



# Center for Environmental Research at Hornsby Bend



## MISSION

### Urban Ecology and Sustainability

- Community
- Education
- Research

## PARTNERS

- Austin Water Utility
- University of Texas
- Texas A&M University

## RESEARCH AREAS

- Soil Ecology, Sewage Recycling and Reuse
- Hydrogeology of the Alluvial Aquifer
- Riparian Ecology and Restoration
- Avian Ecology



50 YEARS OF BIRDING



AUSTIN, TEXAS  
*Hornsby Bend*  
1959-2009



# Center for Environmental Research at Hornsby Bend



## AWU-CER Lunchtime Lectures February – December 2012

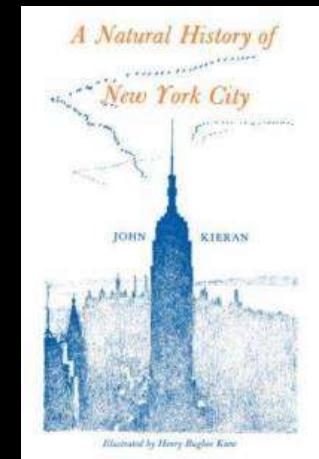
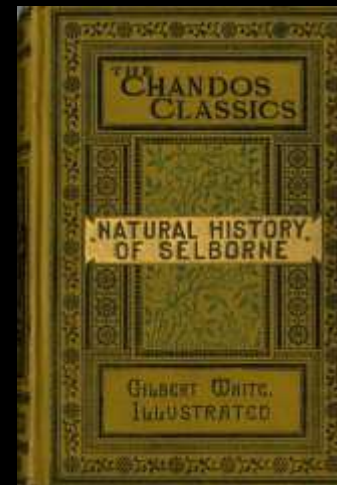
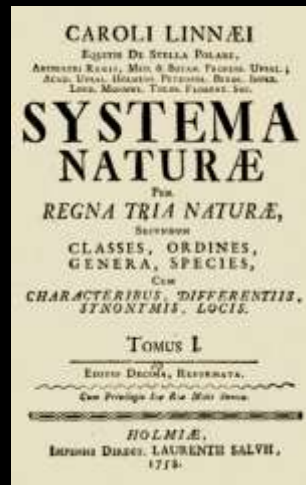
Each talk begins AT NOON Waller Center [625 East 10th Street – between I-35 and Red River] Room 104 or 105

The 1<sup>st</sup> Wednesday of the Month! Free and Open to the Public – bring a lunch and learn

## 2012 - A Year of Natural History: Origins, Practices, and Examples

Natural history is the study of plants and animals leaning more towards observational rather than experimental methods.

Over the next year, we will explore the history, the practice, and examples of natural history in America and Europe.





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## AWU-CER Lunchtime Lectures February – December 2012

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The 1<sup>st</sup> Tuesday of the Month! Free and Open to the Public – bring a lunch and learn

### 2012 - A Year of Natural History: Origins, Practices, and Examples

**February 1** - The History of Natural History: Origins to 19<sup>th</sup> Century [Room 105]

**March 7** - The History of Natural History: 19<sup>th</sup> and 20<sup>th</sup> Century Science and Literature [Room 105]

**April 3** - The History of Natural History: Contemporary Natural History

**May 1** - The Natural History of the Americas: Discovery and Transformation

**June 5** - The Natural History of Texas: Biological Survey and Ecological Change

**July 3** - The Natural History of Austin: Biological Context and Urbanization

**August 7** - Urban Natural History: Life in the City

**September 4** - The Natural History of an Urban Creek: Waller Creek

**October 2** - The Natural History of an Urban Vacant Lot: Tannehill Urban Wild Woodland

**November 6** - The Natural History of an Urban Wasteland: Hornsby Bend

**December 4** - Natural and Unnatural History: The Path Forward

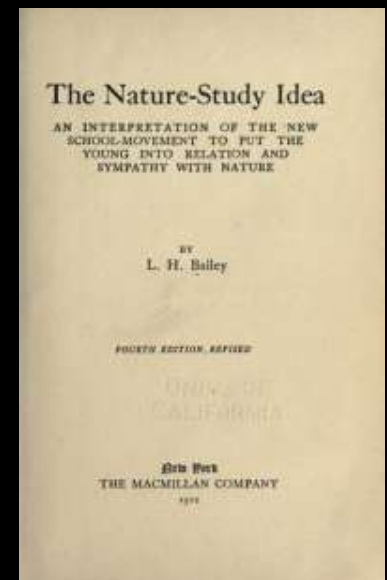
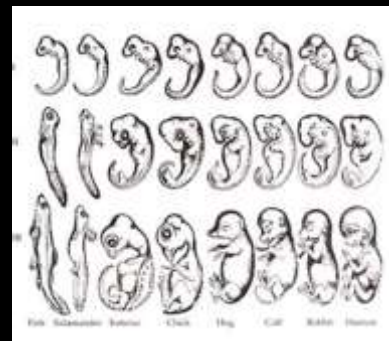
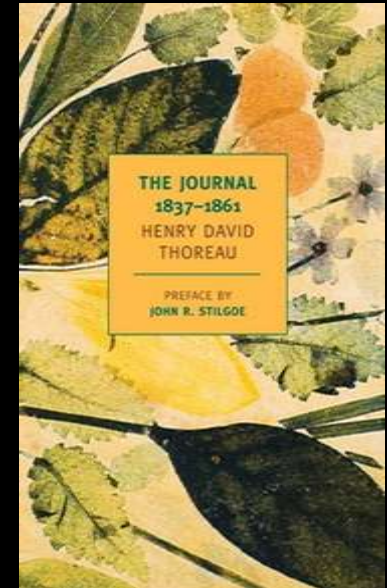
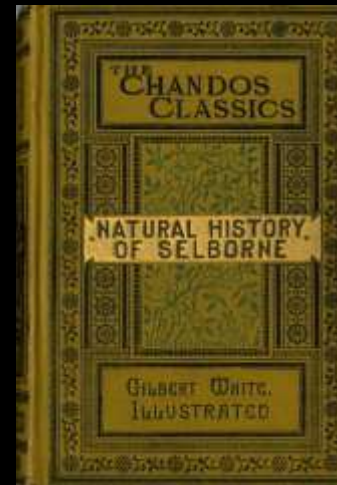
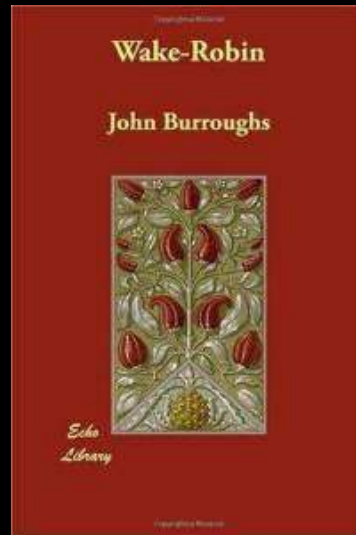


# The History of Natural History: 19<sup>th</sup> Century and 20<sup>th</sup> Century – Science and Literature

Kevin M. Anderson  
Austin Water Center for Environmental Research



NUMBER 51 IN THE HISTORICAL ADVENTURE AND EXPLORATION SERIES



## 19<sup>th</sup> into 20<sup>th</sup> Century Natural History

Amateur to Professional – Exploring and Collecting

Biological Surveys, Ecological Imperialism, and Conservation

From Natural Philosophy/Theology to Science – Agassiz and Darwin

Social Implications of Natural History and Evolution

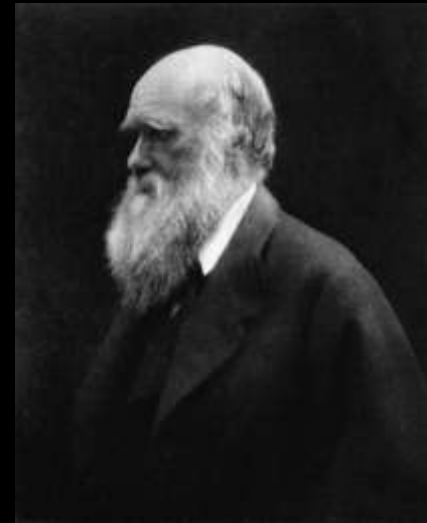
Building Collections, Museums, Gardens, Zoos

Natural History and the Masses – Journals, Books, Societies, Leisure Time

Naming Nature and Knowing Nature

Nature Faking and Natural Writing

Biology and Natural History

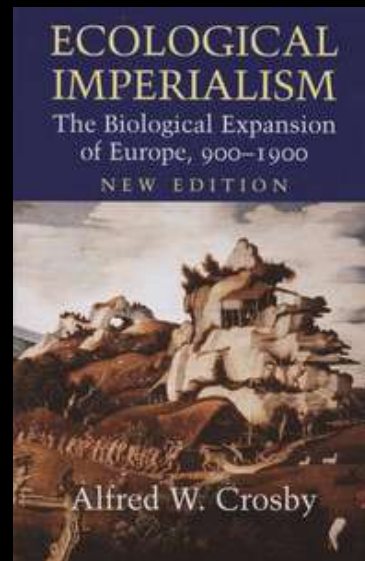
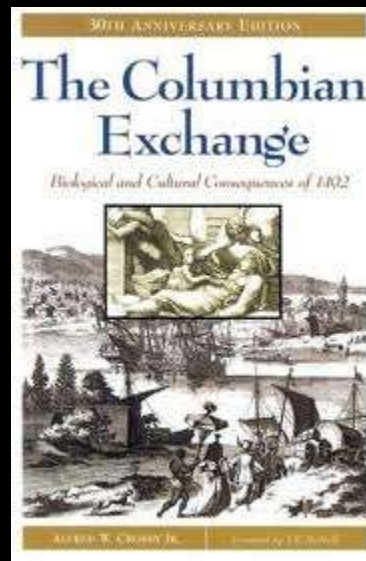
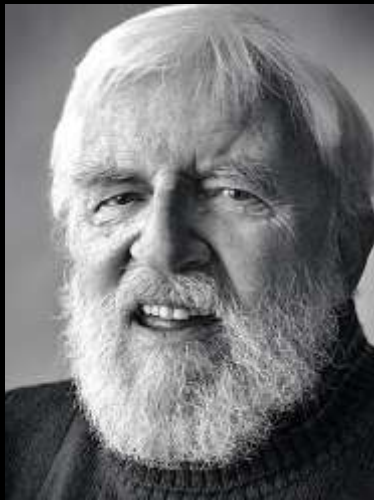


## Ecological Imperialism: The Biological Expansion of Europe, 900-1900

In his book, Alfred W. Crosby investigates the roots of European domination over the western world. He calls the places where early Europeans settled "Neo-Europes" with special emphasis on North and South America, Australia, and New Zealand.

In his prologue he ponders whether Europeans dominated their environment and other cultures because of their technology, or whether the consistent "success of European imperialism has a biological, [and] an ecological, component".

Crosby's thesis is that Europeans were successful imperialists because wherever they went their agriculture and animals thrived; and the indigenous populations and local ecosystems collapsed under their biological advance.



## The Great Nations of Europe – Randy Newman

The Great Nations of Europe had gathered on the shore  
they'd conquered what was behind them and now they wanted more  
so they looked to the mighty ocean and took to the western sea  
The great nations of Europe in the 16th century

Hide your wives and daughters, hide the groceries too  
The great nations of Europe coming through

The Grand Canary Islands first land to which they came  
they slaughtered all the canaries there which gave the land its name  
there were natives there called Guanches, Guanches by the score  
bullet's, disease the Portugese, they weren't there any more

now they're gone, they're gone, they're really gone  
you never seen anyone so gone  
there's pictures in a museum, some lines written in a book  
but you won't find a live one, no matter where you look

Hide your wives and daughters, hide the groceries too  
The great nations of Europe coming through

Columbus sailed for India found Salvador instead  
he shook hands with some Indians and soon they all were dead  
they got tb and typhoid and athletes foot, diptheria and the flu  
'scuse me great nations coming through





# A vision of the unity of Nature

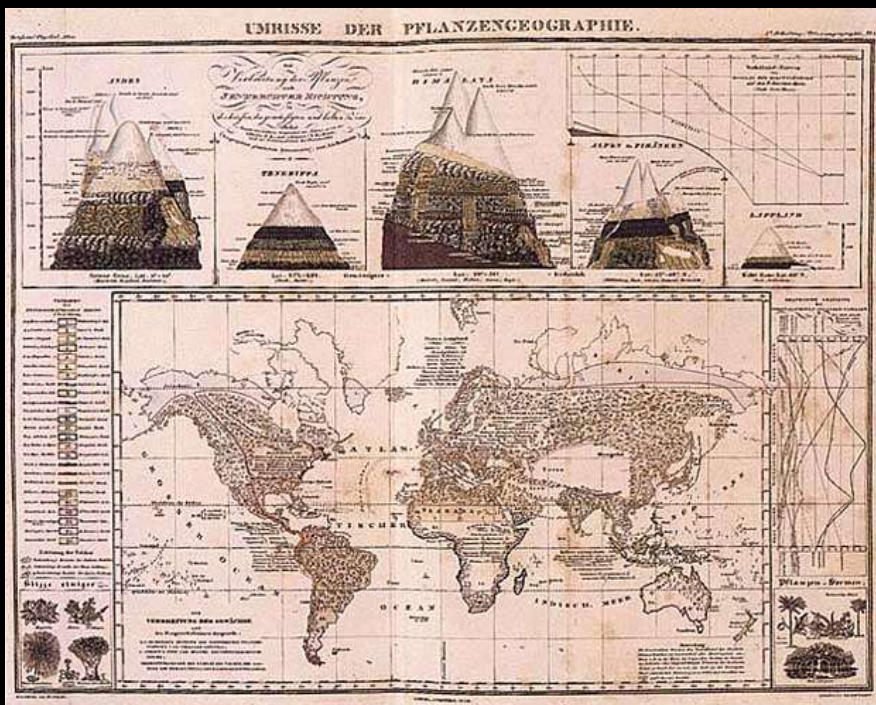
Alexander von Humboldt 1769 - 1859

*Unity in diversity, and of connection, resemblance, and order, among created things most dissimilar in their form, one fair harmonious whole...*

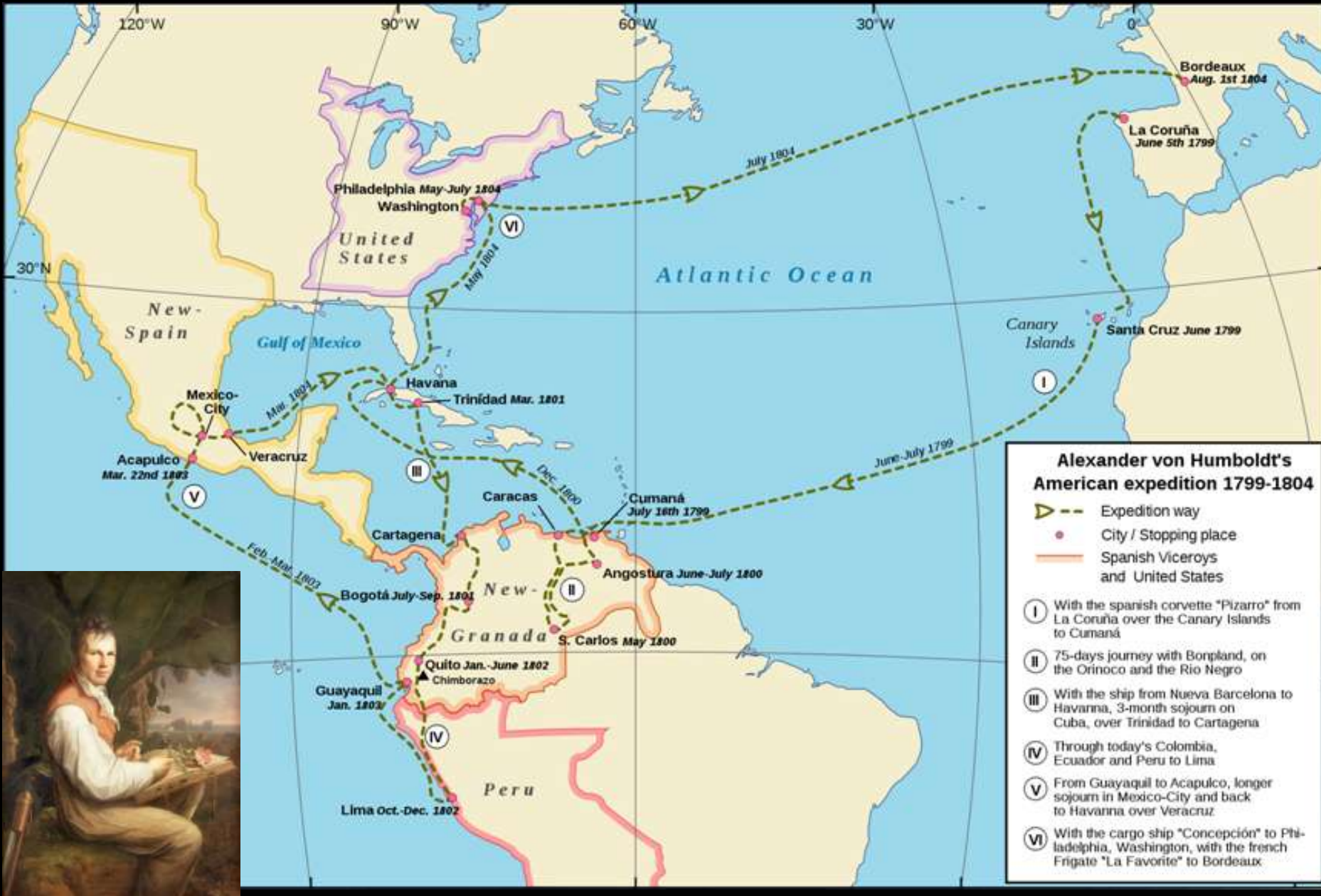
*Kosmos, 1845*

Charles Darwin described him as "the greatest scientific traveler who ever lived." He is widely respected as one of the founders of modern geography and ecology. Alexander von Humboldt's travels, experiments, and knowledge transformed western science in the nineteenth century.

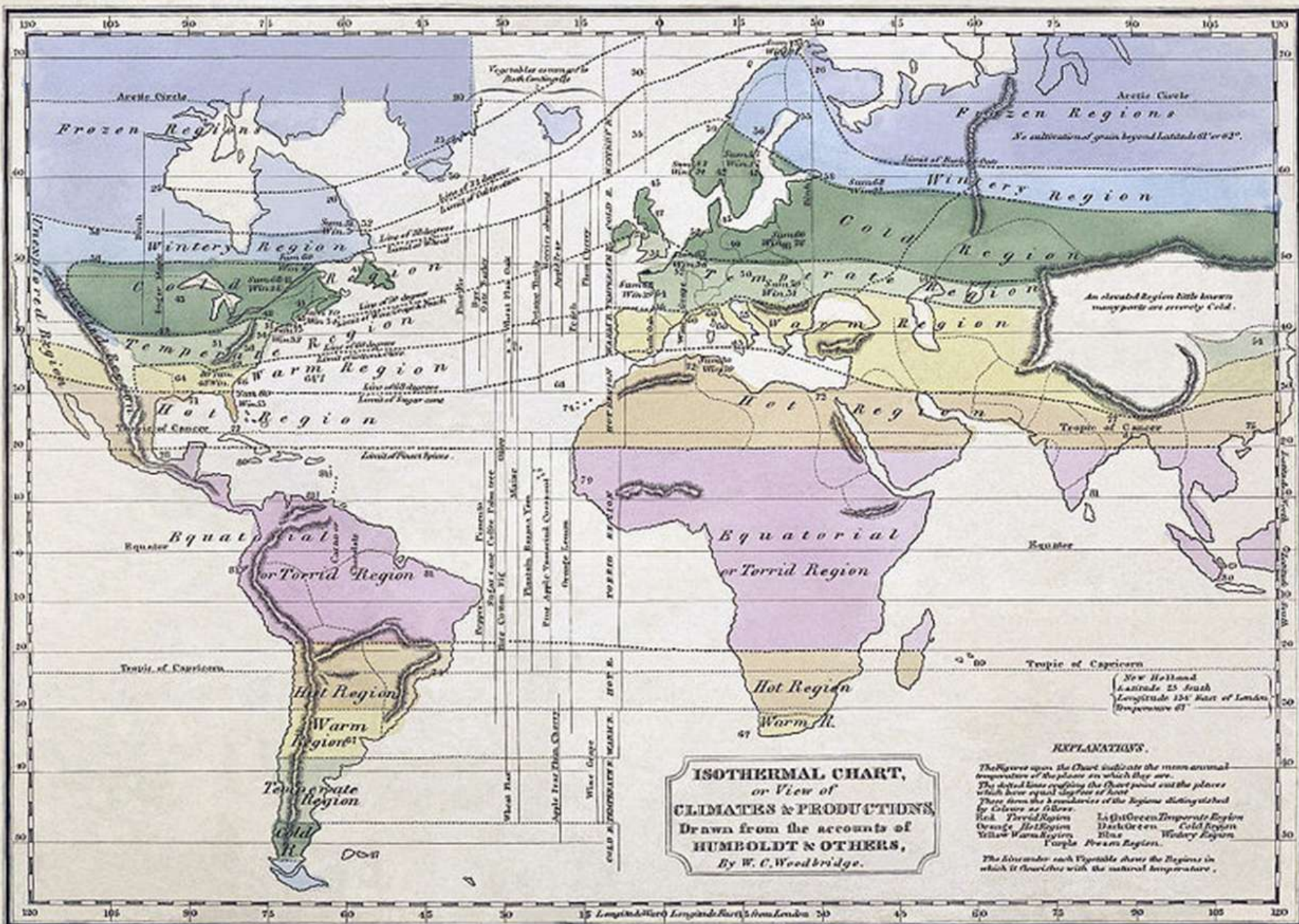
Between 1799 and 1804, Humboldt travelled extensively in Latin America, exploring and describing it. His description of the journey was written up and published in an enormous set of volumes over 21 years. Later, his five-volume work, *Kosmos* (1845), attempted to unify the various branches of scientific knowledge.











**ISOTHERMAL CHART,**  
*or View of*  
**CLIMATES & PRODUCTIONS,**  
 Drawn from the accounts of  
**HUMBOLDT & OTHERS,**  
*By W. C. Woodbridge.*

**EXPLANATIONS.**

The figures upon the Chart indicate the mean annual temperature of the places in which they are.  
 The dotted lines crossing the Chart point out the places which have equal lengths of heat.

These form the boundaries of the Regions distinguished by Colors as follows:

Red Torrid Region	Light Green Temperate Region
Orange Hot Region	Dark Green Cold Region
Yellow Warm Region	Blue Wintery Region
Purple Frozen Region	

The lines under each Vegetable show the Regions in which it flourishes with the natural temperature.

Revised according to an engraving the 15<sup>th</sup> day of January 1850 by William C. Woodbridge of the State of Connecticut.

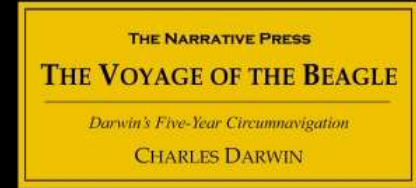
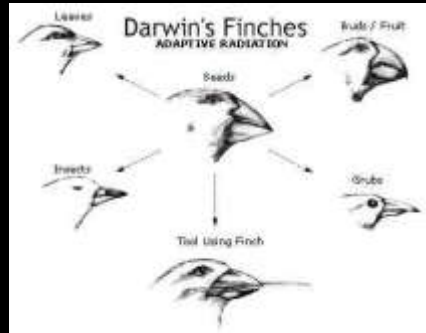


# Natural History and Evolution

## Charles Darwin 1809-1882

He established that all species of life have descended over time from common ancestry, and proposed the scientific theory that this branching pattern of evolution resulted from a process that he called natural selection in *On the Origin of the Species* (1859).

## The Voyage of the Beagle 1831-36 – Galapagos ground finches



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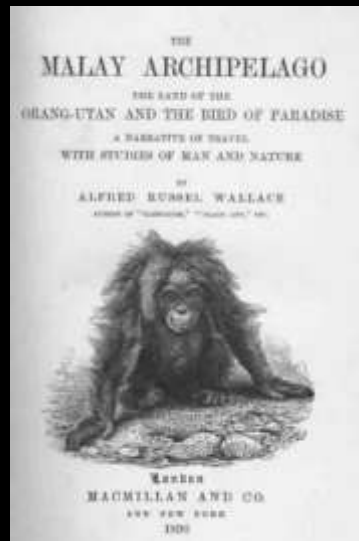
# Natural History and Evolution

## Alfred Russel Wallace 1823-1913

He is best known for independently proposing a theory of evolution due to natural selection that prompted Charles Darwin to publish his own theory.

Wallace did extensive fieldwork, first in the Amazon River basin and then in the Malay Archipelago, where he identified the Wallace Line that divides the Indonesian archipelago into two distinct parts, one in which animals closely related to those of Australia are common, and one in which the species are largely of Asian origin. He was considered the 19th century's leading expert on the geographical distribution of animal species and is sometimes called the "father of biogeography".

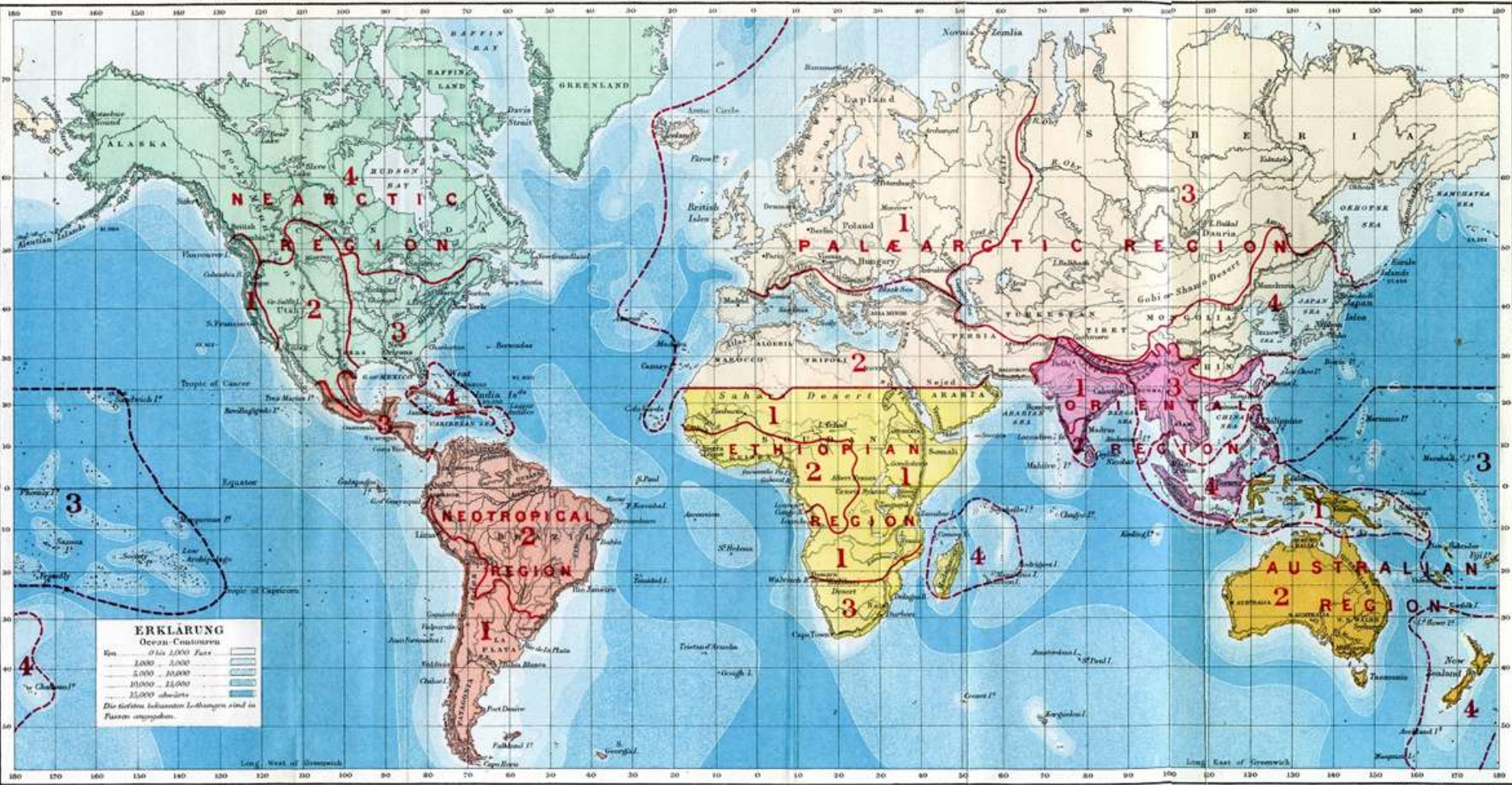
## Travels in the Amazon and Malay Archipelago (1848-1862)





# The Geographical Distribution of Animals (1876)

DIE ERDE IN MERCATOR'S PROJECTION MIT DEN ZOOGEOGRAPHISCHEN REGIONEN UND DEN APPROXIMATIVEN SCHWANKUNGEN DES OCEAN-BETTES



Dresden: R. von Zahn.

Vertrieb: Geograph. Inst. London.

# Evolution and American Natural History

Louis Agassiz 1807 - 1873

He grew up in Switzerland and became a professor of natural history at University of Neuchâtel. In 1848 he accepted a professorship at Harvard.

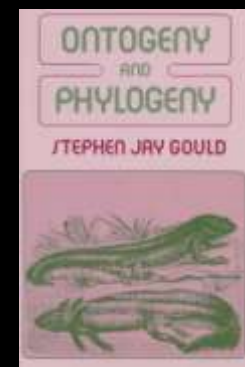
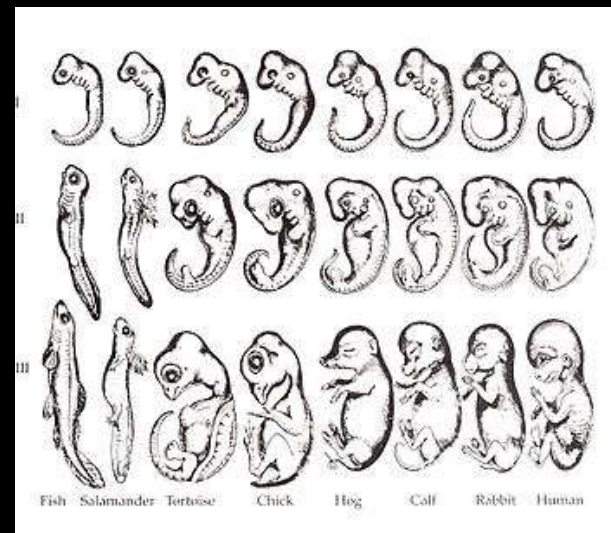
*I have devoted my whole life to the study of Nature, and yet a single sentence may express all that I have done. I have shown that there is a correspondence between the succession of Fishes in geological times and the different stages of their growth in the egg — that is all. It chanced to be a result that was found to apply to other groups and has led to other conclusions of a like nature.*

The "recapitulation of phylogeny by ontogeny" was seen as support for the theory of evolution by Ernst Haeckel. "Ontogeny recapitulates phylogeny" was Haeckel's answer--the wrong one--to the most vexing question of nineteenth-century biology: what is the relationship between individual development (ontogeny) and the evolution of species and lineages (phylogeny)?

One of the last reputable scientists to reject evolution outright. Agassiz saw the Divine Plan of God everywhere in nature, and could not reconcile himself to a theory that did not invoke design.

Agassiz was a staunch creationist, and he taught that after every global extinction of life God created every species anew.

His philosophy of nature, aiming to understand the Divine Plan, is the last great expression of the old school of natural theology, started by men like John Ray almost two hundred years before.





# Natural History, Evolution, and Society

## Social Darwinism

The strongest or fittest should survive and flourish in society, while the weak and unfit should be allowed to die. The theory was chiefly expounded by Herbert Spencer but fit Victorian Era beliefs.

Colonialism was seen as natural and inevitable, and given justification through Social Darwinian ethics - people saw natives as being weaker and more unfit to survive, and therefore felt justified in seizing land and resources.

In its most extreme forms, Social Darwinism has been used to justify eugenics programs aimed at weeding "undesirable" genes from the population; such programs were sometimes accompanied by sterilization laws directed against "unfit" individuals. The American eugenics movement was relatively popular between about 1910-1930, during which 24 states passed sterilization laws and Congress passed a law restricting immigration from certain areas deemed to be unfit. Social Darwinist ideas, though in different forms, were also applied by the Nazi party in Germany to justify their eugenics programs.

## Genetic Psychology

G. Stanley Hall (1844-1924) "genetic psychology" children must recapitulate human development from primitive rural stages to complex urban life; denial of this process in cities bred social immaturity, crime, and chaos.

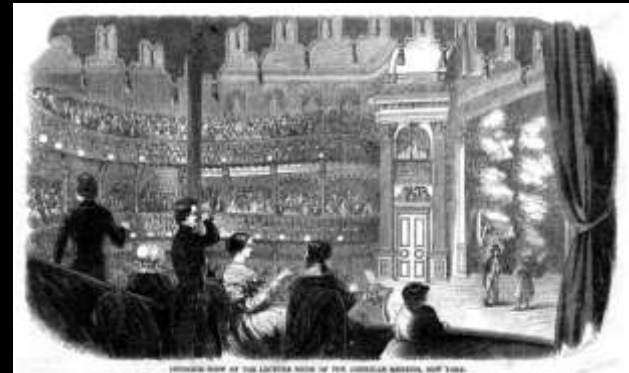
- The Nature Study Movement – Agassiz "Study Nature, not Books"



## Museums and Natural History

P.T. Barnum opens “Barnum’s Great American Museum” in New York 1841. It burns down in 1868.

Louis Agassiz - At Harvard he set about organizing and acquiring funding for a great museum of natural history. In 1859 his dream came true with the founding of the Harvard University Museum of Comparative Zoology, which opened its doors in 1860.



American Museum of Natural History in New York 1868  
Their *American Museum Journal* [later *Natural History*]  
first published 1900

Natural history museums by 1900

Germany 150

Great Britain 250

France 300

The United States 250

Museum displays in naturalistic settings





## Popular Natural History – Gardens and Zoos

Zoological Gardens in London's Regent's Park – opens 1828, 130,000 visitors by 1880's 600,000 annually

Paris Jardin zoologique d'acclimatation 1854 Animal Acclimatization Society – to promote the introduction, acclimatization, and domestication of useful or ornamental exotic animals

New York Zoological Society Park [the Bronx Zoo] 1899 focuses on animals in natural surroundings and preservation of threatened species

Kew Gardens London – Royal Botanic Gardens 1841

New York Botanical Garden 1891

By 1890s over 200 botanical gardens worldwide



# Popular American Natural History – late 19<sup>th</sup> and early 20<sup>th</sup> Century

## Birds and Ornithology

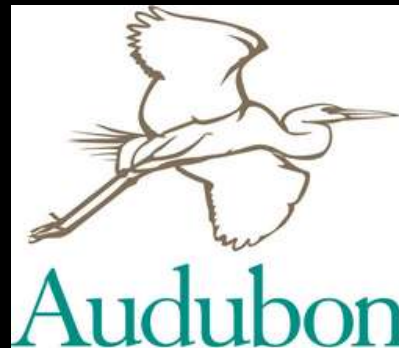
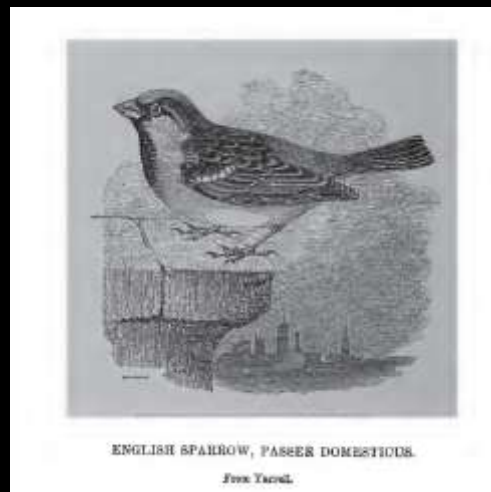
Ornithologist's Union 1883 – checklist and official names

National Association of Audubon Societies 1886 - George Bird Grinnell (1848-1938)

- Junior Audubon Clubs in schools 1911 [205,138 junior members 1916]

## Good Birds and Bad Birds

In 1889, the U.S. Bureau of Biological Survey devoted its first bulletin entirely to “The English Sparrow in North America” and compiler Walter Barrows concluded that these foreigners were “a curse of such virulence” that they should be systematically and completely destroyed. Furthermore, it should be a crime to kill the shrike, sparrow hawk, screech owls, bluejays, or grackles, since they eat English sparrows.

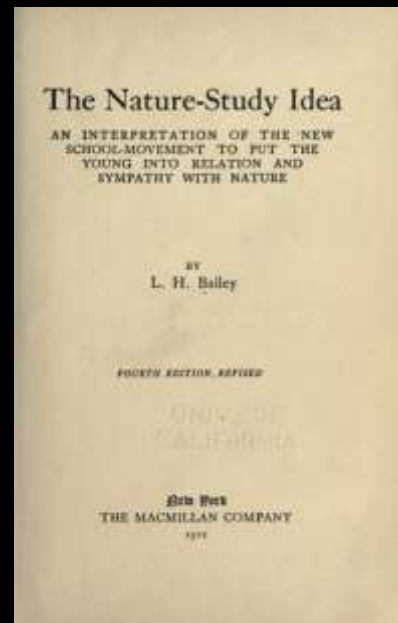
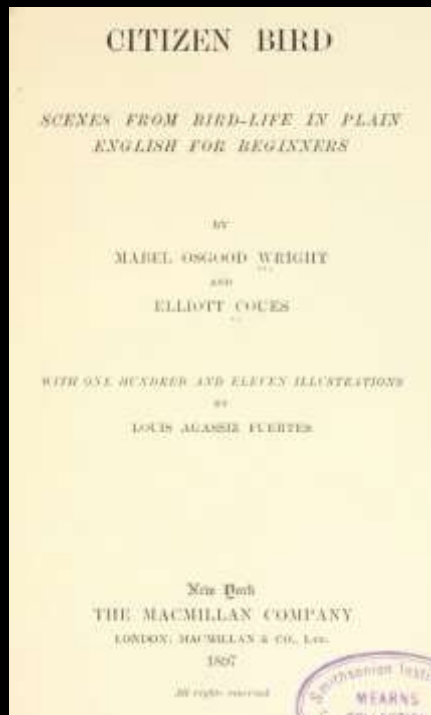


# The Nature Study Movement – Agassiz “Study Nature, not Books”

Liberty Hyde Bailey (1858-1954) The Nature-Study Idea (1903) “we must live closer to nature and we must perforce begin with the child”

The movement popularized scientific study outside of the classroom as well, and has proven highly influential for figures involved in the modern environmental movement, such as Aldo Leopold and Rachel Carson.

Anna Comstock defined the idea extensively in her book, Handbook of Nature Study (1911) "Nature Study is for the comprehension of the Individual life of the bird, insect or plant that is nearest at hand."



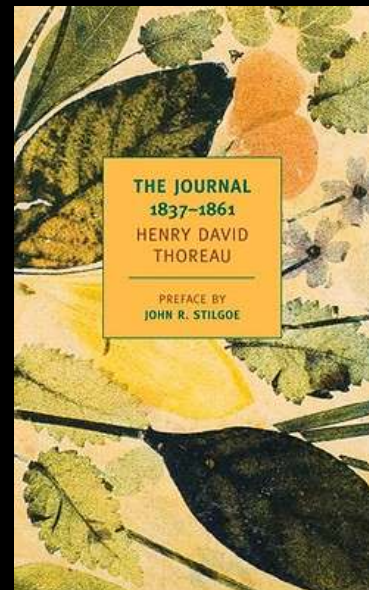
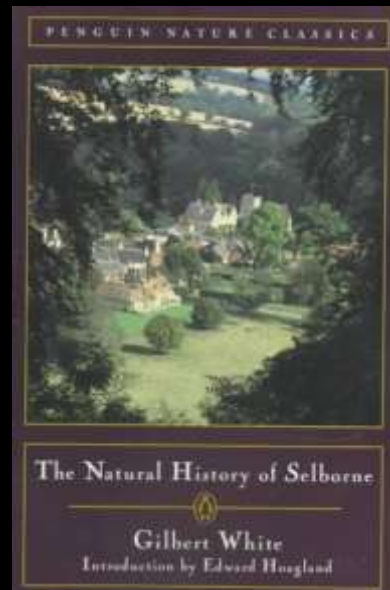


# Natural History and Literature

## The Literary Naturalists

### Gilbert White and Henry David Thoreau

"What impressed me, then and later, was Henry's knowledge of Natural History; a keen observer and great student of things, and a very pleasant talker. He reminded me more of Gilbert White of Selborne than any other character." Edward Waldo Emerson





## The Literary Turn

Gilbert White 1720 – 1793

English clergyman and first literary naturalist

Born in his grandfather's vicarage at Selborne in Hampshire

White is best known for his *The Natural History and Antiquities of Selborne* (1789), one of the most frequently published books in the English language.

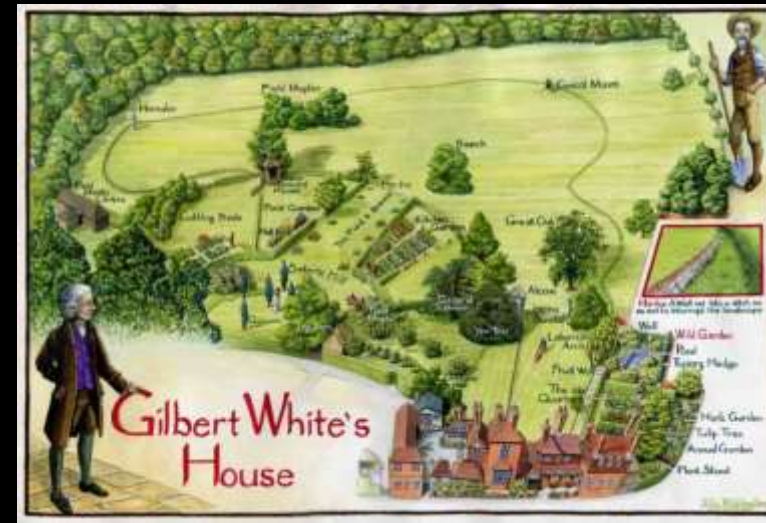
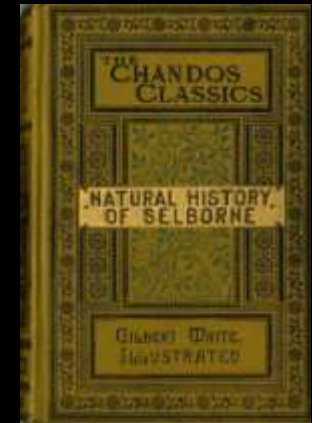
This was a compilation of his letters to Thomas Pennant, the leading British zoologist of the day, and the Hon. Daines Barrington, an English barrister and another Fellow of the Royal Society. These letters contained White's discoveries about local birds, animals and plants.

He believed in distinguishing birds by observation rather than by collecting specimens, and was thus one of the first people to separate the similar-looking Chiffchaff, Willow Warbler and Wood Warbler by means of their song.

White is regarded by many as one of the founders of modern respect for nature and an ecological understanding of place.

He said of the earthworm:

*Earthworms, though in appearance a small and despicable link in the chain of nature, yet, if lost, would make a lamentable chasm. [...] worms seem to be the great promoters of vegetation, which would proceed but lamely without them...*



# Documentation and Reflection - the Beginning of American Nature Writing

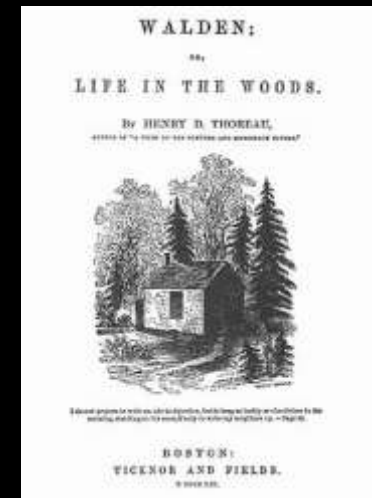
## Henry David Thoreau 1817-1862

He read avidly on botany and often wrote observations on this topic into his journal. He admired William Bartram, and Darwin's *Voyage of the Beagle*. He kept detailed observations of nature around Concord, recording everything from how the fruit ripened over time to the fluctuating depths of Walden Pond and the days certain birds migrated.

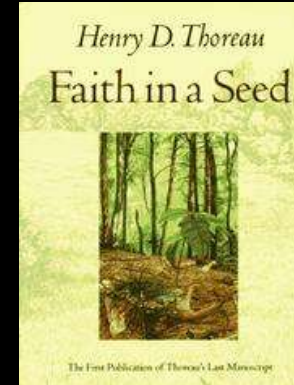
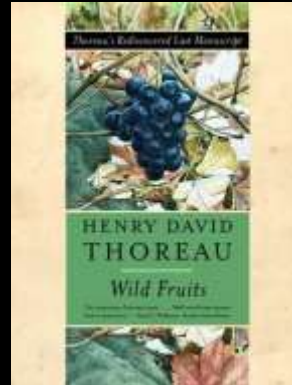
He became a land surveyor and continued to write increasingly detailed natural history observations about the Concord area in his journal, a two-million word document he kept for 24 years. He also kept a series of notebooks, and these observations became the source for Thoreau's late natural history writings, such as *Autumnal Tints*, *The Succession of Trees*, and *Wild Apples*, an essay lamenting the destruction of indigenous and wild apple species.

Until the 1970s, literary critics dismissed Thoreau's late pursuits as amateur science and philosophy. With the rise of environmental history and ecological literary criticism a new perception emerged, showing Thoreau to be both a philosopher and an analyst of ecological patterns in Concord's fields and woods – a naturalist.

The linkage to Gilbert White was clear, and contemporary American nature writing rediscovered its foundations in natural history.



Published 1854



## Natural History and Nature Writing 19<sup>th</sup> Century

Susan Fenimore Cooper (1813-1894)

eldest daughter of James Fenimore Cooper and a distinguished writer and naturalist. She is best known for her nature diary of Cooperstown, *Rural Hours*, first published in 1850 and frequently reprinted.

chronicles the seasonal metamorphoses of the woods, meadows, waters, vegetation, and animal life around her home in Otsego County, New York

Throughout her journal, Cooper carefully distinguishes between the native and the non-native, the natural and the invasive. What is European and imported, cannot be native.



Miss Susan Fenimore Cooper, probably in the  
middle 1850's.  
Photograph by W. G. Smith, Cooperstown.



## John Burroughs (1837 – 1921)

He was born on the family farm in the Catskill Mountains, near Roxbury, New York and lived all his life in the Catskills. He published his first essay in *Atlantic Monthly* in 1860.

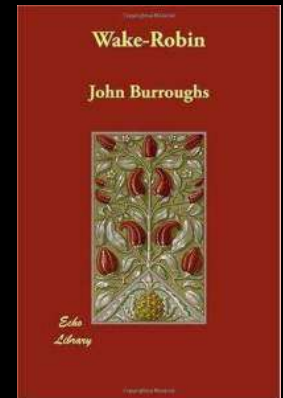


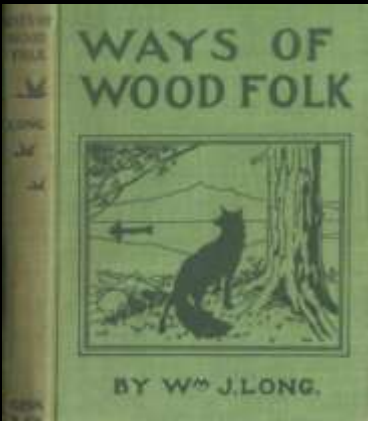
During the Civil War, Burroughs met Whitman in Washington DC, and the two became close friends. Whitman encouraged Burroughs to develop his nature writing as well as his philosophical and literary essays. In 1867, Burroughs published *Notes on Walt Whitman as Poet and Person*, the first biography and critical work on the poet. Four years later, Burroughs's published his first collection of nature essays *Wake-Robin*.

Burroughs accompanied many personalities of the time in his later years, including Theodore Roosevelt, John Muir, Henry Ford (who gave him an automobile, one of the first in the Hudson Valley), Harvey Firestone, and Thomas Edison.



MR. BURROUGHS'S FAVORITE PASTIME.  
By kind permission of Forest and Stream.





## The Nature Fakers Controversy 1903-1907

The nature essay, and particularly stories about animals, had become enormously popular in the early 20<sup>th</sup> century, but Burroughs felt that many of the writers had very little direct experience of nature and simply pretended that the animals are just like us. This new genre emphasized sympathetic and individualistic animal characters.

Burroughs's main objection to these nature writers was that, despite claims of veracity on the part of the authors, the natural history portrayed was not in line with the facts. His critique of the nature fakers was neither a condemnation of sentiment and emotion nor a call for a scientific approach toward nature. He simply did not want nature misrepresented to the eager reading public by twisting the facts and presenting them in an unrealistic manner.

William Joseph Long (1857–1952) *Ways of Wood Folk* (1899).

“This individuality of the wild creatures will account, perhaps, for many of these Ways, which can seem no more curious or startling to the reader than to the writer when he first discovered them. They are, almost entirely, the records of personal observation in the woods and fields. Occasionally, when I know my hunter or woodsman well, I have taken his testimony, but never without weighing it carefully, and proving it whenever possible by watching the animal in question for days or weeks till I found for myself that it was all true.”

Over half of his article consisted of an evaluation of Long's work. The focus of Burroughs's condemnations was a book entitled *School of the Woods*; this book presupposed that animals consciously met in a classroom situation to teach one another the skills needed for life in the woods, including vocalization, food acquisition, nest and shelter building, and defense against predators (Long 5–22). Burroughs concluded that “Mr. Long's book reads like that of a man who has really never been to the woods, but who sits in his study and cooks up these yarns from things he has read in *Forest and Stream*, or in other sporting journals. Of real observation there is hardly a vestige in his book; of deliberate trifling with natural history there is no end”



## The Nature Fakers Controversy 1903-1907

Ernest Thompson Seton (1860 – 1946) Seton was an early pioneer of the modern school of animal fiction writing, his most popular work being *Wild Animals I Have Known* (1898)

“Redruff: The Story of the Don Valley Partridge” –

Down the wooded slope of Taylor's Hill the Mother Partridge led her brood; down toward the crystal brook that by some strange whim was called Mud Creek. Her little ones were one day old but already quick on foot, and she was taking them for the first time to drink...There were twelve of them, but Mother Grouse watched them all, and she watched every bush and tree and thicket, and the whole woods and the sky itself. Always for enemies she seemed seeking—friends were too scarce to be looked for—and an enemy she found. Away across the level beaver meadow was a great brute of a fox. He was coming their way, and in a few moments would surely wind them or strike their trail. There was no time to lose.

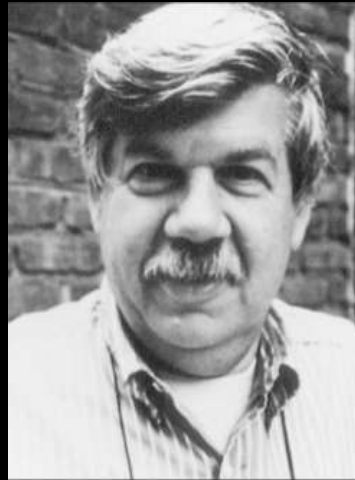
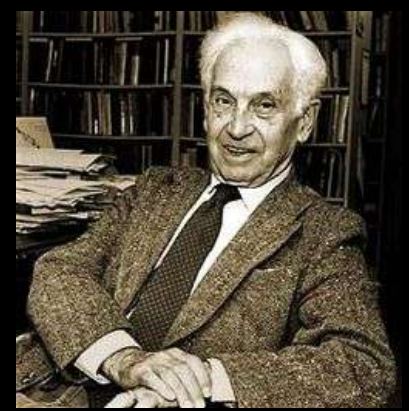
[The] line between fact and fiction is repeatedly crossed and... a deliberate attempt is made to induce the reader to cross too... Mr. Thompson Seton says in capital letters that his stories are true and it is this emphatic assertion that makes the judicious grieve. —John Burroughs on Ernest Thompson Seton's *Wild Animals I Have Known*, in "Real and Sham Natural History,"

When President Theodore Roosevelt came to Burroughs' defense in his article “Nature Fakers,” the debate subsided.

Seton met Scouting's founder, Lord Baden-Powell, in 1906. Baden-Powell had read Seton's book, *The Birch Bark Roll of the Woodcraft Indians*, and was greatly intrigued by it. The pair met and shared ideas. Baden-Powell went on to found the Scouting movement worldwide, and Seton became vital in the foundation of the Boy Scouts of America and was its first Chief Scout.







**STEPHEN J. GOULD**





Applause





# Questions?







# Center for Environmental Research at Hornsby Bend



## AWU-CER Lunchtime Lectures February – December 2012

Each talk begins AT NOON Waller Center [625 East 10th Street – between I-35 and Red River] Room 104  
The 1<sup>st</sup> Tuesday of the Month! Free and Open to the Public – bring a lunch and learn

### 2012 - A Year of Natural History: Origins, Practices, and Examples

**February 1** - The History of Natural History: Origins to 19<sup>th</sup> Century [Room 105]

**March 7** - The History of Natural History: 19<sup>th</sup> and 20<sup>th</sup> Century Science and Literature [Room 105]

**April 3** - The History of Natural History: Contemporary Natural History

**May 1** - The Natural History of the Americas: Discovery and Transformation

**June 5** - The Natural History of Texas: Biological Survey and Ecological Change

**July 3** - The Natural History of Austin: Biological Context and Urbanization

**August 7** - Urban Natural History: Life in the City

**September 4** - The Natural History of an Urban Creek: Waller Creek

**October 2** - The Natural History of an Urban Vacant Lot: Tannehill Urban Wild Woodland

**November 6** - The Natural History of an Urban Wasteland: Hornsby Bend

**December 4** - Natural and Unnatural History: The Path Forward