

History of Science/MHB 333: History of Modern Biology
Fall 2012
Prof. Lynn Nyhart
MW 2:30-3:45 in 2104 Chamberlin

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Office Hours (207 Bradley Memorial Building): Tuesdays 1:30-3:30 pm and by appt.

The word “biology” was coined in 1800, to describe a science of life that would be more than “mere” natural history—a science that would unite all the living world into a single scheme. From then to now, the desire to organize a unified *science* of life has intertwined with key questions about the nature of life itself and how to study it. This course focuses on the relationships between questions about the organization of organisms and scientists’ views of biology writ large. Among other topics, we will examine Lamarck’s conception of living matter and his coining of “Biologie;” the cell theory as a new way of unifying plants and animals; Darwinian evolution; the theory of the gene (“classical” genetics); the “modern” evolutionary synthesis of the 1940s; DNA and molecular biology; recombinant DNA and genomics; and current challenges to the evolutionary “tree of life” that once again call into question foundational assumptions about the nature of life. Across these topics, we will grapple with biologists’ ideas about reductionism, holism, and levels of biological organization; analyze different modes of scientific practice (fieldwork, lab work, theorizing); and consider the institutional and broader politics of biology as it has developed over the last two and a half centuries. Finally, we will also consider how these various themes are reflected in the ways that the history of biology has been written, by critically examining and comparing scientists’ and historians’ accounts.

There is one required book, available for purchase at University Book Store:

*James D. Watson, *The Double Helix* (Norton Critical Edition, 1980)

The other readings are articles and chapters available online via Learn@UW. It is expected that you will either print these up to bring to class, bring extensive notes, or bring your laptop to consult the readings in class (but NOT surf the web, check email or do other homework!).

Undergraduate Course Requirements:

20% Part 1 take-home essay (approx. 1500 words), covering beginning of course thru 10/17, due Friday, 10/26, in class

20% Research analysis on levels of biological organization (1200-1500 words), due Wednesday, 11/21, by NOON

30% Final essay, covering Units 2 and 3 (approx. 1500 words), due at NOON Wednesday, 12/19 (in L@UW Dropbox).

30% Class participation: includes preparing 10 questions/comments for class and 3 analytical discussion pieces—see addendum on class participation and preparation. Attendance is mandatory; participation means talking intelligently based on your active engagement with readings, lecture material, and classmates).

All formal writing assignments are take-home essays and should be word-processed and stapled with your name on the back of the last page, unless otherwise directed. Please be sure to include a title.

Honors students may either 1) extend your short research analysis into a 10-12-page research paper, due the last class day. Or 2) attend the workshop “What is an individual? Where philosophy, history, and biology coincide” (WID, December 14-17), reading its precirculated papers and writing a 5-7

page (double-spaced) commentary on the papers and discussion, due Dec. 21. The honors project will count as 15% of your overall grade, with 5% taken away from each of your other written assignments.

Graduate Students: See separate Graduate Syllabus.

Course Website. We will be using "Learn@UW," an interactive course website, for distributing all writing assignments and handouts and for important website links and other information. To access the Learn@UW site for HS/MedHist 333, follow these two steps:

1. Open up an Internet browser and go to this website (which you should then save in your "favorites" file): <https://learnuw.wisc.edu/> (You can reach it from the UW home page, too, under "Learn@UW.")

This is your login page for Learn@UW. You will need to type in your WiscWorld username and password to get to your "portal page."

2. Once on your Learn @UW portal page, you will see "My Madison Courses" which will list all your UW courses that have a Learn@UW website. Click on the link for this semester for "History of Science 333" or "Medical History and Bioethics 333" and you'll arrive at the course website. Notice that on this page there is information about the "Help Desk" if you have any trouble navigating to the site or getting any of the information.

Schedule of Topics and Readings

W 9/5: Course Introduction: Unifying the Study of Life

Part 1: The Emergence of "Biology" in the Nineteenth Century

Analytical focus: Analyzing primary-source texts, placing them in context

Note: All readings marked with * are posted under "Content" on Learn@UW.

Preamble: Studying Life in the Eighteenth Century

How did naturalists treat living organisms in the 18th century, before there was a self-conscious science of "biology"? How were questions about classification tied up with questions about physiology? How were they viewed as distinct?

M 9/10: Enlightenment Projects of Natural History

*Paul Farber, *Finding Order in Nature* (Baltimore: Johns Hopkins University Press, 2000), 6-21

*Staffan Mueller-Wille and Isabelle Charmantier, "Natural History and Information Overload: The case of Linnaeus," *Studies in History and Philosophy of Biological and Biomedical Sciences*, 2012, 43:4-15

* Carl von Linné, *Philosophia botanica*, tr. Stephen Freer. (Oxford University Press, 2003), 219-226, 328-35.

Visit Linnaeus' reconstructed garden at:

<<http://www.linnaeus.uu.se/tradgardsvandring/indexEng.php>>

Be sure to click around its different parts.

W 9/12: The Mysteries of Generation

*Shirley Roe, "The Life Sciences" in *Cambridge History of Science* vol 4, *Eighteenth-Century Science* (2003), 397-416

*Abraham Trembley, *Memoirs concerning the Natural History of the Polyp* (1744). Translated

and edited by Sylvia G. Lenhoff and Howard M. Lenhoff, in *Hydra and the Birth of Experimental Biology–1744*. (Pacific Grove, CA: Boxwood Press, 1986). Excerpts from the First and Fourth Memoirs, pp. 1-11, 182-188, Plates 11-13.

*Charles Bonnet, *Contemplation de la nature* (1769), tr. J. Wesley, excerpted in T.S. Hall, *Source Book in Animal Biology* (Harvard U P, 1951, 1970), 377-381.

A. The Organization of Life: France, 1795-1831

Issues for 9/17-19: Around what principles—methodological, organizational, epistemological, and metaphysical-- did Lamarck, Cuvier, and Geoffroy organize their sciences of animal life ca. 1800-1830? If you had been a student at the Paris Museum ca. 1829, with whom would you have wanted to work and why?

M 9/17: Studying “Life” in Paris ca. 1800.

*Lamarck, *Zoological Philosophy* (1809), translated by Hugh Elliott (Chicago: Univ. Of Chicago Press, 1984), 181-210

*Toby Appel, *The Cuvier-Geoffroy Debate* (NY: Oxford U. Press, 1987), 11-19, 246-248

W 9/19: The Cuvier-Geoffroy Debate

*Toby Appel, *The Cuvier-Geoffroy Debate*, 34-39, 251-252

*Georges Cuvier, *The Animal Kingdom Arranged in Conformity with Its Organization* (orig. French publ. 1817; English translation New York: Carvill, 1831), "Introduction," 1-32

*Hervé Le Guyader, *Étienne Geoffroy Saint-Hilaire 1772-1844: A Visionary Naturalist* (U. of Chicago Press, 2004), 1-19, 135-146 [Cuvier], 152-165 [Geoffroy]

B. Cell Physiology and Development: 1830s-1840s

Issues for 9/24-9/26: What characterized the upswing in interest in microscopy and cell theory in Germany in the 1830s and 1840s? What might have caused it? (Consider different levels of causation.)

M 9/24: Microscopy and Cell Theory

*Frederic L. Holmes, “The Microscopic Organization of Plants and Animals,” (unpublished ms.), 11-42 (note: this is not all of the selection)

*Theodor Schwann, *Microscopical Researches into the Accordance in the Structure and Growth of Animals and Plants*, tr. Henry Smith (London: Sydenham Society, 1847; orig. 1838), 154-168 (top), Plates I-IV.

W 9/26: Cell Physiology and Development

*Laura Otis, *Müller’s Lab* (Oxford U. Press, 2007), 14-34, 42-75

*Theodor Schwann, *Microscopical Researches*, 186-193

*Holmes, “Microscopic Organization,” 42-55 (still not quite the rest of the reading)

C. New Challenges around Generation: 1840s-1860s

How did biologists try to get a handle on the expansive category of “generation” in the mid-nineteenth century? How was this category linked to questions about individuality? What scientific questions were seen as belonging together and needing common solutions?

M 10/1: Generation and individuality

*John Farley, *Gametes & Spores*, 72-100.

- *Ohad Parnes, "On the Shoulders of Generations: The New Epistemology of Heredity in the Nineteenth Century," chapter 14 in *Heredity Produced: At the Crossroads of Biology, Politics, and Culture, 1500-1870*, ed. Staffan Müller-Wille and Hans-Jörg Rheinberger (Cambridge: MIT Press, 2007), 315-346.
- *Thomas Henry Huxley, "Report upon the Researches of Prof. Müller into the Anatomy and Development of the Echinoderms," *Annals and Magazine of Natural History*, 2nd ser., 7 (July 1851), selections on pp. 11-19, 1 plate.

W 10/3: Spontaneous generation

- *Christina Matta, "Spontaneous Generation and Disease Causation: Anton de Bary's Experiments with *Phytophthora infestans* and Late Blight of Potato," *Journal of the History of Biology*, 2010, 43:459-91.
- *Gerald L. Geison, "Creating Life in Nineteenth-Century France," chapter 5 in *The Private Science of Louis Pasteur* (Princeton: Princeton University Press, 1995), 110-142, 321-324.

D. "Darwin's" Theory, 1830-59

How is it that both Darwin and Wallace came up with "the same" theory? What practices did the two men have in common? What problems in natural history did the theory of descent with modification through natural selection solve? How did it do so? What new problems did it raise?

M 10/8: Darwin, Wallace, and British (Imperial?) Culture

- *Jan Sapp, *Genesis: The Evolution of Biology* (NY: Oxford U. Press, 2003), 16-30, 276-80
- *Jane Camerini, "Remains of the Day," in Bernard Lightman, *Victorian Science in Context* (Chicago: University of Chicago Press, 1997), 354-377
- *Charles Darwin, *On the Origin of Species* (London: John Murray, 1859; reprint ed. Harvard University Press, 1964), 1-7, 80-96, 109-130.

W 10/10: The *Origin*: Solutions and Problems

- *Charles Darwin, *On the Origin of Species*, 456-90.
- *Lynn K. Nyhart, "Embryology and Morphology," in *The Cambridge Companion to the "Origin of Species"*, Michael Ruse and Robert J. Richards, eds. (Cambridge: Cambridge University Press, 2009), 194-215

E. Darwinian Biologies in the Late 19th Century

T. H. Huxley and Ernst Haeckel were both leading Darwinians, and they both exerted enormous influence on teaching and learning about biology in the late nineteenth century. What features are most prominent in their programs, as represented in these writings? How was evolution worked into their programs? What similarities and differences do they bear to one another?

M 10/15: T. H. Huxley's Program: Bringing Nature into the Lab

- *Graeme Gooday, "'Nature' in the Laboratory: Domestication and Discipline with the Microscope in Victorian Life," *British Journal for the History of Science*, 1991, 24: 307-41.
- *Thomas Henry Huxley, "On the Study of Biology" (1876) in *idem, Science and Education. Essays*. (New York: Appleton, 1896), 262-293.

W 10/17: Ernst Haeckel's Program: Uniting Morphology and Darwinism

- (Intro to "Levels of organization" analysis at this class)
- *Ernst Haeckel, *The History of Creation* (trans. 1874) (New York: Appleton, 1887), 1-23.

*Frederick Churchill, "Living with the Biogenetic Law," in *From Embryology to Evo-Devo: A History of Developmental Evolution*, edited by Manfred D. Laubichler and Jane Maienschein (Cambridge, MA: MIT Press, 2007), 37-81.

Part 1 Essay covers material to this point.

Part 2: New Unifying Programs, 1880s-1950s

A. Development, Heredity, and Evolution

How did scientists seek to unite development, heredity, and evolution in the decades around 1900? What practical considerations (in the sense of both scientific practice and instrumental goals) came into play in the development of ideas of heredity?

M 10/22: The Cell in Development, Heredity, and Evolution

*August Weismann, *The Germ-Plasm. A Theory of Heredity*. Trans. W. Newton Parker and Harriet Rönnfeldt. (New York: Charles Scribner's Sons, 1893), pp. 1-35, 75-77, 392-409.

W 10/24: Mendelism and the Mutation Theory of De Vries

*Holmes, "Microscopic Organization," 55-59

*Hugo de Vries, "Evolution and Mutation," in idem, *Plant Breeding* (Chicago: Open Court, 1907), 1-26.

*Jim Endersby, "Oenothera lamarckiana: Hugo de Vries led up the primrose path," chapter 5 in idem, *A Guinea Pig's History of Biology*, 128-169, 451-55

*Barbara Kimmelman, "The American Breeders' Association: Genetics and Eugenics in an Agricultural Context, 1903-13," *Social Studies of Science*, 1983, 13:163-204.

PART 1 Take-home essay due FRIDAY Oct 26 before NOON in L@UW mailbox.

B. Genetics as a New Unifying Device

What made Morgan's gene theory so powerful? What consequences did this have for both genetics and evolution in the early twentieth century?

M 10/29 Classical Genetics: Morgan's School

*T. H. Morgan, "The Theory of the Gene," *American Naturalist*, 1917, 51: 513-44

*Robert E. Kohler, "Drosophila: A Life in the Lab" *J. Hist. Biol.* 1993, 26: 281-310

W 10/31: From Population Genetics to the Evolutionary Synthesis

*Julian Huxley, *Evolution: The Modern Synthesis* (New York: Harper, 1942), 13-46

*Stephen Jay Gould, *The Structure of Evolutionary Theory* (Belknap/Harvard, 2002), 503-508, 518-21, 524-28, 533-43

C. Ecology

What fields did the emerging discipline of ecology draw on in its development? What aspects of these fields were important? What was new?

M 11/5: Plant Ecology

*Peder Anker, "Plant community, Plantesamfund" in *Ecology Revisited: Reflecting on Concepts, Advancing Science*, edited by Astrid Schwarz and Kurt Jax (Springer, 2011), 325-332 [to be added later].

- *Joel Hagen, *An Entangled Bank: The Origins of Ecosystem Ecology* (New Brunswick, NJ: Rutgers University Press, 1992), chapter 2, "A Rational Field Physiology."
- *Robert E. Kohler, "Plants and Pigeonholes: Classification as a Practice in American Ecology" *Historical Studies in the Natural Sciences* 2008, 38(1): 77-108
- *Henry Cowles, "The Causes of Vegetative Cycles," *Botanical Gazette* 1911, 51:161-183.

W 11/7: Marine Ecology and Limnology

- *Lynn K. Nyhart, *Modern Nature: The Rise of the Biological Perspective in Germany*, chapter 9: Museum Research and the Rise of Ecological Animal Geography, pp. 323-354
- *Joel Hagen, *An Entangled Bank: The Origins of Ecosystem Ecology* (New Brunswick, NJ: Rutgers University Press, 1992), chapter 4, "The Metabolic Imperative," 50-77
- *G. Evelyn Hutchinson, "The History of a Lake," *Yale Scientific Magazine*, May 1942, 13-15, 22; reprinted in *The Art of Ecology: Writings of G. Evelyn Hutchinson*, David K. Skelly, David M. Post, and Melinda D. Smith, eds. (New Haven: Yale University Press), 134-137.

Part 3: Molecular Biologies

A. Molecularizing Biology

M 11/12: The Genetics of Little Tiny Things: Viruses and Genes

James Watson, *The Double Helix*, front matter-78

W 11/14: *The Double Helix* (discussion)

Watson, *Double Helix*, 78-133, plus essays by Pauling (146-153), Klug (153-58), Perutz, Wilson, and Watson (207-212)

- *Erwin Chargaff, "A Quick Climb Up Mount Olympus," *Science*, vol. 159, 29 March 1968: 1448-1449

M 11/19: Situating Watson and Crick

- *Francis Crick, *What Mad Pursuit: A Personal View of Scientific Discovery* (Basic Books, 1988), 15-23, 116-136
- *Gunter Stent, "That Was the Molecular Biology That Was," *Science*, 160, 26 April 1968: 390-95
- *Soraya de Chadarevian, *Designs for Life: Molecular Biology after World War II* (Cambridge University Press, 2002), 164-198

W 11/21: NO CLASS (Thanksgiving)

Levels of Organization analysis due by NOON

B. From Molecular Biology to Genomics

What ethical issues were raised surrounding bioengineering? When? What institutional, cultural, and technical factors allowed the further development of recombinant DNA research beginning in the early 1970s? What were the peculiar cultural features of Cetus Corp. that contributed to its success?

M 11/26: The Promise and Threat of Recombinant DNA

- *Nathanial Comfort, "Genetics without Sex," Chapter 7 in idem, *The Science of Human Perfection: How Genes Became the Heart of American Medicine* (New Haven: Yale U. Press, 2012), 200-239, 264-67.

- *Science for the People, "Biological, Social, and Political Issues in Genetic Engineering," in *The Recombinant DNA Debate*, ed. David A. Jackson and Stephen P. Stich (Englewood Cliffs, NJ: Prentice-Hall, 1979), 99-126 (orig. 1978)
- *Joshua Lederberg, "DNA Splicing: Will Fear Rob Us of Its Benefits?" in Jackson & Stich, *The Recombinant DNA Debate*, 174-180 (orig. 1975).

W 11/28: Public and Private Genomics

- *Paul Rabinow, Chapter One, "Toward Biotechnology," in idem, *Making PCR: A Story of Biotechnology* (Chicago: University of Chicago Press, 1996), 19-45, 178-179.
- *Robert Mullan Cook-Deegan, "Origins of the Human Genome Project," *Risk: Health, Safety, and Environment*, Spring 1994, 5: 97-118
- *Maynard V. Olson, "The Human Genome Project: A Player's Perspective," *Journal of Molecular Biology*, 319 (4) 17 June 2002, 931-942

C. What Goes around Comes around? Novelty and Continuity in -omic Biology

What's new in genomics and other -omics? What's not? What challenges to entrenched thinking about biology are raised by recent findings about genomes, viruses, and bacteria? What difference has the introduction of large-scale computational methods made?

M 12/3: Genetics vs. Genomics

- *Evelyn Fox Keller, *The Century of the Gene* (Cambridge, MA: Harvard University Press, 2000), 1-10, 46-72
- *Barry Barnes and John Dupré, *Genomes and What to Make of Them* (Chicago: University of Chicago Press, 2008), chapter 2, 47-74

W 12/5: "Data-driven Biology" in historical perspective

- *Bruno Strasser, "Data-Driven Sciences: From Wonder Cabinets to Electronic Databases," *Studies in History and Philosophy of Biological and Biomedical Sciences*, 2012, 43: 85-87
- *Sabina Leonelli and Rachel Ankeny, "Re-thinking Organisms: The Impact of Databases on Model Organism Biology," *Studies in History and Philosophy of Biological and Biomedical Sciences*, 2012, 43: 29-36.

M 12/10: Horizontal Gene Transfer and "Symbiomics"

How has the study of bacteria and viruses changed biological theory in recent years? How does Sapp's recounting of the history of endosymbiosis change the trajectory we think of as "the" history of biology?

- *Jan Sapp, *Genesis*, chapter 19, "Symbiomics," 234-251, 333-340.
- *Jennifer Ackeman, "The Ultimate Social Network," *Scientific American*, June 2012, 306 (6): 36-43
- *A possible third source TBA

W 12/12: LAST CLASS: Eco-Devo and Individuality

- *Scott Gilbert and David Epel, "Coda," from *Ecological Developmental Biology: Integrating Epigenetics, Medicine, and Evolution* (Sunderland, MA: Sinauer, 2009), 403-420.

Final Essay due Wednesday, Dec. 19, in Learn@UW Dropbox.

Academic Performance and Accommodation:

Essays: Every essay you write should take the form of an argument supporting a thesis. Since all essays are open-book, grading will NOT depend solely or even primarily on the correctness of the facts marshaled for your argument; this correctness is assumed as a base-point. Rather, much of your grade will be based on the persuasive power, sophistication, originality, and succinctness of your argument. (More on this during the course.)

Extensions are only granted if requested before the due date, and only in case of illness or other serious emergency. All extensions will have a definite new due date established. Papers received after the new due date will be subject to late paper penalties.

Late paper policy: any piece of writing that you hand in late without an extension will have the following penalties assessed: a quarter of a grade for every working day late. For example, if the paper on its merits deserves a B, after one day it would receive a B/BC, after two days a BC, after three a BC/C, after four a C. NOTE: LATE FINAL ESSAYS (due May 11) WILL NOT BE ACCEPTED.

Academic Credit and Plagiarism: Students may not copy sentences or ideas from others (including authors, websites, or other students) without giving credit to those sources; if someone else's words are so wonderful that you cannot substantially rephrase them, you must put them inside quotation marks, using the exact same words. If you omit the quotation marks or the credit, you are plagiarizing. Plagiarism is grounds for failure on the assignment plagiarized; repeated plagiarism is ground for failure in the course. If you use 3 or more words in a row from another source, they must be placed in quotation marks and footnoted. Otherwise, it is plagiarism. For more details on what plagiarism is and how to avoid it, consult a style manual or the Writing Lab.

Appealing a Grade: If you have questions about a grade, come speak to me. If the problem is not resolved, speak with the Undergraduate Chair, Prof. Florence Hsia. She will attempt to resolve the issue informally and inform you of the Appeals Procedures if no resolution is reached informally.

Access and Accommodation: I will make every effort to honor requests for reasonable accommodations made by individuals with disabilities. (If you think you qualify for accommodation, please contact the McBurney Disability Resource Center [263-2741; <http://jumpgate.acadsvcs.wisc.edu/~mcburney/>] to establish your eligibility for services.) Requests for accommodation can be responded to more effectively if I receive them as far in advance as possible, preferably at the beginning of the semester. Such requests are confidential.

Religious Observance: If religious holidays or observances conflict with your participation in this course, please come talk to me **well in advance** for us to work out alternative arrangements. If any other problems arise, either academic or personal, which might jeopardize your performance in the course, you must try to inform me after class or by the soonest available office hour, by email (lknyhart@facstaff.wisc.edu), or by leaving a message with the History of Science department administrator (262-1406).

Grading Scale for Take-Home Essays:

[note: papers involving research will also be graded on quality and quantity of research effort.]

A: For outstanding essays only. Thesis and argument are clear, thought-provoking, and based on correctly understood facts; material used to support the argument synthesizes ideas from different parts of the course (readings, lectures, discussions from different weeks); relationships drawn between facts and ideas are sophisticated, subtle, and/or original. Writing is grammatically correct and succinct. The argument flows well from point to point, without any puffery or wasted words.

AB: For very good essays that for some reason fall short of the criteria listed above. For example, the argument may be murky in one place; information may be presented that doesn't directly or clearly contribute to the argument; writing style may be awkward here and there, or flawed by one or two consistent (if minor) grammatical errors.

B: Your basic okay grade. The essay may pursue a straightforward but not especially deep or sophisticated argument; it is okay as far as it goes, but doesn't penetrate the material very far. It may have a flash of brilliance that is unfulfilled, counterbalanced by minor grammatical problems, a weakness in argumentation, and/or a significant misunderstanding of events or chronology.

BC: The essay shows some of the basics of the ideal essay, but is weakened by a lack of serious think-work or writing problems. It may make superficial connections without offering sufficient evidence to make the connections plausible or persuasive, or it may have what is in principle a good argument supported by incorrect facts or chronology. Alternatively, it may provide a fairly solid argument with minor flaws, from which the reader is repeatedly distracted by awkward or ungrammatical prose.

C: A grade signifying some serious problem in essay-writing. It may deliver facts without a recognizable thesis or argument; it may wander away from the point; or it may be a thoughtful attempt so weakened by writing problems (grammar, punctuation, word choice) that it is difficult for the reader to understand a crucial point you are trying to make.

D: A marginal grade. There may be enough in here to show you have attended a few lectures and/or done some of the reading, but the essay indicates no effort at synthesis or thinking on your own, or else shows a serious misunderstanding of the nature of the material and/or the assignment. Also used for essays that are just barely coherent.

F: For unacceptable essays. An essay may be judged unacceptable if it contains plagiarism (see below); if it consists primarily in content inappropriate to the question or the material for this course; if it shows a complete misunderstanding of the course content; or if the writing fails to meet standard college-level requirements of basic communication in English.

HistSci/MHB 333: History of Modern Biology
Fall 2012
Addendum on class preparation and participation:

Preparation:

For your class participation grade, you are expected to come to class prepared and ready to talk about the readings. This means not only having passed your eyes over all the reading, but having thought about it as well. To get you into the habit of thinking actively about the reading in advance of class meetings, I have several devices. First, there are the framing questions printed in italics on the syllabus—some are set for just a particular day, others cover more than one. Those give you a sense of my agenda. But you will undoubtedly come up with other interesting questions of your own if you read actively.

At the level of lowest formality, I am requiring everyone to submit at least **10 questions** (or sets of questions), introduced by a comment if you wish, about the readings **over the course of the semester**, not more than one a week, and on a day in which you aren't submitting an analytical discussion piece (see below). These questions should be genuine. If you have a reason to omit a week and do two in another week, come and talk to me about that in advance. Thinking about it as once a week should be the general rule, with which gives you a couple of weeks off from any class-writing.

Please submit your questions/comments to Learn@UW in the "discussion" forum by 7 a.m. of the class date when the readings are due. (For most of you, that probably means doing it the night before, or earlier.) Bring a copy to class so I can ask you to repeat your question or comment there. You must write in complete sentences and paragraphs, using correct spelling, punctuation and grammar. This may be "informal writing" by academic standards, but it is not a txt msg.

I would prefer you not post your thoughts as an attachment, but write them right into the pane, to make it easier for everyone to read them. (Reading others' questions in advance may stimulate your own thinking—how might you answer the questions that others have posed? You may get a chance in class to bring up your answer. However, if you characteristically write questions that are just a little different from someone else, I will be suspicious about your level of initiative.) The questions will stay up for the duration of the semester.

Sample questions:

1) In the Table of Contents of Lamarck's *Zoological Philosophy*, he starts with the classification of animals, moves on to the nature of life, and then looks at the nervous system and intelligence. What ties all of these together? Is there some common thread, or are these basically three different "philosophical" topics he's interested in?

2) Can we talk about Lamarck's idea of method? It seems kind of vague to me (e.g. p. 184).

Note: If you have questions about what a word means, look it up in a dictionary before you bring it to class as a question. You might skip it if it only appears once, but if it appears more than once, you should probably check. History has no glossary attached. The OED (available online through MadCat; you can bookmark it) can sometimes help as it includes more historical meanings than a regular dictionary.

Discussion pieces: You are to write 3 “discussion pieces” of 300-500 words, one in each interval between the beginning of the course and Oct. 3, Oct. 8-Nov. 7, and Nov. 12-Dec. 10, reflecting on the readings for a particular day. These mini-essays will be graded and will contribute to your class participation grade (together comprising about a third of it). Please submit these as attachments in Learn@UW by 7 a.m. on the day of the relevant class. I recommend you bring a hard copy to use as a prompt in the discussion. Discussion pieces turned in late will receive late-paper penalties. (See the syllabus.)

These should be “think-pieces” showing your reflections on the reading. You may take off from the italicized prompts in the syllabus, but should probably try to narrow down the answers—the questions are often quite broad. For instance, for the question coming up on what divided Cuvier and Geoffroy, you might think about different levels—epistemology, metaphysics, politics, method, personality, experience, for example—and then pick one or two to write about that you single out as most important or interesting. But you might also make up your own question to answer, or just write a reflective essay. (Or, in the case of Cuvier and Geoffroy, you might take a fun option and write about which scientist you’d rather work with as a student and why.) I have just a couple of ground rules:

- 1) Don’t simply tell me whether you liked a reading or not, or even why or why not. That is generally not the point of reading analytically for history. “Critical analysis” in history doesn’t mean flogging someone for their bad ideas but rather trying to understand how they could think the way they did.
- 2) It’s not legitimate to criticize a reading from the perspective of 21st century knowledge. Again, our object here is to try to discover THEIR way of viewing the world, their reasoning, not impose ours on them.

Participation: This class has in the neighborhood of 30 students, and most 75-minute class periods will include some lecturing (no more than 50 minutes). In order for everyone who wants to get in a word who wants to, habitual talkers will need to discipline themselves. If you’re one of those people who tends to jump immediately into the fray, please try to formulate your idea all the way to the end of the sentence before you raise your hand. That might mean writing it down. If you have an okay idea about a topic early on in class, but know that some other important issue will come up soon that you really want to respond to, consider saving your comments for that other important issue. Try to focus your giving of information or analysis on what you think is most burning for you, and spend the majority of your time listening to the other discussants. Taking notes when they speak will help you formulate responses rather than just reacting. (This advice is for shy people too. I am sometimes willing to go back to an old issue even if the discussion has moved on, if it takes you some time to form your thoughts.)

For people who don’t volunteer a lot: I am not fond of putting people on the spot; I’d rather have you volunteer to speak. But if I haven’t heard from you for a few classes, I may ask you to contribute. Attentive listening in class is great, and I respect shyness, but stretching yourself to talk to a group is important, too. One reason to prepare discussion pieces and questions in advance is so that you can read something or take off of something you’ve prepared for the class, which often makes it easier to get involved in a discussion.

