

## ENG 645: Libraries of Life: Species and Print, Extinction and Archive

Prof. Gordon M. Sayre

Spring term 2016 ~ CRN 36011

Mondays and Wednesdays from noon to 1:30 PLC 448

This course takes an innovative approach to literature and environment, by combining the history of science with book history, and art, animal, and media studies. We will follow the development of natural history from antiquity to contemporary bio-science, through the changing modes of species media. The species concept is fundamental to environmentalism. The Endangered Species Act is the most powerful tool in United States law for the protection of natural habitats as well as of species. Species extinction is a particular concern due to the threat of the Sixth Extinction and its role in marking the onset of the Anthropocene. For ecocritics and environmental activists, the importance of protecting biodiversity seems self-evident. In the broader public, the sentimental appeal of charismatic megafauna undergirds support for protecting habitats and reducing carbon emissions.

However, the definition of species and sub-species, the counting and documentation of species for the measurement of biodiversity, and indeed the very concept of species are all contested among scientists. These questions also need to be scrutinized by environmental humanists. In science, politics, and aesthetics, different definitions of species, which arose out of different historical moments, all operate on different scales and discourses. For some purposes, a species matters only if it has a visible identity and emotional impact, if we can see it in a zoo or possibly in the wild. For other purposes, microbial species matter even though they are not visible and known only by a Latin name bestowed by specialist naturalists, or even a number associated with a database file. Herbaria stocked with pressed leaves and flowers began in the sixteenth century, and by the eighteenth the collections of new natural history museums and academic gardens included treasured type specimens, the referential guarantee for the Linnaean binomials of the quickly expanding dictionary of plants, animals, and insects.

It is not possible to have species without modes of reproduction and representation. As media have changed, from manuscript to print, from painting to printing to photography, and from specimen collections to genomic databases, species diversity has changed as well. Both visual and verbal conventions for species classification operate within the constraints of media reproduction technologies. We will study natural history and species media from the Renaissance to the age of genomics, and devote particular attention to 18th and 19th-century figures important both in literary history and the history of science such as William Bartram and John James Audubon.

Books at the UO ~~Book~~-Duck Store:

William Bartram, *Travels* Library of America edition

Beth Shapiro, *How to Clone a Mammoth* (Princeton UP, 2015)

Londa Schiebinger and Claudia Swan, eds., *Colonial Botany: Science, Commerce, and Politics in the Early Modern World* (U Penn Press, 2005)

John James Audubon, *Selected Journals and Other Writings*. Penguin Nature Library edition.

**Writing Assignments:** three short or medium-length papers (2000 - 5000 words) on Archive, Fieldwork, and Theory. One of the three will be the topic of a seminar presentation, and another

the end of term project with more bibliographic and scholarly references. Meet with me during the first two weeks to discuss how you plan to address these topics.

Archive assignment: write about an old natural history book, herbarium, museum exhibit, fossil collection or any way in which species are represented stored or catalogued.

Fieldwork practicum: go out in the field to search for and identify species, using some guide or app such as leafsnap. Or, report on a species conservation issue in the region. The Mt. Pisgah Arboretum Wildflower Festival has a display of local plants that I recommend. It takes place May 20th this year.

Theory analysis: report or review an eco-critic writing on these issues. Could be Foucault or Haraway or Latour or could discuss additional critical assessments of one of the figures we are reading, such as Audubon, Buffon, or Bartram.

### **Week 1: The Sixth Extinction & Biodiversity in a Genomic Age**

Since around 1990 the development of genomics, the threat of global climate change, the loss of species diversity, and the concept of the Anthropocene have each transformed human relations to organismic nature and the environment. How do the four trends relate and interact? This is a necessary prelude to our study of the history of species media.

April 2nd:

- Ursula Heise, “Lost Dogs, Last Birds, and Listed Species: Cultures of Extinction” *Configurations* 18 (2010); 49-72.
- E. O. Wilson, “The Major Historical Trends of Biodiversity” in *Systema Naturae 250: The Linnaean Ark*, ed. A. Polaszek (Taylor and Francis, 2010), 1-4 (pdf)
- Elizabeth Kolbert, “The Lost World” pt. 1 *The New Yorker*, Dec. 16th, 2013

April 4th:

- Gordon McGregor Reid, “Taxonomy and the Survival of Threatened Species: A matter of Life and Death” in *Systema Naturae 250*: 29-51.
- Gordon M. Sayre, “The Alexandrian Library of Life: A Flawed Metaphor for Biodiversity” *Environmental Humanities* 9:2 (November 2017), 280-299.

### **Weeks 2 and 3: Species in Print: Renaissance Botany and Species Media**

In the Rhineland in the 1530s emerged the first comprehensive illustrated guides to plants, with woodcut prints accurate enough to reliably identify plants in the field. This new media made species possible, and contributed to the scientific revolution. Hence this is an important link between species and print, but it also requires a different strategy of reading from what we are used to as literary scholars. How do we read Latin plant books? Do we just look at the woodcuts? Do we observe the structure of each entry or the order of entries as a taxonomy? Consider these reading strategies alongside our methods of finding and interpreting species in their habitats.

April 9th:

- Gordon M. Sayre “Species in Print: Renaissance Illustrated Plant Books and the Study of Species Diversity” (draft chapter)
- F. David Hoeniger, “How Plants and Animals were studied in the 16th c.” in *Science and the Arts in the Renaissance* (1985), 130-148.

- Claudia Swan, “The Uses of Realism in Early Modern Illustrated Botany” in *Visualizing Medieval Medicine and Natural History, 1200-1500*

April 11th: meet in Knight Library Special Collections

- Brian Ogilvie, “The Many Books of Nature: Renaissance Naturalists and Information overload” *Journal of the History of Ideas* 64:1 (January 2003), 29-40
- Michel Foucault, from *Les Mots et les choses* trans. *The Order of Things: An Archaeology of the Human Sciences* (1966) New York: Vintage, 1973. Part I, Chap. 5 "Classifying" 128-165.
- Alain Touwaide, “Botany and humanism in the Renaissance : background, interaction, contradictions” in *The Art of Natural History*

April 16th: How are species like books? How did the species of America transform European natural history?

- James S. Ackerman, “Early Renaissance ‘Naturalism’ and Scientific Illustration” in *Distance Points: Essays in Theory and Renaissance Art and Architecture*. MIT Press 1991
- Walter Mignolo, from “Commentary” to José de Acosta, *Natural and Moral History of the Indies*. trans. Frances López-Morillas. Duke UP, 2002, pp. 456-474

April 18th: Do words or pictures better identify species?

- Sachiko Kusukawa, “Leonard Fuchs on the importance of pictures.” *Journal of the History of Ideas* 58:3 (July 1997), 403-427.
- David Freedberg, “The Failure of Colour” in *Sight and Insight: Essays in Honor of E. H. Gombrich*. (Phaidon, 1994) 245-262
- Karen Reeds, “When the botanist can't draw: the case of Linnaeus” *Interdisciplinary Science Reviews* 29:3 (2004), 248-258.

#### **Week 4: American nature and indigenous taxonomy in natural history manuscripts**

Transporting specimens from American habitats to European “centres of calculation” (Bruno Latour’s term) was difficult in the early modern period, even for pressed plants. Daniela Bleichmar has called this “the fragility of knowledge in motion.” And aside from live and preserved specimens, many superb illustrated natural history manuscripts from America did cross the Atlantic failed to be published, preserved, or properly studied in Europe. Gonzalo Fernandez de Oviedo, Francisco Hernandez, the *Codex Badianus*, Maria Sybilla Meriam, Louis Nicolas and Jane Colden are a few of these authors. The few available sources on early modern indigenous taxonomy in Native American cultures are evidence for the study of ethnobotanical knowledge, or folkbiology.

April 23rd - The Codex Canadensis

- *The Codex Canadensis and the Writings of Louis Nicolas*, I ordered at Knight reserve. look through the illustrations, and read about the Moose, Beaver and Michipichik, pp. 330-349
- Gordon M, Sayre, “Michipichik and the Walrus: Anishinaabe Natural History in the 17th century work of Louis Nicolas” *JEMCS* 17 (2017)
- [Germaine Warkentin, “In Search of ‘The Word of the Other’: Aboriginal Sign Systems and the History of the Book in Canada” *Book History* ]

April 25th - Folk Biology and the Aztec Herbal

- Daniela Bleichmar, “Books, Bodies, and Fields” in *Colonial Botany*

- Jared Diamond and K. David Bishop, Ethno-ornithology of the Ketengban People, Indonesian New Guinea” in *Folkbiology*, ed. Douglas L. Medin & Scott Atran, (MIT Press, 1999).
- Deborah Hassig, “Transplanted Medicine: Colonial Mexican Herbals of the Sixteenth Century” *RES: Anthropology and Aesthetics* 17/18 (1989), 30-53.
- [the best source I found for the Codex Badianus, though longer and less accessible than Hassig, is the introductions to *The Paper Museum of Cassiano dal Pozzo: The Aztec Herbal*]

### **Week 5: Linnaeus and Modern Taxonomy**

The sexual system of classification for flowering plants, and the *Systema naturae* of all living things, are the foundations of modern taxonomy, and have made Linnaeus a central figure for species identity. His system was particularly influential in Britain, where it helped inspire the popular mania for gardening and natural history from the 1750s through 1850s. But this influence obscures his real biography, and the biases of his approach. This week we will study Linnaean botany and taxonomy in cultural and historical context.

April 30th: Linnaeus

- Lisbet Koerner, “Carl Linnaeus in his time and place” and Londa Schiebinger, “Gender and natural history” in *Cultures of Natural History*, ed. Jardine and Spary, Cambridge UP, 1996, pp. 146-177.
- Koerner, *Linnaeus: Nature and Nation* (Harvard UP, 1999) chapters 1 & 2, pp. 14-52
- Stefan Muller-White, “Walnuts at Hudson Bay, Coral Reefs in Gotland: The Colonialism of Linnaean Botany” in *Colonial Botany*

May 2nd: *The Loves of the Plants*

- Erasmus Darwin, from *The Loves of the Plants*, part 2 of *The Botanic Garden* [e-text]. 1st canto, including lines 139-150, about the Silene or Catchfly plant
- Janet Browne, “Botany for Gentlemen: Erasmus Darwin and *The Loves of the Plants*” *ISIS* 80 (1989), 593-621 [I think I decided this was better than the article by Frederika Teute]
- Londa Schiebinger, “Prospecting for Drugs: European Naturalists in the West Indies” in *Colonial Botany*

### **Week 6: Jefferson, Buffon and the American Degeneracy Controversy**

Georges-Louis Leclerc, Comte de Buffon, was born in 1707, the same year as Linnaeus, but the two scientists became rivals with contrasting theories and styles of natural history. Whereas Linnaeus’ binomial nomenclature became foundational for modern taxonomy, his writings in Swedish and Latin had little lasting impact. Buffon’s theories were eclipsed by later scientists, but his multi-volume *Histoire naturelle* was among the most widely read texts in eighteenth-century Europe. Buffon became associated with the theory that American nature was less fertile and healthful than that of Europe, which set off a polemic that influenced the creole revolutions of the 1770s-1820s.

May 7th

- Thomas Jefferson, *Notes on the State of Virginia*, Query VI
- “American Degeneracy: Colonial Science and Environmental Degeneracy in the 18th century”
- Buffon’s chapters on Lion and “Animals of the New World” and “Animals Common to the two continents” in vol. 5 of William Smellie, trans., *Natural history, general and particular, by the Count de Buffon* London, 1785, 9 vols. It is on ECCO

May 9th

- Antonio Lafuente and Nuria Valverde, “Linnaean Botany and Spanish Colonial Biopolitics” in *Colonial Botany*.
- Peter Kalm, *Travels in North America* (1753) Dover, 1964 pp. 54-56, 186-195, 305-309
- Hanna Roman, “Naming as Natural Process and Historical Narrative in Buffon’s *Histoire Naturelle*, 1749-1755” *Romance Studies* 31: 3-4 (Nov. 2013), 238-250.

[Gilbert Chinard’s “America as Human Habitat” is a long detailed article on the controversy]

### **Week 7: William Bartram**

Because America in the 18th century lacked a printing and publishing infrastructure of skilled engravers, woodcutters, type foundries, papermakers and printers, natural history as practiced in America had to step back to a stage prior to the print revolution. The barriers of distance and time meant that species representation in America in the 17<sup>th</sup> and 18<sup>th</sup> centuries could occur only when one person united many skills, to travel, find, collect, interpret, comprehend, describe and depict, new species and specimens. William Bartram, Maria Sybilla Meriam, and John James Audubon were among a very few who had first-rate artistic talents to go with the other skills. Bartram also was able to bring romantic literary imagination to Latinize Linnaean binomials, and to interrogate the divisions between plant and animal and human.

May 14th and 16th

- *Travels* Introduction, Part 1, Part 2 chapters i – vi pp. 13-186.
- Chapter by Thomas Hallock in *From the Fallen Tree*, or article from *SAQ* 2001

### **Weeks 8 and 9: John James Audubon**

Audubon is known today as an artist and ornithologist, and namesake for a major environmental organization. He was also a talented writer and storyteller, who, like Cooper’s Leatherstocking, helped to form the mythic image of the settler colonial frontiersman in the early 19th century. Audubon’s work is foundational for a shift in species media; from painting and engraving to photography, and from pastoral abundance to capitalist scarcity.

May 21st and 23rd

Sketches: "Louisville in Kentucky" (p. 377 or Vol. 1 plate 85) "The Eccentric Naturalist" (p. 508 or Vol. 1 plate 90) "Live Oakers" (p. 429 or Vol 2 plate 140) "Spring Garden" (p. 433 or Vol. 2 plate 145) "A Flood" (Vol. 1 plate 30) "Florida Keys I & II" ( p. 451 or Vol. 2 plates 155, 160) "My Style of Drawing Birds" (p. 531 or Vol 2 plate 158) and "Myself" (p. 1-30) *Ornithological Biography*: Passenger Pigeon, Chimney Swallow, and the Vulture.

In addition to the Penguin volume, view the bird paintings on the University of Pittsburgh library’s Audubon website.

May 30th

- Laura Dugan Partridge, “By the Book: Audubon and the Tradition of Ornithological Illustration” in Amy R. Meyers, ed. *Art and Science in America: Issues of Representation*. or
- Christopher Irmscher, “Audubon at Large” from *The Poetics of Natural History*

### **Week 10: Rewilding and de-extinction**

Re-wilding is a recent movement in conservation ecology that aims to restore ecosystems and food-webs by emphasizing the role of “keystone species,” mega-fauna like wolves, elephants, and big cats that have declined due to habitat loss, hunting and eradication. These ecologists justify a preference for megafauna due to their influence on native vegetation (in savannahs, deserts, forests, or boreal forests and tundra), and the related notions of authenticity and sublime wildness. The movement also has captured the imagination of popular culture in the form of paleo diets, neo-primitivism, and rewilding. In the first week we will study how the Mammoth and Mastodont were the species upon which the concept of extinction, the controversy over American degeneracy, and the beginnings of paleontology all relied in the late 18th century. In the last few decades, the Mammoth has also been the poster species for efforts to use genomics to “de-extinct” animals that were wiped out by humans. In the second week we will look at some early articulations of rewilding philosophy, and learn about how genomics may make de-extinction possible.

June 4th

- Beth Shapiro, *How to Clone a Mammoth: The Science of De-Extinction* (Princeton UP, 2015)
- Tim Sweet, “The Eighteenth-Century *Archives du Monde*: The Question of Agency in Extinction Stories” draft manuscript.
- Gordon M. Sayre “The Mammoth: Endangered Species or Vanishing Race?” *JEMCS* 1:1 (2001) 63-88

June 6th

- Paul S. Martin, “The Last Entire Earth” *Wild Earth* 2:4 (Winter 1992/93) 29-32.
- Michael Soulé and Reed Noss, “Rewilding and Biodiversity: Complementary Goals for Continental Conservation” *Wild Earth* 8.3 (Fall 1998), 18-28.

Threats to plant life. Extinctions of plant and animal species. The graph and chart give information about species extinctions and the threats to plant life. Summarise the information by selecting and reporting the main features, and make comparisons where relevant.

Paragraph 1: Introduction – Says what you can see, try not to repeat words from the question where possible. Paragraph 2: Overview – Most important thing about both graphs. No details. The trend graph and pie chart show the rates at which both plants and animals are becoming extinct as well as detailing the sources of threats to plant life. Overall, we can see that extinction rates are increasing. It is also clear that human impact is responsible for far more harm to plant life than natural events are. The ongoing sixth mass species extinction is the result of the destruction of component populations leading to eventual extirpation of entire species. Populations and species extinctions have severe implications for society through the degradation of ecosystem services. Here we assess the extinction crisis from a different perspective. We examine 29,400 species of terrestrial vertebrates, and determine which are on the brink of extinction because they have fewer than 1,000 individuals. There are 515 species on the brink (1.7% of the evaluated vertebrates). Around 94% of the populations of 77 m An extinct species has gone forever, although some scientists hope that they might bring back some extinct species using genetic engineering. Changes in the environment may leave individuals less well adapted to compete successfully for resources such as food, water and mates. Sometimes an entire species may become unable to compete successfully and reproduce. These problems can lead to extinction. Here are some of the changes in the environment that can cause a species to become extinct: a new disease. a new predator.