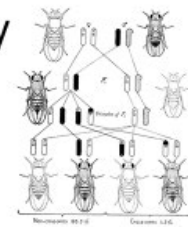
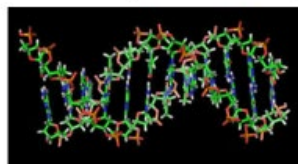
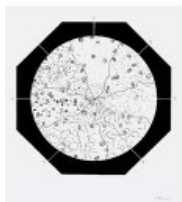


University of Wisconsin-Madison
History of Science/History/MHB 132
Spring 2023



BEES, TREES, GERMS, AND GENES

A History of Biology



Prof. Lynn K. Nyhart

Course Description: How did today's biology emerge out of the diverse traditions of gaining knowledge about living things that stretch back into the eighteenth century? In this course, we divide these into four “ways of knowing” life, using the course’s title words to focus on different themes. With **Trees**, we examine questions about natural history and classification; **Bees** stand for investigations into the nature of biological individuality and organization; **Germs** center on changing understanding and ways of combatting disease; and **Genes** give focus to the desire to master and improve the hereditary and regulatory machinery of life.

What difference does this history make? As we will see, these historical scientists’ ways of knowing, while deeply embedded in the larger social and political concerns of their times, have had consequences that are still with us, even as the crises of our own time require that we rethink many of their assumptions fundamentally. Even as we focus mainly on the past, then, this course challenges you to think critically about our biological present: who benefits most from the production of scientific knowledge, and who is harmed by it? Do the biological sciences have to work this way? How can the history of biology make us better thinkers, better scientists, and better global citizens in 2023?

Course Meeting Times and Locations (all class meetings are 50 min. long):

Lecture:	MW 9:55 a.m.	1641 Mosse Humanities
Discussions:	301 R 8:50 a.m.	2619 Mosse Humanities
	302 R 11:00 a.m.	2619 Mosse Humanities
	303 F 9:55 a.m.	2115 Mosse Humanities
	304 F 11:00 a.m.	2231 Mosse Humanities

Instructional Staff Contact Information, and Office Hours:

Prof. Lynn K. Nyhart

lknyhart@wisc.edu

5117 Mosse Humanities

Office hrs: M 1:30-3:30 pm and by appt.

TA: Sabrina Manero

smanero@wisc.edu

A139 Russell Labs

Office hrs TBA

Course Credits, Designations, and Attributes:

Course Designation: Breadth-Either Humanities or Social Science

Level-Elementary; No prerequisites

L&S Credit: Counts as Liberal Arts and Science credit in L&S

Canvas Course URL: <https://canvas.wisc.edu/courses/345462>. A copy of this syllabus, all readings and homework videos, study guide questions, assignment prompts, and writing tips will be posted to Canvas. All student assignments (essays and reading responses/discussion boards) are to be posted to Canvas.

How Credits are Met: This 3-credit course meets as a group for 3 hours per week (according to UW-Madison's credit hour policy, each 50-minute class counts as one hour). The course also carries the expectation that you will spend an average of at least 2 hours outside of class for every hour in the classroom. In other words, in addition to class time, plan to allot an average of at least 6 hours per week for reading, preparing for discussions, writing responses and essays, and/or studying for quizzes for this course.

Learning Outcomes: In successfully completing this course, students will be able to:

- **Identify** key ideas, people, places, and events in the history of biology since the 18th century (1700s);
- **Connect** a passage of professional or popular scientific writing in biology to larger historical themes and trends;
- **Analyze** similarities and differences in scientific expression across different people, genres, and time periods;
- **Explain** how past ideas about classification and evolution; organismal organization; disease causation and medical intervention; and mastery of genetic machinery have shaped present-day assumptions and attitudes about biology and human nature.

Students will also develop broader historical skills that will allow them to:

- identify whether a text is an article, a chapter, a book section, a book, blog post, or online article, and cite it correctly;
- understand and express basic relationships between historical chronology and causation;
- synthesize information from diverse sources into a coherent historical argument;
- empathize with people living in times and cultures different from their own.

Sources: Source materials for this course (readings, videos, podcasts) are mainly *secondary sources* (works by historians and scientists reflecting on and analyzing what happened in the past), supplemented by *primary sources* (scientific writings by participants “at the time”). Students will develop competency in distilling arguments made by historians and

drawing novel connections among multiple authors.
There are no readings required for purchase.

Course Assessment:

15% Class participation (attendance at both lectures and discussion sections; intelligent participation in discussions). Make sure you sign the attendance sheet when you arrive in class! There will be some opportunities for Q&A in lectures, but your main chance to participate is in discussion section. “Participation” does not mean dominating the conversation, but rather engaging thoughtfully with the material and respectfully with others in the discussion. You can expect your TA to call on you to raise issues from your discussion post, so don’t forget what you said!

14%: Discussion posts. Each post should be 200-250 words long and are due **by 7 a.m.** the day of your discussion section. Prompts will appear in Canvas. Discussion posts will not be accepted after the deadline.

Grading: Posts will be graded on a scale of 0-2: 0 = unacceptable/missing/received after deadline; 1 = acceptable but needs improvement; 2 = complete.

Posts are to be turned in for weeks 2, 4, 6, 8, 9, 10, 11, and 13 (eight weeks). They must be turned in by the deadline to count. Lowest score will be dropped.

What makes a good discussion post? Prose (not bullet-points) that provides concrete evidence that you have done the readings and other assigned work (mention something specific!); have attended the lectures; and have made a sincere attempt to answer the prompt seriously; or that raise your own thoughtful question about the week’s material that you justify in the larger context of the week’s materials and themes.

16% Quizzes (on Canvas, during discussion sections). Quizzes cover all required materials (lectures, videos, and readings) for the period specified. For each quiz, there will be a question pool from which 10 questions will be drawn for you individually. The 8% quiz may include a greater number of questions or more complex ones.

Quiz 1 (4%): covers weeks 2-3

Quiz 2 (4%): covers weeks 6-7

Quiz 3 (8%): covers weeks 10-12

55%: Essays. All writing assignments are to be deposited in Canvas Dropbox.

15% Part I Essay (1200 words, plus or minus 100 words, exclusive of references). Due in Canvas by **11:59 pm Sunday 2/26**

15% Part II Essay (1200 words, plus or minus 100 words, exclusive of references). Due in Canvas by **11:59 pm Tuesday 4/4**

25% Final Cumulative Essay (1200-1800 words, exclusive of references). Due in Canvas by **11:59 pm Tuesday 5/9**

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.)

Late paper policy: If you are facing circumstances that are making it difficult for you to meet assignment deadlines, I am happy to discuss deadline extensions or other accommodations. (All extensions will have a definite new due date established. Papers received after the new due date will be subject to late paper penalties.) Please talk to me or Sabrina well in advance of the assignment deadline whenever possible. Excepting genuine emergencies, if you do not make arrangements with one of us more than 24 hours before the due date and time, late penalties will have the following penalties assessed: 3 percentage points for every 24 hours late. (The first 3% is docked between 0 and 24 hours.) Papers without extensions will not be accepted more than 120 hours (5 days) after the due date and time. LATE FINAL ESSAYS WILL NOT BE ACCEPTED.

Grading: All assignments will receive a numeric score (e.g. 2/2, 9/10, 29/30); your final composite numerical grade (weighted according to the percentages above) will be converted into a final letter grade using the conversion table below.

Percentage	<60	60-68.9	69-74.9	75-80.9	81-86.9	87-92.9	93 and above
Grade	F	D	C	BC	B	AB	A

Accommodation of Student Needs: We are invested in your success in this course. We aim to ensure that the course is accessible and that students have the support they need. Please discuss any accommodations or accessibility needs with Sabrina and myself as soon as possible. The sooner we can address issues, the more options we have to solve and head off problems. If unforeseen circumstances arise over the semester, please talk with us about how we can help support your success.

Resources:

McBurney Center for Disability Services: If you are interested in receiving university services and accommodations for your disability, please contact McBurney by phone at 608-263-2741 or email at FrontDesk@mcb.wisc.edu.

History Lab and Writing Center: Both the History Lab and Writing Center offer a variety of useful resources, including tutoring sessions, handouts and writing classes. If you find that you need extra writing help for any of our assignments (especially the final assignment), I highly recommend you make appointments early to make sure you have enough time to integrate the feedback you receive. For information, visit <https://history.wisc.edu/undergraduate-program/the-history-lab/> or <http://www.writing.wisc.edu>.

University Health Services: If you could use some FREE help managing your time, dealing with stress, managing money, or pretty much anything else, UHS has got you covered: <https://www.uhs.wisc.edu/mental-health/lets-talk>.

Diversity & Inclusion: Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinions enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals. The University of Wisconsin—Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.

Academic Integrity: As stated on the University of Wisconsin-Madison’s page on academic integrity (<https://conduct.students.wisc.edu/academic-integrity/>):

“Academic misconduct is governed by state law, UWS Chapter 14 (PDF). Misconduct includes the following, but is not limited to this list:

- Seeks to claim credit for the work or efforts of another without authorization or citation (plagiarism)
- Uses unauthorized materials or fabricated data in any academic exercise (using notes for a closed-book online exam)
- Forges or falsifies academic documents or records (having a friend sign you in for attendance when you’re absent)
- Intentionally impedes or damages the academic work of others (tampering with another student’s experiment)
- Engages in conduct aimed at making false representation of a student’s academic performance (altering test answers and submitting the test for regrading)
- Assists other students in any of these acts.”

****For the purposes of this course, using ChatGPT or other AI programs to assist you in drafting your written work in this course falls under the category of academic misconduct.**

“The University of Wisconsin-Madison takes academic misconduct allegations very seriously. If an instructor suspects a student has engaged in academic misconduct, then the instructor will contact the student and ask him/her to explain their work. If the instructor still believes academic misconduct occurred after meeting with the student, he/she will determine the consequences, known as sanctions. One or multiple sanctions may be imposed.

Types of sanctions include an oral reprimand up to expulsion. If the sanction affects any grade, the student will then be notified in writing, typically by email, of the instructor’s decision. The Office of Student Conduct & Community Standards (OSCCS) is also informed and will contact the student about his/her rights and any additional sanctions. Repeated acts of academic misconduct or extreme circumstances may result in more serious actions such as probation, suspension, or expulsion.”

If you have concerns or confusion around academic integrity, please discuss them with me. The Writing Center can also help you with general citation rules.

Privacy of Student Records & the Use of Audio Recorded Lectures Statement

View [more information about FERPA](#).

“Lecture materials and recordings for this course are protected intellectual property at UW-Madison. Students in this course may use the materials and recordings for their personal use related to participation in this class. Students may also take notes solely for their personal use. If a lecture is not already recorded, you are not authorized to record my lectures without my permission unless you are considered by the

university to be a qualified student with a disability who has an approved accommodation that includes recording. [Regent Policy Document 4-1] Students may not copy or have lecture materials and recordings outside of class, including posting on internet sites or selling to commercial entities, with the exception of sharing copies of your personal notes as a notetaker through the McBurney Disability Resource Center. Students are otherwise prohibited from providing or selling their personal notes to anyone else or being paid for taking notes by any person or commercial firm without the instructor's express written permission. Unauthorized use of these copyrighted lecture materials and recordings constitutes copyright infringement and may be addressed under the university's policies, UWS Chapters 14 and 17, governing student academic and non-academic misconduct."

Thematic Course Overview:

Part I. Trees: The Diversity of Life and the Order of Nature, 1730s – 1870s

Weeks 2-5 (Jan. 30- Feb. 26)

***Overall Questions:** Scientist's question: What is the "true order of nature"? Historian's questions: How were efforts to answer this question tied into empire and its assumptions about racial hierarchy? What difference did Darwin's theory of evolution make?*

Part II: Bees and Germs, 1830s-1920s

Weeks 6-9 (Feb. 27-March 31)

***Overall Questions:** Scientist's questions: what makes the organism an autonomous living being? How autonomous is it, really? How can we protect ourselves (and other organisms) from disease-causing invaders? Historian's questions: How were these preoccupations and the language used to express them shaped by the political contexts of the development of the nation-state, tropical empires, and wars? What changed over the period in question, what stayed the same?*

Part III: Genes: Shaping Life Itself, 1900-2000

Weeks 10-12 (April 3-21)

***Overall Questions:** Scientist's questions: how does heredity work? How can improved genetic understanding help humans to improve life? Historian's questions: From its beginnings ca. 1900, how has the concept of the gene changed? Despite these changes in our gene concept, what themes have remained continuous? What have been the goals of those who controlled genetic knowledge? What can the history of genetics tell us about reconciling the knowledge and goals of scientific experts with democratic processes?*

Part IV: All Together, Now: Bees, Trees, Germs, and Genes Today

Weeks 13-14 (April 24-May 5)

***Overall Questions:** How have the assumptions of the past, about studying and intervening into living nature, become the issues of today? How can the past inform our understanding of the present and help guide our future?*

Weekly Topics and Discussion Section Workflow

All assignments are to be submitted to Canvas. Discussion posts are due the day of your discussion; Quizzes will take place during your discussion section.

Part I: Trees: The Diversity of Life and the Order of Nature, 1730s – 1870s

Week 2: Before “Biology”: Natural History, Western Imperialism, and Slavery

2/2-2/3: Due by 7 a.m.: Discussion Post #1

Week 3: “Biology” Emerging

2/9-2/10: in section: Quiz #1 (covers weeks 2 and 3)

Week 4: Trees and Transformations: Extinction and Progress

2/16-2/17: due by 7 a.m.: Discussion Post #2

Week 5: Evolution: A Great *Gestalt* Shift?

2/23-2/24: No Discussion Post or Quiz

Part I Essay due by 11:59 pm Sunday 2/26

Part II: Bees and Germs, 1830s – 1920s

Week 6: The Life of the Organism

3/2-3/3: due by 7 a.m.: Discussion Post #3

Week 7: The Incomplete Individual

3/9-3/10: Quiz #2 (covers weeks 6 and 7)

[Spring Break 3/11-3/19]

Week 8: Protecting the Body from Microbial Invasion

3/23-3/24: due by 7 a.m.: Discussion Post #4

Week 9: Pandemic 1918

3/30-3/31: due by 7 a.m.: Discussion Post #5

Part II Essay due by 11:59 pm Tuesday 4/4

Part III: Genes: Shaping Life Itself, 1900-2000

Week 10: “Classical” Genetics, Eugenics, and Evolution, 1900-1959

4/6-4/7: due by 7 a.m.: Discussion Post #6

Week 11: DNA: The Secret of Life?

4/13-4/14: due by 7 a.m.: Discussion Post # 7

Week 12: The Century of the Gene?

4/20-4/21: Quiz #3 (covers weeks 10-12)

Part IV (Course Cap): All Together, Now: Bees, Trees, Germs, and Genes Today

Week 13: Improving (on) Life?

4/27-4/28: due by 7 a.m.: Discussion Post #8

Week 14: Big Pictures

5/4-5/5: review

Final Essay due Tuesday May 9 by 11:59 pm

Detailed Course Schedule with Readings

Week 1: Introductions

(1) W 1/25: Introduction: What is the History of Biology and Why Should You Know about It?

1/26-1/27: Discussion sections: *You are expected to attend discussion sections this week!*

Part 1: Trees: The Diversity of Life and the Order of Nature, 1730s-1870s

Week 2: Before “Biology”: Natural History and Western Imperialism

(2) M 1/30: Natural History, Western Imperialism, and Bioprospecting

Sam Kean, “Science’s Debt to the Slave Trade,” *Science*, 364, issue 6435 (5 April 2019), 16-20.

Juliane Braun, “Bioprospecting Breadfruit: Imperial Botany, Transoceanic Relations, and the Politics of Translation,” *Early American Literature* 54 (2019): 643-671, EXCERPTS pp. 643-44, 647-654, 658-659, Notes and bibliography, pp. 664-671.

(3) W 2/1: Searching for the Order of Nature

Read/view online article from The Linnaean Society [Who was Linnaeus? / Career and Legacy](#) (be sure to watch the video “Carl Linnaeus’ Systema Naturae” [3:32 min.] at the end of the text).

Isabelle Charmantier, [“Linnaeus and Race”](#) (online article from The Linnaean Society by its Head of Collections). Please READ THIS VERSION, not the “easy read” version. (It’s not hard!)

Audrey Smedley and Brian D. Smedley, *Race in North America: Origin and Evolution of a Worldview* (4th ed., 2011). Retrieved from <http://ebookcentral.proquest.com>, 2020-07-11, pp. 213-216, 219-225.

2/2-2/3: Discussion Sections: Discussion post #1 due by 7 a.m. on your section day.

Week 3: “Biology” Emerging

(4) M 2/6: The Beginnings of “Biology”: Joining the Natural History and Natural Philosophy of Life

Rebecca Stott, excerpts from Chapter 9, “The Jardin des Plantes: Paris, 1800,” in *Darwin’s Ghosts: The Secret History of Evolution* (New York: Spiegel & Grau, 2012), 183-207.

(5) W 2/8: Historicizing Natural History
Receive Part 1 Essay assignment

Georges Cuvier, “The Megatherium from South America,” and introduction to it, in *Georges Cuvier, Fossil Bones, and Geological Catastrophes*, edited and translated by Martin J. S. Rudwick (Chicago: University of Chicago Press, 1997), 25-32

Jean Baptiste de Lamarck, *Zoological Philosophy* (1809) 124-127 (on the sloth), 131, 169-173 (on humans).

***Optional film:** “The Life and Times of Sara Baartman.” (Baartman was famous as the “Hottentot Venus,” brought from South Africa to London and then Paris between 1810 and 1816. Cuvier examined her, alive and dead.) Viewable at: <https://video-alexanderstreet-com.ezproxy.library.wisc.edu/watch/the-life-and-times-of-sara-baartman/transcript?context=channel:the-icarus-films-collection>. The film is over 50 min. long; the part about Baartman’s travel to Paris begins at about minute 31. I recommend watching from there to the end. [20 min.]

2/9-10: Discussion sections: Quiz #1 (covers weeks 2 and 3)

Week 4: Trees and Transformations: Extinction and Progress

(6) M 2/13: The History and Geography of Life on Earth

James Secord, “Introduction” to Charles Darwin, *Evolutionary Writings* (Oxford University Press, 2008), x-xx.
Darwin Voyage primary source packet

(7) W 2/15: The Tree of Life and the *Origin of Species*

Please be sure to read these readings BEFORE lecture! I will be asking you about Darwin’s language around the term “natural selection.”

James Secord, “Introduction” to Charles Darwin, *Evolutionary Writings* (Oxford University Press, 2008), xx-xxiii
Charles Darwin, On the Origin of Species (London: John Murray, 1859; reprint ed. Harvard University Press, 1964), 1-6, 80-87, 126-130, 484-490.

2/16-2/17: Discussion Sections: Discussion Post #2 due by 7 a.m. on your discussion day.

Week 5: Evolution: A Great Gestalt Shift?

(8) M 2/20: Darwinism: Problems Solved and Unsolved

James Secord, “Introduction” to Charles Darwin, *Evolutionary Writings* (Oxford University Press, 2008), xxiv-xxvi (on *Descent of Man*) plus selections from reviews.

(9) W 2/22: Transition Class [Part I wrap-up, Q&A, Intro to Part II]

2/23-2/24 Discussion Sections: No discussion post or quiz; review.

Part I Essay due 11:59 pm Sunday, 2/26

Part II: Bees and Germs: How Autonomous is the Body?

Week 6: The Life of the Organism

(10) M 2/27: What Makes Living Things Alive?

William B. Carpenter, *Principles of General and Comparative Physiology*, first edition (London: John Churchill, 1839) paragraphs 1-4, 8,10.

(11) W 3/1: Organisms and Organization: Governing the Individual

Andrew Reynolds, *The Third Lens: Metaphor and the Creation of Modern Biology* (Chicago: University of Chicago Press, 2018), 13-4, 17-34, 215-17

Rudolf Virchow, selections from “Atoms and Individuals” (1858), translated by Leland J. Rath in *Disease, Life, and Man. Selected Essays by Rudolf Virchow* (Stanford, CA: Stanford University Press, 1958), pp. 134-139.

3/2-3/3: Discussion Sections: Discussion post #3 due by 7 a.m. on your section day.

Week 7: The Incomplete Individual

(12) M 3/6: Introducing Developmental Complexity: Reproduction, Alternation of Generations, and the “Life Cycle” Concept

Nick Hopwood et al., “Cycles and Circulation: A Theme in the History of Biology and Medicine,” *History and Philosophy of the Life Sciences* 43(3) (2021), selections, pp. 15-19.

(13) W 3/8: Parasitism, Symbiosis, and the Emergence of Ecology

Jan Sapp, *Evolution by Association: A History of Symbiosis* (New York: Oxford University Press, 1994), 3-14, 25-31, 214-220 (notes).
A primary source TBD.

3/9-3/10 Discussion Sections: Quiz #2 (Covers weeks 6 and 7)

SPRING BREAK 3/11 - 3-19

Week 8: Protecting the Body from Microbial Invasion

(14) M 3/20: Germ Theories and Heroic Medical Scientists, 1850s-1910s

Roy Porter, *The Greatest Benefit to Mankind: A Medical History of Humanity* (NY/London: W.W. Norton, 1997) 428-448

["How the Public Became Interested in Medical Science"](#)--interview with Bert Hansen.
Distillations, Science History Institute. (4:37 min.)

(15) W 3/22: Nation, Empire, and Tropical Disease

W. F. Bynum, *Science and the Practice of Medicine in the Nineteenth Century* (New York: Cambridge University Press, 1994), Chapter 6: “Medical Science Goes Public” (selections), pp. 142-158 [or 153?]

Stephen Frenkel and John Western, “Pretext or Prophylaxis? Racial Segregation and Malarial Mosquitos in a British Tropical Colony: Sierra Leone,” *Annals of the Association of American Geographers*, Vol. 78, No. 2 (Jun., 1988), pp. 211-228

3/23-24: Discussion sections: Discussion post #4 due by 7 a.m. on your section day.

Receive Part II essay assignment

Week 9: Pandemic 1918

(16) M 3/27 The 1918 Influenza Pandemic and Its Puzzles

Nancy Bristow, *American Pandemic: The Lost Worlds of the 1918 Influenza Epidemic* (Cary: Oxford University Press USA), 43-45, 71-74, 131-139.

Steven Burg, “Wisconsin and the Great Spanish Flu Epidemic of 1918,” *Wisconsin Magazine of History*, Autumn 2000, pp. 37-56.

(17) W 3/29: Bad Microbes, Good Microbes, and in-between (Wrap-Up of Part II)

Articles “Parasites” and “Parasitic Diseases” (classification), *Encyclopedia Britannica*, 11th edition (1911), vol. 20, pp. 770-771.

3/30-31: Discussion Sections: Discussion post #5 due by 7 a.m. on your section day.

Part III: Genes: Shaping “Life Itself”

Week 10: “Classical” Genetics, Eugenics, and Evolution, 1900-1959

(18) M 4/3: Good Breeding: Classical Genetics and Eugenics

Jan Sapp, *Genesis: The Evolution of Biology* (New York: Oxford University Press, 2003), pp. 130-138, 304-307

Diane Paul, *Controlling Human Heredity: 1865 to the Present*. (Atlantic Highlands, NJ: Humanities Press, 1995), pp. 73-91

Video: “A Dangerous Idea: A History of Eugenics in America,” log into UW library: <https://video-alexanderstreet-com.ezproxy.library.wisc.edu/watch/a-dangerous-idea>, 56:40 to 1:13:40 (mostly early 20thC eugenics movement). 20 min.

Part II Essay due Tuesday 4/4 by 11:59 pm

(19) W 4/5: The “Modern Synthesis” and the Ambiguities of Race in the 1950s

Jan Sapp, *Genesis: The Evolution of Biology*, pp. 143-154, 307-311 (in same file with previous Sapp chapter above)

UNESCO, *The Race Concept: Results of an Inquiry* (Paris, UNESCO, 1952), 11-16.

4/6-7: Discussion Sections: Discussion Post #6 due by 7 a.m. on your section day.

Week 11: DNA: The Secret of Life?

(20): M 4/10: The Rise and Ambitions of Molecular Genetics

Watch: [DNA Discoveries before Watson and Crick](#) (from PBS American Masters)
James D. Watson and Francis Crick, "Molecular Structure of Nucleic Acids: A Structure for Deoxyribose Nucleic Acid," *Nature* (25 April 1953): 737-8.
Nathaniel Comfort, *The Science of Human Perfection: How Genes Became the Heart of American Medicine* (New Haven: Yale University Press, 2012), 214-219 (to asterisks) [more to follow next week]

(21) W 4/12: Recombinant DNA and the Rise of the Biotech Industry

John Durant, "'Refrain from Using the Alphabet': How Community Outreach Catalyzed the Life Sciences at MIT" pp. 145-163 In *Becoming MIT: Moments of Decision*, ed. David Kaiser (Cambridge, MA: MIT Press, 2010), pp. 145-163
Watch: "[Hypothetical Risk](#)," min. 25-32. of 32 min. film (beginning with testimony by Jonathan King.) (7 min.)
Bob Park and Scott Thacher, "Dealing with Experts: The Recombinant DNA Debate," *Science for the People* 9, no. 5 (Sept-Oct. 1977): 28-35

4/13-4/14: Discussion Sections: Discussion Post #7 due by 7 a.m. on your section day

Week 12: The Century of the Gene?

(22) M 4/17: Beyond the Double Helix: Molecular Biology in Conversation with Evolution and Classification 1960s-1980s

Edward O. Wilson, *Naturalist* (Washington, DC: Island Press, 1994), selection from Chapter 12, "The Molecular Wars," pp. 218-232
David Quammen, "The Scientist Who Scrambled Darwin's Tree of Life," *New York Times Magazine*, Aug. 13, 2018 (24 pages)

(23) W 4/19: Part III Wrap-up: The Transformation of the Gene in the Twentieth Century (includes Q&A)

4/20-21: Discussion sections: Quiz #3 (covers weeks 10-12)

Part IV (Course Cap): All Together, Now: Bees, Trees, Germs, and Genes Today

Week 13: Improving (on) Life? CRISPR and Genome Editing

(24) M 4/24: CRISPR against Malaria

Dylan Matthews, “A Genetically Modified Organism Could End Malaria...” Vox, May 31, 2018, updated Sept. 26, 2018: <https://www.vox.com/science-and-health/2018/5/31/17344406/crispr-mosquito-malaria-gene-drive-editing-target-africa-regulation-gmo>

Patience Arinaitwe, “[Meet Anopheles stephensi, the Mosquito Threatening to Derail Malaria Prevention Efforts in Africa.](#)” at targetmalaria.org. Posted 21 Dec. 2022.

Browse <https://targetmalaria.org> . Be sure to look at the posts under “latest,” as well as “About us.”

(25) W 4/26: De-Extinction and Rewilding

George Church and Ed Regis, *Regenesis* ch. 6 (on Mammoths)

Carl Zimmer, “[A New Company with a Wild Mission: Bring Back the Woolly Mammoths.](#)” *New York Times*, Sept. 13, 2021 (Updated Sept. 30, 2021)

*Possible updates TBA

4/27-28: Discussion Sections: Discussion Post #8 due by 7 a.m. on your section day

Week 14: Big Pictures

(26) M 5/1: “Life” as a Set of Relations

Scott F. Gilbert, “*Perspective: Rethinking Parts and Wholes,*” in *Landscapes of Collectivity in the Life Sciences*, eds. Snait B. Gissis and Ehud Lamm (Cambridge: MIT Press, 2018), 123-132.

Richard Grant, “The Whispering of the Trees,” *Smithsonian Magazine*, March 2018, 49-57.

For color images, access at:

<https://www.smithsonianmag.com/science-nature/the-whispering-trees-180968084/>

(27) W 5/3: Last Lecture: What is the History of Biology? Why does it Matter? (Reprise)

Discussion Sections 5/4-5/5: Review.

Final Essay due Tuesday May 9 by 11:59 pm