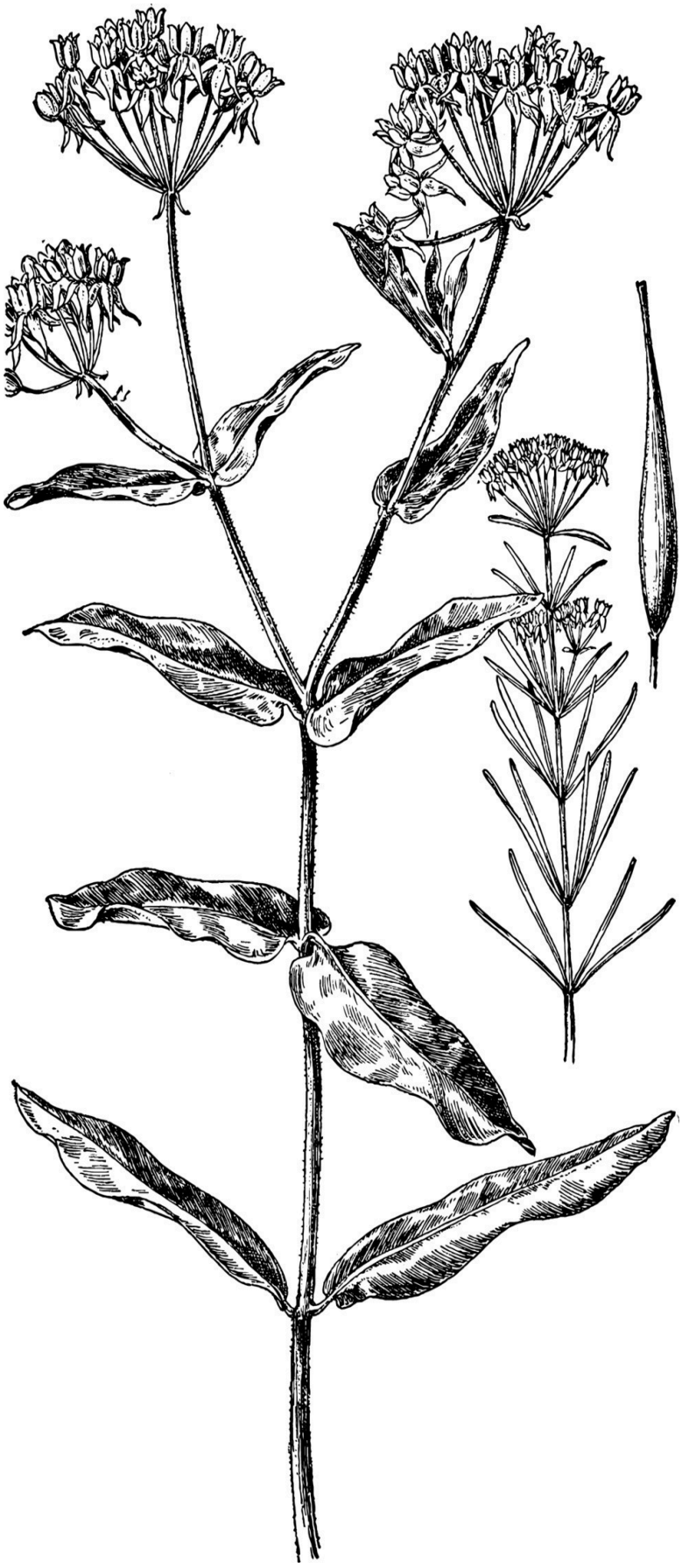

Flowers and Femininity: Sex, Women, and the Botanical Sciences

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The Discovery and Development of Plant Sexuality:

The so-called “Father of Botany” is Theophrastus of Eressus, who was a student and close friend of Aristotle. His major works discussing botany are *Enquiry into Plants* (*Historia Plantarum*) and *Causes of Plants* (*Causae Plantarum*), these works cover a classification of plants and discussions on the subject in regard to ‘applied botany’ namely agriculture. Some of these works by both Theophrastus and Aristotle would not be found and compiled until the 18th century.

The beginnings of the study of botany concerning plant anatomy and detailed biology as a science occurred in the 17th century. Prior to the dawn of understanding plants as valued and worthy of study, most plant-related interest in Europe and America was considered ‘frivolous’ or even ‘womanly.’ This indicates social thought devaluing objects or subjects typically nurtured or practiced by women (home-medicine, gardening, cooking, etc.). In 1676, Nehemiah Grew published *The Anatomy of Plants* which was the first comprehensive collection of observations on plant anatomy. His work was critical to the study of plant and reproduction, both sexual and asexual. Rudolf Jakob Camerarius’ *Epistolae de sexu plantarum* (1694), also challenged traditional views on the nature of reproduction and plant sexuality. Camerarius builds on the anatomical discoveries of Grew discussing male and female sex organs in plants.

Arguably the most influential publication of the 18th century related to botany was the tenth edition of Carl Linnaeus’s *Systema Naturae (Full: Systema Naturae per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis)* in 1758, was the most well-known edition in its time and today. The first edition of *Systema Naturae was published* in 1735 and was important in establishing and consistently using Linnaean Taxonomy; now referred to as binomial nomenclature. Linnaeus’s *Systema Naturae* was first published in English in 1806; previous editions were in Latin as was the norm for scientific literature, under the title "A General System of Nature, Through the Three Grand Kingdoms of Animals, Vegetables, and Minerals, Systematically Divided Into their Several Classes, Orders, Genera, Species, and Varieties, with their Habitations, Manners, Economy, Structure and Peculiarities." Linnaeus would go on to publish books on a wide range of botanical subjects, but the next one of particular note was the 1737 publication of *Genera Plantarum* which focused heavily on the sexual aspects of plants and their sexual reproduction. This botanical work influenced construction of gender, suggesting that there was a natural basis for the differentiation of sex – both botanical and human.

Also published in the 18th century, though bearing no specific connections to botany or plant studies, was Mary Wollonstonecraft’s *A Vindication of the Rights of Women* (1792). Wollstonecraft had written previously on the subject of gender and education making herself known as a nonconformist. She originally wrote *A Vindication of the Rights of Men* in 1790 reflecting on the Enlightenment, reason, and individualism. Through 1791 she expanded on this essay criticizing the narrow borders to which women were constrained and how it did nothing to

further educate them, reducing them to a shell of what they could be. The publishing in 1792 included critiques of gender roles, marriage, suffrage, and a theme of the equality of the sexes. This treatise was indirectly supported by the emerging science on plants and sexuality in gendering plants, and 'female' plants not being inherently weaker than the 'male,' the notion of the natural inferiority of women was challenged.

The 19th century saw significant changes in the social understandings and rights of women. This was also reflected in the botanical sciences as women began gaining respect and prominence in the field, seizing their first foothold in the practices and arts of botanical illustrations. These illustrations had and still have tremendous value as the illustrator is able to enhance specific details which might not be obvious on collected specimens. Elizabeth Blackwell was one of the first to publish a collection which was both illustrated and compiled by a woman. The publishing of her *Counsel to Parents on the Moral Education of Their Children in 1878* along with the 1840 publication of *A Curious Herbal* gained her respect and recognition, and began the long road of acceptance of women into science and other male-dominated fields (Kakati and Das, 2022). She was so celebrated that she became the first woman to have a genus of plants named for her, Blackwellia of the class Dodecandria Pentagynia, appearing in Carl Linnaeus' *Species Plantarum* (1757).

Charles Darwin, famed evolutionary biologist, published *The Descent of Man, and Selection Related to Sex* in 1871. The book applies Darwin's evolutionary theories to human evolution, detailing his theory of sexual selection and the role of women in mate selection. "Darwin, an eminent man of science, could explore human sexuality through the sexual system of Linnaeus but women writers were not at liberty to address such potentially inflammatory issues in such a public way," (George, 2014). In grounding such erotic practices in nature, similarly to Linnaeus's *Genera Plantarum* (1737), sexuality and the roles of men and women were once again challenged against the rigid gender roles of the time. Especially in the sense that it challenged the notion that women should only be in the private sphere and completing domestic duties. Gregor Mendel, well known geneticist, biologist, and botanist, nicknamed the Father of Genetics presented his revolutionary experiments *Experiments on Plant Hybridization* in 1865 after conducting them between the years 1856 and 1863. These experiments provided a new scientific basis for equality of the sexes in terms of reproductive selection with the combination of positive or advantageous male and female contributions being crucial for proper propagation of traits through lineages.

Descriptions of Human Sexual Behavior:

The increased knowledge surrounding naming and functionality of plant reproduction found its use in the scientific community, often described as the universal translation or understanding, did not mean that it was appropriate for the female sensibilities. "Linnaean metaphors tended to fall into two categories, either sexual or military" (George, 2005). Many editions employ military

metaphors, allowing for the upholding of conservative views, however the sexual metaphors could be seen as “undermining [the] moral and social order,” (George, 2005). There was a large division of opinion on what was appropriate for women to access, mostly presented by Erasmus Darwin; the father of Charles Darwin, who was in favor of the original Linnaean ‘sexual’ descriptions, and William Withering who was for a revised or “English” description. Withering maintained that he presented Linnaeus in a more widely consumable manner, while this may have been true it was only due to the fact that women had supposed ‘delicate sensibilities.’

His translations cost a significant amount of scholarly value since the use of a euphemistic translation ended up mudding understanding. Joseph Pitton de Tournefort in his translations, used the terms ‘stamen’ and ‘pistil’ from Linneaus’s works in Latin. Comparatively, Withering for the word ‘pistil;’ meaning the ovary and its parts, as ‘pointal,’ and for ‘stamen’ employed the word ‘chive.’ (George, 2014). The obstructed references to the plant organs could cloud understanding, and while this was considered appropriate for women, those other than women who might be seeking knowledge were also left partially in the dark. After a publication of *Systema Vegabilium*: *A System of Vegetables* (1783) by Darwin led Botanical Society at Lichfield, the translated book and generally the use of ‘sexual’ termed translations became known as the Lichfield translation.

Darwin was not the only botanist who could not reconcile the confusion caused by these alternate translations. Prominent female botanist Maria Jackson, a student of Darwin, in her 1804 publication of *Botanical Lectures By A Lady*, noted that her work was to be used with the Lichfield translation specifically. Although Jacson’s scientific allegiance lies with the original Linneaus, she did discourage women in her other works to use the language in public settings. Despite her scientific leanings the use of ‘English' translated botanical books became commonplace for women, and future female botanists were inspired by the works of Withering to study the subject (George, 2014). One should keep in mind that Linneaus’s work pushed talk of reproduction and sex to be more explicit and specific. This normalization did in fact help break down rigid gender roles, norms, and promote recognition of sexuality.

Impact of Botanical Discoveries on Societal Attitudes and Norms:

The ‘woman question’ and changing attitudes toward gender roles in the late 18th and 19th centuries were deeply embedded in public discourse, shaped by literature, scientific thought, and cultural anxieties especially in light of the Enlightenment. Richard Polwhele’s *The Unsex’d Females, A Poem* (1798) reflects early fears about women surpassing traditional gender norms, by his portrayal of educated and politically active women as going against nature.

> “Survey with me, what ne'er our fathers saw,
> A female band despising NATURE's law,
> As "proud defiance" flashes from their arms,

And vengeance smothers all their softer charms." (ll. 11–14)

Polwhele's poem was written as a direct response to Mary Wollenstonecraft's *A Vindication of the Rights of Women* (1792), where she argues for education of women not for men's sake but for their own, the opportunity for equal contribution to society by men and women, and for equal partnerships in marriage through companionship and respect rather than female obedience. This skepticism toward women's autonomy persisted but evolved in the Victorian era, where the debate over the 'New Woman' became central to discussions of femininity. Danielle Nielson argues that "[w]ithout the conversation—the intercommunication—the debate about who the New Woman was, what she did, and stood for, and the dangers or interests she represented would have been less meaningful in determining how late-Victorians thought about and represented femininity," (2012). The anxieties expressed in public debate and various forms of literature illustrate how changing attitudes toward gender were not the ideas of a few vocal individuals but rather part of a broader societal reckoning with the evolving role of women.

In the early-18th century, John Lindley a professor of Botany, gave the Inaugural address at University College in London in which he stated "It has been very much the fashion of late years, in this country, to undervalue the importance of this science, and to consider it an amusement for ladies rather than an occupation for the serious thoughts of man," (1829). This statement is a reflection of the sentiments of the time for which men and especially men of science did not respect science done by women, and by extension saw the devaluation of sciences worked upon by women. According to Ann Shteir "[T]he gendered shape of botanical culture gave women access to botany during this earlier period, the same gendering was inverted after 1830 so as to restrict access to an increasingly "scientific" botanical practice (1997). Previous to men's study of botany, plants, including their uses as floral decor, herbal medicine, cooking, dye for paints, etc. were a woman's tool. Going as far back to general assessments of women as gathers and men as hunters in the pre-modern era, plants had been the business of women. After botany was studied by men such as Linnaeus, Darwin, and Mendel it was taken from women to be studied as a 'serious science.' This began to shift back in the later 18th century when "women had more culturally sanctioned access to botany than any other science: they collected plants, drew them, studied them, named them, taught their children about plants, and wrote popularizing books on botany. Botany came to be widely associated with women and was widely gender coded as feminine," (Shteir, 1997).

Debates of Botanical and Human Sexuality:

Carl Linnaeus's publication of *Systema Naturae* (1758) and his synthesis of his newly learned information with previously understood knowledge on the reproduction of plants from works such as Nehemiah Grew's *The Anatomy of Plants* (1676) brought about the knowledge of sexual reproduction being present not only in fauna but also flora. The defining of male and female sex organs in plants and study of their fertilization and gestation led to numerous similarities being

noted between the two. As a result, discussion of sex and sexuality became more commonplace and explicit not only in the medicinal sciences but in the botanical sciences as well. This breakdown and normalization of using sexual language when discussing natural phenomena aided in the breaking down of the use of the language in all facets of life especially that of human sexuality. Furthermore, in identifying various diverse and complex reproductive strategies utilized by plants the rigid norms and practices of human reproductive strategy were challenged.

However, these new discoveries could be used to argue for the reinforcement of gender norms and practices. It is undeniable that the proliferation of occasions for which it was appropriate to use sexual languages forced the slight normalization in some circles, simultaneously blocking women from the sciences or areas of sexual interest. Linneaus' work suggested that there were not only socially accepted gender roles in human society for reproduction but that these roles were also present in plants, suggesting that they be a part of the natural way of life – reinforcing traditional gender roles through needing them for species reproduction.

Charles Darwin's theory of natural selection describes the process of evolution occurs by which an animal adapts and is better suited to their environment will live to reproduce healthy and well-adapted young, passing on further these favored traits through generations.

Gregor Mendel's work in genetic inheritance in pea plants demonstrated the presence of dominant and recessive traits in parents and how those traits can be passed down through selective breeding of parent organisms, emphasizing the importance of female choice of reproductive partner and of male competition for female breeding partner. Darwin's work specifically provided a scientific basis for challenging the gender norms of the time (of female inferiority and male superiority) by illustrating both males and females could be and are subject to the pressures of evolution.

The work of Darwin and sexual selection illustrated the impact of gender difference in evolutionary processes–both human and botanical. These understandings then influenced contemporary discussions surrounding gender. Darwin's work also suggested that gender roles as understood and performed by European society had evolved over time in order to maximize evolutionary success, which would provide a natural explanation for the gender roles and differences of the day.

Moving into insights of the 19th Century, Gregor Mendel's experiments of genetic inheritance using pea plants occurred between 1855 and 1863 and left a lasting impact on the scientific community for its importance not only in botany but in human anatomy as well. His findings on inheritance introduced a new element to scientific and reproductive sciences watch was selective breeding. This idea had already been present in human society with inter-class, inter-racial, and inter-religious marriages being either illegal or not commonplace, but the introduction of this research provided these ideas with a scientific basis. This in turn reinforced ideas of a combination of positive or advantageous male and female contributions being crucial for proper

propagation of traits through lineages. These understandings supported arguments in favor of gender equality by placing importance on the complementary roles of either contributing partner (both father and mother) in reproduction and inheritance. Ultimately the decision of partnership should be the role of both partners and so, both partners deserve a say in the decision.

The Role of the Enlightenment:

Conversations around sexuality pre-Enlightenment were very heavily influenced by religion, especially Christianity in Europe and America. The mainly theological lens through which sexuality was viewed resulted in the association of sex and sexuality outside of marriage and procreation as sinful and improper, even unnatural. This added another layer to women's behaviour and propriety being more strictly controlled, often with female virtue being at the center of her personhood and value followed closely with concepts of purity and chastity. Enlightenment thinkers like Jean-Jacques Rousseau and Mary Wollenstonecraft began discussing sexuality in more of a natural lens as ideas of sexuality emerged from the botanical sciences, shifting discussions away from the sinful nature of sex and further on to the action of reproduction. As it was necessary for procreation in humans sexual pleasure emerged as being discussed, although the ideas were discussed within a male-centered worldview rather than of both sexes. Further connections between the botanical and anatomical sciences brought about new discussions concerning reproduction, gender roles, and sexuality often with ideas reinforcing biological determinism.

Women's Roles as understood before the Age of Enlightenment were largely within the private sphere; domestic duties and a guide for the family's moral uprightness as described by Coventry Patmore in his 1854 essay *The Angel in the House*. The Public sphere; economics, education, employment, and politics, was the place of men due to the intense legal restrictions and social norms. Religious teachings emphasized a woman's obedience to men especially in her marriage to her husband. They were viewed as 'delicate' and 'intellectually inferior' to their male counterparts and were thus unwelcome to participate in many aspects of a public life and scholarly work. The Enlightenment saw philosophers like Mary Wollenstonecraft publish and argue in favor of equal education and intellectual opportunities for women. This was accompanied by an increased discussion concerning women's mental faculties although many who explored this still believed the primary role of a woman was as a mother and caretaker. Although the Enlightenment saw the entrance of early feminist philosophical thought which challenged prescribed gender roles, and true change both socially and legally was not seen.

The Age of Enlightenment was a philosophical and intellectual movement which occurred in the 17th and 18th centuries in Europe. The movement focused heavily on revolutionary approaches to literature, science, philosophy, politics and the use of reason to understand the world and society. Botany and the natural sciences were among those studied and reevaluated under this new approach. Women were able to gain more information and to write texts on sex and

sexuality through the avenue of plants and botany. “Mary Kirby (1817-1893), working jointly with her sister Elizabeth Kirby, wrote many botany and natural history books for children and general readers during the 1840s to 1860s,” (Shteir, 1997) the sisters were a wonderful example of how women were not only learning for themselves but also using their newfound knowledge to teach other women and to educate children in sex.

Botany was thus used as a means of gaining access to entry into professional writing where its use could benefit women, especially after Darwin and Linneaus had been successfully exploiting the feminization of botany to keep women away from the scientific profession. According to Sam George “Such texts were liberating for women, offering access to scientific knowledge for the first time but they also had a conservative function and could be seen as incorporating conduct book constructions of femininity,” (2014).

Conclusions

The discovery and development of plant sexuality from the 17th to the 19th century played a crucial role in shaping both scientific thought and societal norms, particularly regarding gender and sexuality. Early botanical studies, such as those by Nehemiah Grew and Rudolf Jakob Camerarius, laid the foundation for understanding plant reproduction, which Carl Linnaeus expanded upon with his sexual classification system. These discoveries not only advanced botany but also influenced broader discussions on gender by challenging rigid notions of male and female roles.

The connection between botanical science and human sexuality became increasingly evident in the 18th and 19th centuries. While the sexual classification of plants sometimes reinforced traditional gender norms, it also provided scientific reasoning to question them. The works of figures like Mary Wollstonecraft, Charles Darwin, and Gregor Mendel further complicated these discussions, as they explored the biological and evolutionary significance of both male and female contributions to reproduction. The Enlightenment’s emphasis on reason and inquiry allowed women to engage with botanical sciences as a means of accessing and contributing to knowledge about sexuality, ultimately challenging restrictions on their intellectual and social participation.

By the 19th century, the shifting role of women in botany reflected larger societal changes regarding gender equality. Although botany was initially seen as an acceptable pursuit for women due to its ties to domestic life, it later became devalued as a "feminine" science once male scientists established it as a serious academic discipline. Despite these barriers, women continued to use botany as a way to educate themselves and others, demonstrating how scientific inquiry could serve as both a tool for reinforcing and subverting societal norms. The study of plant sexuality thus became more than just a scientific pursuit—it was a catalyst for broader conversations about gender, knowledge, and power.

References

Blackwell, Elizabeth. *A Curious Herbal, : containing five hundred cuts, of the most useful plants, which are now used in the practice of physick. Engraved on folio copper plates, after drawings taken from the life. To which is added a short description of ye plants; and their common uses in physick*. London: Printed for John Nourse at the Lamb without Temple Bar., MDCCXXXIX. [1739].

Blackwell, Elizabeth. *Counsel to Parents on the Moral Education of Their Children*. Hirst Smyth and Son, 1878.

Camerarius, Rudolf Jakob: *De sexu plantarum epistola.* Romney. 1694.

Darwin, Charles. *The descent of man, and selection in relation to sex*. London: John Murray. Volume 1. 1st edition. 1871.

Darwin, Erasmus. *The botanic garden, a poem. In two parts. Part I. Containing the economy of vegetation. Part II. The loves of the plants. With philosophical notes.* Volume 2. 1791.

Grew, Nehemiah. "The anatomy of plants with an idea of a philosophical history of plants, and several other lectures, read before the royal society." 1682.

Jackson, Maria Elizabeth. *Botanical Lectures: By a Lady*. London: Printed for J. Johnson, by T. Bensley. 1804.

Linnaeus, Carl. *Genera Plantarum*. 1737.

Linnaeus, Carl. *Systema Naturae*. 10th edition. 1758.

Patmore, Coventry. *The Angel in the House*. 1854.

Polwhele, Richard. *The Unsex'd Females, a Poem*. 1798.

Theophrastus. *Enquiry into Plants and Minor Works.* London: Printed for William Heinemann at G.P. Putnam's Sons, MCMXVI.

Wollstonecraft, Mary. *A Vindication of the Rights of Woman*. 1790.

Wollstonecraft, Mary. *A Vindication of the Rights of Woman*. 1792.

Citations

Bradstreet, Christina. "'Wicked with Roses': Floral Femininity and the Erotics of Scent." *Nineteenth-Century Art Worldwide*, vol. 6, no. 1, spring 2007, https://doi.org/http://www.19thcartworldwide.org/spring07/144-qwicked-with-rosesq-floral-femininity-and-the-erotics-ofscent.

Ethelmer, Ellis. *The Human Flower: A Simple Statement of the Physiology of Birth and the Relations of the Sexes*. Frank J. Boyer, 1897.

George, Sam. "Botany, sexuality and women's writing 1760–1830." *European Journal of English Studies*, 2009, https://doi.org/10.7765/9781526130174.

George, Sam. *Botany, Sexuality and Women's Writing, 1760–1830*, 1 Oct. 2017, https://doi.org/10.2307/j.ctt1vwmdrr.

George, Sam. "Carl Linnaeus, Erasmus Darwin and Anna Seward: Botanical poetry and female education." *Science Education*, vol. 23, no. 3, 30 Jan. 2014, pp. 673–694, https://doi.org/10.1007/s11191-014-9677-y.

George, Sam. "Linnaeus in letters and the cultivation of the female mind: 'botany in an English dress.'" *Journal for Eighteenth-Century Studies*, vol. 28, no. 1, 1 Oct. 2008, pp. 1–18, https://doi.org/10.1111/j.1754-0208.2005.tb00313.x.

George, Sam. "'Not strictly proper for a female pen': Eighteenth-century poetry and the sexuality of botany." *Comparative Critical Studies*, vol. 2, no. 2, June 2005, pp. 191–210, https://doi.org/10.3366/ccs.2005.2.2.191.

Jacobs, Joela. "'These lusting, incestuous, perverse creatures': A Phytopoetic History of Plants and Sexuality ." *Environmental Humanities*, vol. 14, no. 3, 1 Nov. 2022, pp. 602–617, https://doi.org/10.1215/22011919-9962926.

Kakati, Debashree, and Nibedita Das. "Women in Botany: A Review on the Impact of Gender Bias in Plant Science and Biodiversity Conservation." *Women and Society Prospects, Issues and Challenges*, Rajesh Publications, 2022, pp. 87–100, https://www.researchgate.net/publication/365519409_Women_in_Botany_A_Review_on_the_Impact_of_Gender_Bias_in_Plant_Science_and_Biodiversity_Conservation#full-text.

Lindley, John. *An Introductory Lecture Delivered in the University of London: On Thursday, April 30, 1829*. Printed by Richard Taylor, printer to the University of London, 1829.

Nielsen, Danielle. “The Dangerous New Woman in the Victorian Press: ‘blind alike to maiden modesty and maternal dignity.’” *The Latchkey: The Journal of New Woman Studies*, 2012, https://doi.org/http://www.thelatchkey.org/Latchkey4/essay/Nielsen.htm.

Rudolph, Emanuel D. “Women in Nineteenth Century American botany; a generally unrecognized constituency.” *American Journal of Botany*, vol. 69, no. 8, Sept. 1982, p. 1346, https://doi.org/10.2307/2442761.

Rudolph, Emanuel D. “Women who studied plants in the pre‐twentieth century United States and Canada.” *TAXON*, vol. 39, no. 2, May 1990, pp. 151–205, https://doi.org/10.2307/1223016.

Shteir, Ann B. “Gender and ‘Modern’ Botany in Victorian England.” *Osiris*, Women, Gender, and Science: New Directions, vol. 12, The University of Chicago Press, Jan. 1997, pp. 29–38, https://doi.org/10.1086/649265.

Stott, Annette. “Floral Femininity: A Pictorial Definition.” *American Art*, vol. 6, no. 2, spring 1992, pp. 60–77, https://doi.org/https://www.jstor.org/stable/3109092.

Subramaniam, Banu, and Madelaine Bartlett. “Re-imagining reproduction: The queer possibilities of plants.” *Integrative And Comparative Biology*, vol. 63, no. 4, 6 Apr. 2023, pp. 946–959, https://doi.org/10.1093/icb/icad012.

Vail, Anna Murray. “Jane Colden, an Early New York Botanist.” *Torreya*, vol. 7, no. 2, Feb. 1907, pp. 21–34, https://doi.org/https://www.jstor.org/stable/40594571.

Weems, Lucretia Saville. *This Wild Life: Heroines in the History of Botany, 1650-1850*. New Northwest Productions, 2023.

Zent, Egleé L. “Book review: Women and plants: Gender relations in Biodiversity Management and Conservation.” *Journal of Ethnobiology*, vol. 25, no. 1, Mar. 2005, pp. 151–154, https://doi.org/10.2993/0278-0771_2005_25_151_br_2.0.co_2.