The NEW ENGLAND JOURNAL of MEDICINE

Perspective

JUNE 6, 2024

RECOGNIZING HISTORICAL INJUSTICES IN MEDICINE AND THE *JOURNAL*

Malicious Midwives, Fruitful Vines, and Bearded Women — Sex, Gender, and Medical Expertise in the *Journal*

Ben Maldonado, B.A., Jamie Marsella, M.A., Abigail Higgins, A.B., and Sarah S. Richardson, Ph.D.

This article is part of an invited series by independent historians, focused on biases and injustice that the Journal *has historically helped to perpetuate. We hope it will enable us to learn from our mistakes and prevent new ones.*

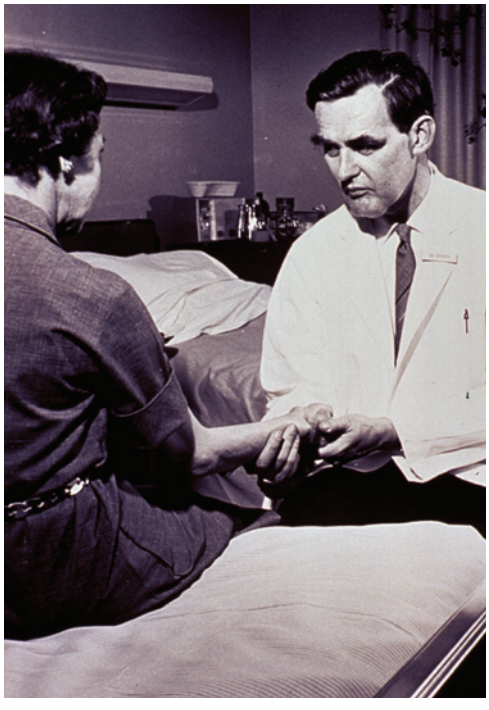

Photo credit: National Library of Medicine.

Since its founding in 1812, the *Journal* has served as a source of medical claims about sex differences, portraying male and female bodies as not only different in terms of physiology, but completely different in nature. Sex was, as one 1844 article put it, "the greatest distinction by far of any which exists among mankind."[1] Early articles in the *Journal* openly endorsed the superiority of men over women. An 1892 summary of a speech by Scottish physician James Crichton-Browne, for example, argued that differences in brain sizes and thus intelligence were a "fundamental sexual distinction" between men and women.[2]

We analyzed publications in the *Journal*'s archives covering more than 200 years, which we retrieved by means of directed keyword searches, using a snowball approach. The sources we present here are both extraordinary and representative of the *Journal*'s approach to sex in medicine. We structure our discussion using three topic areas, which are neither discrete nor exhaustive, that illustrate the ways in which the *Journal* has circulated sexist ideas as it has generated authoritative medical discourse about innate sex differences: women in the medical profession, reproductive biology and medicine, and the medical management of intersex conditions. The next article in this series will complement this one, expanding on the theme of sex by addressing sexual and gender minorities.

Can Women Practice Medicine?

Closely associated with the founding of Harvard Medical School, the *Journal* has served as an outlet for debate regarding who can participate in medical education and practice. By 1893, only 37 of 105 medical schools in the United States accepted women; 2019 was the first year that the number of women equaled or exceeded the number of men in U.S. medical education.[3,4]

During the *Journal*'s first century, ideas about innate differences between men and women, elaborated using medical and physiological language, flourished as a justification for the exclusion of women from the medical profession. An 1856 article, for example, asserted that women were unsuited to practicing medicine because "their weak physical organization renders them unfit for such duties and exposures" and because "their *physiological condition, during a portion of every month*, disqualifies them for such grave responsibilities" (emphasis in original).[5] In 1869, the *Journal* published a transcript of Edward Clarke's address to the graduating medical class of Harvard College arguing that most women were not fit for medical education. A professor of medicine at Harvard and a vocal opponent of women's education, Clarke argued that "an exact knowledge of woman's organization and possible development, would show both what she can do and what she ought to do."[6] In a later review of Clarke's controversial 1873 book *Sex in Education*, the *Journal* highlighted "the errors in our system of educating girls, errors which are fraught with evils so serious as to endanger, not only the present health of our women, but also the whole future of our nation."[7] Clarke argued in this book that education led to the degeneration of women's reproductive organs, especially during menstruation.[8]

Within the *Journal*, one author proposed that "substituting an equally qualified *female* for a male physician" (emphasis in original) would better serve the needs of women patients who are averse to seeing a physician for fear of violating "scruples of delicacy."[9] More often, however, such scruples were used to suggest that women were unsuited to practicing medicine, which demonstrates the *Journal*'s active contribution to resistance to women's move into medicine. After the Massachusetts Medical Society (now the publisher of the *Journal*) voted in favor of allowing the admission of female physicians in 1879, for example, the *Journal* reluctantly announced this result: "We regret to be obliged to announce that…it was voted to admit women to the Massachusetts Medical Society." The *Journal* went on to express concern that the presence of women physicians in "public meetings or lecture rooms when certain topics are discussed" would transgress "barriers which decency has built up."[10]

At the same time, many authors in the *Journal* embraced the view that innate care instincts and moral superiority made women particularly suited to practicing nursing. As one letter to the *Journal*'s editors professed, "As a rule, women make the best nurses, or, rather, more of them have a natural aptitude for the work."[11] In the late 19th century, nursing emerged as an important form of women's paid labor, shaped by cultural expectations of women's responsibility for care-related work in the family and community; nursing "became a poignant manifestation of female virtue," according to historian Susan Reverby.[12] The professional authority of both physicians and nurses was in part constructed according to a gendered division of labor based on cultural ideas of masculinity and femininity. To this day, nursing as well as medical assistance and home care remain underpaid, feminized, strongly gender-segregated fields.[13-15]

Meanwhile, within the pages of the *Journal*, physicians were also grappling with the "midwife problem," a term used to describe the prevalence of midwives and the preference for midwives over obstetricians, particularly within rural, immigrant, and Black communities.[16] Physicians proposed many ways to regulate or eliminate the practice of midwifery. Articles emphasized the elite skill of the physician, attributing high infant and maternal mortality to the practices of the "ignorant, half-trained, often malicious midwife."[17,18] The specter of the "ignorant" midwife led to strict licensing requirements and intense stigma that severely limited access to reproductive care for many women, especially within Black and Indigenous communities.[19]

Over the course of the 20th century, women's participation in medicine was transformed — a development that was debated and discussed extensively in the *Journal*. The proportion of U.S. medical students who were women gradually increased, from 4.4% in 1929–1930 to 25.3% in 1979–1980.[20] Particularly from the 1970s

onward, authors in the *Journal* began highlighting the interpersonal and structural barriers to women's participation in medicine, including the burdens associated with domestic responsibilities such as housekeeping and childcare[21]; sexism and sexual harassment[22,23]; and a lack of maternity leave and support during pregnancy, especially in residency.[24,25] Even by the late 1970s, however, women accounted for only approximately 15% of full-time medical school faculty in the United States.[20] The effects of the exclusion of women persist in medical knowledge today. A 2023 analysis determined that, at the current rate of increase, "it will take more than 725 years for the fraction of *NEJM* 'original articles' with a female first author to reach 50%."[26]

Reproductive Biology and Medicine

From the earliest days of the *Journal*, articles emphasized that female bodies were biologically distinct from male bodies because of their reproductive capacity, a difference that frequently marked women as intellectually and physically inferior to men. Articles in the *Journal* suggest a robust fascination with women's bodies and biologies, focused on gynecologic and obstetric issues.

Gynecologic and obstetric cases in the *Journal* demonstrate the ways in which authors understood women's primary capacity as healthy childbearing. Clinicians frequently reported on their patients' successful pregnancies after treatment as evidence of their recovery. An 1880 report, for example, described one patient as "a fruitful vine" after gynecologic surgery and another who, despite already having a teenage daughter, chose to undergo surgery to "gratify still further the instinct of maternity" and have more children.[27]

Concerns were quite different when the reproductive capacity of enslaved women was under discussion in the *Journal*. For slave owners and southern physicians, the reproduction of enslaved persons was necessary for the continuation of slavery as an institution,[28-30] a belief that was reflected in case studies in the *Journal*. An 1841 article, for example, detailed the treatment of an enslaved woman with "an obstruction of the menses." The article claimed that her condition left her "unfitted … for the duties of the plantation." After the woman's treatment, the author reported that she had recovered and was thus able to present "her master with an increase of family."[31]

Authors in the *Journal* saw the female reproductive system as the most important component of women's health and well-being — and a root cause of nonreproductive pathologies, especially mental illness. As one article explained in 1913, "An intimate relationship between the female genital organs and the nervous system has been recognized from the earliest times." When "considering the relationship between the genital and nervous systems," the article argued, "the important influence which the function of menstruation has on the general organism of a woman" must be appreciated. This supposed connection led to numerous articles detailing ovariectomies performed with the intention of curing a broad swath of diseases, including depression, neuroses, "true psychoses," and neurasthenia.[32] Later legacies of this overfocus on the female reproductive system can be seen in the lack of attention to nonreproductive conditions, such as heart disease, in women.[33]

From the 19th century to the present, physicians publishing in the *Journal* have navigated state policies and practices controlling and restricting women's reproduction. They claimed expertise in monitoring and controlling reproduction and asserted their authority in medical–legal matters. Physicians also made pronouncements on the legal provision of abortion and contraception and issued eugenic judgments about the reproductive fitness of particular people and groups.

When Massachusetts criminalized abortion in 1845,[34] authors in the *Journal* grappled with the medical and legal stakes of providing reproductive care and often expressed harsh views about women who sought abortions. An 1883 article, for example, characterized an abortion resulting in the death of the patient as "sometimes a fortunate medico-legal accident." A woman willing to undergo an abortion, it argued, "readily takes whatever physical risks pertain to the wretched business." Her death represents "an opportunity" in which she becomes "a better witness against her accessory and herself than she could possibly be if living."[35] Clinicians also offered advice on how to examine the bodies and corpses of women for the purpose of serving as an expert witness in criminal abortion cases.[36]

By the 1920s, physicians were engaging with eugenic ideas about reproductive control. As

discussed by historian Paul Lombardo, many physicians publishing in the *Journal* supported sterilization as a eugenic tool,[37] and a multitude of articles provide insights into the ways in which eugenic practices cruelly demeaned and dehumanized members of social groups — both men and women — deemed unfit to reproduce. Famed eugenicist Paul Popenoe, for example, argued in the *Journal* that sterilization benefited the "feebleminded" by preventing pregnancy.[38]

Technological and pharmaceutical advances led to new debates about contraceptives. Before the *Roe v. Wade* decision in 1973, the *Journal* offered a space for wide-ranging debate about the physician's role in providing access to both abortion and contraception.[39,40] More recently, when Susan Wood resigned in 2005 as assistant commissioner for women's health at the Food and Drug Administration as a result of the agency's decision to "delay indefinitely" approval of levonorgestrel without a prescription, she chose an article in the *Journal* to explain her reasoning to the medical community.[41] In the aftermath of the *Dobbs v. Jackson Women's Health Organization* decision, the history of the *Journal* powerfully reminds us that it is nothing new for medical providers to assert expert authority and seek political power to fight for patients to obtain treatments, medications, and care vital to reproductive health.

Diagnosing Sex and Maintaining the Sex Binary

Discourse about sex and gender in the *Journal* has not been restricted to immense interest in female diseases and organs but has also included a steady literature on what might broadly be referred to as intersex conditions. It is now widely acknowledged that a history of medical mistreatment of intersex people, including approaches to medical management aiming for the maintenance of a strict sex binary, has caused serious harm. In publications on cases of unclear sex, authors in the *Journal* reinforced social ideas of "normal" maleness and femaleness in their medical and scientific assessments and framed cases of indeterminate sex as a threat to gender and sex binaries.[42]

The *Journal* featured numerous case studies describing humans of "doubtful sex," as multiple 19th-century authors put it — people whom medical experts could not fit neatly into the male–female binary.[43,44] This interest in intersex people reflected a mix of aims: sharing best practices for the medical management of intersex conditions, promoting understanding of the biology of sexual development and reproduction, and engaging in voyeurism and fascination with sexual deviancy. Case studies of "bearded women" and other examples in which "nature deviates from her organic laws" frequently appeared in issues of the *Journal* throughout the 19th century.[45]

Physicians often expressed excitement at the prospect of examining "hermaphrodites." In an 1840 case, a physician recounted his failed attempts at bribing and threatening a "hermaphrodite" who refused a physical examination. After the person died, the physician eagerly performed a postmortem examination and published his report on their sex organs, "having much curiosity to make the examination after death, which had been sought unsuccessfully during life."[46] Another article, bluntly entitled "Some Hermaphrodites I Have Met," simply presented a list of cases, voyeuristically detailing people's physiology and sexual activities.[47] One article reported on a fetus whose sex could not be determined, referring to the fetus as a "sexless monster."[48]

Articles in the *Journal* also portrayed intersex people as dangerous sexual deviants.[49] In a 1909 article, surgeon William Harris described his surgical removal of a penis from an intersex patient who was raised as a girl. After hearing that the patient had later become engaged to a man, Harris reported meeting with her fiancé and urging him not "to marry a man," so as not to "waste on a monstrosity the honorable sentiments which in normal circumstances would have won for him a happy home." Unable to prevent the marriage, Harris concluded that the mind of his intersex patient was "not that of a girl" but rather that it resembled "that of a sexual pervert."[50]

Medical interest in cases of intersexuality also appeared in the context of slavery and racial science. In 1851, the *Journal* reprinted from a Virginia medical journal two cases describing indeterminate gonads in enslaved persons. One of these cases noted the presence of both labia and testes and described a specifically "African prepuce," a reflection of ideas that were prominent at the time that considered sexuality and the reproductive organs to be enriched sources of evidence of the differences among racial groups.[51] These cases reveal the

ways in which physicians exploited the status of enslaved persons to gain access to medical material: one examination of the sexual organs of an enslaved person was described as occurring only after "the authority of a master whom he … greatly feared could induce him to submit."[43]

Concerns about sex indeterminacy also occupied eugenicists publishing in the *Journal*. As part of the push to limit the immigration of the unfit, immigration officers were tasked with identifying migrants who displayed any form of indeterminate sex.[52] A 1914 article, "Medical Inspection of Immigrants at the Port of Boston," authored by a surgeon affiliated with the U.S. Public Health Service, for example, suggested that immigration inspectors should be wary of admitting men with "a feminine voice" and an "absence of beard," since these were signs of faulty sexual development.[53]

The focus on cases of indeterminate sex as problems to be categorized, corrected, or eliminated continued into the era of defining sex by means of genetics. Genetic cases of intersexuality were linked to unwanted behavior: a 1970 article, "Prevalence of XYY and XXY Karyotypes in 337 Nonretarded Young Offenders," for example, suggested that these chromosomal conditions were associated with criminal behavior and low IQ.[54] Such speculations led to the notorious Harvard XYY study, which screened newborns at Boston Women's Hospital for XYY aneuploidy in order to trace their behavior over years of development.[55] The project, vigorously debated in letters to the editor in the *Journal*, was shut down in 1975 because of ethical concerns.[56,57]

The Role of the *Journal* in a Transformative Moment

To read the pages of the *Journal* from its founding in 1812 until the present day is to learn that medical science has held women and men to have different bodies, different diseases, different minds, and different social roles based on their sex. For more than two centuries, the *Journal* has circulated ideas about innate sex differences, in the authoritative language of medicine and science, that played a role in facilitating the exclusion of women from medical practice, the essentialization of women patients to their reproductive roles, the medical surveillance of gender norms, and the mistreatment of intersex people. Much work remains to be done, not only to preserve the dignity and rights of women and people who do not fit neatly into binary sex or gender categories, but also to challenge the controlling assumption in much of medical research and clinical practice that there exist thoroughgoing, essential differences between the sexes and that variation outside narrow definitions of typical maleness and femaleness represents abnormality in need of medical management.

Today, a new generation of clinicians and scholars is working to build practices and frameworks that transcend the crude sex categories that historically encouraged ideas of innate difference and facilitated sexist ideologies. These researchers are establishing critical and contextual approaches to enabling precision and rigor in the study of sex-related variables in biomedicine and public health, as emphasized in recent special issues of *Cell* and *Hormones and Behavior* on sex and gender in science.[58-62] Their work recognizes that biology is not the only driver of sex- and gender-based differences in health and is generating new frameworks for empirically understanding the ways in which gendered systems, norms, and behaviors contribute to health inequities.[63] These approaches reflect awareness of the potential ethical harms and empirical distortions associated with commonplace assertions of sex differences in biomedicine.

But promoting rigorous and precise science is just one step. Sexism in medicine will not be ameliorated by better science alone. There exist deeply carved pathways related to publishing, funding, and conducting research that diminish women's experiences and their reproductive and bodily autonomy; that focus intensive interest on biologic differences between the sexes, thereby obscuring the role of social factors in driving sex- and gender-based disparities in health outcomes; and that consider intersex people, gender-nonconforming people, trans people, and other sexual and gender minorities first and foremost as pathologic entities or political liabilities rather than coproducers of a new medical future that rejects gender and sex essentialism. The *Journal* can and must lead in challenging these norms as it addresses its history of promulgating scientific claims that have directly affected the life prospects, bodily rights, and freedoms of all people.

The series editors are David S. Jones, M.D., Ph.D., and Scott H. Podolsky, M.D.

Disclosure forms provided by the authors are available at NEJM.org.

From the Department of the History of Science (B.M., J.M., A.H., S.S.R.), and the Committee on Degrees in Studies of Women, Gender, and Sexuality (S.S.R.), Harvard University, Cambridge, MA.

This article was published on June 1, 2024, at NEJM.org.

1. Slack DB. An essay on the human color. Boston Med Surg J 1844;30:518-22 (https://www.nejm.org/doi/full/10.1056/NEJM184407310302603).
2. Sex in education. Boston Med Surg J 1892;126:507-8 (https://www.nejm.org/doi/full/10.1056/NEJM189205191262008).
3. Morantz-Sanchez R. Sympathy and science: women physicians in American medicine. Chapel Hill, NC: University of North Carolina Press, 2000.
4. Association of American Medical Colleges. The majority of U.S. medical students are women, new data show. December 19, 2019 (https://www.aamc.org/news/press-releases/majority-us-medical-students-are-women-new-data-show).
5. Female physicians. Boston Med Surg J 1856;54:169-74 (https://www.nejm.org/doi/full/10.1056/NEJM185604030540901).
6. Clarke EH. Medical education of women. Boston Med Surg J 1869;81:345-6 (https://www.nejm.org/doi/full/10.1056/NEJM186912160812401).
7. Chadwick JR. Report on obstetrics and diseases of women — diseases of women. Boston Med Surg J 1874;90:211-5 (https://www.nejm.org/doi/full/10.1056/NEJM187402260900903).
8. Clarke EH. Sex in education; or, a fair chance for the girls. Boston: James R. Osgood, 1873.
9. The medical education of women. Boston Med Surg J 1853;49:419-22 (https://www.nejm.org/doi/full/10.1056/NEJM185312210492103).
10. The admission of women to the state society. Boston Med Surg J 1879;101:527-8 (https://www.nejm.org/doi/full/10.1056/NEJM187910091011505).
11. Nursing as an art. Boston Med Surg J 1874;90:610 (https://www.nejm.org/doi/full/10.1056/NEJM187406180902513).
12. Reverby S. Ordered to care: the dilemma of American nursing, 1850–1945. New York: Cambridge University Press, 1987.
13. Day JC, Christnacht C. Women hold 76% of all health care jobs, gaining in higher-paying occupations. Census Bureau, August 14, 2019 (https://www.census.gov/library/stories/2019/08/your-health-care-in-womens-hands.html).
14. England P, Allison P, Wu Y. Does bad pay cause occupations to feminize, does feminization reduce pay, and how can we tell with longitudinal data? Soc Sci Res 2007;36:1237-56 (https://www.sciencedirect.com/science/article/abs/pii/S0049089X06000718?via%3Dihub).
15. Goubert A, Cai JY, Applebaum E. Home health care: Latinx and Black women are overrepresented, but all women face heightened risk of poverty. Center for Economic and Policy Research, October 27, 2021 (https://cepr.net/home-health-care-latinx-and-black-women-are-overrepresented-but-all-women-face-heightened-risk-of-poverty/).
16. Ladd-Taylor M. Mother-work: women, child welfare, and the state, 1890-1930. Urbana, IL: University of Illinois Press, 1994.
17. Emmons AB, Huntington JL. A review of the midwife situation. Boston Med Surg J 1911;164:251-62 (https://www.nejm.org/doi/full/10.1056/NEJM191102231640801).
18. Cody EF. The registered midwife: a necessity. Boston Med Surg J 1913;168:416-8 (https://www.nejm.org/doi/full/10.1056/NEJM191303201681202).
19. Menzel A. The midwife's bag, or, the objects of Black infant mortality prevention. Signs (Chic Ill) 2021;46:283-309 (https://www.journals.uchicago.edu/doi/full/10.1086/710806).
20. Braslow JB, Heins M. Women in medical education — a decade of change. N Engl J Med 1981;304:1129-35.
21. Practice of medicine by married women. N Engl J Med 1954;250:486 (https://www.nejm.org/doi/full/10.1056/NEJM195403182501110).
22. Howell MC. What medical schools teach about women. N Engl J Med 1974;291:304-7.
23. Farley MM, Kozarsky P. Sexual harassment in medical training. N Engl J Med 1993;329:661-3.
24. Sayres M, Wyshak G, Denterlein G, Apfel R, Shore E, Federman D. Pregnancy during residency. N Engl J Med 1986;314:418-23.
25. Levinson W, Tolle SW, Lewis C. Women in academic medicine. N Engl J Med 1989;321:1511-7.
26. Abdalla M, Abdalla M, Abdalla S, Saad M, Jones DS, Podolsky SH. The under-representation and stagnation of female, Black, and Hispanic authorship in the Journal of the American Medical Association and the New England Journal of Medicine. J Racial Ethn Health Disparities 2023;10:920-9.
27. Buckler TH. On strangulated veins of the uterus and the importance of restoring their circulation and function of drainage, thereby preventing engorgement and morbid nutrition. Boston Med Surg J 1880;102:74-9 (https://www.nejm.org/doi/full/10.1056/NEJM188001221020402).
28. Jones DS, Podolsky SH, Bannon Kerr M, Hammonds E. Slavery and the *Journal* — reckoning with history and complicity. N Engl J Med 2023;389:2117-23.
29. Roberts DE. Killing the Black body: race, reproduction, and the meaning of liberty. New York: Pantheon Books, 1997.
30. Morgan JL. Laboring women: reproduction and gender in new world slavery. Philadelphia: University of Pennsylvania Press, 2004.
31. Stockbridge W. Obstruction of the menses. Boston Med Surg J 1841;25:99-100 (https://www.nejm.org/doi/full/10.1056/NEJM184109150250605).
32. Graves WP. Relationship between gynecological and neurological diseases. Boston Med Surg J 1913;169:557-67 (https://www.nejm.org/doi/full/10.1056/NEJM191310161691601).
33. Fallon CK. Husbands' hearts and women's health: gender, age, and heart disease in twentieth-century America. Bull Hist Med 2019;93:577-609.
34. Punishment of criminal attempts at abortion. Boston Med Surg J 1845;32:45 (https://www.nejm.org/doi/full/10.1056/NEJM184502120320205).
35. Draper FW. On sudden death by the entrance of air into the uterine veins. Boston Med Surg J 1883;108:3-7 (https://www.nejm.org/doi/full/10.1056/NEJM188301041080102).
36. Draper FW. Criminal abortion, with a dying declaration. Boston Med Surg J 1899;141:461-3 (https://www.nejm.org/doi/full/10.1056/NEJM189911091411901).
37. Lombardo PA. "Ridding the race of his defective blood" — eugenics in the *Journal*, 1906–1948. N Engl J Med 2024;390:869-73.
38. Popenoe P. Eugenic sterilization in California. N Engl J Med 1929;201:880-2 (https://www.nejm.org/doi/full/10.1056/NEJM192910312011804).
39. Medicalized sex. N Engl J Med 1970;283:709-10 (https://www.nejm.org/doi/full/10.1056/NEJM197009242831316).
40. Peterson ML. Control of fertility. N Engl J Med 1970;282:1432-3.
41. Wood SF. Women's health and the FDA. N Engl J Med 2005;353:1650-1.
42. Fausto-Sterling A. Sexing the body: gender politics and the construction of sexuality. New York: Basic Books, 2000.
43. Haskins WD. Report of a case of doubtful sex. Boston Med Surg J 1851;44:57-9 (https://www.nejm.org/doi/full/10.1056/NEJM185102190440307).
44. Mak G. Doubting sex: inscriptions, bodies and selves in nineteenth-century hermaphrodite case histories. Manchester, UK: Manchester University Press, 2013.
45. A bearded woman. Boston Med Surg J 1854;49:526-7 (https://www.nejm.org/doi/full/10.1056/NEJM185401250492605).
46. Hermaphroditism. Boston Med Surg J 1840;23:145-7 (https://www.nejm.org/doi/full/10.1056/NEJM184010070230903).
47. Young HH. Some hermaphrodites I have met. N Engl J Med 1933;209:370-5 (https://www.nejm.org/doi/full/10.1056/NEJM193308242090803).
48. Green CM. Report of a summer course in obstetrics. Boston Med Surg J 1883;108:434-6 (https://www.nejm.org/doi/full/10.1056/NEJM188305101081902).
49. Reis E. Bodies in doubt: an American history of intersex. Baltimore: John Hopkins University Press, 2021.
50. Harris WL. A case of pseudo-hermaphroditism. Boston Med Surg J 1909;160:371-3 (https://www.nejm.org/doi/full/10.1056/NEJM190903251601204).
51. Broocks WM. Report of a case of doubtful sex. Boston Med Surg J 1851;45:57-8

(https://www.nejm.org/doi/full/10.1056/NEJM185108200450303).
52. Canaday M. The straight state: sexuality and citizenship in twentieth-century America. Princeton, NJ: Princeton University Press, 2009.
53. Nute AJ. Medical inspection of immigrants at the port of Boston. Boston Med Surg J 1914;170:642-6 (https://www.nejm.org/doi/full/10.1056/NEJM191404231701702).
54. Hook EB, Kim D-S. Prevalence of XYY and XXY karyotypes in 337 nonretarded young offenders. N Engl J Med 1970;283:410-1.
55. Richardson SS. Sex itself: the search for male and female in the human genome. Chicago: University of Chicago Press, 2013.
56. Franzke AW. Telling parents about XYY sons. N Engl J Med 1975;293:100-1.
57. Pyeritz R, Beckwith J, Miller L. XYY disclosure condemned. N Engl J Med 1975;293:508.
58. Velocci B. The history of sex research: is "sex" a useful category? Cell 2024;187:1343-6.
59. Aghi K, Anderson BM, Castellano BM, et al. Rigorous science demands support of transgender scientists. Cell 2024;187:1327-34.
60. Pape M, Miyagi M, Ritz SA, Boulicault M, Richardson SS, Maney DL. Sex contextualism in laboratory research: enhancing rigor and precision in the study of sex-related variables. Cell 2024;187:1316-26.
61. Williams JS, Fattori MR, Honeyborne IR, Ritz SA. Considering hormones as sex- and gender-related factors in biomedical research: challenging false dichotomies and embracing complexity. Horm Behav 2023;156:105442.
62. Smiley KO, Munley KM, Aghi K, et al. Sex diversity in the 21st century: concepts, frameworks, and approaches for the future of neuroendocrinology. Horm Behav 2024;157:105445.
63. Danielsen AC, Lee KM, Boulicault M, et al. Sex disparities in COVID-19 outcomes in the United States: quantifying and contextualizing variation. Soc Sci Med 2022;294:114716.

DOI: 10.1056/NEJMp2404784