9-2020

Co-teaching Botany and History: An Interdisciplinary Model for a More Inclusive Curriculum

Frederica Bowcutt

Tamara Caulkins

Co-teaching Botany and History: An Interdisciplinary Model for a More Inclusive Curriculum

Frederica Bowcutt, *Evergreen State College*
Tamara Caulkins, *Douglas Honors College, Central Washington University*

Abstract: This essay offers numerous ideas on how to integrate science and history into classroom pedagogy in a way that acknowledges the contributions of women and other groups underrepresented in science by highlighting the cultural and political contexts in which science developed rather than by adding token individuals to a history of science still largely defined by the achievements of a few great men. It details how students in a General Education class co-taught by a botanist and a historian of science at the Evergreen State College not only gained skills in field botany and vegetation analysis but also became more informed about how modern scientific disciplines took shape. Recognizing that race, class, and gender have played a role in how science developed, the students' understanding of the complicated legacy of scientific inquiry gave them tools to be more rigorous in their thinking about scientific practice. This interdisciplinary approach, so crucial in fostering inclusivity in scientific disciplines, also promoted a deeper engagement with historical inquiry.

INTRODUCTION: SHIFTING THE BOUNDARIES OF THE SCIENTIFIC CANON

Historians of science have long pondered how best to articulate the development of science beyond a narrow canon of Western European men.[1] After all, one cannot teach plant taxonomy

Frederica Bowcutt is a faculty member at the Evergreen State College. She specializes in floristics and plant-centric history. She also serves as Director of the Evergreen Natural History Museum. Her books include *The Tanoak Tree: An Environmental History of a Pacific Coast Hardwood* (Washington, 2015). She is a contributor to the forthcoming *A Cultural History of Plants* (Bloomsbury). Evergreen State College, 2700 Evergreen Parkway, NW, Lab 2, Olympia, Washington 98505, USA; bowcuttf@evergreen.edu.
Tamara Caulkins is a faculty member who teaches in the William O. Douglas Honors College at Central Washington University. She researches eighteenth-century scientific visualizations and natural history. Her current book project examines the impact of geometric diagrams on embodied knowledge during the Enlightenment. She is a contributor to *Women in the History of Science: A Liberating the Curriculum Sourcebook*, a UCL Press (University College London) open-access digital project. Douglas Honors College, Central Washington University, 400 East University Way, Ellensburg, Washington 98926, USA; tamara.caulkins@cwu.edu.
Acknowledgments. We are grateful to Geena Barker, Stacey Davis, Rachel Homchick, Julia Metzker, Brenda Kellar, Karen Rader, and Pauline Yu for helpful feedback on earlier drafts and to the Evergreen State College for funding to share our work at a pedagogy session at the 2018 conference of the American Society for Environmental History in Riverside, California.
[1] Attempts to reenvision the global development of modern science include the multivolume work *Science and Civilisation in China* by Joseph Needham and collaborators (Cambridge: Cambridge Univ. Press, 1954–); and James E. McClellan III and Harold Dorn,

Isis, volume 111, number 3. © 2020 by The History of Science Society.
 0021-1753/2020/0111-0013$10.00.

without drawing on a familiarity with Carl Linnaeus's classification system; nor can one discuss evolution without mentioning Charles Darwin. However, organizing a history of science course around the achievements of a few mostly European men gives many students, particularly women and students of color, the impression that they do not belong in the science classroom.

Rather than ignoring the complexities of race, class, and gender that are woven into the very fabric of science, students in a class co-taught by a botanist and a historian examined the historical roots of modern life science to gain an appreciation of the achievements of science alongside its complicated legacy. Exploring this history brought to light the many ways women and others who have been underrepresented in numerous scientific fields participated in the growth of modern botany, often in spite of deliberate efforts to exclude them.[2] Students learned that science is not generated in a vacuum but, instead, in particular cultural and political contexts.

Our interdisciplinary, full-time undergraduate program, "The Nature and Culture of Natural History," included a mix of lower- and upper-division students, a quarter of whom were first-generation college attendees. Most of our students were highly capable and well prepared for the rigors of postsecondary study; a few of them struggled with health challenges or other extenuating circumstances. Over the course of six months, this cohort of forty-eight students developed a learning community, supporting, challenging, and learning from each other as they attended the same classes together each week. Sessions included lectures on history and botany, discussion groups, small writing workshops, science labs, and fieldwork.[3] As faculty, we positioned ourselves as co-investigators and learning facilitators, intentionally avoiding the "hierarchical and authoritarian tendencies of transmission-oriented teaching."[4] We promoted critical thinking skills through collaborative knowledge-construction and active learning exercises. This learning community model has proven effective in the retention and success of first-generation, underrepresented, and underprepared college students, particularly early in their coursework.[5] This approach has also been effective in other liberal arts colleges and with honors students at a large state university.[6]

Science and Technology in World History: An Introduction, 3rd ed. (Baltimore: Johns Hopkins Univ. Press, 2015). Transnational approaches have shifted focus from knowledge construction to knowledge circulation, furthering investigations into non-Western science. See James A. Secord, "Knowledge in Transit," *Isis*, 2004, 95:654–672; Kapil Raj, *Relocating Modern Science: Circulation and the Construction of Knowledge in South Asia and Europe, 1650–1900* (New York: Palgrave Macmillan, 2007); Adriana Craciun and Mary Terrall, eds., *Curious Encounters: Voyaging, Collecting, and Making Knowledge in the Long Eighteenth Century* (Toronto: Univ. Toronto Press, 2019); and John Krige, *How Knowledge Moves: Writing the Transnational History of Science and Technology* (Chicago: Univ. Chicago Press, 2019).

[2] The literature on women and gender politics in botany and in science more generally is large and growing. Sources we consulted include Samantha George, *Botany, Sexuality, and Women's Writing, 1760–1830: From Modest Shoot to Forward Plant* (Manchester: Manchester Univ. Press, 2007); Tina Gianquitto, *Good Observers of Nature: American Women and the Scientific Study of the Natural World, 1820–1885* (Athens: Univ. Georgia Press, 2007); Londa Schiebinger, *Nature's Body: Gender in the Making of Modern Science* (New Brunswick, N.J.: Rutgers Univ. Press, 2004); and Lincoln Taiz and Lee Taiz, *Flora Unveiled: The Discovery and Denial of Sex in Plants* (Oxford: Oxford Univ. Press, 2017).

[3] In the Fall term students earned credits for "Introduction to Natural History," "Cultural History of Natural History," "Expository Writing," and "Field Botany." In the Winter term they earned credits for "Environmental History," "Independent Research," and "Winter Natural History" (with possible upper-division science credit).

[4] Ana Maria Villegas and Tamara Lucas, "Preparing Culturally Responsive Teachers: Rethinking the Curriculum," *Journal of Teacher Education*, 2002, 53:20–32, on p. 25. See also Xenia Meyer and Barbara A. Crawford, "Teaching Science as a Cultural Way of Knowing: Merging Authentic Inquiry, Nature of Science, and Multicultural Strategies," *Cultural Studies of Science Education*, 2011, 6:525–547, esp. p. 534.

[5] Catherine Engstrom and Vincent Tinto, "Pathways to Student Success: The Impact of Learning Communities on the Success of Academically Under-Prepared College Students" (Syracuse, N.Y.: William and Flora Hewlett Foundation, 31 Jan. 2007), pp. 3–4.

[6] Karen I. Spears *et al.*, *Learning Communities in Liberal Arts Colleges* (Olympia, Wash.: Evergreen State College, Washington Center for Improving the Quality of Undergraduate Education, in cooperation with the American Association for Higher Education, 2003). This model can be adapted to a more traditional curriculum. Building on her experience teaching with

TEACHING INCLUSIVE SCIENCE THROUGH A HUMANITIES FRAMEWORK

In addition to studying natural history in American and European history, we explored global networks linking Europe and its colonies to Indigenous peoples, particularly women, in New Zealand, Kenya, the Arctic, and South America.[7] Alongside their empirical studies, students learned to recognize and analyze the cultural values inherent in the way they and others approached botany as a science.[8] Through interdisciplinary teaching, we aimed to instill "the specific skills of interpretation, clarification, evaluation, and judgment that the humanities develop across all of their range."[9] By pairing humanistic and scientific inquiry, students learned to pay attention to the meaning and values of science as well as the content.

In the science section of the course, our class focused on local natural history. Students examined environmental gradients and learned how climate, geology, and other factors affect plant life and vegetation patterns. To develop their analytical abilities, they learned to identify the common native plants in the college's forest reserves and on other nearby public lands. They cultivated observation skills and learned to capture what they saw through detailed notes and scientific illustrations in a natural history journal.[10] By the end of the course, students were able to identify numerous vascular plants, including deciduous species in dormancy, using scientific and common names.[11] They learned to use those skills to make causal links to distribution patterns in nature. Students had ample time in the lab and in the field to make their own observations and connect their empirical experiences with descriptions of natural history conducted in the past. Teaching inquiry-based science rooted in historical context positioned Western science as a "cultural way of knowing."[12] Thus students began to apply scientific tools of inquiry while also learning to deconstruct assumptions and consider multicultural accounts of botany as a discipline.

In history lectures, readings, and discussions, students broadened their perception of what counted as science and interrogated the contexts in which natural history as a discipline grew. We wanted students to read sources from the past for themselves so that they could "harness the

---

Frederica Bowcutt, Tamara Caulkins has now co-taught a five-credit one-quarter course at Central Washington University with biology faculty member Fabiola Serra Fuertes: "The Nature of Beasts: Animals in Science and History," Summer 2019 (online) and Fall 2019 (in class).

[7] Lectures and discussions drew on material from Geoff Bil, "Between Māori and Modern? The Case of Mānuka Honey," in *Appreciating Local Knowledge*, ed. Elisabeth Kapferer, Andreas Koch, and Clemens Sedmak (Newcastle upon Tyne: Cambridge Scholars, 2016), pp. 61–78; Bil, *Indexing the Indigenous: Plants, Peoples, and Empire* (Baltimore: Johns Hopkins Univ. Press, forthcoming); Wangari Maathai, *Unbowed: My Autobiography* (London: Arrow, 2008); Mark Carey *et al.*, "Glaciers, Gender, and Science: A Feminist Glaciology Framework for Global Environmental Change Research," *Progress in Human Geography*, 2016, *40*:770–793; and Londa Schiebinger, *Plants and Empire: Colonial Bioprospecting in the Atlantic World* (Cambridge, Mass.: Harvard Univ. Press, 2004). Students also read primary sources in class (with a critical eye!), including excerpts from Erasmas Darwin's 1789 *Loves of the Plants*, an Iroquois creation legend, accounts of creation in the Bible, Mary Wollstonecraft's *Letters Written during a Short Residence in Sweden, Norway, and Denmark* (1796), William Bartram's *Travels through North and South Carolina, Georgia, East and West Florida, the Cherokee Country, etc.* (Philadelphia: James & Johnson, 1791), and Alexander von Humboldt and Aimé Bonpland's *Personal Narrative of Travels to the Equinoctial Regions of America, during the Years 1799–1804*, trans. Thomasina Ross (London: Bell, 1907).

[8] Students read about nineteenth-century women naturalists in Gianquitto, *Good Observers of Nature* (cit. n. 2), and then read excerpts from their publications: Almira Phelps, *Familiar Lectures on Botany* (1829); Margaret Fuller, *Summer on the Lakes* (1843); Susan Fenimore Cooper, *Rural Hours* (1850); and Mary Treat, *Home Studies in Nature* (1885).

[9] Ted Toadvine, "Six Myths of Interdisciplinarity," *Thinking Nature: A Journal on the Concept of Nature*, 15 June 2011, pp. 1–7, on p. 4, https://www.academia.edu/2440706/Six_Myths_of_Interdisciplinarity_2011 (accessed 31 Jan. 2020).

[10] Arthur R. Kruckeberg, *The Natural History of Puget Sound Country* (Seattle: Univ. Washington Press, 1995), pp. 3–34; and John Muir Laws, *The Laws Guide to Nature Drawing and Journaling* (Berkeley, Calif.: Heyday, 2016).

[11] H. Gilkey, *Winter Twigs: A Wintertime Key to Deciduous Trees and Shrubs of Northwestern Oregon and Western Washington* (Corvallis: Oregon State Univ. Press, 2001); and Jim Pojar and Andy MacKinnon, *Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia, and Alaska* (Auburn, Wash.: Lone Pine, 2016).

[12] Meyer and Crawford, "Teaching Science as a Cultural Way of Knowing" (cit. n. 4).

past as a perspective that goes beyond a single book or a solitary course." Through the process of learning how to analyze primary sources, including a seventeenth-century description of a natural history collection, eighteenth-century encyclopedia entries on animals, and nineteenth-century travel accounts, students came to realize that the past is more complicated than the grand narratives still prevalent in many history textbooks.[13] Reading between the lines, students started to see in the historical record that the participation of women and people of color has been an integral part of the development of science all along.

By tracing the history of botany from ancient Egyptian and Greek texts to early modern European herbals, students better understood the discipline as rooted in botanical medicine and local knowledge. This knowledge was often held by women herbalists whose contributions were made invisible or disparaged. For example, in his 1542 herbal Leonhart Fuchs chided his physician colleagues, insisting that they learn to identify medicinal plants themselves rather than relying on "foolish and superstitious old women who gather herbs and roots"—indicating that these physicians were, in fact, turning to women herbalists.[14] Imperialism and colonial expansion radically increased the number of plants known to Europeans, which provided the impetus for herbals and *florilegia* with more detailed and increasingly naturalistic illustrations, as well as more complex systems of nomenclature and classification. However, we complicated the narrative of linear progress by contrasting the realistic depictions of plants in a twelfth-century Arabic pharmacological manuscript with the fanciful image of the Barnacle tree producing a water bird, "bigger than a mallard, and lesser than a goose," in John Gerard's 1596 *Herball*. We also read excerpts from the 1653 herbal of the astrological botanist Nicholas Culpeper, who assigned zodiac signs to medicinal plants.[15] We grappled with defining "science" and "scientist" though discussions that ranged from the Renaissance moral animal fables of Conrad Gesner (1516–1565) to the romanticism of Alexander von Humboldt (1769–1859).[16] Natural philosophers such as Gesner and Humboldt contributed to the science of description, but they did not fit students' preconceived models of an objective scientist.[17]

Religious beliefs motivated many early naturalists. Reading William Paley's natural theology for themselves, students gained an appreciation for the wonder and confidence that motivated naturalist parsons such as Gilbert White (1720–1793). Linnaeus, too, looked to the book of nature as divine revelation, believing that taxonomy made God's ordered creation visible. Nevertheless, his hierarchical taxonomic system also reflected racist and sexist ideology, suggesting that

---

[13] Emily Wakild and Michelle K. Berry, *A Primer for Teaching Environmental History: Ten Design Principles* (Durham, N.C.: Duke Univ. Press, 2018), p. 3. The primary sources included John Evelyn, *The Diary of John Evelyn*, ed. Esmond Samuel De Beer (Oxford: Oxford Univ. Press, 2000); George-Louis Leclerc, comte de Buffon, *Natural History, General and Particular*, 1791 facsimile, trans. William Smellie, 9 vols. (Bristol: Thoemmes, 2000); Carl Linnaeus, *Species plantarum 1753*, trans. William T. Stearn (London: John Ray Society, 2013); and Alexander von Humboldt and Aimé Bonpland, *Personal Narrative of Travels to the Equinoctial Regions of the New Continent during the Years 1799–1804*, trans. Helen Maria Williams (London: Longman, Hurst, Rees, Owen, and Brown, 1822).

[14] Frank N. Egerton, ed., *Landmarks of Botanical History by Edward Lee Greene*, Pt. 1 (Stanford, Calif.: Stanford Univ. Press, 1983), pp. 276–277. For a slightly different translation see Leonhart Fuchs, *The Great Herbal of Leonhart Fuchs: De Historia Stirpium Commentarii Insignes, 1542*, ed. and trans. Frederick Gustav Meyer, Emily W. Emmart Trueblood, and John Lewis Heller, Vol. 1 (Stanford, Calif.: Stanford Univ. Press, 1999), p. 204.

[15] Agnes Arber, *Herbals: Their Origin and Evolution, a Chapter in the History of Botany, 1470–1670* (1912; Cambridge: Cambridge Univ. Press, 1986), pp. 130–134 (Gerard), 261–263 (Culpeper).

[16] William Ashworth, Jr., "Emblematic Natural History of the Renaissance," in *Cultures of Natural History*, ed. N. Jardine, J. A. Secord, and E. C. Spary (Cambridge: Cambridge Univ. Press, 1996), pp. 17–37; and Andrea Wulf, *The Invention of Nature: Alexander von Humboldt's New World* (New York: Vintage, 2016).

[17] Brian Ogilvie, *The Science of Describing: Natural History in Renaissance Europe* (Chicago: Univ. Chicago Press, 2006).

some human races were primitive and that women were inferior.[18] Minimizing the importance of community to scientific innovation, Linnaeus claimed to have invented binomial nomenclature through a stroke of genius, despite having built on the earlier work of Gaspard Bauhin (1560–1624) and being greatly aided by his "apostles" in the field. Students became more alert to the connections between science and politics, noting the ways Linnaeus's classification system, for example, aided the colonial enterprise as it assisted in the identification of profitable new crops, some of which became the basis of plantation economies.[19]

To complicate historical accounts of science focused on iconic male scientists, students considered the investigations of women such as Maria Sibylla Merian (1647–1717), Elizabeth Blackwell (1707–1758), Mary Treat (1830–1923), and Beatrix Potter (1866–1943). Some of these women contributed to the realistic study of nature through their artistic skill as well as their scientific observations.[20] Others were highly influential in the work of their male colleagues. Mary Treat, for example, informed Darwin's research on carnivorous plants, a group of plants often referenced in the nineteenth century to counter the notion of a benevolent God. Treat's work also challenged maternal stereotypes and natural theology, which had been used to justify limiting women's political rights and education, through wickedly humorous accounts of female spiders practicing infanticide. We discussed other contributors who remain at the margins of historical accounts of scientific inquiry, like the African slave Edmond Albius (1829–1880), who discovered how to hand-pollinate vanilla orchid flowers, thereby facilitating lucrative exploitation of this tropical plant—which, paradoxically, contributed to the expansion of slavery to work vanilla plantations.[21] Students also studied accounts of Indigenous people who resisted the appropriation of their traditional knowledge of botanical remedies like cinchona (aka Peruvian bark), thus delaying the European colonization of India and other regions affected by malaria. Through a case study on the tanoak tree, we considered how Indigenous knowledge systems are becoming more valued for their utility in addressing contemporary environmental problems. We also explored the recent plant conservation efforts of women of color such as Robin Wall Kimmerer (b. 1953) and Wangari Maathai (1940–2011).[22]

MULTIPLE MODES OF ENGAGEMENT

Research on effective and inclusive pedagogy indicates that retention is enhanced by using a wide variety of assignments.[23] Multiple short essays, a long research paper, and exams made up an important part of the academic work of our two-quarter program. To link intellectual

---

[18] Lisbet Koerner, "Linnaeus in His Time and Place," in *Cultures of Natural History*, ed. Jardine *et al.* (cit. n. 16), pp. 145–162; and Londa Schiebinger, "Gender and Natural History," *ibid.*, pp. 163–177.

[19] Koerner, "Linnaeus in His Time and Place"; and Schiebinger, *Plants and Empire* (cit. n. 7), pp. 200–201.

[20] Natalie Zemon Davis, "Metamorphosis: Maria Sibylla Merian," in *Women on the Margins: Three Seventeenth-Century Lives* (Cambridge: Cambridge Univ. Press, 1995), pp. 140–202; Ann B. Shteir, *Cultivating Women, Cultivating Science: Flora's Daughters and Botany in England, 1760–1860* (Baltimore: Johns Hopkins Univ. Press, 1996), pp. 39–40; and Linda Lear, *Beatrix Potter: A Life in Nature*, reprint ed. (New York: St. Martin's Griffin, 2016).

[21] Gianquitto, *Good Observers of Nature* (cit. n. 2), pp. 151, 155 (on Treat); and Robert A. Voeks, *The Ethnobotany of Eden: Rethinking the Jungle Medicine Narrative* (Chicago: Univ. Chicago Press, 2018), pp. 116–118 (on Albius).

[22] Lucile H. Brockway, *Science and Colonial Expansion: The Role of the British Royal Botanic Garden* (New Haven, Conn.: Yale Univ. Press, 2002), pp. 103–139 (Indigenous resistance to appropriation); Frederica Bowcutt, *The Tanoak Tree: An Environmental History of a Pacific Coast Hardwood* (Seattle: Univ. Washington Press, 2015), pp. 130–146; Robin Wall Kimmerer, *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants* (Minneapolis, Minn.: Milkweed, 2013); and Lisa Merton *et al.*, *Taking Root: The Vision of Wangari Maathai* [film] (Toronto: Mongrel, 2009).

[23] Engstrom and Tinto, "Pathways to Student Success" (cit. n. 5); and Geneva Gay, "The What, Why, and How of Culturally Responsive Teaching: International Mandates, Challenges, and Opportunities," *Multicultural Education Review*, 2015, 7:123–139, esp. pp. 128–129, 135.

inquiry with embodied ways of knowing, each student also maintained a natural history journal over the six-month program. Through scientific illustration workshops and visual literacy lectures, they learned about various approaches to drawing from direct observation to create illustrated species accounts in the field and the lab. (See Figure 1.) Through the examination of early models of herbals, natural history journals, encyclopedias, and monographs, students learned that the development of a precise and specific format for specimen descriptions has a history.

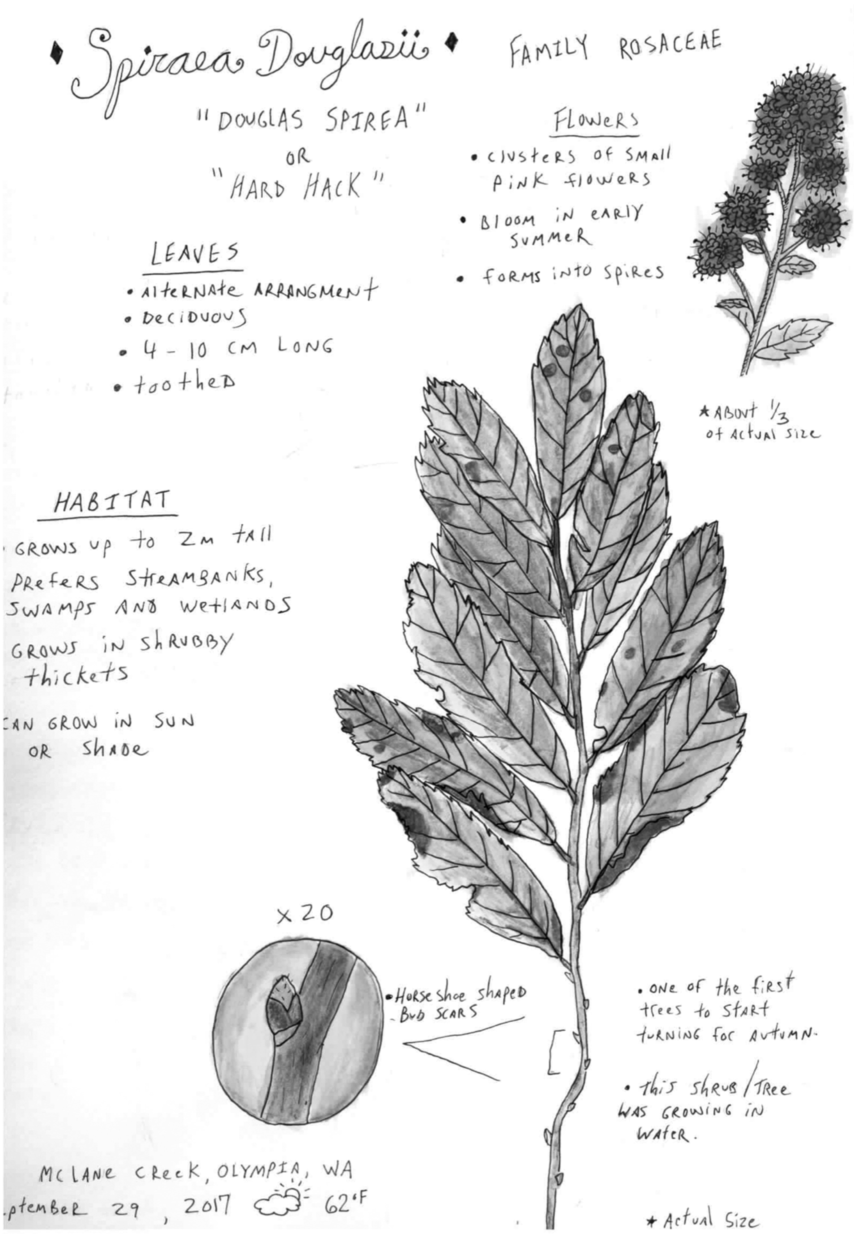

Figure 1. A species account of hardhack (*Spiraea douglasii*) by our student Renee Ackerman. Shared with permission.

Using a place-based learning model inspired by the environmental historian William Cronon, we took students on a field trip to the Billy Frank Jr. Nisqually National Wildlife Refuge. We asked them to create an illustrated entry in their natural history journals based on close description of both natural features and human-created landforms. Students were adept at documenting plant communities and ecological relationships in the refuge. A few noted the evidence of white settlement reflected in abandoned dairy barns and derelict apple orchards remaining from early twentieth-century agricultural use of the land. However, after reading the Medicine Creek treaty, the 1854 government document that regulated the transfer of the area we had visited, students began to grasp more thoroughly the complex and conflicted history between Indigenous peoples and white settlers grounded in that place.[24] Students expressed surprise at the terms under which much of western Washington was ceded to the state in exchange for small Indian reservations on unfertile soil. On the basis of their close reading of this treaty, they came to understand how the many stipulations placed on area tribes worked to undermine traditional cultural practices and land use. Nevertheless, students also recognized the ways Indigenous agency was evident in relatively recent estuary restoration work conducted to improve anadromous fish habitat at the mouth of the Nisqually River.

As a final project, students created an exhibit of algae collected on the Puget Sound (aka the Salish Sea) shoreline of Evergreen's thousand-acre campus. Their herbarium specimens were paired with other *naturalia*, photographs, and interpretive texts. (See Figure 2.) Initially students focused solely on the utility of algae to humanity—for example, as wrappers for sushi and food binders for ice cream. Thinking of nature as a warehouse of natural resources was a paradigm hard for them to shake. However, with some coaching, students came to realize that phycology offered intersections with women's history as well as Indigenous studies. In their final library exhibit, interpretive texts written by the students explained how women such as Anna Atkins (1799–1871), Isabella Gifford (1825–1892), and Josephine Tilden (1869–1957) made significant scientific contributions to the study of seaweeds. (See Figure 3.) Furthermore, inspired by our discussion of the Medicine Creek treaty, one student contacted a Native American administrator on campus to get input on his interpretive text for the exhibit. As a result, he was able to make the history of Indigenous relations to the college's shoreline more visible, including the recent successful effort formally to change the name of a land feature from a sexist and racist one imposed by white settlers to its original Indigenous name: Bushoowah-ahlee Point.[25] These assignments at the end of our program exemplified the students' expanding capacity to think about science and its applications in a historical context.

CONCLUSION: SCIENCE AS A HISTORICALLY GROUNDED MODE OF INQUIRY

Through their field and lab work, students developed skills in plant identification and illustration, scientific nomenclature, and ecological inquiry. However, they practiced these skills in the context of critical thinking about the received authority of science—and this changed their experience of learning the scientific material. Throughout the class, they encountered new ways of thinking about what science is as well as how it has changed over time. As the philosopher Ted Toadvine observes, "in contrast with the empirical method of the natural sciences, the method

[24] William Cronon, "The Trouble with Wilderness," in *Uncommon Ground: Rethinking the Human Place in Nature*, ed. Cronon (New York: Norton, 1996), pp. 69–90; and "Medicine Creek Treaty," U.S. Bureau of Indian Affairs, 1854, https://goia.wa.gov/tribal-government/treaty-medicine-creek-1854 (accessed 3 Feb. 2020).

[25] Laura VerMeulen, Assistant Director, Longhouse, Evergreen State College, Olympia, Washington, personal communications, 29 July 2019.

Figure 2. As a culmination of their work with seaweeds, students curated an exhibit of seaweed herbarium specimens, shells, and other *naturalia* they had collected and documented from the college's Salish Sea shoreline. "The Algae of the Evergreen Beach," Daniel J. Evans Library exhibit. Photograph by Frederica Bowcutt.

of the humanities is hermeneutical; the concern here is not with the gathering of facts, but rather with the assumptions that frame what counts as a fact and the broader context that determines which facts are gathered and how they are to be put to use."[26] This interdisciplinary course provided

[26] Toadvine, "Six Myths of Interdisciplinarity" (cit. n. 9), p. 4.

Figure 3. The exhibit's juxtaposition of natural and cultural history showcased important contributions women made to phycology in the nineteenth and early twentieth centuries. "The Algae of the Evergreen Beach," Daniel J. Evans Library exhibit. Photograph by Frederica Bowcutt.

a new way for students to frame science. Making visible the many contributors who had been marginalized in many historical accounts of science supported a richer, more robust understanding of science.

Our students came to understand that science is not a static set of facts but a mode of inquiry, one mode among many. Individual research projects and case studies at the end of the course proved to be powerful ways for students to synthesize their interdisciplinary learning. Through their study of a local federal wildlife refuge and the college's Salish Sea shoreline, our students learned to interpret the natural world in scientifically accurate ways while reimagining how accounts of the past—and the science of the future—can be more inclusive.