are joined for most of their length and have a broad sole in common.

PAMPRODACTYL: all four toes are forward, the hallux is turned forward.

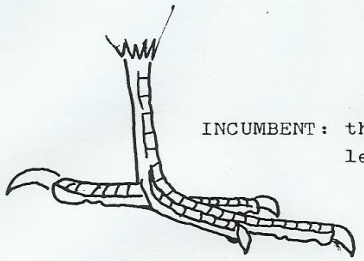
LEGS –Arrangement Of Scales



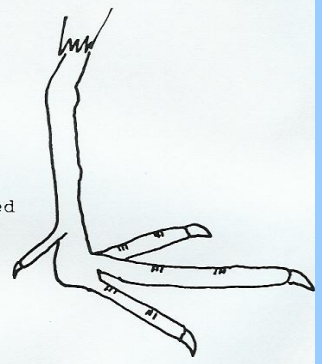
NAIL SHAPES


LENGTHENED: the nail(s) is somewhat straight and elongated, and pointed
OBTUSE: the nails are less curved and have somewhat blunt points.
PECTINATE: the nails have serrated edges.
SPURRED: the posteri investment is modifie to form a spur.
ACUTE: the nails are extremely curved and sharp pointed.
FLATTENED: the nails are so flattened and broad they resemble a human fingernail

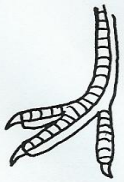
HALLUX – position of hind toe



INCUMBENT: the hallux is located at the level of the other toes.



ELEVATED: the hallux is located high on the metatarsus, its tip does not touch the ground.

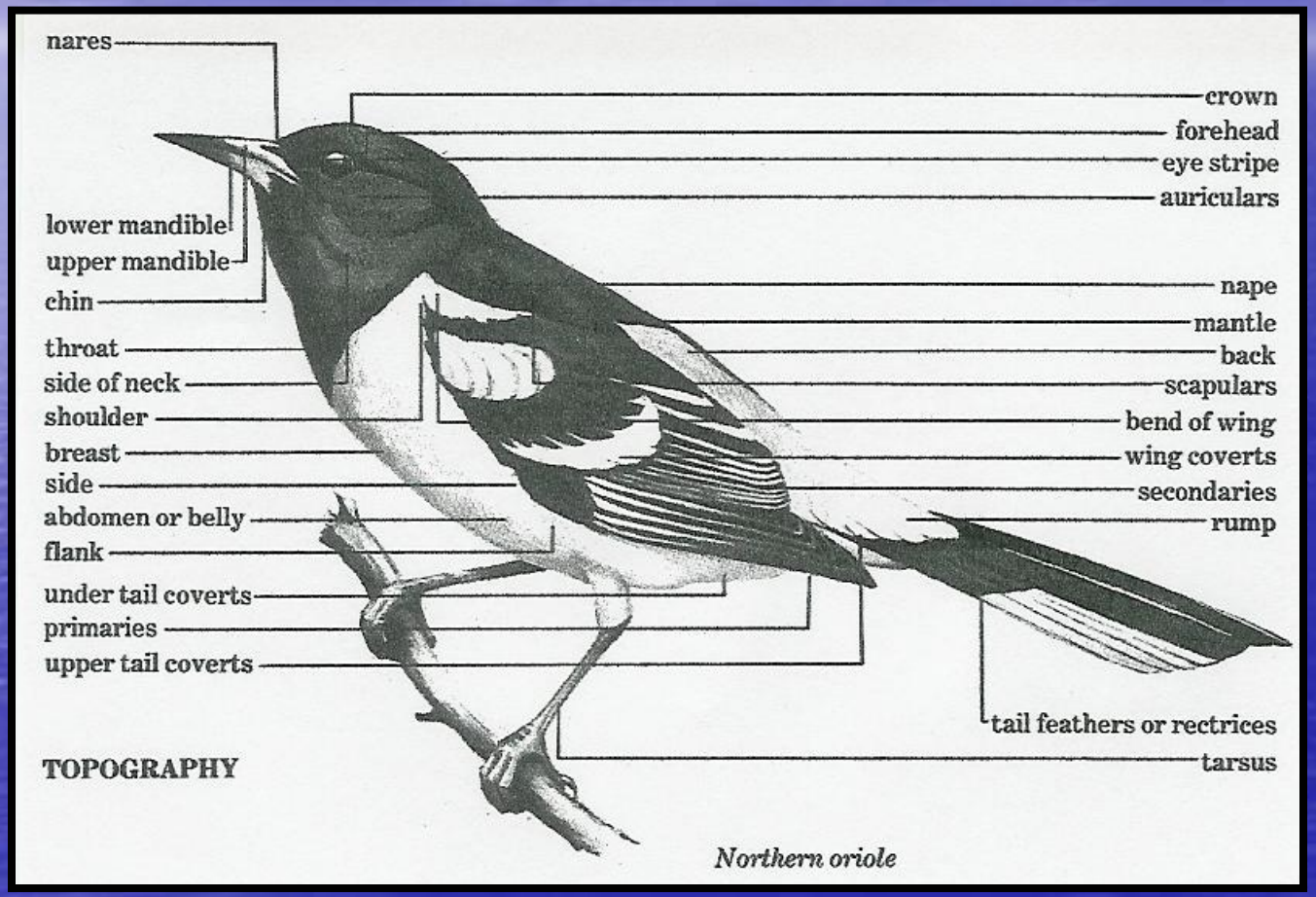


TRIDACTYL: the hallux is absent.

PLUMAGE

- SOFT – Owls
- STIFFENED – Woodpecker/Anhingas
- TOUGH/BRISTLE LIKE
- LAX – Wrentits
- FLUTINGS – Anhingas
- BARE
- COVERED – Feathered Feet - Owls
- MODIFIED FEATHERS Ear Tufts, Crests, Facial Disks

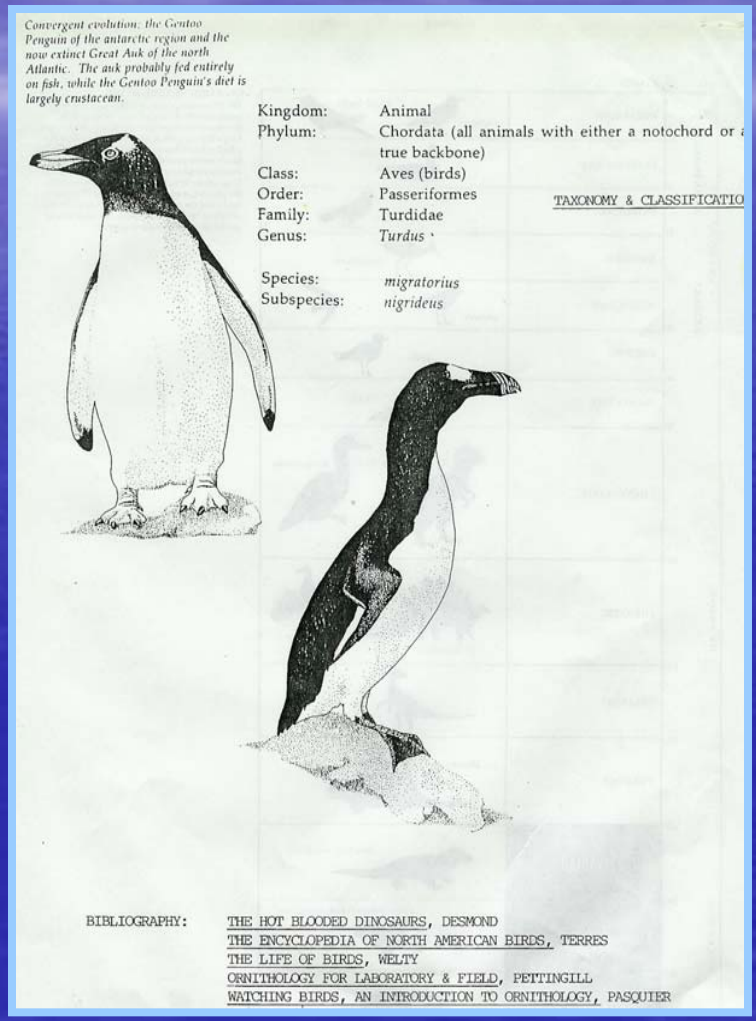
BIRD TOPOGRAPHY



MISCELLANEOUS SHAPES

- Frontal Plate
- Eye Scales
- Wattles
- Carnuncles

SPECIATION, EVOLUTION & TAXONOMY



Convergent evolution: the Gentoo Penguin of the antarctic region and the now extinct Great Auk of the north Atlantic. The auk probably fed entirely on fish, while the Gentoo Penguin's diet is largely crustacean.

TAXONOMY & CLASSIFICATIO

Kingdom:	Animal
Phylum:	Chordata (all animals with either a notochord or a true backbone)
Class:	Aves (birds)
Order:	Passeriformes
Family:	Turdidae
Genus:	*Turdus*
Species:	*migratorius*
Subspecies:	*nigrideus*

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