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Given the ubiquitous dominance of men as scientists and engineers and doctors throughout history, what are the consequences of changing the kinds of questions we ask about the scientific enterprise from, for example, “why did scientists think X?” to “why did male scientists think X?” Or, more exactly, what does it add to our understanding of science if we factor in the masculine social and cultural perspectives of time and place? In some cases, the answer will be quite revealing; in other cases, less so. We should ask the question anyway—after all, we ask it of women scientists all the time. The tools for understanding complex gender dynamics and the importance of gender in the everyday lived experiences of scientists and engineers have been amply demonstrated by the substantial literature on women in science and gender studies of science.

The first efforts to explore the issue of gender in the history of science in the 1960s were feminist analyses of the causes and reasons for the exclusion of women from professional science, technology, and medicine. Several myths needed to be exploded: science was a masculine and objective enterprise unsuited to women; women had contributed historically little to scientific developments; when they did contribute it was in fields appropriate to their natures and skills. The job of unpacking these myths has fallen to philosophers, sociologists and historians of science. Philosophers have worked to discredit the notion of the gender neutrality of valid science, sociologists have illuminated the practical obstacles and constricted pathways leading to careers for women in science, and historians have studied the diversity of historical, cultural, and disciplinary

situations in which “invisible” women have contributed to scientific and medical research and teaching.¹

Though much of the early work on science and gender was about men, patriarchy, and a masculinist domination of nature, the need to identify how and why women had been marginalized took precedence over using the tools of gender analysis to understand the specific natures of masculine scientific and professional cultures. Whereas women usually have been historically invisible as individuals, it may be argued that men have been invisible collectively, as have the discriminatory hierarchies of masculine culture.² The challenge to historians is to bring to light the ways that scientific masculinities have operated over time, and within different cultures, without re-enacting history by excluding women or femininity from the story.³ Gender theory has taught us that

¹ Some important philosophical works in this area are Evelyn Fox Keller, *Reflections on Gender and Science* (New Haven, CT: Yale University Press, 1985); Helen Longino, *Science as Social Knowledge* (Princeton, NJ: Princeton University Press, 1990); Sandra Harding, *The Science Question in Feminism* (Ithaca, NY: Cornell University Press, 1986); Londa Schiebinger, *Has Feminism Changed Science?* (Cambridge, MA: Harvard University Press, 1999); see also Muriel Lederman and Ingrid Bartsch, eds., *The Gender and Science Reader* (New York: Routledge, 2001); some sociological works are Henry Etkowitz, Carol Kemelgor, Brian Uzzi, eds., *Athena Unbound: The Advancement of Women in Science and Technology* (Cambridge: Cambridge University Press, 2000); Sue V. Rosser, *The Science Glass Ceiling* (New York: Routledge, 2004); Margaret A. Eisenhart and Elizabeth Finkel, *Women's Science: Learning and Succeeding From the Margins* (Chicago: University of Chicago Press, 1998); pioneers in history have been Carolyn Merchant, *The Death Of Nature: Women, Ecology, and the Scientific Revolution* (San Francisco: Harper and Row, 1980); Margaret Rossiter, *Women Scientists in America: Struggles and Strategies to 1940* (Baltimore: Johns Hopkins University Press, 1982) and *Women Scientists in America Before Affirmative Action, 1940-1972* (Baltimore: Johns Hopkins University Press, 1995); Ellen S. More, *Restoring the Balance: Women Physicians and the Profession of Medicine, 1850-1995* (Cambridge, MA: Harvard University Press, 1999). See in this same vein the earlier volume of *Osiris* that dealt directly with science and gender, Sally Gregory Kohlstedt and Helen E. Longino, eds. *Women, Gender, and Science: New Directions, Osiris* 12 (1997).

² Michael S. Kimmel, *The History of Men: Essays in the History of British and American Masculinities* (Albany: SUNY Press, 2005); R.W. Connell, *Masculinities* (London: Polity, 1995).

³ The most comprehensive source for appreciating the depth and global scope of recent historical studies of gender is Teresa A. Meade and Merry E. Wiesner-Hanks, *A Companion to Gender History* (Oxford: Blackwell, 2004).

the masculine/feminine binary is conceptually and practically conjoined; to define the masculine as *not* feminine or vice versa evokes the other as an inevitable component of identity.

In the last decades, “gender” has evolved from being an element of grammar to a crucial aspect of modern selfhood. The history of this evolution illuminates the many ways scientific language constructs and is itself constructed by material and cultural change. The first use of gender as a non-grammatical term was made in the 1950s by John Money and his colleagues at Johns Hopkins in the creation of a protocol for the rearing of intersex children whose genitals had been surgically “improved” to resemble typical male or female organs. In this protocol “gender” was the assigned sex of rearing, it being thought by Money and his associates that the power of the environment was superior to the children’s ambiguous sex. The psychoanalyst Robert Stoller later coined “gender identity” to describe the endpoint of a successful transition for intersex and transsexual individuals, a term which was then taken up by feminist theorists who regarded “gender” to be a less determinate way of thinking about men and women than “sex.”⁴ Ironically, as a marker of personal identity, gender has acquired a deterministic quality in the last two decades that has led to its being used by psychiatrists, doctors, scientists, and other scholars as a valid substitute for sex, but that is another, and very complicated, story.⁵

Feminist and post-structuralist scholars have also used gender as an historical tool. A recent AHR forum on Joan Scott’s epochal 1986 article, “Gender: A Useful Category of Historical Analysis”

⁴ Robert Stoller, *Sex and Gender* (New York: Science House, 1968); Joanne Meyerowitz tells part of this story in “A History of ‘Gender,’” *American Historical Review* 113/5 (2008): 1346-1356; The medical history may be found in Anne Fausto-Sterling, *Sexing the Body: Gender Politics and the Construction of Sexuality* (New York: Basic Books, 2000), 45-78. For the clinical process of sex determination see Sandra Eder, “The Volatility of Sex: Intersexuality, Gender and Clinical Practice in the 1950s,” *Gender and History* 22/3 (2010): 692-707.

⁵ See the article by the evolutionary biologist David Haig, “The Inexorable Rise of Gender and the Decline of Sex: Social Change in Academic Titles,” *Archives of Sexual Behavior* 33/2 (2004): 87-90; see also Robert A. Nye, “The Biosexual Foundations of Our Modern Concept of Gender,” in Nicole C. Karafyllis and Gotlind Ulshöfer, eds., *Sexualized Brains: Scientific Modeling of Emotional Intelligence From a Cultural Perspective* (Cambridge, MA: MIT University Press, 2008), 69-80.

revealed the prodigious use which historians throughout the world have made of gender analysis in their work.⁶ In her own remarks Scott foregrounds the role the “linguistic turn” has had for her and her generation, which taught her “to understand that differences of sex were not set by nature but were established through language, and to analyze language as a volatile, mutable system whose meanings could never be fully secured.... It is above all an invitation to think critically about how the meanings of sexed bodies are produced, deployed, and changed.”⁷ A focus of this volume is to consider how sex and/or gender have been constructed in particular material, social and cultural contexts and to provide explanations of their historical meanings.

Three recent texts on gender history exemplify the importance of language and representation in the way bodies are observed, described, dissected, and modified.⁸ The authors of these texts and most gender scholars eschew the radical nominalism that considers bodies to be merely the “effects” of language. Though some scholars adopt explanations for how culture “naturalizes” bodies that are loosely drawn from Judith Butler’s notion of gender performativity, many prefer the French sociologist Pierre Bourdieu’s notion of “habitus”, according to which femininity and masculinity are “embedded” in “bodies and structures” in ways that perpetually reconfigure gender difference as a transhistorical invariant. In Bourdieu’s sociological account, the capacity of language to “make what it states...., does not lie in the language itself, but in the group that authorizes and recognizes it and, with it, authorizes and recognizes itself,” the so-called

⁶ Scott’s article was incorporated into her book, *Gender and the Politics of History* (New York: Columbia University Press, 1988); see “AHR Forum: Revisiting ‘Gender: A Useful Category of Historical Analysis,’” *American Historical Review* 113/5 (2008): 1344-1430.

⁷ Joan Scott, “Unanswered Questions,” *American Historical Review*, 113/5 (2008): 1423.

⁸ Kathleen Canning, *Gender History and Practice* (Ithaca, NY: Cornell University Press, 2006), esp. 168-192; Laura Lee Downs, *Writing Gender History* 2nd ed. (New York: Bloomsburg, 2010); Sonya O. Rose, *What is Gender History?* (London: Polity, 2010).

“officialization effect.”⁹ This process implants particular qualities in bodies which are felt and perceived by others to be “natural,” endowing gender with a material and “lived” corporeality.

The predominantly male groups which have authorized the gendered qualities of bodies have also shaped the work of science, technology and medicine. In the last two decades, historians have begun to explore the masculine cultures of the “field” sciences, engineering, and technology, as well as mathematics, the physical sciences, computer science, medicine and its specialties, genetics, and other fields encompassing all historical periods and cultures.¹⁰ However, even recent scholarship may either confine the discussion of masculinity to instances in which men and women interact or

⁹ Pierre Bourdieu, *The Logic of Practice*, trans. Richard Nice (Stanford, CA: Stanford University Press, 1990), 109-110; see also *La Domination Masculine* (Paris, Seuil, 1998). For Judith Butler see *Gender Trouble: Feminism and the Subversion of Identity* (New York: Routledge, 1990), and “Performativity’s Social Magic,” in Richard Shusterman, ed., *Bourdieu: A Critical Reader* (Oxford: Blackwell, 1999), 113-128.

¹⁰ David Noble, *A World Without Women: The Christian Clerical Culture of Western Science* (New York: Knopf, 1992); Sharon Traweek, *Beamtimes and Lifetimes: The World of High Energy Physics in Japan* (Cambridge, MA: Harvard University Press, 1992); Elizabeth Lunbeck, *The Psychiatric Persuasion: Knowledge, Gender and Power in Modern America* (Princeton, NJ: Princeton University Press, 1994); Bruce Hevly, “The Heroic Science of Glacier Motion,” 66-86, and Naomi Oreskes, “Objectivity or Heroism? On the Invisibility of Women in Science”, 87-116, in Henrika Kuklick and Robert E. Kohler, eds., *Science in the Field*, *Osiris* 11 (1996); Robert A. Nye, “Medicine and Science as Masculine Fields of Honor,” Kohlstedt and Longino, eds., *Women, Gender and Science*, *Osiris* 12 (1997): 60-79; Ruth Oldenziel, *Making Technology Masculine: Men, Women, and Modern Machines in America, 1870-1945* (Amsterdam: Amsterdam University Press, 1999); Roger Horowitz, *Boys and Their Toys? Masculinity, Technology, and Class in America* (New York: Routledge, 2001); Jane Margolis and Allan Fisher, *Unlocking the Clubhouse: Women in Computing* (Cambridge, MA: MIT Press, 2003); Andrew Warwick, *Masters of Theory: Cambridge and the Rise of Mathematical Physics* (Chicago: University of Chicago Press, 2003); Grace Yen Shen, “Taking to the Field: Geological Fieldwork and National Identity in Republican China,” in Carol E. Harrison and Ann Johnson, eds., *National Identity: The Role of Science and Technology*, *Osiris* 24 (2009), 231-252; Ellen S. More, Elizabeth Fee and Manon Parry, eds. *Women Physicians and the Cultures of Medicine* (Baltimore: Johns Hopkins University Press, 2009); Rob Boddice, “A Victorian Gentleman Defends Animal Experimentation,” *Isis* 102/2 (2011): 215-237; Henrika Kuklick, “Personal Equations: Reflections on the History of Fieldwork, with Special Reference to Sociocultural Anthropology,” *Isis* 102/1 (2011): 1-33; Ian Nicholson, ‘Shocking’ Masculinity: Stanley Milgram, ‘Obedience to Authority,’ and the ‘Crisis of Manhood’ in Cold War America,” *Isis* 102/2 (2011): 238-268; Rob Boddice, “The Manly Mind? Revisiting the Victorian ‘Sex in Brain’ Debate,” *Gender and History* 23/2 (2011): 321-340.

ignore it altogether, even where it would appear essential for understanding behavior.¹¹ The contributors to this volume will make the formative influence of masculine cultures a foundation of their analyses of the history of science, technology and medicine in a number of particular settings.

The contributions will address four main questions:

- How did men construct scientific and medical visions of normative male anatomy and sexual behavior?
- How do male scientists negotiate their relationships with other male scientists and why does that matter?
- How has technology helped define what it meant to be a male and how did men define technology as a masculine subject?
- How have writers about science (both men and women) perpetuated and popularized the idea that exploration, science, and technology were natural masculine enterprises?

Although the contributions are divided into four separate subject areas, there are two major themes that connect the volume as a whole: the history of the body and popular scientific discourse.

The relative historical invisibility of the male body has been in part a consequence of its putatively universal status. In the modern era, a growing scientific and medical understanding of the building blocks of sex roughly coincided with a new cultural self-consciousness about the constructedness and mutability of bodies, so that men have become visible as men and therefore more readily objects of the gaze of other men and of women.¹² It has been pointed out by

¹¹ For example, Bernard Lightman's wonderful recent treatise—*Victorian Popularizers of Science: Designing Nature for New Audiences* (Chicago: University of Chicago Press, 2007)—laudably takes the lessons of decades of gender and science work to heart in a well-theorized chapter on female popularizers of science. Yet the only times the words “male” or “masculine” appear in the book are within this chapter; for the rest of the book the identity of most science popularizers as men goes unexamined. More egregiously, an article by Ed Larson ignores the question of gender altogether, as the men in his story suffer and persevere through the bitter cold of Antarctica—Edward J. Larson, “Public Science for a Global Empire: The British Quest for the South Magnetic Pole,” *Isis* 102/1 (2011): 34-59.

¹² On this point see Terence MacMullan, “Introduction” to Nancy Tuana, et al, eds, *Revealing Male Bodies* (Bloomington, IA: Indiana University Press, 2002), 2. Of particular importance to this new visibility was the discovery of the hormones; Nelly Oudshoorn, *Beyond the Natural Body: An*

medievalists and early modernists that the prevailing dominance of Greek medicine encouraged contemporaries to think of bodies as governed by the influences of internal humors and the environment and therefore subject to change, but neither modern science nor modernity itself have succeeded in eliminating this mutability; they have further complicated the problem and raised the stakes. As Christopher Forth has recently written, the conditions of modernity “at once reinforce and destabilize the representation of masculinity as an unproblematic quality of male anatomy. These conditions reflect what we might call the double logic of modern civilization, a process that promotes and supports the interests of males while threatening to undermine those interests by eroding the corporeal foundations of male privilege.”¹³

Several of the papers in this proposed volume will address the matter of the construction of gendered and sexed bodies by scientific and medical authorities in particular historical circumstances. Leah DeVun explores medieval surgical manuals for insights into how and why doctors “corrected” the errors of nature in the genitals of hermaphrodites. Zeb Tortorici looks at judicial archives in eighteenth-century New Spain to see how medical experts construed the evidence of male and female bodies to construct narratives of gender norms, deviance, and victimhood. Alexandra Rutherford considers a moment in the history of American psychology when psychological “truths” were used by Edwin Boring, one of the founders of experimental psychology, to head off the feminization of his discipline. Nathan Ha explores the debates of the 1970s and 80s between researchers who hoped to discover the “natural” genetic and structural foundations of

Archaeology of Sex Hormones (London: Routledge, 1994) and Chandak Sengoopta, *The Most Secret Quintessence of Life: Sex, Glands, and Hormones, 1850-1950* (Chicago: University of Chicago Press, 2006); On the operationalization of “masculine” hormones see John Hoberman, *Testosterone Dreams: Rejuvenation, Aphrodisia, Doping* (Berkeley, CA: University of California Press, 2005).

¹³ Christopher Forth, *Masculinity in the Modern West: Gender, Civilization and the Body* (New York: Palgrave Macmillan, 2008). See also Christopher Forth and Ivan Crozier, eds., *Body Parts: Critical Explorations in Corporeality* (Lanham MD: Lexington Books, 2005). On medieval bodies see Joan Cadden, *Meanings of Sex Difference in the Middle Ages* (Cambridge: Cambridge University Press, 1993).

homosexuality, and feminist and queer critics of this work who resisted its deterministic conclusions. Finally, Frances Bernstein and Beth Linker examine the social and cultural assumptions that governed Soviet medical authorities and American sexologists in “rehabilitating” the veterans of World War II. They examine, in turn, how to remake Soviet men with prostheses and return traumatized American men to sexual functionality and optimum masculine performance.

Many of the papers in this volume also touch on the question of public images of men and science. Although popular conceptions of science indeed mirror the gendered realities of contemporary scientific culture, they also preserve and popularize some images of science at the expense of others. Further, through film, advertising, journalistic attention, and mere happenstance, these visions of science and scientists help generate cultural values and popular interests.¹⁴

Depending on the socio-cultural context, of course, there are varieties of masculine roles from which scientists and authors can choose, from the laboratory-based scientist-hero¹⁵ or outdoor, self-reliant, ambitious, competitive man,¹⁶ to the sensitive and sympathetic reader of nature¹⁷ and family man.¹⁸

¹⁴ Bernard Lightman, *Victorian Popularizers of Science: Designing Nature for New Audiences* (Chicago: University of Chicago Press, 2007); Salim Al-Gailani, “Magic, Science and Masculinity: Marketing Toy Chemistry Sets,” *Studies in History and Philosophy of Science, Part A* 40/4 (2009): 372-381; David A. Kirby, *Lab Coats in Hollywood: Science, Scientists, and Cinema* (Cambridge, MA: MIT Press, 2011).

¹⁵ Natasha Myers, “Pedagogy and Performativity: Rendering Laboratory Lives in the Documentary *Naturally Obsessed: The Making of a Scientist*,” *Isis* 101/4 (2010): 817-828.

¹⁶ Donna Haraway, “Teddy Bear Patriarchy: Taxidermy in the Garden of Eden, New York City, 1908-1936,” in *Primate Visions: Gender, Race, and Nature in the World of Modern Science* (New York: Routledge, 1989), 26-58; Gregg Mitman, “Cinematic Nature: Hollywood Technology, Popular Culture, and the American Museum of Natural History,” *Isis* 84/4 (1993): 637-661.

¹⁷ Janet Browne, “I Could Have Retched All Night: Charles Darwin and His Body,” in *Science Incarnate: Historical Embodiments of Natural Knowledge* (Chicago: University of Chicago Press, 1998): 240-287; Jim Endersby, “Sympathetic Science: Charles Darwin, Joseph Hooker, and the Passions of Victorian Naturalists,” *Victorian Studies* 51/2 (2009): 299-320; Rob Boddice, “Vivisecting Major: A Victorian Gentleman Defends Animal Experimentation, 1876-1885,” *Isis* 104/2 (2011): 215-237.

¹⁸ Pnina Abir-Am and Dorinda Outram, eds. *Uneasy Careers and Intimate Lives: Women in Science, 1787-1979* (New Brunswick: Rutgers University Press, 1987).

Zeb Tortorici, for example, explores the influence of clerical and medical discourses on the shaping of norms of sexual behavior in New Spain, while Mary Terrall emphasizes the association of masculinity with utility and curiosity for the public good. On one end of the mind-body dichotomy, Alex Rutherford revisits psychologists' concerns with the popular and professional assumption that the minds of men were uniquely suited to scientific inquiry. At the other end, Nathan Ensmenger discusses rugged individualism as part of a masculine self-identity created by male computer programmers. Erika Milam explores the parallels between pop-anthropological theories of male-bonding (and aggression) and the predominantly-male professional identity some anthropologists feared to lose. Gregg Mitman identifies a variety of masculine tropes associated with an outdoor life, from the sensitivity and awe with which Jacques Cousteau sought to inspire the preservation of oceanic life to the rough-and-ready mastery over nature projected in Steve Irwin's interactions with crocodiles, snakes, and other creatures.

Other papers will highlight the fact that both male and female voices helped create masculine scientific and technological achievements, as Michael Robinson's exploration of female authorship of Arctic travel narratives so deftly illustrates. Similarly, Eugenia Lean identifies the importance of feminine domesticity as a cultural trope enticing elite men to engage in scientific and technological work in industrializing China. Through interviews with both female and male scientists about their work and home lives, Sally Horrocks, Tom Lean, and Paul Merchant investigate how shared male experiences unified the diverse masculine scientific cultures of twentieth-century Britain, from all-male schooling to sports. Mary Terrall further provides us with an important cautionary note—easy dichotomies, such as domestic/public, masculine/feminine, and to which we might add popular/professional, break down under close scrutiny.¹⁹ In place of such dichotomies, this volume

¹⁹ See, for example, James Secord, "Knowledge in Transit," *Isis* 95/4 (2004): 654-672; Katherine Pandora, "Popular Science in National and Transnational Perspective: Suggestions from the American Context," *Isis* 100/2 (2009): 346-358.

will explore the nuanced hierarchies of scientific masculinities that were created by, and which sometimes resisted, overlapping discourses of morality, family life, education, class, disciplinary affiliations, and cultural identity.

We have secured funding for a conference from the Philadelphia Area Center for the History of Science (PACHS, www.pachs.net/). The conference will be held in early June, 2012 in Philadelphia and this will allow volume contributors to pre-circulate and discuss first drafts of their papers. Based on feedback at the conference, authors will revise their papers and submit their final versions to us in time to meet the Osiris publication schedule.

List of Contributors & Proposed Volume Outline

Introduction – Robert Nye and Erika Milam

I. Scientific Constructions of Masculinities

Many disciplines have contributed to scientific constructions of sex and gender. Of particular importance to the papers in this section will be an analysis of the diverse and changing tools scientists employed in defining what it meant to be a (masculine) male in particular historical eras and how scientific cultures operated to underpin and define those investigations. Together, these papers will reveal negotiations over the ambiguous nature of sexual “facts” and how a “natural” association of men and objectivity was contested and served to question stable definitions of masculinity.

Hermaphrodites in Medieval surgical manuals

Leah DeVun, Associate Professor of History, Rutgers University

This article explores how surgeons assessed the masculinity of hermaphrodites in the late Middle Ages (13-14th centuries). During this period, a group of educated surgeons began writing Latin surgical manuals for European audiences in order to enhance the professional reputation of

surgeons and regularize the practice of surgery. Many of the most prominent surgical writers in the medieval Muslim world, including Rhazes, Avicenna, and Albucasis, had devoted a section of their manuals to structural problems of the genitals and reproductive organs, and these sections included a chapter on the corrective surgery of hermaphrodites. European surgeons were deeply influenced by Muslim surgical texts, and they adopted and expanded upon these earlier opinions in their own chapters or clusters of chapters devoted to insufficiently feminine or masculine genitals. European surgeons likewise provided instructions on how to perform surgeries in order to bring these anatomies into conformity with societal expectations of male and female bodies. The perceived masculinity or femininity of a hermaphrodite's anatomy (as well as his/her ability to take part in particular sex acts) guided medieval surgeons in their decision to perform surgery on a particular patient. In their analyses, surgeons expressed notions about how bodies should look and behave based upon current assumptions about the nature of masculinity. This article examines discussions of hermaphroditism in a group of related surgical manuals – those of Lanfranco da Milano, Guglielmo da Saliceto, Bruno Longobucco, and Guy de Chauliac. These manuals were central to the medieval surgical tradition and found lasting influence among subsequent generations of surgeons or university physicians. Finally, this article draws some connections between medieval approaches to hermaphroditism and comparable ideas about intersex in modern literature, showing how these parallels might help us to better appreciate contemporary ideas about masculinity.

Masculinity and Objectivity in mid-20th Century American Psychology: Edwin Boring and the "Woman Problem" Revisited

Alexandra Rutherford, Associate Professor, Department of Psychology, York University

In 1951, after publishing a series of empirical articles on the “woman problem” in American psychology, well-known Harvard psychologist Edwin Boring wrote to a female colleague: “I think you are unable to consider this problem dispassionately and objectively.” Boring objected to his

colleague's supposed conflation of facts and values, a distinction that Boring was keen to maintain in his analysis of why women were less likely than men to achieve prestige in psychology in proportion to their numbers, and that moreover was central to his conception of psychology as an experimental science. In this paper, I use the rich correspondence between Boring and several of his female colleagues, including his collaborator Alice Bryan, to explore how masculinity and objectivity were positioned in mid-20th century American psychology. I use this analysis to reveal some of the specific rhetorical strategies that positioned objectivity as masculine and that served to adjudicate not only *what* but *whose* knowledge claims were legitimate in a period when collective feminist action in psychology (the formation of the National Council of Women Psychologists) made its first, albeit short-lived, appearance. Although the idea of objectivity as a masculine virtue has a long history in psychology (as in other sciences), and there are numerous examples of “cultures of masculinity” in early American psychology (E. B. Titchener's all-male *Society of Experimental Psychologists* is one prominent example), in this paper I suggest that the shifting gender ideals of the immediate post-WWII period provoked particularly interesting reactions from both male and female psychologists not about objectivity as an epistemic virtue in psychology, but about the very kind of thing that objectivity was.

“Fruitless” Fruit-flies, “Homosexual” Rats, and the Making of Gay Genes

Nathan Ha, Postdoctoral Fellow, UCLA Center for Society and Genetics

In the 1990s, biologists Simon LeVay and Dean Hamer published several scientific articles and two popular books, *Queer Science* and *The Science of Desire*, claiming that they had discovered the genetic basis of homosexuality in human beings. Both scientists pointed to 1970s and 1980s studies of sexuality done on fruit-fly genes, rodent brains, and primate courtship to support their contention that sexual desire had a biological basis, ultimately traceable to genes. It was assumed that animal

sexual behaviors provided adequate models from which to draw inferences about human sexuality, and that certain behaviors could be easily differentiated as stereotypically male or female. My interest in this essay is to examine how LeVay and Hamer re-presented the history of biological sex studies to legitimize their claims, selectively emphasizing post-World War II (and some prewar) research that supported the thesis of genetic determinism. After all, the theory that homosexuality had a genetic basis had been formulated by Richard Goldschmidt in 1916, but it had fallen out of vogue during the 1950s. It was not until the 1970s and 1980s that genetic theories of homosexuality, some with connections to Goldschmidt, re-emerged as productive scientific questions. As I will argue, renewed interest in the genetics of homosexuality, studied via animals, coincided with the rise of sociobiology, behavioral genetics, the AIDS crisis, and the feminist and homosexual rights movements. All of these developments figured prominently in re-kindling the search for the genetic causes of sexual orientation. For some gay male biologists, such as LeVay and Hamer, science seemed to offer a means to combat homophobia by naturalizing homosexuality. For feminist and queer critics of this research, however, the search for “gay genes” appeared both naive and dangerous. Searching for gay genes assumed normative ideals about masculinity and femininity that deserved to be challenged, not reified. Even if gay genes could be found, this did not guarantee that such knowledge would not be used to pathologize or eliminate homosexuality. The science of homosexuality, in other words, could be broadly mobilized across the political spectrum.

II. Masculine Scientific Cultures

This section highlights male intra-gender dynamics in historical scientific settings. Such dynamics are complicated by the real and symbolic presence of women, and often reveal important cleavages between men, including race, class, educational and academic credentials, personal appearance and character, familial structure, and the language, gestures, and emotional aspects of competition.

This essay looks at the use of medical examinations to inspect the bodies of men (implicated in sodomy cases), animals (bestiality cases), and women (rape cases) in eighteenth-century Mexico and Guatemala. I focus primarily on sexual deviance, masculinity, and the male perpetrators of sodomy, bestiality, and rape to show how, largely through religious and medical discourse, sexual crimes became gendered judicial categories. A microhistorical approach allows us to examine how surgeons, barbers, and midwives read the signs of the body and, in doing so, constructed particular narratives of gender, deviancy, and victimhood. The inclusion of expert testimonies in criminal trials shaped the transcripts of the trials themselves, as well as the judicial, medical, and historical understandings of gender. These criminal cases demonstrate that different types of medico-scientific authority intersected with the construction of gender at official and popular levels, largely construing males as the perpetrators of violent sexual acts and women either as victims, or in cases of abortion and infanticide, as deviant would-be mothers. Just as sexual deviancy was interpreted through models of gender, sexual crimes themselves were partly constructed on the basis of colonial notions of race and gender. In illustrating how male medical, ecclesiastical, and secular authorities positioned themselves *outside* of the category of violent masculinity and predatory male sexuality, I argue that they sought to legitimize their own authority in a colony replete with unruly subjects, thereby rendering medico-scientific knowledge, in conjunction with religious and judicial discourse, a linchpin of colonial rule.

This paper, in essence, shows how medical readings of the body assisted authorities in substantiating instances of sodomy, bestiality, and rape. In this sense, medical discourse both depended upon and shaped popular, official, and historical notions of gender, sex, and deviance. Finally, in order that we not render “medico-scientific authority” a monolithic category, I pay as

careful attention to the ways in which gender played a role in determining *whose* body was to be examined as it did in deciding *who* was to do the examining (i.e., surgeon, barber, or midwife).

Masculine Knowledge for the Public Good: Utility and Curiosity in an Old-Regime Scientific Household
Mary Terrall, Professor of History, UCLA

The Paris Academy of Sciences was a bastion of male privilege, structured as a hierarchy of rank and status like so many other old regime institutions. No surprises there. But much of the knowledge presented to and validated by the academy was made in other kinds of spaces and addressed, at least in part, to other audiences. Some of these (laboratories or studies) were masculine domains, but others (natural history collections, gardens, poultry yards and drawing rooms) were places where men and women might observe, experiment, read, converse and even reason together. Though such spaces were hardly gender-neutral egalitarian utopias, it is worth thinking about how the kind of homosocial masculinity of the academy's meeting room drew on or fed back into the gender distinctions and resonances of other places and other audiences. If we reflect on the gendered meanings of these spaces, we find that a simple binary dividing masculine from feminine, public from private or domestic, will not adequately represent the use of these spaces or the values attached to the knowledge produced in them. This paper examines a "scientific household" in mid-18th-century Paris headed by René-Antoine Ferchault de Réaumur. He was, among other things, a bachelor, academician, naturalist and member of the minor provincial nobility, famous for his work on insects and his vast natural history collections, in addition to inventions and technologies of various kinds. The household included servants, gardeners, assistants and technicians, and the woman who made hundreds of drawings to illustrate his work – as well as her mother and sisters. Most of these people contributed one way or the other to observation, experiment, collection, and all the ancillary activities connecting this work to the world outside the household, including to the

Academy of Sciences. Even though this was not a family – Réaumur never married – it was in an important sense a patriarchal operation, and a genteel one. What kind of knowledge was produced in this setting, and how did it relate to the public? In answering this question, I explore the gendering of knowledge touted as amusing, curious and useful all at the same time. While the public good was associated with a kind of paternalist masculinity, utility is difficult to separate (in this setting) from a feminized curiosity that also had an important role to play in the production and consumption of knowledge. Ultimately, the paper will suggest ways in which attention to gender (not just the sex of individuals) can illuminate the practice and even the meaning of science in the hierarchy-conscious society of old-regime France.

Manliness and Exploration: Men, Women, and the Creation of the Modern Arctic Narrative

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Americans rushed to the newsstands in early 1910 to read Robert Peary's first hand account of his expedition to the North Pole. As they read "Peary's Own Story," serialized exclusively in *Hampton's Magazine*, few knew that this harrowing, hyper-masculine tale was really crafted by New York poet Elsa Barker. Barker's authorship of the North Pole story put her at the center of a large community of explorers, writers, patrons, and fans who were mesmerized by Arctic exploration as much for its moral and national symbolism as for its thrilling tales. As a woman, Barker's ascent into elite expeditionary circles is remarkable. Yet this paper argues that it was also representative: women shaped the ideas and practices of manly exploration at home as well as in the field. Interestingly, this growing dependence upon women writers, patrons, and audiences came at a time when explorers were breaking away from their traditional base of support: male scientific networks that had promoted their expeditions since the 1850s. Barker's story, then, is part of a broader narrative about the changing roles of explorers in American culture. Despite the "go-it-alone" ideals of their expedition accounts, explorers adopted masculine roles shaped in significant ways by external forces:

by the growing influence of women writers, readers, and lecture-goers and, simultaneously, by the declining influence of traditional scientific peers and patrons.

*'The Usual Problem with the Female Staff is That There is No Lavatory Provided for Them':
Cultures of Masculinity in mid-Twentieth Century Britain*

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Our paper draws on new oral history material recently collected by the Oral History of British Science, a National Life Stories project based at the British Library, to examine the masculine and homosocial cultures found in British engineering laboratories and field sciences between the 1940s and the 1980s. The life story interviews collected by the project provide a unique insight into the culture of British science during the second half of the twentieth century through the lives and careers not only of prominent scientists but also of their lesser known co-workers. This material includes extended interviews with both men and women that covered all aspects of their life and work, starting with their earliest memories. As part of this they were questioned about their recollections of the place of women in the laboratory and the field and how this changed during their careers as well as about their own domestic and childcare arrangements. By asking both men and women these questions this project has created a unique resource for examining the gendered nature of scientific cultures and for locating them within their wider social and cultural as well as scientific contexts. It also reveals how these changed during the second half of the twentieth century, sometimes leading to a reticence among interviewees to discuss situations that they feel might be judged harshly by 21st century audiences. Our research suggests that there were many similarities between the masculine cultures of field science and the engineering laboratory, with common roots in experiences of all-male schooling, military or other wartime service and other elements of male socialization, notably sporting activities that excluded not only women, but also

men who did not share this background. These were taken for granted by male scientists, the majority of whom also describe a clear and unquestioned gender division of labor in their private lives where family life was shaped around the scientific career and wives ran households as well as directly supporting their husbands' careers. This created an environment that encouraged women scientists to cultivate particular forms of femininity where they saw themselves as different from other women but unremarkable amongst the men.

III. Gendering Technology

Building on the extensive literature concerning technology and gender, two of the three papers in this section will contribute to the growing literature on disability, prostheses, and masculine identity, and the third paper will highlight the creation of a masculine technological culture in computer science.

Arms and the [Soviet] Man: Prosthetic Manhood after World War Two

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This article examines the impact of the mass disabling of Red Army soldiers during World War Two, addressing how the state confronted and responded to the physical challenges posed by the “invalids of the patriotic war,” as they were known. I address one of the main programmatic and policy agendas in dealing with this category: the necessity of healing these bodies sufficiently to get them back to work. Reemployment of the country's disabled, ideally in industry, was vital to rebuilding the country's devastated economy. Crucially, it would also mean the state need no longer financially support them. The chief avenue of this agenda was pursued through the development and provision of prosthetics. I chart the medical and political interests and recommendations that shaped the design and production of artificial limbs at the end of World War Two. Given the paucity of [intentional] visual images of the war invalids, the state's campaign to promote prosthetics is noteworthy for a number of reasons. In the context of a culture long hostile to physical

impairment, such substantial numbers of disabled men constituted a potent threat to the myth of Soviet invincibility already being manufactured even before Germany's surrender, as the Cold War heated up. Prostheses provided a model of compensatory, active masculinity to hide and counter the reality of countless damaged and needy male bodies, of men who had overcome their own physical limitations to serve the needs of the peacetime state. Finally, the history of post-war prosthetics encapsulates the larger story of technology in the Soviet state: from utopian belief in its transformative power, through technological quick-fixes, to systemic breakdown.

Sexology and WWII-era American Veterans

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The science of sexology experienced a renaissance in post-World War II America. Alfred Kinsey's Institute for Sex Research at Indiana University produced a plethora of studies concerning human sexuality, including sexual dysfunctions, disorders, and variations. One group curiously missing from Kinsey's studies, however, was World War II veterans, specifically men with physical disabilities. This essay will explore how the science of sexology came to bear on the more than 600 thousand injured veterans who came home after the war. Although Kinsey may not have had much to say about sex and disability, the U.S. military and rehabilitation officials did. Using published sources such as Edwin H. Kitching, *Sex Problems of the Returned Veteran* (1946), as well as oral histories and group surveys, this article will investigate the understudied area of disability and sex. Worried about the emasculating effects of permanent physical disability, rehabilitation experts believed heterosexual relationships to be essential to getting a soldier integrated and adjusted back to civilian life. While many scholars demonstrate how post-World War II films (such as *The Best Years of Our Lives*, *The Men*, and *Coming Home*) gesture toward the importance of disabled veterans achieving remasculinization through heterosexual relationships, a history that takes material culture into

account remains to be written. By tracing the creation and reception of military sex-ed manuals, psychological studies, and technological devices (such as penile prosthetic devices), this essay will show how the science of sexology played a crucial role in the post-World War II effort to make maimed men manly again.

“Beards, Sandals, and Other Signs of Rugged Individualism”: Masculine Culture within the Computing Professions

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With the possible exception of theoretical physics and mathematics, there is perhaps no discipline more associated with masculinity --- albeit an unconventional, distinctively asexual and anti-sensual form of masculinity --- than computer science. Within the university, computer science departments represent some of the most gender segregated spaces on campus, a situation that has been getting worse rather than better in recent decades. In popular culture, the figure of the white, male, perpetually adolescent computer nerd has become an almost mythical creature, simultaneously celebrated and reviled. And yet computer programming was originally envisioned as a feminine occupation. The first computer programmers were women whose work was expected to be routine, mechanical, and low-status. Over the course of the 1950s and 1960s, however, male computer experts were able to successfully transform the “merely technical” (and therefore feminized) activity of programming into a highly valued, well-paying, and scientifically respectable discipline. They did so by constructing for themselves a distinctively masculine identity in which individual artistic genius, personal eccentricity, anti-authoritarian behavior, and a characteristic “dislike of activities involving human interaction” were mobilized as sources of personal and professional authority. Although the dramatic sex reversal that occurred in the computer sciences over the course of the 1950s and 1960s bears some resemblance to other professionalization and masculinization efforts in the sciences, the specific mechanisms involved, which included the widespread use of aptitude testing and

psychometric personality profiling, are unique to the computing professions. This paper will situate the masculine cultural practices of “computer boys,” “IT guys,” and the male-dominated discipline of computer science within the larger history of the professionalization of technical expertise.

IV. Popular Science and Gender Norms

Despite advances in the numbers of women scientists and engineers and the professional recognition they have received, the papers in this section illustrate how commercial and entertainment industries – in movies, television shows, popular books and articles, and advertisements for cosmetics – have continued to equate men and masculinity with heroic scientific endeavors.

My Chemical Romance: Men of Feeling and the Manufacturing of Make-up in 1910s China

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In the Chinese journal *Nüzi shijie* (*Women's World*), a 1915 “how-to” column dedicated to the manufacturing of make-up portrayed chemical manufacturing as highly suitable for the inner chambers of the domestic realm, identifying women as the ideal manufacturers of cosmetics and toiletry items. What explains such a gendered portrayal of chemical experimentation and light industrial production during the first decades of the twentieth-century in China? Indeed, such a portrayal diverges markedly from the modern history of Euro-America, where popular science has tended to identify scientific activity with men and masculinity. This paper argues that, despite the feminine veneer, the “how-to” column targeted a new group of post-imperial era urban men seeking to encourage their engagement in science and industrial manufacturing. Longstanding elite distaste towards hands-on engagement with things for purposes of subsistence had persisted into the twentieth-century, as did class suspicion towards certain skills and forms of knowledge long associated with toiling artisans. In the years just following the fall of the Chinese empire in 1911, this column sought to change such views by tapping into a long tradition of literati men appropriating the sentimentalized female voice to promote unorthodox ways of thinking. It promoted for a new-

style urban man of feeling new fields of knowledge such as chemistry, adjacent realms of industrial technology, and the virtue of manufacturing things (*zhi zuo* 製作 or *zhi zao* 製造). As such, the column was indicative of a broader reordering of elite male knowledge and identity taking place in the initial years of China's new Republic.

Men in Groups: Anthropology and Aggression in the 1960s

Erika Milam, Associate Professor of History, University of Maryland

This paper investigates the intertwined concepts of masculinity and human nature in the United States during the 1960s and 1970s, a time of high stakes in understanding and controlling our own behavior. During these decades, concerns over natural aggression in humans loomed large in the American public imagination and the minds of scientists. A new emphasis on social interactions driven by aggression stemmed from a variety of sources: from the deepening quagmire in Vietnam lighting up television screens in homes nationwide; to domestic urban unrest and riots in Watts, Detroit, Newark, Baltimore, and other major cities around the country; not to mention the high-profile assassinations of John F. Kennedy, Malcolm X, Martin Luther King, Jr., and Robert Kennedy. Yet, depending on which set of scientific sources an author chose to emphasize, books, magazine articles, or television specials could weave radically different morals for what it meant to be a man. In 1963, Jane Goodall, for example, began observing chimpanzees manufacturing tools for extracting termites from mounds, living what appeared to be peaceful, idyllic lives in the forests of Tanzania. Yet according to Lionel Tiger and fellow biological anthropologist Robin Fox, in baboons as well as in people, male-male dominance hierarchies defined the social dynamics of the group, while females bonded primarily with their offspring. By the late-1960s the association of male bonding with group hunting, new discoveries in anthropology, and a changing field of animal behavior fed into a popular press far more interested in engaging with a vision of man as innately

violent. These theories were picked up in a variety of “New Hollywood” films of this era that similarly depicted urban jungles or rustic wildernesses in which men found the very essence of their humanity (and their masculinity) challenged—Sam Peckinpah’s *Wild Bunch*, released in 1969, captured exactly this sentiment. Such films drew on the same pop-anthropological sources as the mass media. I argue that the true horror of these depictions rested on the idea that normal men, in their average lives, naturally embodied the beast within.

The Changing Voice of Nature: From The Silent World to Crocodile Hunter

Gregg Mitman, William Coleman Professor of History of Science, Univ. of Wisconsin-Madison

A poster for the 1956 film, *The Silent World*, Jacques Cousteau’s cinematic triumph with Louis Malle, lures audiences with a “wave of adventure” pitting “Skin-Divers vs. Beasts of the Sea.” The poster traded on the heroism, adventure, and conquest over nature that had defined the naturalist-explorer since the filming of Teddy Roosevelt’s 1909 African safari. But *The Silent World* offered a more subtle and complex relationship between man and nature destabilized the masculine code embodied in the iconic Great White Hunter, a theme the 2004 Hollywood film *The Life Aquatic* humorously played upon. This paper follows the careers of Jacques Cousteau, Marlin Perkins, David Attenborough, and Steve Irwin to consider how the growing environmental movement and public awareness of an increasingly fragile planet altered what it meant to be a masculine voice for nature on the television screen.