**Historical Comment**

“Her Joyous Enthusiasm for Her Life-Work...”: Early Women Authors in *The American Naturalist*

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**Abstract:** Women have long been underrepresented in the natural sciences, and although great progress has been made in recent decades, many subtle and not-so-subtle barriers persist. In this context, it is easy to get the impression that the early history of ecology and evolutionary biology was exclusively the domain of male researchers. In fact, a number of women made very substantial contributions to *The American Naturalist* in its first decades. In a follow-up to a series of retrospective essays celebrating 150 years of this journal, we highlight the scientific contributions of the women published in it during its first 50 years (1867–1916). We also discuss the diverse paths that their scientific careers took and the barriers they faced along the way.

**Keywords:** history of science, women in science, ecology, evolution.

In the countdown to its recent 150th anniversary, *The American Naturalist* published a series of retrospective essays highlighting important but often overlooked articles from the journal’s history. With only two exceptions—LoPresti and Weber (2016) and Metcalf (2016)—the highlighted articles were all authored by men. It is thus easy to come away with the impression that the journal (like the natural sciences in general) was an all-male club in its early years. The vast majority of articles, including almost all the classics that are still actively discussed today, were indeed written by men.

However, women scientists made significant scientific contributions throughout *The American Naturalist*’s early years. The goal of this historical commentary is to recognize the women who contributed during the first half-century of the journal (1867–1916). We highlight their research contributions but also use this opportunity to explore their fascinating lives and what they reveal about gender disparities during the first 50 years of professional science in North America. How often did women publish in *The American Naturalist* during this early era? What were their stories? How did they enter science? Were they able to establish scientific careers? How did their backgrounds and fates change over the 50-year period that we cover? The answers to such questions both teach us about the history of our field and reveal familiar themes that echo in modern discussions of inequality in academia (see, e.g., Moss-Racusin et al. 2012; Larivière et al. 2013; Holman et al. 2018). Although here we focus exclusively on the first half-century of this journal, readers will readily identify parallels to the barriers and biases that persist for scientists who are women, minorities, first-generation college students, or from developing nations.

**How Often Did Women Publish in *The American Naturalist* in Its First 50 Years?**

To explore the early history of women authors in this journal, we scanned every issue published from 1867 to 1916 (580 issues, 2,889 articles). Of these, 76 (2.6%) had a female author (88% of these were sole-authored, typical of the era). Female representation among authors increased only incrementally over the period we consider (fig. 1).

We read each female-authored or coauthored article from this period, noting the topic, general approach, major conclusions, and institutional affiliation (if any) of the author. An annotated list of articles authored by women between 1867 and 1916 is provided in table A1 (tables A1, A2 are available online). We then searched books, journals, and websites for information about the authors’ lives. Brief biographical information and sources can be found in table A2.

These 76 articles were authored by 57 different women; that is, some women published more than once—a few rather prolifically—in the journal. It is possible that we missed...
articles by women who published under a pseudonym or their first initials. However, the large majority of authors in this era of the journal published with their full names, with the exception of certain extremely well-known men (including the journal’s founders), so we doubt that we missed many female-authored works.

These women were almost exclusively American, although many studied in Europe (where some institutions granted PhDs to women before American institutions did). International authors appear periodically from the early years of the journal but became commonplace only toward the end of our focal era. It is difficult to identify other aspects of diversity.

Who Were the Earliest Women Authors?

To give these early scientific pioneers the credit they deserve, we start by presenting the first three women (shown in fig. 2) to publish in this journal. We describe their backgrounds, research contributions, and how these reflected the scientific themes of the time. These stories are similar in some respects but also highlight the diversity represented in this very small pool of extraordinary scientists.

Lucie L. Hartt was the first woman to publish in The American Naturalist, in its third year, 1869. She was personally connected to the journal through her husband, Charles Frederick Hartt, a prominent Canadian geologist who studied alongside the journal’s founders at Louis Agassiz’s museum at Harvard. Lucie Hartt apparently visited her husband-to-be while he was the founding director of the Section of Geology at the National Museum of Rio de Janeiro (1866–1867); the two married in 1869 and then returned to Brazil in 1870. Lucie Hartt’s 1869 article describes general information about cuttlefish natural history and her personal observations of one individual cuttlefish. It includes an endearing passage about how the cuttlefish in question, an “uncivil individual,” seized her finger “with a pressure far too ardent to be agreeable” (p. 33) and would not let go. Her writing was typical of many articles from that time: entertaining, personal, and inquisitive but focused on describing observations of organisms. (Interestingly, she published an almost verbatim article in the October 2, 1869, issue of Scientific American under a
different title. Clearly, copyright and plagiarism rules have changed.) Lucie Hartt apparently stopped contributing to science soon thereafter. She gave birth to twins and then became pregnant again while in Brazil, where her husband was looking for geological evidence of Agassiz’s theory that the biblical flood left glaciation-like signatures in both the tropic and temperate zones. She later apparently left her husband because he worked too hard: a brief genealogical essay on Charles states that “his decision to put geology first had cost him dearly.” He died of yellow fever a few years later, in 1878. Lucie Hartt had her estranged husband’s remains returned to New York, where she ran a girl’s school that emphasized college preparation.

Grace Anna Lewis (1821–1912) published two articles in the fourth and fifth volumes (1870 and 1871). In contrast to Lucie Hartt’s personal anecdotes, but emblematic of another writing style of the time, Lewis offered textbook-like descriptions. One article described the lyrebird in Australia, while the next documented microscopic structures in bird feathers. In contrast to Lucie Hartt’s, Lewis’s life is well documented. She was a pioneer on many fronts: as a female American scientist, an abolitionist, a suffragist, and a temperance activist. Her Quaker family placed her in a boarding school after her father died. The Quakers were early proponents of girls’ education, as well as abolition and women’s right to vote. Consequently, several early women scientists were also active in these social movements. Lewis, who never married, learned to be an accomplished naturalist and illustrator. After the Civil War, at age 39, she turned her attention to ornithology, supported by her patron and teacher John Cassin, curator of the Philadelphia Academy of Natural Sciences. She published a widely acclaimed book, The Natural History of Birds. It was intended to be the first of a several-volume magnum opus, but Cassin died in 1869 of arsenic poisoning from handling preserved bird skins, and Lewis, without his sponsorship, saw her access to the Academy’s museum curtailed. Yet her expertise was widely acknowledged: T. H. Huxley, visiting the United States in 1876, judged her work as “fully up to the latest and most advanced ideas in regard to systematic classification.” For a time, Lewis supported her own research by selling off her family’s land and by periodically giving private lectures on ornithology in her parlor. She applied to many university jobs but was unable to obtain a steady teaching position that would allow her to continue her research. It is hard to say how much this reflected the pervasive sexism of the time or her lack of formal education beyond high school, but the two factors certainly went hand in hand. She ultimately took a teaching job at the Foster School for Girls and never published again.

Mary Treat (1830–1923), the third woman to publish in The American Naturalist, had a long and prominent scientific career, unlike her predecessors. She published five articles in the journal between 1873 and 1881 on diverse topics, including carnivorous plants, sex determination in butterflies, tarantula behavior, and flycatchers. Like Grace Anna Lewis, Mary Treat dove into research relatively late in life: she published her first article (in The American Entomologist) when she was 39 years old. Her work began in collaboration with her husband, Joseph Treat, an abolitionist and professor, and then continued after they separated. She ultimately published 76 scientific articles and five books, one of which (Injurious Insects of the Farm and Field) was reprinted five times. She corresponded avidly with Asa Gray and Charles Darwin, who engaged in a spirited debate with “Mrs. Treat”
(as she was generally called) about control of sex in insects. Although Darwin disagreed with her, his serious attention to her ideas legitimized her in the eyes of many other scientists of the day.

These first women authors were under immense societal pressures to conform to a culturally specific vision of womanhood that is hard for us to fathom today. The title of our article comes from a contemporary description of the spectacularly successful Mary Treat (Harshbarger 1899). There is supreme irony, then, in reading the full passage from which we took it:

Her most prominent characteristic is a modesty so shrinking as to make any public recognition of her services painful to her, while her joyous enthusiasm for her chosen life-work is so great and so contagious that her home is always a centre of attraction, where are welcomed all who care to learn even the alphabet of her beloved book of nature, and where she dispenses the bounty of her gifts and attainments with a modest lavishness and an unwearied patience, which appears to be to her their own reward. (pp. 300–301, italics added for emphasis)

How Did Early Women Authors in The American Naturalist Enter Science?

Hartt, Lewis, and Treat, our three pioneers, were soon followed by a small but steadily growing list of other female authors (table A1). They offered novel observations on topics ranging from botany to zoology to anthropology, conducted experiments, and presented literature reviews; they worked both nationally and internationally, at prominent field stations, and in their own backyards. In these ways, they represented a typical cross-section of American Naturalist scientists of their time, and indeed of our own.

But women had very limited opportunities for higher education and hence little access to mentors. Some private colleges began to admit women in the early to mid-1800s (e.g., coeducational Oberlin College was founded in 1833 and all-women’s Mount Holyoke College in 1837). However, these institutions often lacked departments in which the natural sciences were taught. Graduate education opportunities lagged still farther behind. Emily Gregory (1840–1897) was the first American woman to receive a PhD in botany in the mid-1880s, though she had to go to Zurich to do so (she was also the first woman elected to the then-invitation-only American Society of Naturalists in 1886). She received her undergraduate degree from Cornell University in 1881 (at the age of 41). Cornell is a common thread linking many of the women publishing in The American Naturalist. It began admitting undergraduate women in 1870 (though they were initially not welcomed by the male students), and its strong natural sciences faculty apparently drew many women into science.

Some women became authors in The American Naturalist with very little formal mentorship. Erminnie Smith (1836–1886), for example, has been called the first woman field ethnographer (Miller 2007). She was the first female member of the New York Academy of Sciences (1877) and the American Association for the Advancement of Science (AAAS). She received a degree in mining in Germany, and then, without formal training, became a self-taught expert on the culture and language of the Iroquois. She started the Women’s Anthropological Society of America after she was barred, as a woman, from membership in her major professional society; this policy was apparently a backlash to the exceptionally large numbers of women anthropologists working in the Washington vicinity in the 1880s (Rossiter 1982). Miller (2007) points out that “for the nation’s pioneer women anthropologists, membership in an organization of like-minded women reinforced their identity as professionals and serious scholars” (p. 75). Networking among women in academia clearly had an early origin.

With few undergraduate and no graduate opportunities, the early women authors found mentors in other ways. Erminnie Smith lacked a professional mentor, but her research was funded by John Wesley Powell, the first director of the Bureau of Ethnology at the Smithsonian Institution and director of the US Geological Survey. A handful of prominent evolutionary biologists mentored large numbers of women, including David Starr Jordan, Thomas Hunt Morgan, William Bateson, and Charles Davenport. These training opportunities, while essential, did not generally translate to professional success: indeed, women were marginalized in most of these labs even when hired into permanent positions (Richmond 2007b). Further, sometimes these mentors’ motives were not entirely admirable. Edward Cope (an early editor of this journal) taught for some time at the Quaker-founded,
coeducational Haverford College, where he mentored many young women. For example, Helen Abbott (whom we discuss in greater depth below) went on a paleontological expedition with Cope to the Western United States, chaperoned by her father. She later wrote that Cope believed women required extra education to compensate for what he saw as their innate lack of ability (LoPresti and Weber 2016). An alternative explanation was proffered by a contemporary, Charles Knight, who once said of Edward Drinker Cope that “no woman was safe within five miles of him” (Davidson 1997, p. 109).

Many women were encouraged by husbands or other family members who were themselves studying natural history. These collaborations were an entry point into science but at the same time could be a constraint on advancement (Ros-siter 1982). Susanna Phelps Gage (1857–1940) obtained her BA from Vassar College first as one of its science graduates. Together, the Peckhams published early studies on sexual selection (Peck-ham and Peckham 1889, 1890), supporting Darwin over Wallace. From 1883 to 1909, they described 63 genera and 366 species of arthropods.

Toward the end of the nineteenth century, women’s access to higher education expanded. However, women still had to fight for formal training. For example, Ida H. Hyde (1857–1945) was a physiologist known for developing a powerful microelectrode. She studied at Cornell University and then was mentored by Jacques Loeb and Thomas Hunt Morgan at Woods Hole Biological Laboratory, a common training ground for women scientists in this era. Hyde then went to Heidelberg University in Germany to train for her PhD with Wilhelm Kühne studying jellyfish development. Heidelberg was her second choice; Strasburg denied her admission on the basis of her gender. Even at Heidelberg, the faculty barred her from entering the lectures and laboratories. Kühne disliked teaching a woman and demanded far more work from her than from male students. Despite these significant hurdles, Hyde succeeded. Her male colleagues shared their lecture notes with her, and she passed her doctoral exam with honors in 1896 (at age 39), becoming the first woman to obtain a doctorate there. She wrote wryly about her experiences in an article entitled, “Before Women Were Human Beings” (Hyde 1938).

By the late 1890s to early 1900s, the list of universities that were training and, to a lesser extent, employing women expanded considerably. We begin to see women authors from Bryn Mawr College, University of Cincinnati, University of Illinois, Lake Forest University, University of Texas, Smith College, University of Michigan, Columbia University, and the University of Chicago. Graduate programs in some subfields, in fact, were dominated by women to a level unmatched today. Langenheim (1996) notes that women received every PhD awarded in ecology prior to 1920 at the University of Illinois and half of those awarded at Cornell. She points out that these figures are particularly significant considering that women did not get suffrage in the United States until 1920. We stress, however, that receiving a PhD and finding a position in academia were two quite different things.

**Under What Circumstances Were the Early Women Authors in The American Naturalist Able to Establish Careers in Science?**

As we have pointed out, some women published only a single article in The American Naturalist and then dropped off the scientific map (e.g., our first woman author, Lucie Hartt). Others had long careers and multiple articles over many years. There is no doubt they all faced barriers, from the bias of their male colleagues to limited educational and employment opportunities. We illustrate these barriers by
describing some of their career trajectories. We then ask how it was that, among the many who either dropped out of science or toiled for decades with little professional support, a few women managed to establish thriving scientific careers.

“Without Work, Life Is Not Worth Living”

One story of unfulfilled promise involves Helen Abbott (1857–1904), who published a visionary article in this journal in 1887 arguing how principles of evolutionary biology could be applied to explain variation in plant biochemistry (LoPresti and Weber 2016). After several years conducting research on that theme, she returned to medicine, lacking the advanced degrees that her male colleagues in biology expected. Eventually, Abbott did return to school to obtain her PhD from Tufts University in 1903. Tragically, she died of influenza a year later, never having obtained the research position she richly deserved.

An advanced degree, though, was not a guaranteed ticket to success. Julia B. Platt (1857–1935) had credentials to impress. She studied embryology at Harvard in 1887 and then conducted research at Woods Hole, Bryn Mawr, the University of Chicago, Radcliffe, Hopkins Marine Laboratory, and at several German universities. She received her PhD in developmental biology in 1898 and then published 12 articles in just 10 years, including one in *The American Naturalist* in 1899. Most notably, she showed that neural crest cells formed the jaw cartilage and tooth dentine in salamanders. This conclusion was rejected by her contemporaries, who believed that only mesoderm formed bones and cartilage. It took 50 years for her hypothesis to be confirmed. Despite her depth of training and her productivity, she landed none of the academic positions for which she applied. Platt then wrote, “Without work, life is not worth living. If I cannot obtain the work I wish, then I must take up the next best” (quoted in Zottoli and Seyfarth 1994). She moved to Pacific Grove, California (where the American Society of Naturalists has recently held its stand-alone conferences), and became its first female mayor. She is noted for initiating marine protected reserves that were crucial for the survival of the California sea otter (Palumbi and Sotka 2012). We can take some solace from the hindsight that her municipal leadership probably had a bigger impact than most of her male peers’ research ever did, though it is unclear how she herself eventually felt about her life’s path.

Nevertheless, She Persisted

There were women who did succeed in gaining a coveted research or teaching position. Some of their stories are phenomenal examples of persistence, perhaps none more than Lilian Vaughan Morgan (1870–1952). Morgan was an American experimental biologist who made seminal contributions to the genetics of *Drosophila melanogaster* that cemented its status as one of the most powerful model systems in biology. Yet she remained at the margins of science for decades because of her own husband. After graduating from Bryn Mawr College with honors in biology in 1891, she published a few articles from her graduate work on Anuran development. In 1904, at the age of 34, she married her graduate advisor, Thomas Hunt Morgan. She then went nearly two decades without conducting her own research while she supported her husband’s career and raised four children. Once their children were grown, she resumed research, now focusing on *Drosophila* genetics, even though her husband refused to collaborate with her. Her achievements include the discovery of the attached-X and ring chromosomes in *Drosophila*. Despite Thomas Morgan’s admirable record of mentoring women at Bryn Mawr, including *American Naturalist* authors Annah Hazen, Helen Dean King, Hannah Teresa Rowley, Henrietta Thatcher, and Eleanor Rathbun (see tables A1, A2), he was not comfortable with them in the “exclusive men’s club” that was his own lab (Keenan 1983). It was only when Thomas died (1945) that Lilian Morgan was granted the first paid job of her life, at the age of 76, more than a half-century after her start in research.

Mary Rathbun (1860–1943) was another long-marginalized but ultimately successful scientist. Like many of her generation, she lacked a formal college education. She started her scientific work in 1884, when she became an unpaid assistant to her brother studying crustacean taxonomy at the Smithsonian Institution. After 3 years as an unpaid assistant, she was granted a clerkship at the Smithsonian. After another 28 years of mostly solo work describing more than a thousand new species, during which she published four *American Naturalist* articles, she was finally promoted to be an assistant curator of Crustacea. Upon retirement in 1915, she was granted an honorary master’s degree by the University of Pittsburgh and a PhD from George Washington University in 1917.

Not all women had to wait so long for a formal job. One of the earliest women scientists to establish a career was the malacologist Mary Wilcox (1856–1955). She first studied at the Massachusetts Institute of Technology, then went to Cambridge, and eventually obtained her PhD from the University of Zurich. Despite her mother’s concern that a scientific career meant spinsterhood, Wilcox sought a position at the Museum of Comparative Zoology at Harvard. Louis Agassiz’s son denied her application, saying there were “three windows, and a man for each window” (Palmieri 1997, p. 119), but he sponsored her to start the zoology department at Wellesley College in 1883. She was a full professor by 1890 and continued to publish articles on gastropod taxonomy and anatomy and to mentor other women scientists. She published a
new species description and two studies in comparative anatomy in this journal between 1901 and 1906. This is not to say that she had an easy life. Palmieri (1997) reports that Willcox resigned at age 54, ostensibly because of ill health but more likely due to guilt over her professional success compared to a sickly sister who never had such opportunities. After her retirement, she lived another 45 years, devoting herself to her sister’s care.

Like Mary Willcox, Ida Hyde held prestigious positions and, spurred by her own difficulties along the way, became a vigorous advocate for women in academia. After obtaining her PhD, she was chosen as a prestigious investigator of residence to study marine invertebrate physiology at the Naples Zoological Station. During this time, she published a comparative study of mammalian hearts in this journal. She was ultimately hired as an assistant professor at the University of Kansas in 1899, where she was the founding chair of the Department of Physiology. She organized a fund (the Naples Table Association) to provide financial aid and professional support to women pursuing scientific research, founded a scholarship at the University of Kansas, and endowed the Ida H. Hyde International Fellowship with the Association of American University Women (AAUW). She argued for everything from equal pay for women to installing women’s toilets in the science buildings at her university.

Edith “Becky” Saunders is probably the most dramatically successful early woman author in The American Naturalist. She is not well known among evolutionary biologists today, but she should be. In an obituary in Science, J. B. S. Haldane described her as the “mother” of plant genetics, saying, “It is clear that she and Bateson had independently rediscovered some at least of Mendel’s laws before his work was known to them” (p. 385). Her first article on plant genetics was published in 1897, before Mendel’s work was uncovered. She ran the Balfour Biological Laboratory for Women, where she was able to conduct and publish the most extensive and careful plant genetics crosses in the early days of Mendelian rediscovery. Her 1902 book with Bateson introduced the terms “allelomorph” (later shortened to “allele”) and “heterozygote.” In 1904, The American Naturalist published a review of her book, the first discussion of Mendelian genetics in this journal: “As this is the first extensive post-Mendelian account of hybridization experiments, it may be fairly called epoch-making” (American Naturalist 38:322). In a 1906 awards ceremony where she received the Banksian medal from the Third International Conference on Genetics, Bateson said, “Had it not been for the work that has been done by my friends and pupils—first of all by my colleague Miss Saunders, whose name has been so deservedly honoured to-night [. . .] I could never have dared, without that force behind me, to have asserted that Mendelian research has been and is of the importance that we now know it must possess” (Wilks 1906, p. 75). For her central role in early genetics, she became one of the first female members elected to the Linnean Society, served as its vice president in 1912–1913, and was named president of the British Genetical Society in 1938. She left science to assist the war effort in Europe (exactly what she did is not clear) and was killed in a bicycle accident shortly after returning to England.

“I Have Been Bossed My Entire Life”

It is easy to assume, from our own biases, that the ultimate goal of these early women scientists was a position in academia and that working in a nonacademic setting was a tragic fate rather than a matter of choice. But when the option is available to us, it is important to let these women speak for themselves. Sarah Monks (1841–1926), an authority on many topics in natural history, published in The American Naturalist in 1881 on the behavior and life history of lizards. She obtained her MS at Vassar College in 1871. She never married and taught for 22 years at a variety of small colleges and the Los Angeles State Normal School (now the University of California at Los Angeles). However, Monks seems to have really come into her own after she quit academia and devoted herself wholeheartedly to natural history. She wrote a high school physiology textbook, discovered regeneration in starfish, studied diatoms, wrote poetry, and more generally seems to have had the best time of her life. She was widely known as “the consulting naturalist”: “From the four corners of the earth they come to her, seekers of scientific knowledge. Scholars and students have long made a beaten path to her door, for she is a recognized authority on zoology, botany, geology, and minerology” (Boeckmann 1920, p. 54). She wrote, with obvious satisfaction, “I am pleasing myself as I please. I have been bossed my entire life. First, I had to obey my parents, then the college professors, and later the president and faculty and social life at the normal school” (Boeckmann 1920, p. 54).

Conclusions

Examining the early days of a field serves to remind us of how far we have come but also of how much we owe those who came before us. We have highlighted here the lives and achievements of a diverse, previously overlooked set of our forebears: the women scientists who published in The American Naturalist during its first 50 years (1867–1916). These individuals led rich and complex lives, contributed to the cutting-edge science of their day, and received varying degrees of credit for their work. Sadly, with some notable exceptions highlighted in the text and in table A2, they have left behind little or no written record, beyond their fascinating contributions to this journal. We hope that readers will be inspired to investigate their lives and scientific contributions further. There are other sets of overlooked authors that
deserve attention as well. Not all of these, including racial minorities, are as easily identified as we found our women authors to be, but they too deserve recognition as pioneers who enriched our field in its earliest days.

The lives of women scientists changed markedly across the era we cover here. Our earliest women authors were mostly self-trained naturalists with the leisure, resources, and connections to be able to spend significant amounts of time observing nature and recording what they saw. They were unconnected with universities or museums, except insofar as their husbands, fathers, and brothers were. The late 1800s saw a clear shift, with surprisingly large numbers of women being trained in university labs; a few key institutions (Wellesley, Bryn Mawr, Cornell) and mentors (T. H. Morgan, David Starr Jordan) played outsized roles. However, very few of these women remained in science after publishing their American Naturalist articles, which were often the products of their MS or PhD research. Those that did establish scientific careers often occupied unpaid assistantships for many years; they appear in many cases to have been deeply appreciated by their institutions, but professional advancement did not come with those sentiments. We were struck by how the lives and career trajectories of the women we have explored, for both better and worse, were strongly tied to those of powerful men (for good or ill) but also by the fact that professional networking among women scientists had emerged as early as the 1880s.

The causes of these patterns are complex and reflect broad-scale social trends of the era that go well beyond academia—and within academia, well beyond the biological sciences. We refer readers interested in a deeper historical and sociological consideration to several outstanding analyses of early women in science: Rossiter (1982), Abir-Am and Outram (1987), and Schiebinger (1989). Valuable works are available on women’s experiences in certain subfields of biology, including ecology (Langenheim 1996) and genetics (Richmond 2007b), and at certain key institutions, including Wellesley College (Palmieri 1997) and Radcliffe College (Tonn 2017). Finally, biographies and autobiographies have been written of a handful of our authors (Hyde 1938; Warner 1979; Keenan 1983; Miller 2007; Ogilvie 2007; Richmond 2007a; Palumbi and Sotka 2012; LoPresti and Weber 2016).

We are left with many questions. First, did the women of this (or any other) era do science in any fundamentally different way than did the men of the same era? Did they ask different questions, use different forms of reasoning, rely on different tools? We will only note here that the marked topical shift in the journal across this period—from natural history observations toward rigorous laboratory investigations in physiology and genetics—is evident in articles published by both female and male authors. Second, what was the publication experience like for these pioneering scientists: Did women have to struggle more to publish their work, and were they held to any different publication standards? Were certain journals (including The American Naturalist) more, or less, welcoming for them? Third, to what extent did the experience of women scientists in other countries parallel the American trends we have discussed here?

Finally, when did things begin to change?—those things, that is, that did change. At least with regard to publication frequency, the answer is clear (fig. 1). During the period we considered, less than 3% of articles were authored by women. This rate held fairly steady until the mid-1950s, when it began to rise and then accelerate toward its present state. In recent years, women have been lead authors on slightly more than 40% of American Naturalist articles and authors on nearly 70%. Of all 414 articles published from January 2016 through August 2018 (at the time this article was written), 40% had women as first authors, 27% had women among the coauthors, and 33% were authored by men only. It is difficult to know what null expectation to compare these numbers to, because genders are not equally represented at all career stages. But, clearly, more improvements can be made. We should note that during the time covered by these numbers, two of the three editors were women and the journal used mostly double-blind review (except when authors opted out). However, many questions remain. What cultural and political events drove this change, particularly its onset in the 1950s? How important a role did mentorship of women students by women faculty play in this increase?

We hope that this comment has sparked interest in our readers to further explore our past, with the goal of documenting how it led us to where we are today and where we might yet go. The women whose lives and contributions we have highlighted here made real and, in many cases, highly significant scientific contributions. But they did more for us than that: they set the stage for later women by breaking barriers to university admission, professional degrees, and financial resources and by creating networks to support and mentor other women. Sadly, barriers remain for women in science, as well as for other underrepresented groups (see, e.g., Moss-Racusin et al. 2012; Larivière et al. 2013). These historical women’s stories of perseverance (and, often, failure) remind us of how strongly social norms can limit who participates in science and how our science advances, or does not, as a result.

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"Then raising himself on his long limsy arms, he stalked away towards the water, making such a comical figure, that in spite of my fright I indulged in a hearty laugh." From "A Chapter on Cuttle-Fishes" by Lucie L. Hartt (*The American Naturalist*, 1869, 3:257–261).