

Ornithology

BIOL 4044

Class 1 Agenda:

- Introductions
- Syllabus & Course overview
- Importance of Birds in science (and society)
- Structure of Ornithology in North America
- Get involved at OU

Goals for this course

- Learn the birds of your local area
- Awareness of the vast diversity around the world
- Predict a bird's ecology based on its appearance
- Learn to communicate with ornithologists
- Become a keen observer
- Contribute to citizen science
- Put your bird observations in an ecological and evolutionary context
- Appreciate the unique and amazing functional capabilities of the avian body

WHAT MATERIALS?

REQUIRED:

- Field Guide. Options include National Geographic, Sibley (North America), Peterson, and several others; in book and/or smartphone app form.
- Binoculars: Between 7 and 10X; higher quality will improve your experience. (Can be borrowed from Biology, recommended to have your own!)
- Textbook: Handbook of Bird Biology, 3rd edition (2016). Available as eBook, new, used, or rented.
- Personal eBird account. Sign up here:
<http://ebird.org/content/ebird/>

WHAT MATERIALS?

RECOMMENDED:

eBird app for your smartphone.

OPTIONAL:

GILL, F. B., *ORNITHOLOGY*, 3RD edition (2007).

Handbook of the Birds of the World, and related resources.

Neotropical Birds Online

Birds of North America online ('life history accounts').

Bird Migration app.

Larkwire app.

Birdcast.info (migration forecasts in real time!)

Other birding apps.

Spotting scope & tripod.

HOW WILL GRADING WORK?

Your grade will be based on a 1000-pt distribution

Exam 1 (first 3 rd of lecture)	100 points
Exam 2 (second 3 rd of lecture)	100 points
Final Exam (final 3 rd : 100,, cumulative: 50)	150 points
Lab Practical I	100 points
Lab Practical II	100 points
Lecture & Lab Quizzes	100 points
Zoo Scavenger Hunt	50 points
eBird /Field Notes	100 points
Bird Report	200 points

Extra Credit: Preparing museum study skins:
10 points / 5 specimens

Make up for weekend field trips: TBA

FIELD TRIPS



EBIRD

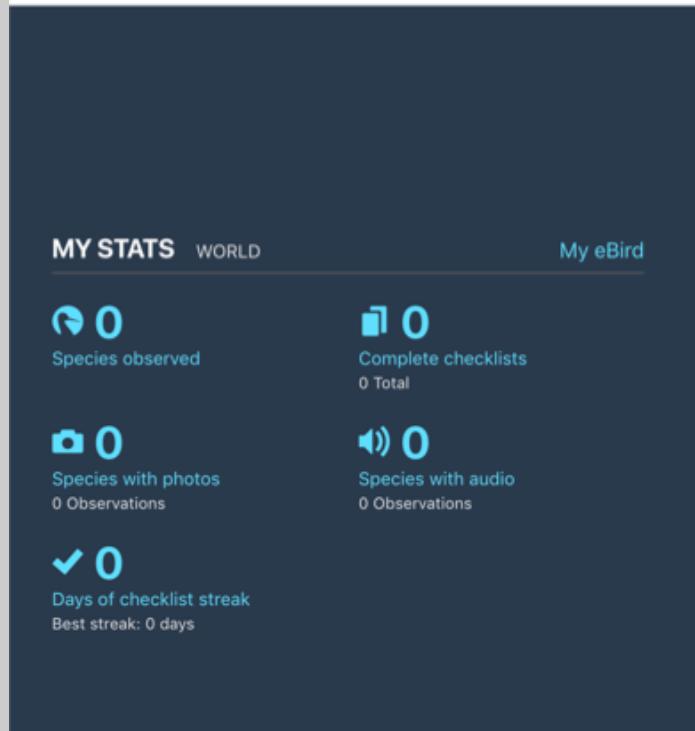
The Cornell Lab of Ornithology

[Donate](#)

Matthew Miller (dend)

eBird

[Submit](#) [Explore](#) [My eBird](#) [Science](#) [About](#) [News](#) [Help](#)



Ebird is a handy citizen science tool that makes finding birds and sharing your observations fun and easy.

Ebird entries are part of your grade

BIRD REPORT

<https://neotropical.birds.cornell.edu/Species-Account/nb/home>

The Cornell Lab of Ornithology
Neotropical Birds

Enter a species name... Browse Species Contribute

Chestnut-backed Antbird *Poliocrania exsul* ← White-bellied Antbird |

Order: Passeriformes | Family: Thamnophilidae | Polytypic: 5 subspecies | Authors: Stefan Woltmann, Ryan S. Terrill, Matthew J. Miller, and Matthew L. Brady

Introduction Appearance Systematics Distribution Diet and Foraging Sounds and Vocal Behavior Behavior Breeding Demography and Populations Conservation Future Research References Acknowledgments

Multimedia



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The Chestnut-backed Antbird is one of many secretive forest understory species that is far more often heard than seen. The song -- a two- or three-note whistle -- is a common feature of many lowland forests throughout the species' range. Like most antbirds, the species has no special predilection for foraging at army-ant swarms, though it does so opportunistically when a swarm passes through a territory. The specific name *exsul* ("stranger" in Latin) may have reflected its sporadic appearance at ant swarms to early naturalists.



Listen Song © Justin

You will form a team of 3–4. Your team will select a Neotropical bird with an incomplete species account. You will draft an account. If your account is accepted for publication by NBO, you get an A; otherwise, B, C, D, etc.



Greater Flamingos, Mexico (photo by Alejandro Prieto Rojas)



Northern Cardinals (photo by Linda Hartong)



Blue Tit (photo by Markus Varesvuo)



Andean Condor (photo by Colegota)

Ornithology as Epistemology



Contributions to Ecology



- Island biogeography
- Niche theory
- Ethology
- Optimal foraging theory
- Community structure paradigm

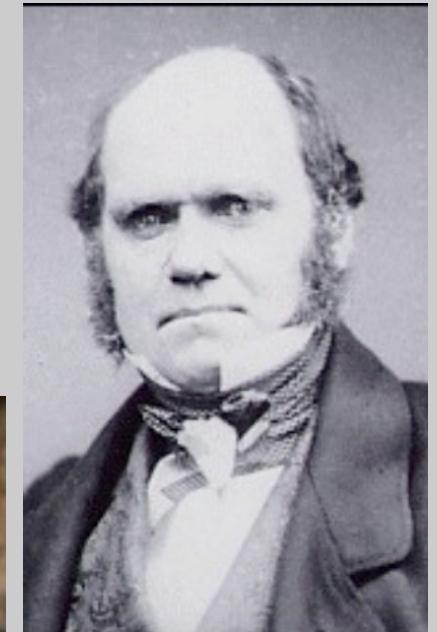
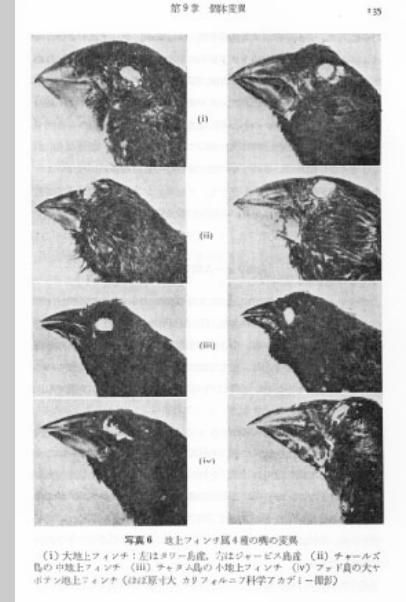
Contributions to Evolution

- Speciation
- Species concepts
- Natural Selection
- Life History Evolution

Contributions to Ecology/Evolution

Charles Darwin

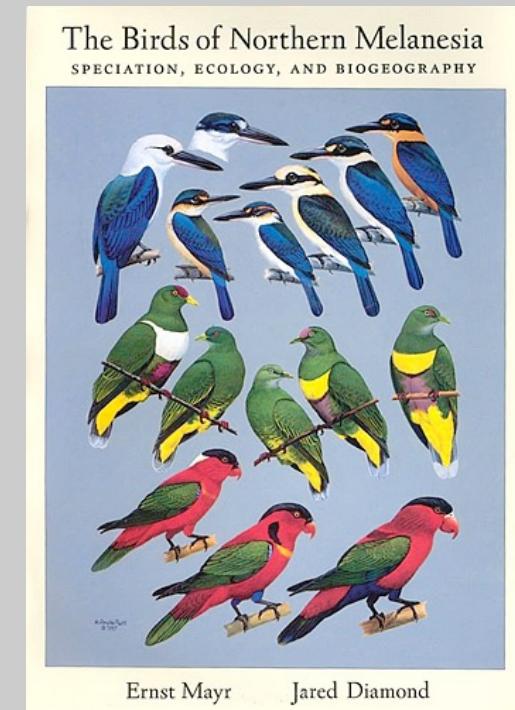
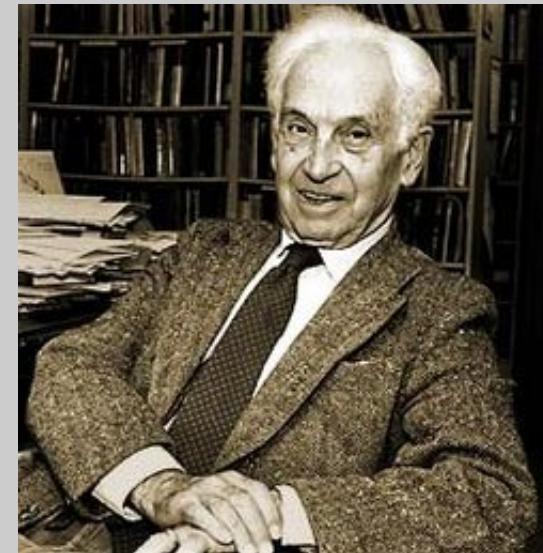
- Heritability in pigeons
- Common ancestry of Galapagos Mockingbirds
- Natural selection in finches



Contributions to Ecology/Evolution

Ernst Mayr

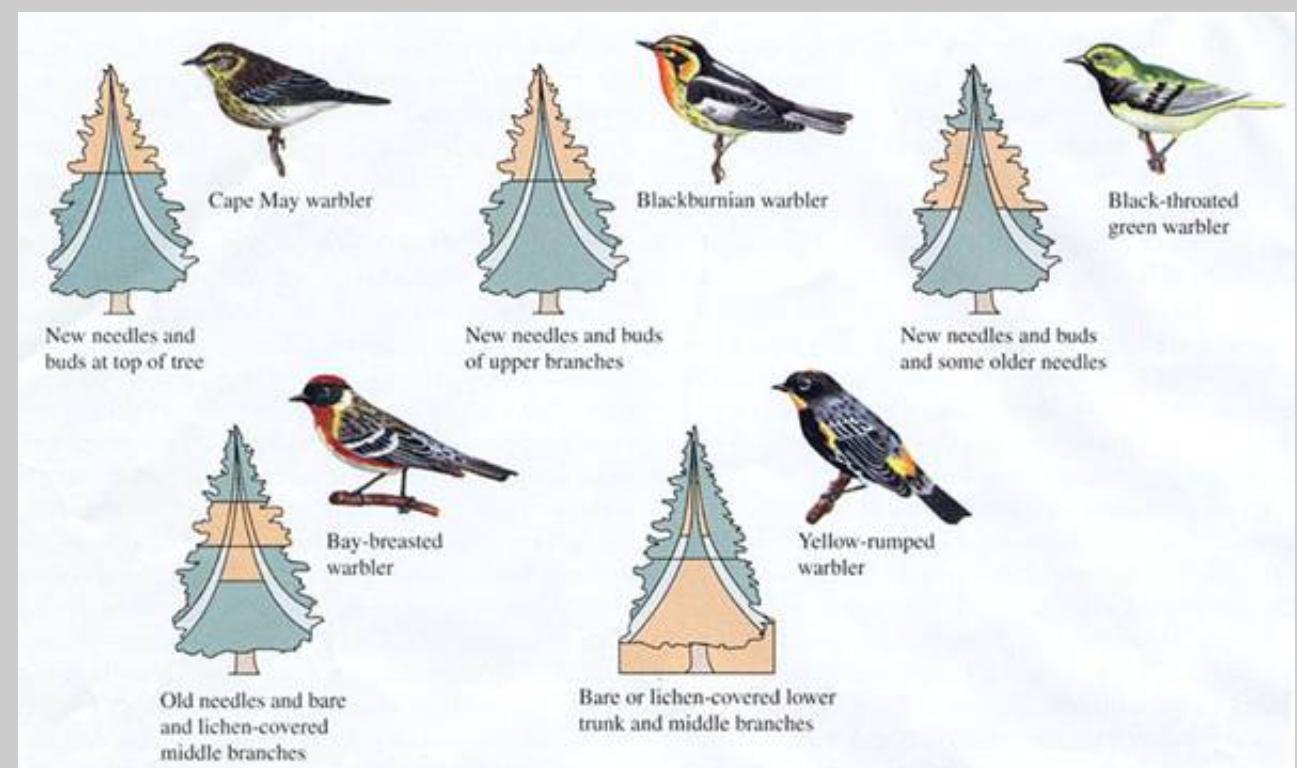
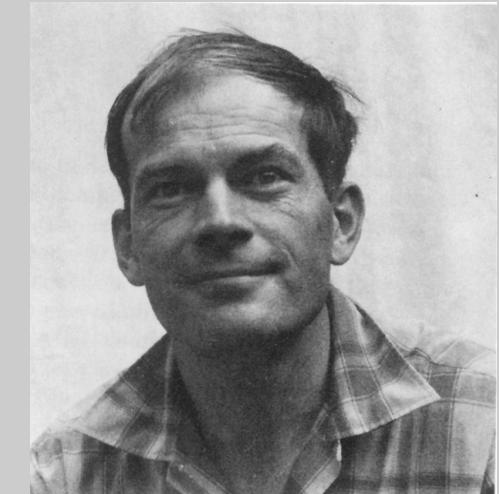
- Speciation process
- Species concepts
- Role in new synthesis



Contributions to Community Ecology

Robert MacArthur

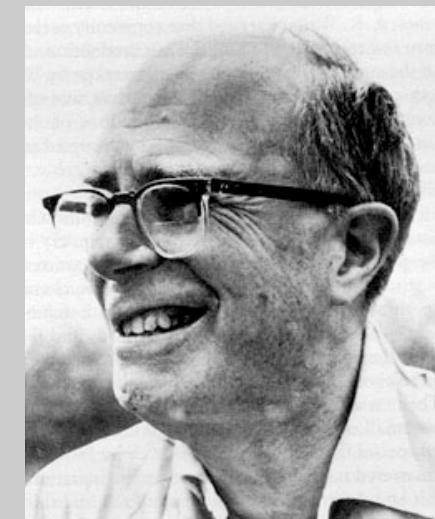
- Ecological divergence/ resource partitioning mediated by competition
 - Verification of G. E. Hutchinson's multidimensional niche
 - Paradigm of community structure
 - Island Biogeography



Contributions to Behavioral Ecology

David Lack

- Individual decisions maximize individual fitness
 - Clutch size optimization
 - Group vs. solitary living
 - Optimal foraging theory



“Ecological Adaptations to Breeding in Birds” (1968)

Contributions to Evolutionary Behavior

W. Hamilton

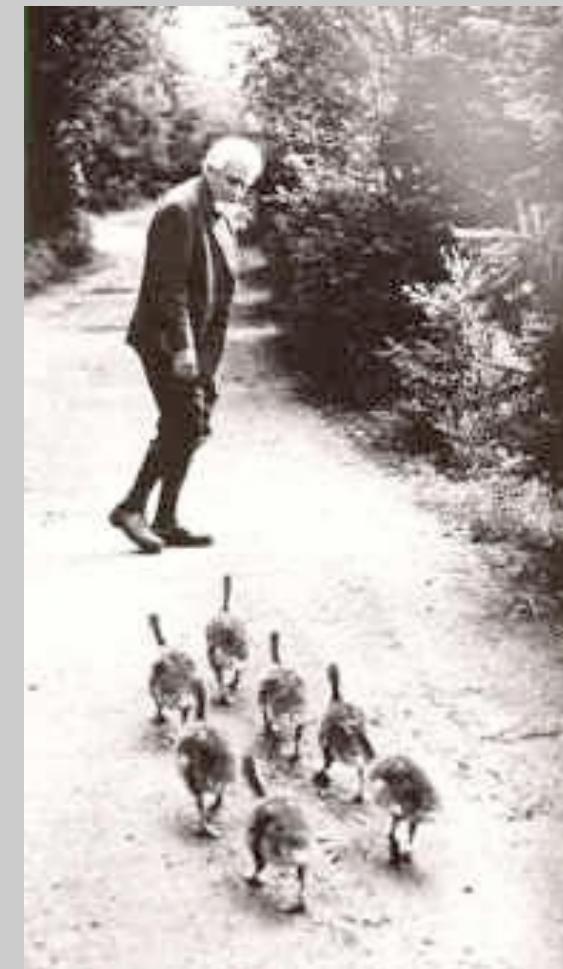
- Altruism as inclusive fitness (Hamilton's rule)
- Kin selection in cooperative breeding birds



Contributions to Ecology/Evolution

N. Tinbergen and K. Lorenz

- Ethology as a field
- Imprinting
- Signaling



- One of 3 Nobel Prizes for ornithology

Contributions to Ecology/Evolution

Margaret Morse Nice

- Lived in Norman, OK from 1913–1927
- Influenced Mayr, Lack, Lorenz
- Described territoriality and life history evolution
- over 250 publications, several books, >3000 book reviews
 - wrote: *Birds of Oklahoma* in 1931
- Women have been less heralded than men through the history of ornithology



Contributions to Genomics

Chicken & Zebra Finch were some of the earliest vertebrate genomes to be published

- similar # of genes to mammals
- But smaller overall size due to reduction in noncoding DNA and repetitive elements
- Stable synteny (chromosomal organization), with many microchromosomes containing important genes
- High standing genetic diversity

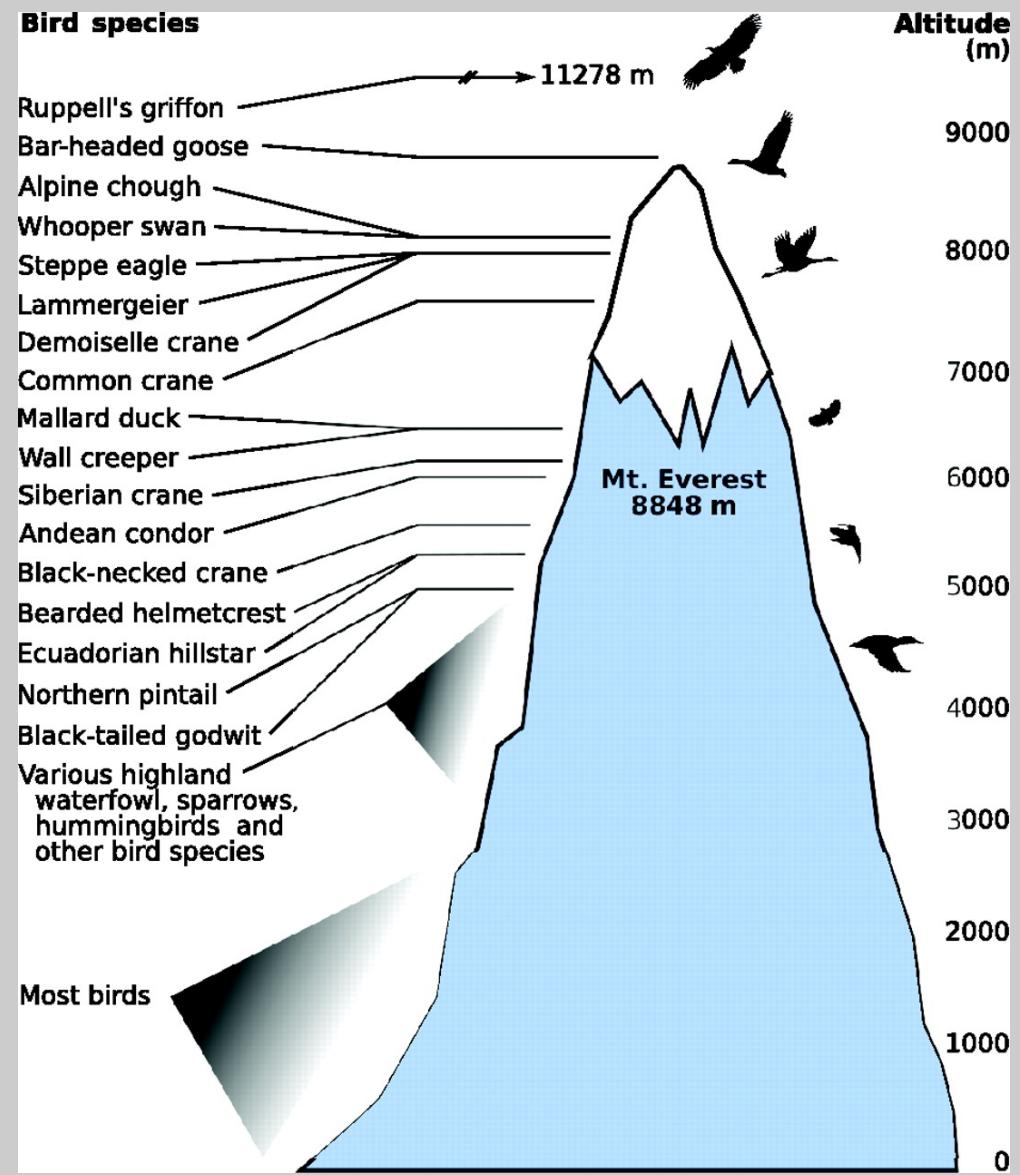
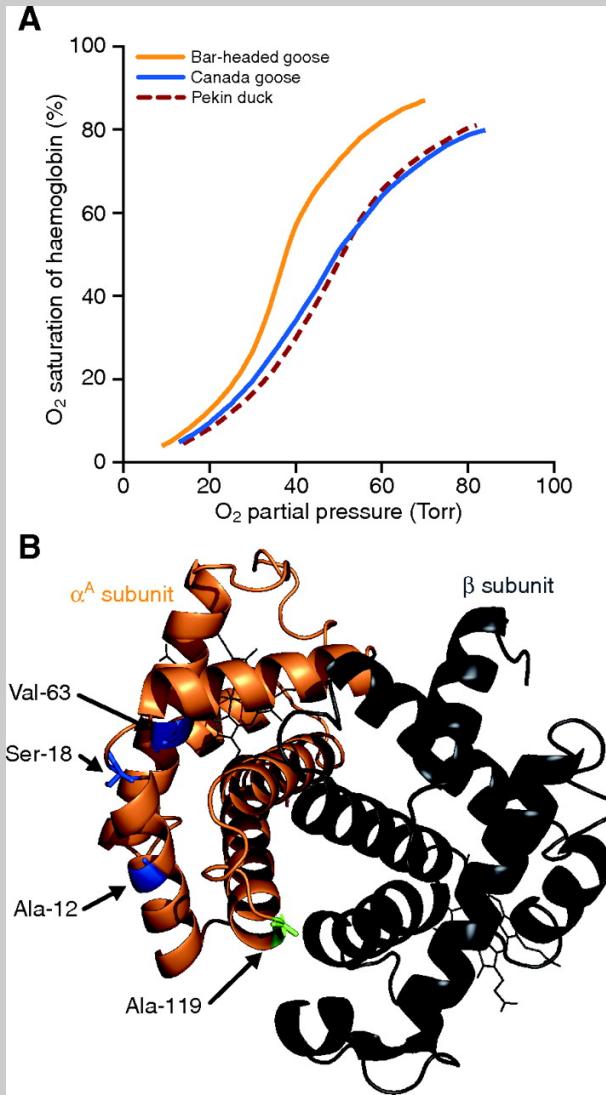
Contributions to Physiology

Song Learning as a model for human learning

- Similarity to infant speech acquisition
- Innate susceptibility to learn conspecific sounds
- Babbling stage of learning
- Plasticity in the adult avian brain
- NIH views this model as a priority

Contributions to Physiology

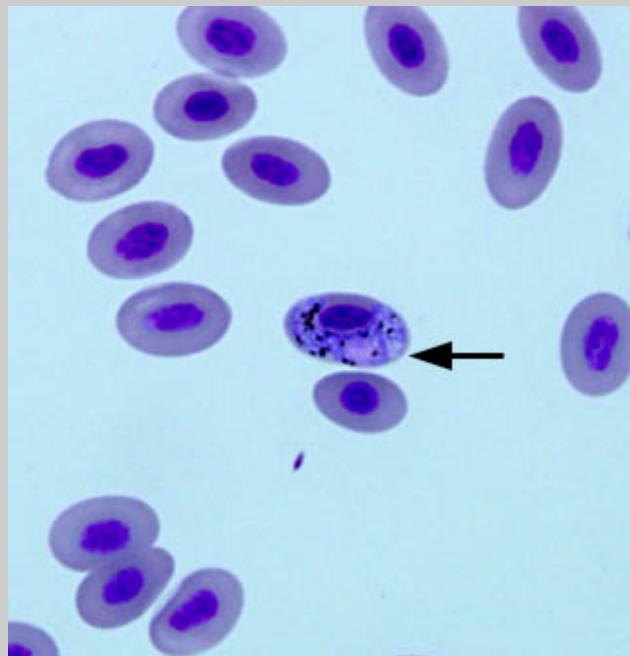
High altitude biology



Contributions to Epidemiology

Malaria transmission cycle discovered by studies of avian malaria in early 19th century

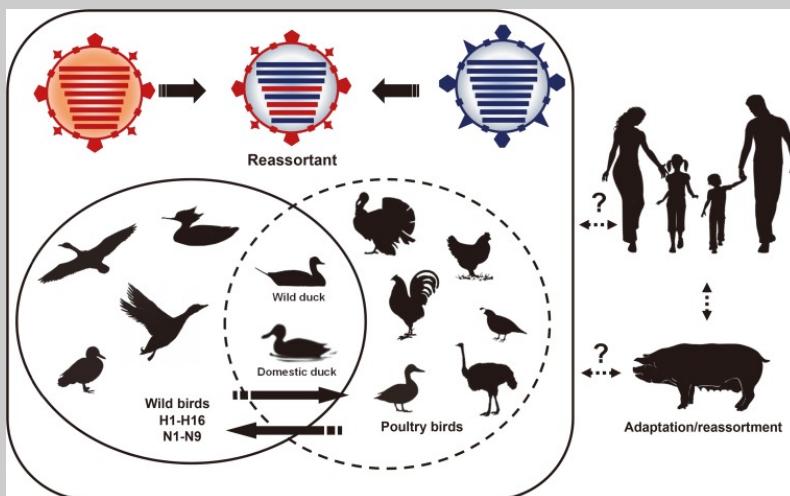
- Most species of malaria occur in birds
- Experimental infections in birds more ethical



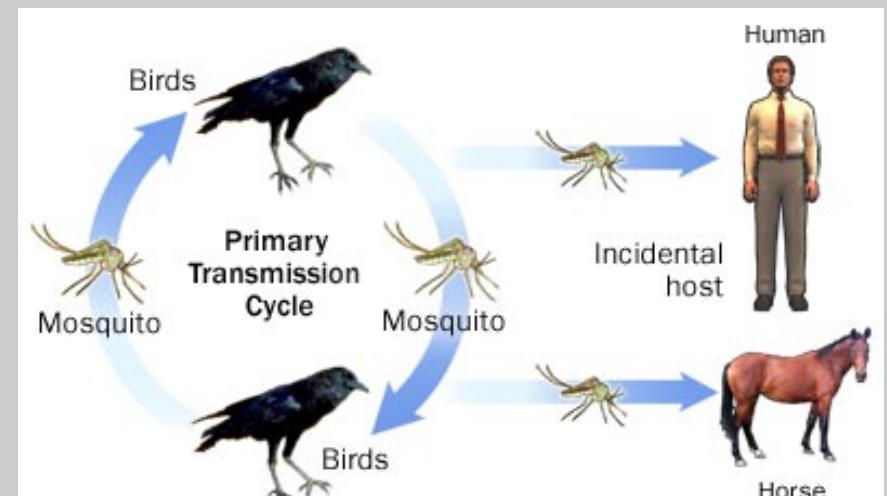
Contributions to Epidemiology

The role of wild birds in emerging disease

Influenza

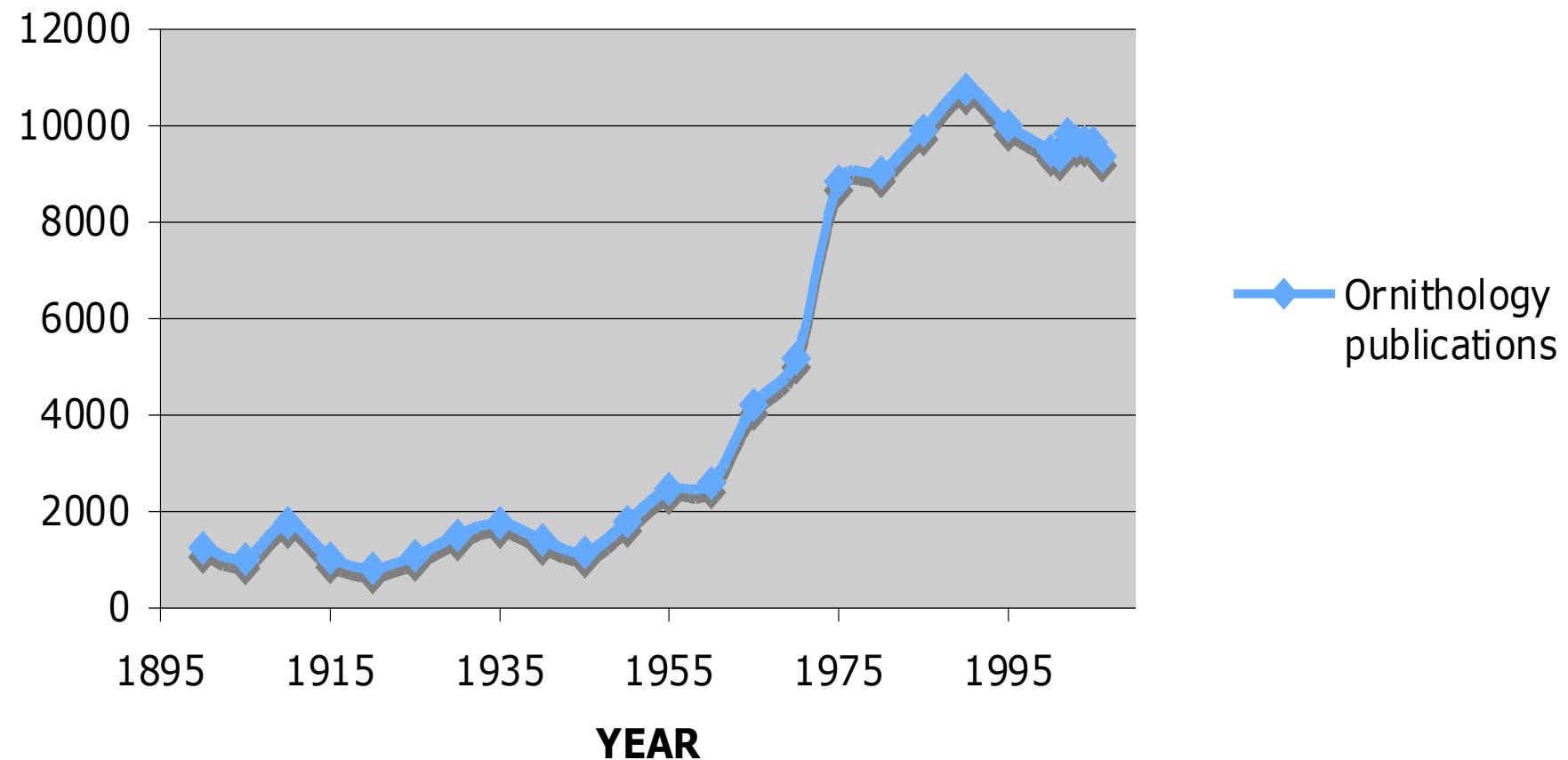


Mosquito-borne virus, e.g. West Nile



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Ornithology publications, 1900-2006



Source: Zoological Record search by source year for TOPIC equals “bird* NOT poultry NOT Gallus NOT Broiler*”

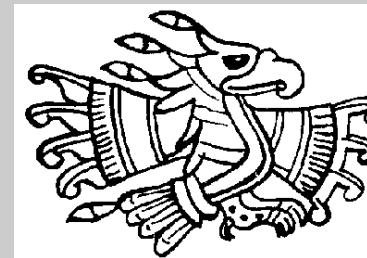
Institutional structure of professional ornithology in N. America



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[Society for the
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of Caribbean Birds](#)



[Waterbird
Society](#)

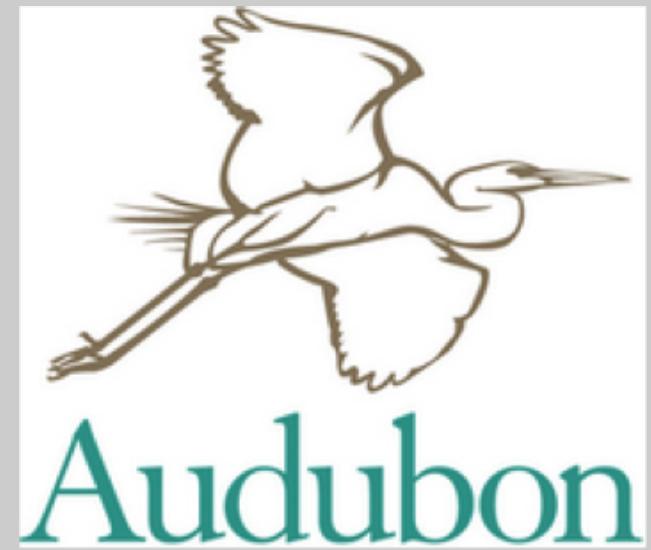


[Wilson
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[Neotropical
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Society](#)

Institutional structure of amateur ornithology, conservation, & citizen science in N. America



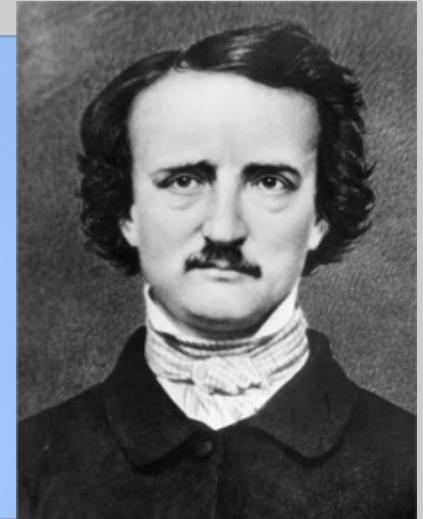
The Cornell Lab of Ornithology
Exploring and Conserving Nature

Importance to society

- Bird Symbolism

"Take thy beak from out my heart,
and take thy form from off my
door!" Quoth **the Raven**,
"Nevermore."

- Edgar Allan Poe, 1845



Bald Eagle



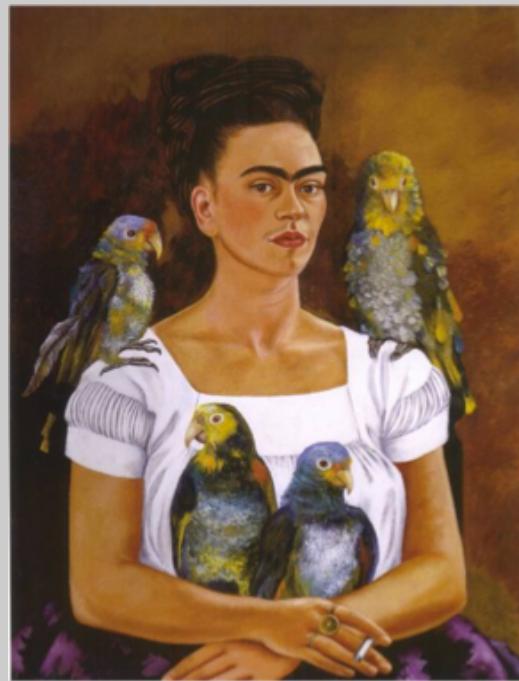
Check out this Colbert video:

<http://www.cc.com/video-clips/wna0mw/the-colbert-report-global-warming-threatens-bird-species>

Importance to society

- Bird Symbolism

Harpy from Ulisse Aldrovandi's (1642) Monstrorum Historia. In Greek and Roman mythology the Harpy was a half bird-half human wind spirit.



Frida Kahlo, *Me and my parrot*, 1941

Importance to society

- Economics



Economic impact of bird watching



- 45 million Americans watch birds recreationally
- Birdwatchers spend \$41 billion annually on gear and trips
- They spend \$14.9 billion in local communities
- In 2011, 666,000 jobs were created to support birdwatching

OPPORTUNITIES FOR ORNITHOLOGY RESEARCH @ OU

My lab:

Population genetics/phylogeography

Specimen measurement/population analysis

Pathogen-detection/malaria/viruses

Jeff Kelly:



Aeroecology
Movement ecology



Jeremy Ross:
Extreme weather ecology

Eli Bridge:
Avian movement
Geolocators



Michael Patten:
Tropical Ecology