

History of Science 909  
Spring 2009: History of Biogeography, 1750-1950  
Weds. 9-11:30 a.m., 7130 Sewall Social Science Building  
Prof. Lynn K. Nyhart  
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Office hours: Wed. 1:20-3:15 and by appointment

This seminar focuses on the following questions: How did European and American scientists and social theorists make meaning of the distribution of living things—plants, animals, and people—across the face of the earth from about 1750 to the aftermath of World War II? And how do we situate their scientific theorizing in relation to imperial ambition and conquest, human migration, and the human-driven redistribution of organisms across the globe? Topics will range from debates over geographical determinism in the Enlightenment to twentieth-century debates over the roles of isolation and migration in evolution, and from analyses of bird distribution to ideas about human migration and the rise of civilization. Our task will be to understand the intellectual history involved here in relation to the political, social, and environmental histories in which it was embedded. While it covers two centuries, emphasis will be laid on time periods and topics of most interest to seminar participants.

#### Requirements:

50%: Original research paper of 20-35 pages

50%: class participation. Each student will be responsible for sessions in each of the 3 parts of the course.

In Part I, each student will be in charge of leading one discussion. The student will write a “think-piece” of 1-2 pages raising issues and questions for discussion, and perhaps putting forth some of his or her own interpretations; this will be circulated by Monday night of the week the student leads.

In Part II, each student will pick some reading or readings, primary and/or secondary, relating to a topic that interests them (this will probably be the topic of your research paper), amounting to no more than 60 pages total, as the basis for a discussion which s/he will lead. The readings must be made available a week in advance of the discussion date, along with a brief discussion of why you chose them and what questions you’re interested in. There will be two such topics in each meeting in this section; the sessions are aimed at facilitating students’ working out their questions and arguments in their papers.

In Part III, each student will circulate a draft of their paper for workshopping and discussion. Across these sessions, which will cover two or three paper drafts, depending on the week, each student will have two formal roles (in addition to your regular role as discussant): as author, your responsibility will be to highlight your argument and the issues you want to discuss. As discussion facilitator for one other student’s paper, your responsibility will be to lead and structure the discussion to be as productive as possible for the other student. Of course, all students will be expected to read the other students’ papers and be prepared to supply comments and suggestions in the session.

## **Week-by-Week Overview**

Jan. 21: Introductions and Conjunctions

### I. Chronological Overview

Jan. 28: Climate and Physiology in the 18th Century

Feb. 4: Mapping Distribution in the Early Nineteenth Century

Feb. 11: Relations of Space and Time: Lyell, Forbes, and Darwin (1830s-1850s)

Feb. 18: Natural Regions and Imperial Movements (1850s-1880s)

Feb. 25: The Dynamics of Dispersion

March 4: Ecological Turns: Warming to Hesse (1890s-1940s)

March 11: Geography, Speciation, and the Evolutionary Synthesis (1930s-1950s)

[March 18: Spring break]

### II. Student-Chosen Topics

March 25 (2 topics)

April 1 (2 topics)

April 8 (2 topics)

April 15 (1 topic)

### III. Student Research Presentations/Workshopping

April 22 (2 presentations; drafts due Sunday, April 19)

April 29 (3 presentations; drafts due Friday, April 24)

May 6 (2 presentations; drafts due Sunday, May 3)

Final paper due Wednesday, May 13

**Jan. 21: Introductions and Conjunctions**

*Why are we here? What do you want to accomplish? What intersections of science, history, and environment might we consider this semester? These introductory readings confront us with the question of how historians of science have come to use space as an analytical tool (Finnegan); how they have analyzed geography's own history (Livingstone); and how biogeographers have characterized their own history. What questions are stimulated by the juxtaposition of these different ways of thinking about geography, biogeography, and history? What traps might we want to be aware of?*

**Common Reading:**

C. Barry Cox and Peter D. Moore, *Biogeography: An Ecological and Evolutionary Approach*, 7th edition (2005), 15-44.

David N. Livingstone, "Geography," in *Companion to the History of Modern Science*, ed. R.C. Olby, G. N. Cantor, J.R.R. Christie, and M..J.S. Hodge (Routledge, 1990), 743-760

Diarmid A. Finnegan, "The Spatial Turn: Geographical Approaches in the History of Science," *Journal of the History of Biology* 41 (2), 2008: 369-388

## **Jan. 28: Climate and Physiology in the Eighteenth Century**

The ideas of Georges-Louis Leclerc, Comte de Buffon, are often considered a starting point for modern animal geography, and his ideas on new and old world animals ignited the so-called "Dispute of the New World." However, ideas about environmental determinism in the eighteenth century extended beyond plants and animals to humans, as the selections from Montesquieu remind us.

### **Common Reading:**

Montesquieu, *The Spirit of the Laws* (1748), Books 14-18

[http://www.constitution.org/cm/sol\\_02.htm](http://www.constitution.org/cm/sol_02.htm) (scroll down to Book 14ff)

Buffon, *Natural History*, tr. William Smellie (1781), excerpts:

\*"Dissertation on Wild Animals" <http://faculty.njcu.edu/fmoran/vol4wildanimals.htm>

"Dissertation on Animals Peculiar to the Old World," <http://faculty.njcu.edu/fmoran/vol5old.htm>

"Dissertation on Animals Peculiar to the New World,"

<http://faculty.njcu.edu/fmoran/vol5new.htm>

\*"Of Animals Common to Both Continents," <http://faculty.njcu.edu/fmoran/vol5common.htm>

Gerbi, *The Dispute of the New World: The History of a Polemic, 1750-1900* (orig. Spanish 1955; first English ed. 1973), Contents, Translator's Preface, 3-34 (on Buffon), 252-268 (on Jefferson) (Mem: E19 G3713).

Bowler, *Environmental Sciences*, ch. 5.

Browne, *Secular Ark*, ch. 1, 1-31

### **Bibliography:**

Alan Bewell, "Jefferson's Thermometer: Colonial Biogeographical Constructions of the Climate of America," in *Romantic Science: The Literary Forms of Natural History*, ed. Noah Heringman, 111-38. Albany: State University of New York Press, 2003.

Jorge Cañizares-Esguerra, *How to Write the History of the New World: Histories, Epistemologies, and Identities in the Eighteenth-century Atlantic World* (Stanford: Stanford University Press, 2001)

Alfred W. Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492* (Westport, CT: Praeger, 2003) (orig. Greenwood Press, 1972; 30th anniversary ed., 2003). Note especially his revisionist reflections on what he got wrong and write in his foreword.

Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900-1900* (Cambridge: Cambridge University Press, 1986)

## Feb. 4: Mapping Distribution

How did German, French, and British scientists come to look for global distribution patterns? How were these handled technically, through visual and statistical means? How do we understand the role of empire in these pursuits, given Browne's strong argument for imperialism at the heart of British biogeography and the much more open question of the nature of German "imperialism," when there was neither a German state nor a German empire?

### Common Readings:

Janet Browne, *The Secular Ark*, chs.2-3, pp. 32-85

Browne, "British Biogeography Before Darwin," *Revue d'Histoire des Sciences*, 1992, 45(4): 453-75

Alexander von Humboldt, selections from *Kosmos* and *Views of Nature, A Source Book in Geography*, ed. George Kish (Cambridge: Harvard University Press, 1978), 408-418.

J. B. Wilbrand and F. A. Ritgen, *Picture of Organized Nature, in its Spreading over the Earth* (London: Smith & Son, Mapsellers, 1828). English translation of *Gemälde der organischen Natur in ihrer Verbreitung auf der Erde* (Giessen: C. G. Müller 1821). Also available online at: <http://www.archive.org/details/pictureoforganiz00londrich> . I am trying to locate a copy of the spectacular image that this description accompanies; right now we have only a detail from the cover of *Darwin's Garden* (plus a tiny image of it as Fig. 1 of the same book), which I will place on the 909 shelf in the History of Science Reading Room.

Larson, James, "Not Without a Plan: Geography and Natural History in the Late Eighteenth Century," *J. Hist. Biol.* 19, 3 (Autumn 1986): 447-488

Malcolm Nicolson, "Alexander von Humboldt, Humboldtian Science and the Origins of the Study of Vegetation," *History of Science*, 1987, 25: 167-94.

### Supplementary readings:

Nicolaas A. Rupke, "Humboldtian Medicine," *Medical History*, 1996, 40: 293-310, online at: <http://www.pubmedcentral.nih.gov/tocrender.fcgi?iid=113837>

*Medical History*, Supplement 20 (2000): *Medical Geography in Historical Perspective*, online at: <http://www.pubmedcentral.nih.gov/tocrender.fcgi?iid=171451>

Alberto Castrillon, "Humboldt et la géographie des plantes," *Revue d'Histoire des Sciences*, 1992, 45(4): 419-33.

Martin Rudwick, "Picturing Nature in the Age of Enlightenment," *Proceedings of the American Philosophical Society*, Vol. 149, No. 3 (Sep., 2005), pp. 279\_303 (available through JSTOR)

M. Eulàlia Gassó Miracle, "The Significance of Temminck's Work on Biogeography: Early Nineteenth century Natural History in Leiden, The Netherlands," *J. Hist. Biol.*, Winter 2008, 41(4): 677-716. Available through SpringerLink (go through MadCat).

## Feb. 11: Relations of Space and Time: Lyell, Forbes, and Darwin

The history of biogeography is often divided into before and after Darwin. But one can't understand Darwin's biogeography without understanding that of Lyell, who was arguably the more influential biogeographer. And one must not forget scientists less well known today but towering figures in their own time, such as Edward Forbes. This week, then, focuses on these major figures, but especially Lyell.

Janet Browne, *The Secular Ark*, ch. 4-end

Lyell, *Principles of Geology*, first ed., vol. 2, chs. 5-12, available online at: <http://www.esp.org/books/lyell/principles/facsimile/> (click on the blue-linked Table of contents, then scroll down to vol. 2—note that each volume's chapters start from 1). or 2nd (or later) ed.,

### Supplementary reading:

Charles Darwin, *On the Origin of Species* (London: John Murray, 1859), chapters 11 and 12. Available online at:

[http://darwin\\_online.org.uk/EditorialIntroductions/Freeman\\_OntheOriginofSpecies.html](http://darwin_online.org.uk/EditorialIntroductions/Freeman_OntheOriginofSpecies.html)

Peter Bowler, "Geographical Distribution in the **Origin of Species**," in *The Cambridge Companion to the Origin of Species*, ed. Michael Ruse and Robert J. Richards, 153-172.

Philip F. Rehbock, *The Philosophical Naturalists* (Madison: University of Wisconsin Press, 1983), chapter 4: "Zonation, Provinces, and Biogeographic Statistics," and chapter 5, "Whence Came the Flora and Fauna?" (117-191).

James Moore, "Revolution of the Space Invaders: Darwin and Wallace on the Geography of Life," in *Geography and Revolution*, ed. David Livingstone and Charles W. J. Withers

## Feb. 18: Natural Regions and Imperial Movements

From the 1850s to the 1880s, biogeography became intensely focused on the establishment of natural regions (especially those of Wallace) and their boundaries. Here the notion of the natural “region” drew on political language with implications for human settlement and notions of environment. At the same time, acclimatizers were actively seeking to establish plant and animal species beyond the locations where they had been found. How might we understand the relations between these seemingly contradictory trends?

### Common Readings:

Bowler, Peter J., “The Geography of Life,” chapter 8 in idem, *Life’s Splendid Drama* (U. Chicago Press, 1996), 371-418.

Alfred Russel Wallace, “The Distribution of Animals as Indicating Geographical Changes” (1877), revised and published in *Tropical Nature and Other Essays* (London: MacMillan, 1878), 306-347

Michael Osborne, “Acclimatizing the World: A History of the Paradigmatic Colonial Science,” *Osiris*, 2001, 15: 135-51

David N. Livingstone, “Human Acclimatization: Perspectives on a Contested Field of Inquiry in Science, Medicine, and Geography,” *History of Science*, 1987, 25: 359-394.

### Supplementary Readings:

#### A. Biogeographical Regions

Jane R. Camerini, “Evolution, Biogeography, and Maps: An Early History of Wallace’s Line,” *Isis*, 1993, 84(4): 700\_727

Jeremy Vetter, “Wallace’s Other Line: Human Biogeography and Field Practice in the Eastern Colonial Tropics,” *Journal of the History of Biology*, Vol. 39, No. 1 (Spring, 2006), pp. 89\_123

Martin Fichman, “Wallace, Zoogeography, and the Problem of Land Bridges,” *J. Hist. Biol.* 10 (1977): 45-63.

Joel Asaph Allen, “The Geographical Distribution of North American Mammals,” reprinted from *Bulletin of the American Museum of Natural History*, 4, 1892. In *Selected Works of Joel Asaph Allen*, edited with an introduction by Keir B. Sterling (NY: Arno Press, 1974)

C. Hart Merriam, “The Geographic Distribution of Animals and Plants in North America,” Reprinted from *Annual Report of the Board of Regents, Smithsonian Institution, 1891*, Washington, D.C., 1983. In *Selected Works of Clinton Hart Merriam*, edited with an introduction by Keir B. Sterling (NY: Arno Press, 1974)

Rexford F. Daubenmire, "Merriam's Life Zones of North America," *Quarterly Review of Biology*, 1938, 13 (3): 327-32.

## **B. Acclimatization**

Warwick Anderson, "Climates of Opinion: Acclimatization in 19th-Century France and England," *Victorian Studies* 35 (1992), 549-59.

Lynn K. Nyhart, "The World in Miniature: Practical Natural History and the Zoo Movement," ch. 3 in idem, *Modern Nature: The Rise of the Biological Perspective in Germany* (University of Chicago Press, 2009), 79-124.

## **C. Environmental History**

Melissa Johnson, "The Making of Race and Place in Nineteenth-Century British Honduras," *Environmental History* 8 (2003), 598-617

Diana K. Davis, "Potential Forests: Degradation Narratives, Science, and Environmental Policy in Protectorate Morocco, 1912-1956," *Environmental History*, Vol. 10, No. 2 (Apr., 2005), pp. 211\_238

Yossi Ben-Artzi, "The Idea of the Mediterranean as a Region in Nineteenth- to Mid-Twentieth Century German Geography," *Mediterranean Historical Review*, 19 (2) (Dec. 2004), 2-15.

Joachim Radkau, "Colonialism as a Watershed in Environmental History," Chapter 4 in idem, *Nature and Power: A Global History of the Environment* (Washington, D.C.: German Historical Institute, 2008) [original German 2002]

## Feb. 25: The Dynamics of Dispersion

In the early twentieth century, biogeographers devoted ever more attention to the question of how plant and animal distribution reflected the history of migration and spread of species. How were rare forms, endemic ones, and closely related ones to be interpreted in historical terms? Whereas the American paleontologist William Diller Matthew's "Climate and Evolution" offered an influential account of "waves" of migration of animals that was especially important for ideas about human evolution, the Briton J. C. Willis' "Age and Area" approach was especially important for botanists. What roles might we assign to national or disciplinary differences in thinking about their different reasoning? And how might we think about "migration" in relation to evolution and biogeographical theory more broadly (Nyhart)? Finally, the history of dispersalism generally assumed a fixed earth. But the early twentieth century was also the period when Alfred Wegener's continental drift theory appeared on the scene, challenging this basic assumption of biogeographers. Although we won't be tackling this last topic very directly this week, you should know about it (Bowler).

### Common Reading:

Bowler, *Environmental Sciences*, 340-356, 435-45; 389-92, 399-412

W. D. Matthew, "Climate and Evolution," *Annals of the New York Academy of Sciences*, 1914-15 (24): 171-318. Rev. ed., published as a book with supplements: Geol. Lib: QE 721 M3; Mem. Lib: Cutter MG M43

J. C. Willis, "The Endemic Flora of Ceylon, with Reference to Geographical Distribution and Evolution in General," *Philosophical Transactions of the Royal Society of London*, Series B, 1915, 206: 307-342

Lynn K. Nyhart, "Immigrants and Pioneers: Moritz Wagner's 'Law of Migration' in Context," ms. chapter to be published in *Knowing Global Environments: New Historical Perspectives on the Field Sciences*, ed. Jeremy Vetter.

Peter J. Bowler, "The Geography of Extinction: Biogeography and the Expulsion of 'Ape Men' from Human Ancestry in the Early 20th Century," in *Ape, Man, Apeman: Changing Views since 1600*, ed. Raymond Corbey and Bert Theunissen, [PAGES AND PUB INFO]

### Supplementary Readings:

Rexford F. Daubenmire, "Merriam's Life Zones of North America," *Quarterly Review of Biology*, 1938, 13(3): 327-332

Gareth Nelson, "From Candolle to Croizat: Comments on the History of Biogeography," *J. Hist. Biol.* 1978, 11: 269-305.

Homer E. LeGrand, *Drifting Continents and Shifting Theories* (Cambridge UP, 1988)

Mott Greene, "Plate Tectonics and Biogeography," *Earth Sciences History* 1985, 4: 91-97.

Victor Hehn, *The Wanderings of Plants and Animals from their First Home* (English translation of: Kulturpflanzen und Haustiere in Ihrem Übergang aus Asien nach Griechenland und Italien sowie in das übrige Europa: Historisch-linguistische Skizzen. Berlin: Gebrüder Borntraeger, 1870) ed. James Stallybrass (London: Swann Sonnenschein 1885) (esp. intro.)

George Gaylord Simpson, "Antarctica as a Faunal Migration Route, *Proceedings of the Sixth Pacific Science Congress of the Pacific Science Association* (Berkeley & Los Angeles: Univ. of California Press, 1940), Vol. 2: 755-768. Text available online at:  
<http://www.wku.edu/~smithch/biogeog/SIMP940A.htm>

Ronald Rainger, *An Agenda for Antiquity: Henry Fairfield Osborn and Vertebrate Paleontology at the American Museum of Natural History*. (Tuscaloosa: U. of Alabama Press, 1991), esp. chapters 6-8.

#### **March 4: Ecological Turns: Warming to Hesse**

In the same period when historical biogeographers were wrestling with dispersion from a historical perspective, another group abandoned history to focus on ecology. How did ecological plant and animal geography look different from historical biogeography? What did ecology seem to offer that history did not? And what other factors in the rise of the ecological approach might we consider?

#### **Common Reading:**

Bowler, *Environmental Sciences*, 361-378

Lynn K. Nyhart, "Museum Research and the Rise of Ecological Animal Geography," chapter 9 in *Modern Nature* (Chicago: University of Chicago Press, 2009)

Eugenius Warming, *Oecology of Plants: An Introduction to the Study of Plant Communities*, tr. Isaac Bailey Balfour and Percy Groom (Oxford: Clarendon Press, 1909) (translation of *Plantensamfund*, 1895). Look at translator's preface, Table of Contents, and Introduction (pp. 1-16) at:  
[http://chla.library.cornell.edu/cgi/t/text/text\\_idx?c=chla;cc=chla;idno=2811757;node=2811757%3A5;frm=frameset;view=toc](http://chla.library.cornell.edu/cgi/t/text/text_idx?c=chla;cc=chla;idno=2811757;node=2811757%3A5;frm=frameset;view=toc)

Hugh M. Raup, "Trends in the Development of Geographic Botany," *Annals of the Association of American Geographers*, 32(4), Dec. 1942, 319-354.

Hesse, Richard, W. C. Allee, and Karl P. Schmidt, *Ecological Animal Geography* (New York: John Wiley & Sons; London: Chapman & Hall, 1937), Front matter, 1-31, 72-120, 135-45, 538-56.

#### **Supplementary Readings:**

William Coleman, "Evolution into Ecology? The Strategy of Warming's Ecological Plant Geography," *J. Hist. Biol.* 1986, 19: 181-96.

Victor E. Shelford, "Physiological Animal Geography," *Journal of Morphology*, 1911, 22(3): 551\_618.

Peder Anker, *Imperial Ecology: Environmental Order in the British Empire, 1895-1945* (Harvard University Press, 2002), esp. chapter 1.

## March 11: Geography, Speciation, and the Evolutionary Synthesis

The “evolutionary synthesis” of the 1930s and 1940s most prominently brought together Mendelian genetics and Darwinian evolution (Bowler), but another important aspect was Ernst Mayr’s placement of systematics and field natural history at the center of his version of the synthesis. It still remains for historians to situate Mayr’s work adequately in the larger realm of biogeography and evolution—in large part because the broader history remains unwritten—but there is no question that he was instrumental in resituating evolutionary studies around the problem of speciation, a problem area that in his view was fundamentally a geographical one.

### Common Reading:

Bowler, *Environmental Sciences*, 445-78

Ernst Mayr, *Systematics and the Origin of Species* (Columbia U. Press, 1942), esp. chapters 3-9.

### Supplementary Readings:

Robert Cushman Murphy, “Animal Geography: A Review,” *Geographical Review*, 1938, 28: 140-144.

David Magnus, “Theory, Practice, and Epistemology in the Development of Species Concepts,” *Studies in History and Philosophy of Science* 1996, 27: 521-545

Kristin Johnson, “Ernst Mayr, Karl Jordan, and the History of Systematics,” *History of Science*, 2005, 43: 1-35

Ernst Mayr, “Ecological Factors in Speciation,” *Evolution* 1(4), 1947, 263-288.

François Vuilleumier, “Ernst Mayr’s Biogeography: A Lifetime of Study,” *Ornithological Monographs* 58 (2005): 58-72.

### **General Bibliography/Resources:**

Charles H. Smith, "Early Classics in Biogeography, Distribution, and Diversity Studies: To 1950," <http://www.wku.edu/%7Esmithch/biogeog/>.

Charles H. Smith, Joshua Woleben, and Carubie Rodgers, "Some Biogeographers, Evolutionists and Ecologists: Chrono-Biographical Sketches."  
<http://222.2ku.edu/%7Esmithch/chronob/homelist.htm>.

Jan Smits, *Petermann's Maps: Carto\_bibliography of the Maps in Petermanns geographische Mitteilungen 1855\_1945* ('t Goy\_Houten : Hes & De Graaf, 2004).

### **Electronic Resources in MadCat:**

*Journal of the History of Biology*: available on JSTOR, 1968-2004, and on Springer Link Journals from 1997-present.

