

Gender, Race, and the Complexities of Science and Technology

[Main wikipage for the course](#)

Bibliography, with links to Annotations

Guidelines & Instructions

Insert citations in alphabetical order by first author under the heading below, "[General Bibliography](#)."

Include keywords in brackets after the reference.

Contribute annotations by linking the citation to a wikipage name GRSTyyzz, where yy is the first author's name and zz is the year, then adding the annotation into that wikipage.

Annotations should convey the article's key points as well as its connection to the student's own inquiries and interests.

[Guidelines](#) about joining the sicw wikispace and for a link to a place to practice (a "sandbox").

example

[McNeal, A. \(n.d.\)](#) How to Read a Scientific Research Paper--a four-step guide for students and for faculty. Retrieved on August 23, 2007 from http://helios.hampshire.edu/~apmNS/design/RESOURCES/HOW_READ.html

[Tips_for_Students]

Keywords

(To enable searches of this bibliography, select keywords from this list and list them in brackets after the reference. Feel free to add keywords to this list--in alphabetical order.)

A: action_research, art_science, abortion, ancestry

B: "bad"_science, biology, black_women, bioethics, black_bodies_in_medical_experimentation

C: colonialism, culture_of_science, cultural_reconstruction, commodification, cultural_science, critical_analysis_of_the_history_of_technology_and_science

E: education, eugenics

F: feminist_perspectives

G: gmo_critique, gendered_technology, genome_phenome, genetic_testing, global_impacts_of_technology

H: human_animal, historical_examination_of_the_intersection_of_race_and_sexuality

I: industrial_influences

L: linguistics, literacy

M: multicultural_interpretations, music_technology, medical_industrial_complex, musical_technology, Medical_sociology

N: nonhuman_communication, nature_nurture

O: objectivity_strong

P: personal_genomics, privacy

R: race, representation, reproduction, reproduction_politics, race_&_reproduction, reflexivity_strong

S: science_and_morality, science_and_politics, scientific_ethics, scientific_objectivity_subjectivity, science-as-power, STS, STS_History, science_literacy, scientist_activist, social_change, scientific_racism, scientists_in_media

T: technototemism, Tips_for_Students, technical_politics, technology_and_classical_music, technology_and_culture

W: women_knowledge, women_in_academia, women_in_science

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[science_and_politics, scientific_objectivity_subjectivity, science-as-power, science_literacy, scientist_activist, social_change, scientists_in_media]

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[musical_technology, technology_and_culture]

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Good advice for how to systematically approach reading a technical or scientific article with little or no background in the topic. The section for faculty is also helpful for students as it shows how to “chunk” different parts of the paper in order to reduce anxiety and concentrate on the type of information provided in each part (i.e., introduction, methods, results, discussion). (Jan Coe)

Armand Marie Leroi, an evolutionary developmental biologist at Imperial College in London, is the author of "Mutants: On Genetic Variety and the Human Body."

Aikenhead, Glen. "Integrating Western and Aboriginal Sciences: Cross-Cultural Science Teaching." *Research In Science Education* 31, no. 3 (2001).

This article describes the cultural assimilation that commonly takes place in science classrooms and the corresponding alienation experienced by students whose world-views do not resonate with that of the world-view of Western science commonly expressed in a classroom. Aboriginal students (in Aikenhead's Canadian context) are particularly subject to this alienation, according to Aikenhead, and it can prove detrimental for them and their communities; for Western science is still "a major global influence in their lives. Alienation reduces their effectiveness at 'legitimate peripheral participation' in community matters related to science and technology" (2-3). Aikenhead proposes a cross-cultural approach to teaching science, one that does not seek to indoctrinate students into a particular culture or to resolve conflicts of culture, but to simply give culture, specifically Aboriginal culture, a voice. Aikenhead then illustrates what such a teaching approach could look like within specific teaching units. He pays particular attention to what words mean in each context, such as the "wolf" or "to observe", encourages teachers to ask students to say which cultural perspective they are speaking from when they describe what they have learned, and suggests field trip initiatives and even how the design of a classroom can help students learn to look at the world from each other's perspectives.

Glen Aikenhead's Webpage. [**http://www.usask.ca/education/people/aikenhead/**](http://www.usask.ca/education/people/aikenhead/) (accessed March 4, 2009).

Glen's webpage includes teacher resources for teaching cross-cultural science and technology units in a classroom as well as links to numerous published articles (his own and others) on cross-cultural (Aboriginal and other) approaches to science in the classroom.

Anglin, Mary K. 1997. "Working from the Inside Out: Implications of Breast Cancer Activism for Biomedical Policies and Practices." *Social Science & Medicine* 44:1403-1415.

In this article, Anglin studies the treatment activism of women with breast cancer through an ethnographic study of NORCAL, an advocacy organization, and its members. While others have focused on women's health behaviors, treatment decision-making, and risk factors, Anglin examines patient experience through breast cancer activists. What she terms "treatment activists" are women who work to improve access to and knowledge of available breast cancer treatment options. They reframe access to care to "access to the *right kind of care*" (1407). NORCAL has advocated for less toxic treatment options, more alternatives, and access to clinical trials through "compassionate use". The women that speak on behalf of NORCAL build from the feminist saying "the personal is political" and extend this philosophy to medicine. They do not separate emotional experience of having breast cancer from the scientific information relevant to treatment. One avenue they have taken is to pressure government agencies and pharmaceutical companies to make drugs more quickly accessible to very ill patients. Another is to improve public policies about breast cancer treatment coverage. A limitation of this group is that they encompass mostly white middle class women and as a result do not address issues that affect women of other social classes or racial groups. As the author notes, obtaining access to "the *right kind of care*" presumes that women already have access to some form of health care.

Rita Arditti, in her 1980 article, "Feminism and Science," describes her own gradual realization that women were not well-served by the culture of science in the U.S. through the 1950s and 1960s. Her attempts to call male colleagues' attention to inequities were dismissed and considered trivial compared with the ongoing Vietnam War, or met with comments that she was being "difficult" and "oversensitive" (p. 362). She argues ultimately that science suffers as a result of such narrow vision, and envisions science influenced by a feminist perspective:

A feminist perspective in science would involve the creation of an environment that maximizes the development of minds and bodies... conversion of an exploitative "value free" technology to a commitment to humane technology...assessed by the impact it has in bringing meaningful change in social relations....

Since science does not progress only by inductive analytical knowledge, the importance of imagination and emotion in the creative process should be obvious.... A feminist perspective would re-introduce and re-legitimize the intuitive approach. The benefits of this in terms of new knowledge might well be incalculable. (pp 365-366)

She asserts that science requires a transformation to a "more humane" approach that takes into account the consequences and ramifications of its outcomes (p. 364); she credits her own "learning about the past and present position of women in science" with a realization that women can and should contribute to this transformation (p. 363).

Armstrong, V. (2001). Theorizing gender and musical composition in the computerized classroom. *Women: A Cultural Review* 12(1), 35-43(9).

This study proposes that certain forms of music technology are gendered and exclusionary for many women. Armstrong argues that computerized musical composition is constructed within a masculine domain. She believes that modern the computerized composition technology incorporated into music classrooms is plan-oriented and canonical. According to the girls Armstrong interviewed, this style of learning is undesirable and limits creativity. Male students preferred this style of working and were therefore more successful in computerized compositional classrooms.

[Aronson, Debra](http://www.scienceprogress.org/2009/02/the-authenticity-filter/) (2009). "The Authenticity Filter: Lessons from Photoshop on Biological Engineering," Science Progress. February 5th, 2009. Accessed on February 11, 2009 at: <http://www.scienceprogress.org/2009/02/the-authenticity-filter/>

Article looks at the influence technologies have in influencing our perceptions of what is real and authentic. Expresses tensions over acceptance of technologies as natural to our daily experience of truth. Also contemplates the point at which this tension erodes and the use of technology is conceived of as real.

[annotated by FMS]

Bandelt, Hans-Jurgen, Yao, Yong-Gang, Richards, Martin, and Antonio Salas (2008) "The brave new era of human genetic testing" *BioEssays* 30, 1246-1251

The authors look at the how genetic research is influenced by the pressures of the commercial market specifically the medical industrial complex comprised of pharmaceutical industries, mass media and private funding. While the research is taking time to yield usable results, the market is pushing for the transformation of this knowledge into usable products. This is especially evident in the use of genetic testing to trace ancestral roots. These pressures in turn are impacting the direction and scope of research. Erosion of traditional research methods and protocols are in danger.

[annotated by FMS]

Barr, Jean and Birke, L. (1998). Common Science? Women, Science, and Knowledge

The England-based authors report on research conducted to evaluate different modes of adult education for women. On the way, they share women's reported perception of science and scientists, their understanding of the scientific process, and suggestions for sharing and co-creating knowledge. They assert that women already have knowledge that is science, yet it is not recognized as such by society. Once women realize that they hold knowledge, they are empowered for a give-and-take with the existing power structure around science.

Best, S. & Kellner, D. (2001). *The Post Modern Adventure*. New York: Guilford Press.
[cultural_science, global_impacts_of_technology]

Best and Kellner explore the ways in which advances in science and technology are shaping society and culture in the new global era. Developments in science and technology have started a transition from the modern to the post-modern societies. The authors propose that the very nature of this global era will evolve based on the ways in which people use developing science and technology in creating a society of liberation or a society of domination. To explore these issues, Best and Kellner look at the technical developments in warfare, comparing biographical narratives from the Viet Nam war and the Gulf war. *The Post Modern Adventure* examines not only how science and technology has affected culture in Western society but on all across the globe. [HER]

Bolnick, Deborah et al (2007) "The Science and Business of Genetic Ancestry Testing" Science 318 pp399-400 and follow-up letters in Science 319 pp1039-1040.

A brief piece that examines the rising popularity of personal genomics for ancestral research. The joint authors caution that such "recreational" use of such tests are not without risks. Unintended consequences, limitations of the tests and increasing commercialization all create unstable ground for the consumer. Impacts on identities, community formation and social constructs such a race may surface out of seemingly simple tests. The tests themselves may only contain fragments of information that fail to allow for complex interpretations. The for-profit sphere may gloss over or promise results that are impossible to deliver and raise expectations.

[annotated by FMS]

Bucchi, Massimiano and Federico Neresini (2008). "Science and Public Participation," *The Handbook of Science and Technology Studies*. Cambridge, MA: MIT Press. pp. 449-472.

This article opens with a criticism (and explanation of the crisis) of the deficit model of public understanding of science. The deficit model has been used by scientific experts to promote an increase in scientific education directed towards the general public, reasoning that an increase in the quantity and quality of public scientific knowledge would guarantee "favorable attitudes toward science and technological innovation" (450). The problem with that model, according to Bucchi, Neresini and others, is that it "problematize[s] the relationship between science and the public only as regards the... public" (450) and prioritizes public knowledge as qualitatively inferior to expert knowledge.

Bucchi and Neresini offer an alternative framework to the deficit model and construct a typology of public participation in the production of scientific knowledge that differs even from other typologies of such public participation. To the authors, the interaction between the public and experts is not just one of knowledge transfer but of social conditions which enable spontaneous, non-sponsored public participation as well. The range of public participation, and the changing definitions and forms of democracy which enable it, however, are not evaluated by the authors. Bucchi and Neresini do not offer prescriptive advice for the generation of future hybrids of public-expert scientific knowledge but offer, rather, a description of various forms of that hybrid and the various conditions which might enable each form.

Butler, Judith. (1993). *Bodies That Matter: On the Discursive Limits of "Sex"*. New York: Routledge.

Philosopher Judith Butler wrote *Bodies That Matter* to clarify her earlier misunderstood assertions of gender as a daily performance. Rather than being something that a person can put on or remove, she claims that gender, while constructed, is more potent and indispensable than that—a potency that often manifests onto the body through the projection of regulatory ideals. Much of this has been due to the heterosexual imperative, which mandates that bodies align with a hegemonic understanding of sex and gender. In doing so, she challenges the readers and broader culture to use the tools of a hegemonic society, but to re-adapt them.

Collins, P. H. (2005). Prisons for our bodies, closets for our minds: Racism, heterosexism, and black sexuality. *Black Sexual Politics*. New York: Routledge, 87-116.

[black_bodies_in_medical_experimentation,
historical_examination_of_the_intersection_of_race_and_sexuality]

In this chapter of *Black Sexual Politics*, Collins explores the historical and contemporary state-sanctioned institutional mechanisms used to maintain sexual and racial hierarchies. Specifically relevant to this course is the laboratory experiments and field research used by natural and social scientists in the 19th and early 20th centuries on Black bodies. Collins explores how Black women's sexuality was historically exploited as Black women were used as breeders to increase the property of white property owners. Enslaved Black women were also used for medical and gynecological experimentation. These experiments often took place in unsanitary places such as barns and backyards. More contemporary examples of the medical exploitation of Black bodies often center around limiting Black women's access to pregnancy, as Black babies are no longer profitable. Collins cites Norplant, Depo-Provera and unwanted sterilization as modern means of controlling Black sexuality and choice. [HER]

[Council for Responsible Genetics](http://www.gene-watch.org/pages/genewatch.html) (2009) GeneWatch - <http://www.gene-watch.org/pages/genewatch.html>

[personal_genomics, scientist_activist]

This is a resource supported by the Council for Responsible Genetics that “fosters public debate about the social, ethical and environmental implications of genetic technologies.” GeneWatch makes available online and in print a bimonthly magazine that explores the rapidly evolving issues in the biotech industry especially from a critical stance.

[annotated by FMS]

[Critical Art Ensemble](#) (2002) *The Molecular Invasion*. Brooklyn, NY: Autonomedia. 140pp. Anti-copyrighted; available for [download](#) at <http://www.critical-art.net/books/molecular/index.html>

A manifesto from a performance- and installation-art collaborative, laying out a plan for generating and supporting public debate re: genetically modified foods. (From the Introduction: "The perception that science is too difficult for anyone other than a specialist to understand is socially ingrained in those separated from the discipline on an everyday life basis. The walls of the division of technical labor seem unbreachable. The common English expression 'it's not rocket science,' usually made as a sarcastic remark when someone has an inordinate trouble with any task, is but one example of a manifestation of public reverence for the intellectual intensity of science and its separation from common daily activities.")

This is part of my (Pam's) investigation into artistic critique/response to the scientific process as a means to make the latter accessible to stakeholders. A question raised in response to Donna [Haraway case](#).

[Croissant, JL and Smith-Doerr, L](#) (2008). "Organizational Contexts of Science: Boundaries and Relationship between University and Industry," in *The Handbook of Science and Technology Studies* (3rd Edition), EJ Hackett, O Amsterdamska, M Lynch, and J Wajcman (Eds). Cambridge, MA: MIT Press: 691-718.

[cultural_of_science, industrial_influences]

Examines the exchange of knowledge and values between the academy and industry which has grown since the 1980s as a result of shifted government legislation and increased funding from industry. The authors detail the historical context of these university-industry research relationships (UIRRs). The professionalization of science and technology coincided with the growing structures of corporate capital. The growth of a federal research system (i.e. NSF, DARPA) also created bureaucratic funding mechanisms that matched the private sector developments. These were solidified by amendments to trade and patent law which assigned increasing property rights to corporations. These institutional configurations were supported by new measurements and the growing science of economics as well as new geographical formations such as research parks, incubators, and networked communication tools. The authors then question the effects these connections have for knowledge creation.

[annotated by FMS]

Conrad, Peter. (1992). Medicalization and Social Control in *Annual Review of Sociology*, Vol. 18: 209-232
Conrad examines the relationship between medicalization and social control, by employing studies published on the topic since 1980. Of particular focus are changes in the medical profession and how it effects medicalization, as well as the social dilemmas faced in the realm of medical research and practice.

This article is about the internet and online sex industries. It based on the perspective of science and technology.

Deloria, Vine Jr. (1999). "Perceptions and Maturity: Reflections on Feyerabend's Point of View." *Spirit and Reason*. Golden, CO: Fulcrum Publishing. pp.3-16.

This essay is the first of four essays under Part I: Philosophy of Vine Deloria Jr.'s *Spirit and Reason*. It is a provoking, lively and even uncomfortable at times introduction to an influential Native American perspective on the norms of western-dominated science. Deloria offers a brief comparison on the philosophies of Thomas Kuhn and Paul Feyerabend, all the while keeping the priorities of Native American values at the forefront: perspective over truth, maturity over accomplishment and wisdom over knowledge. The main thrust of Deloria's argument is that mainstream science fails to recognize any knowledge claims that do not fit into pre-established categories; any information that does not fit into a very strict and limited world-view, explains Deloria, is often ignored or condemned into a category of non-existence. On the other hand, for the Native American, he says, gathering knowledge assumes that everything one encounters in experience is significant and that pre-mature conclusions about experience or encountered knowledge should be avoided. Maturity, says Deloria, is learning how "to decide how special forms of knowledge are to be applied, how far they may be trusted, what their relationship is to the totality of human experience and therefore to other forms of knowledge" (13).

Not only is the essay a good introduction to a Native American perspective on science, but the rest of the essays in the book provide poignant reflection on Native Americans and their relationship to other sciences, the education system and religion. Deloria does not suggest that his fellow Native Americans should avoid the scientific establishment but rather that they should engage themselves with it, critique it and provide their own perspective to it. The book is also, then, a good resource to have when working alongside Native Americans in educational and community settings: it allows the non-Native American to hopefully have a better understanding of the rich Native American culture and Deloria is also a leading voice that Native Americans themselves - young and adult learners alike - can learn from with the confidence that their own perspective is being acknowledged. (SLP)

Dilworth, J. (1999). The cello: Origins and evolution. *The Cambridge Companion to the Cello* (R. Stowell, Ed.). Cambridge: Cambridge University Press.
[technology_and_classical_music]

In this chapter of Stowell's *The Cambridge Companion to the Cello*, John Dilworth examines the origin of the cello. Dilworth compares the engineering, construction and design of the cello from the introduction of the instrument in the 16th century to the modern instrument used among the majority of professional musicians today. He looks at both modifications and alterations that have developed as instrument making expanded into the industrial sphere. The reading suggests the important dimensions science and technology play within the realms of art and music. [HER]

Dreger, Alice. (1998). *Hermaphrodites and the Medical Invention of Sex*. Cambridge, Massachusetts: Harvard University Press

Foregrounding the medical treatment of intersxuals and hermaphodrites in a historical perspective, Alice Dreger traces the advancements of medical technology and how it affects the individuals who often suffer from its pernicious consequences. In doing so, she creates a compelling discourse not only around sex, sexuality and gender, but how the conditions (namely intersex) that blur our understanding of them, should be treated both within the medical community and broader society, championing a social response rather than a medical one.

Epstein, Steven. 2008. "The Rise of `Recruitmentology': Clinical Research, Racial Knowledge, and the Politics of Inclusion and Difference." *Social Studies of Science* 38:801-832.

This article addresses the consequences of mandates to include women and minorities in clinical trials. "Recruitmentology", Epstein argues, is a new science of techniques to recruit underrepresented groups to participate and remain in clinical trials. The recruiters are torn, he states, between their sensitivity to the cultural and social histories of underrepresented racial/ethnic groups and the treatment of these groups as administrative categories. The later is at least partially required by the federal mandates for inclusion of underrepresented groups. This article is helpful in thinking about this week's case, the genetic websites for www.personalgenomes.org, www.africandna.com, and www.decode.com, because it provides an analysis of the dangers of using racial categories as ways to recruit participants. Also it addresses some of the ethical issues that arise from this method, including reinforcing notions of racial difference. This article, through an examination of the sensitivity of recruiters to cultural and historical differences between groups, also suggests that the gathering of information about genealogy may be more complex than it initially appears. In the [africandna.com](http://www.africandna.com) website for example, we see an infusion of language about race and also shared history, culture, and ancestry.

In this chapter, Steve Epstein provides a comprehensive overview of studies of patient groups and health movements (which I will abbreviate as “patient groups”). Studies of patient groups have increased in the past 15 years in part due to an increase in their numbers, the move “beyond the lab” in science studies, and changes in biomedicine outlined in a widely cited review of “biomedicalization” by Clarke and others]. In the remainder of the article Epstein conducts a literature review of patient group studies; he begins by with analysis of the definitions of “patient groups”, explains some of the methods used, criterion used to compare and classify groups, outlining the key research questions, and enumerating some of the consequences of the existence of these patient groups and health movements. Patient groups, he argues vary considerably in terms of membership (who can be patients, proxies for patients, and/or medical professionals), the aims of the group (political, civic, medical), and whether groups are engaged in boundary-crossing (specifically in the areas of lay-expert, state-civil society; state-market; science-politics). One way that patient groups are classified, which Epstein argues only tells part of the story, is through their relationship to medicine. Specifically, researchers sometimes classify groups as being involved in medicalization, or trying to gain legitimacy by claiming that their condition is “of a medical nature” (510)]. As Epstein notes, the relationship between patient groups and medicine is complicated and often cannot be captured through this concept. Some of the key research questions seek to understand how social and technoscientific developments and aspects of disease impact the formation of patient groups. Another set of questions seeks to understand the type of knowledge they use and expertise they develop. Specifically, researchers are interested in the use of informal knowledge and the ways that knowledge is produced in biomedicine.

I found this article useful because it takes a look at how scientific knowledge about drug efficacy is produced – not from scientists, but through recruiters. The process of recruitment itself is laden with subject and sympathetic tendencies as well as the scientifically-driven understandings of racial groups.

]Clarke, Adele, Shim, Janet K., Mamo, Laura, Fosket, Jennifer Ruth, and Fishman, Jennifer R. 2003. "Biomedicalization: Technoscientific Transformations of Health, Illness and U.S. Biomedicine." *American Sociological Review* 68:161-194.

] See (Conrad 1992; 2007) for a slightly different definition of medicalization. Medicalization is obtaining legitimacy for a condition by adapting medical terminology to explain it. Conrad, Peter. 1992. "Medicalization and Social Control." *Annual Review of Sociology* 18:209-232, Conrad, Peter. 2007. *The Medicalization of Society: On the transformation of human conditions to treatable disorders*. Baltimore: Johns Hopkins University Press.

First Nations University of Canada, Department of Science **[**http://www.firstnationsuniversity.ca/default.aspx?page=30**](http://www.firstnationsuniversity.ca/default.aspx?page=30)**

The First Nations University of Canada, Department of Science incorporates Indigenous knowledge and holistic learning and support into their research and pre-professional science programs. Their purpose, as stated on their site, is to:

“Promote scholarly research, teaching and learning activities that will directly and indirectly benefit Aboriginal communities in an age of technological advancements and globalization, and thereby, increase the representation of Aboriginal people in science and health related careers.”

Their site, apart from the university program, also describes community projects and research that the department is affiliated with. Health and science camps are sponsored for youth and one of the departments largest community-based research endeavors is National First Nations Environmental Contaminants Program. Through the program, communities and researchers apply for funding to assess the exposure level and health effects of individual communities in relation to environmental contaminants as well as funding for research to develop methods for remediation, once assessed. The program is committed to community participation at all levels – initiation, assessment, policy-making and policy-implementation, and is an example of how environmental and health related issues particular to Aboriginals are able to receive research attention when Aboriginals are part of institutional and 'expert' design of research in addition to being part of communities.

In this article, Fausto-Sterling examines scientific studies of bone density that make claims about race and racial differences. While many studies do not find race differences, they set out initially looking for these differences. Studies often attribute differences to race without a more comprehensive examination of the social factors (geography, diet, life history, exercise, etc) that influence bone density. Fausto-Sterling argues that genetics are not causes of conditions, but rather a set of possibilities that can be triggered by social conditions. This particular study is helpful in understanding how the importance of incorporating social conditions to scientific understandings of the body. The use of genetic knowledge is limited without information about the social conditions of people's lives. This is an accessible article about the "science" of bone studies and the need to bring social conditions into these studies.

[Ford, A & Peat, FD](#) (1988). The Role of Language in Science. Foundations of Physics. Vol 18, 1233, Retrieved on February 1, 2009 from <http://www.f davidpeat.com/bibliography/essays/lang.htm>.

Ford and Peat propose a range of explorations into the role of language in science. In this exploration, all concepts are bound up in the language in which they are conceived. The authors understand that language can block or impede the exploration of new ideas. While there are those that argue meaning is simply transmitted from speaker to listener, the authors see language as part of a much more active and dynamic system of constructed meaning. Yet, meaning can become a contested space causing confusion and argument within the conveyance of knowledge. They posit that the language of every day, natural language, is capable of expressing a wide range of meanings required by science but that it is necessary to thoroughly examine the concepts being explored and to understand where confusion can arise. The creation of artificial languages to address gaps in new concepts may only lead to continued confusion. Other language systems such as mathematics, primitive and technical are all equally useful in the communication of science.

[annotated by FMS]

Fox, M.F., Johnson, D. G., Rosser, S. V. (2006). *Women, Gender, and Technology*. Urbana-Champaign: University of Illinois Press. Preview Retrieved on February 25, 2009 from http://books.google.com/books?id=nf1E3EFqoXAC&printsec=frontcover&source=gbs_summary_r&cad=0#PPP1,M1

This book was designed to fill in the gaps in current American STS literature with regard to the relationship between gender and technology. The authors argue that most literature on this topic focuses on the barriers women entering technological fields face but does not address feminist perspectives on technology and the impact of gendered technology on gender relations within US society. The authors use an interdisciplinary method to bring forth these issues and suggest multiple approaches exploring women in technology and the impact of gendered technology on society, institutions, organizations and individuals. (HER)

Garver, K. L. & Garver, B. (1994). The human genome project and eugenic concerns. *The American Journal of Human Genetics* 54(1), 148-158.

This article examines the darker possibilities that could evolve from the U.S Human Genome Project. While the authors are hopeful about the benefits of the project, they are concerned with possible breaches of bioethics. This article specifically examines the ways in which genome development could be incorporated into a eugenics ideology. Garver and Garver take a historical approach as they cite examples of eugenics and biological determinism in the United States and Germany. The article is an excellent source for considering how race and gender are intertwined in technology, especially genetic research.

Gorz, Andre. 1980. *The Scientist as Worker*. In: *Science and Liberation* Boston: South End Press. 398pp

In this article reprinted from *Liberation* magazine (May/June 1974), Gorz exposes the scientist as another tool for the ruling elites of capitalism, as much as the factory worker. He cites evidence in three areas: the realm of science itself (e.g., compare the use of the terms “scientific” and “technical” to the terms “craftsmanship” and “skill”), the “language and object of science” (which keeps science in the realm of the experts and useful information out of the hands of those who need it), and the ideological content of science (i.e., the existing power structure decides what will be studied, and bars from the discussion knowledge that would empower society to take things into its own hands).

Scientists have not broken out of their bondage because of competition for the perceived shortage of challenging positions and the extreme specialization of scientific work that prevents any one scientist from taking matters into their own hands – only by working together will they see the whole picture, in a form useful to societal change.

Gorz calls on scientists to cease being victims of this system as a matter of principle. Though he doesn't employ the term activist, he calls on scientists to take action:

“the goal is not for a few specialists to achieve the highest possible professional standards; the goal is the general progress and diffusion of knowledge within the community and the working class as a whole... the best possible ways of sharing new knowledge must be the permanent concern of all research scientists... It will call for research to be carried out in constant cooperation and interchange between experts and non-experts.” (p. 278)

Haraway, Donna. 2004. "Teddy Bear Patriarchy: Taxidermy in the Garden of Eden, New York City, 1908-1936." Pp. 151-197 in *The Haraway Reader*, edited by D. Haraway. New York: Routledge.

In this paper, Donna Haraway analyzes the creation and organization of the African Hall exhibit in the American Museum of Natural History and the biography of the exhibit's primary taxidermist, Carl Akeley. Haraway uses the experience of walking through the African Hall exhibit and details from Carl Akeley's biography, in published works and museum archives, to study messages that visitors receive about animals, nature, and "primitive" people. Haraway argues that the preservation of the animals in taxidermy actually creates new animals that have "transcended mortal life" (157). Haraway goes further to say: "[t]his is a spiritual vision made possible only by their death and literal representation. Taxidermy fulfills the fatal desire to represent, to be whole; it is a politics of reproduction" (157). Haraway argues that the experience of the exhibit is historically and geographically situated and that the camera and gun are used to create meanings. And finally, the ways that biography is "woven into and from a social and political tissue" (162).

Throughout the rest of the chapter, Haraway uses examples from Akeley's biography to explain the ways that racialized and gendered elements of art of taxidermy and the creation of African Hall museum from 1908 to 1936. Using the biographies that Akeley's wives (through first and second marriage) wrote about him, Haraway analyzes the role of these women in the hunt and final creation of the exhibit. Haraway's explanation of their relationship to the "African boys," Akeley, and the gorilla illuminates the complex relationships between humans-animals, blacks-whites, man-woman, etc.

Annotation: Haraway, Donna. 2004. "A Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980s." Pp. 7-45 in *The Haraway Reader*, edited by D. Haraway. New York: Routledge.

In this paper, Haraway outlines and critiques elements of feminism and proposes a new approach to feminism using irony as a tool. There is irony in the construction of a "women's experience" by the international women's movement because the construction is both necessary and contrary to the very purpose of the women's movement. Haraway starts by saying that she would like to see irony, "the tension of holding incompatible things together because both or all are necessary and true . . . more honored within socialist feminism" (7). Haraway speaks about the possibility for cyborgs, "creatures simultaneously organism and machine, who populate worlds ambiguously natural and crafted" as a site for challenging boundaries and being more conscious in construction of boundaries. She argues "for *pleasure* in the confusion of boundaries and for *responsibility* in their construction" (8, original emphasis). Haraway identifies three boundary breakdowns that make this vision possible: the animal-human boundary, the organism-machine boundary, and the physical-nonphysical boundary.

Haraway discusses the work of Chela Sandoval and Katie King, both attempts "to craft a poetic/political unity without relying on a logic of appropriation, incorporation, and taxonomic identification" (15). A major argument in this paper is that feminist theory should take into account partial explanations rather than the totalizing explanations usually employed. Another part of her argument is that a critical analysis of science does not involve a total rejection of science, or the cyborg, but instead understanding of the ways science is used for domination and human satisfaction.

[Harding, S](#) (1991). *Whose Science? Whose Knowledge?: Thinking from Women's Lives*. Ithaca, NY: Cornell University Press.

[science_feminism, feminist_perspectives, reflexivity_strong, objectivity_strong]

Harding explores the possibilities of a feminist science in meeting the needs of all women. She argues that inclusion of women (as well as “others”) challenge the fabric of knowledge by bringing new and strong objectivity to inquiry. In addition to arguing for more access and control over such knowledge creation by women, she details the way in which feminist standpoint theory can inform ways of gaining new knowledge by others through situating the inquiry in the perspective of the “the other” . She also stresses the need for knowledge to be informed by experience as well as political activity thus linking theory to practice. Harding concedes that a feminist science is contradictory, multiple and complex which can only serve to strengthen scientific research.

[annotated by FMS]

Harmon, A. (2007). Genetic testing + abortion =??? New York Times (New York, NY). Retrieved March 18, 2009 from <http://www.nytimes.com/2007/05/13/weekinreview/13harm.html>
[genetic_testing, abortion]

This newspaper article explores the new dynamics of abortion in an era of genetic testing. Harmon believes that many women who identify as being pro-choice find the abortion choice less clear if abortion is used as a means to terminate an undesirable child. In other words, many pro-choice women find they support abortion if a woman does not want to have a baby but question abortion used by a woman who does not want a particular baby. Harmon exposes a new (yet ironically very old) element in the abortion debate; how much "choice" should a woman be given? Where does the line between a woman's body and a "child's" body become blurred. The article is an interesting representation of bioethics, politics, gender dialogues, science and technology in popular American culture. [HER]

Hess, DJ (1995). *Science and Technology in a Multicultural World: The Cultural Politics of Facts and Artifacts*. New York, NY: Columbia University Press.

[culture_of_science, science-as-power, cultural_reconstruction, technototemism, multicultural_interpretations]

Hess looks at the social construction of science and technology knowledge in terms of what it means for underrepresented and marginalized groups. He explores concepts such as temporal cultures (e.g., time shapes the meaning), technototemism (e.g. cultural artifacts shape the meaning), intercultural communications (e.g. how meaning is shaped by cultural context and history). He also considers the variety of knowledge systems that exist and the ways in which science can be culturally reconstructed to bring about new meaning.

[annotated by FMS]

Ho, Mae Wan. 2007. "The Importance of Being a Science Activist." Lecture presented at the launch of *Confessions to a Serial Womaniser* by Zerbanoo Gifford (www.ashacentre.org), Nehru Centre, London, 1 October 2007. Accessed at <http://www.i-sis.org.uk/ScienceActivist.php> 2/22/2009.

Mae-Wan Ho tells her own story of becoming a scientist-activist and the founder of the Institute of Science in Society with her husband, Peter Saunders. Ho is a PhD geneticist; she was awakened to the need to bring "independent" scientific information to the public realm when she attended a conference titled "Redefining the life sciences" co-organized by Vandana Shiva, another scientist-activist based in India. Ho describes her own work to promote global sustainability (e.g., responding to climate change, ensuring clean water and food in all corners of the globe).

Ho is an example of a scientist who has found a way to put her knowledge and expertise to use in the policy arena, advocating for social justice without compromising the underlying science.

Jungwirth, Bernhard and Bertram L. Bruce (F 2002). "Information Overload: Threat or Opportunity." *Journal of Adolescent and Adult Literacy*. 45 no. 5 pp. 400-406.

This article explores the pace and the implications of the ever-expanding global accumulation of knowledge. Both individuals and whole cultures, say the authors, are feeling the effects of the information "bomb" which is growing at a rate faster than ever before. Though the burden of too much information (and, consequently, how to manage it) has been persistent for hundreds of years, the last thirty years has witnessed more information produced than the grand total of produced information in the previous 5000 years. In less than one generation people are being asked to manage and filter more information than have previous civilizations in their entire history. One opinion is that technology and scientific advancement do not necessarily enable acquisition of information but are created as a managerial adjunct to information and changing world views which already acknowledge and have opened themselves up to new categories of information. In this case, information overload is an opportunity, it is a manifestation of a new wave of culture and being.

On the other hand, as the majority of the authors quoted in the article believe, too much information is becoming a looming threat. One researcher proposes that most people with common exposure to the internet, newspapers, television and public education have cultural AIDS: Anti-Information Deficiency Syndrome. The symptoms of this disease, says the researcher, is that people are no longer able to filter information. They can neither control what they receive nor are they able to pass judgments on it. "Everything is everywhere at every time." The result is an increasing dependency on experts which only increases the vulnerability of groups of people being taken advantage of by those experts or of dismissing contextually crucial information which may not be considered crucial in the experts' contexts.

Though the article offers very little in terms of prescription, it is a good resource for a) the multitude of researchers who have published on the topic of information overload and anxiety and b) becoming aware of the problem and possible consequences of too much information. Teachers especially would do well to consider the problem of information overload. One consideration could be that passing on information to students and instilling a love of learning, regardless of students' age, is very important; but teaching students how to filter and pass judgments on received information may be just as crucial. (SLP)

Kahn, Johnathan. 2008. "Exploring Race in Drug Development." *Social Studies of Science* 38.

In this article Kahn takes the case of BiDil, an FDA approved drug for the treatment of African Americans with heart failure. The formal clinical trial for BiDil was conducted with only self-identified African American patients. This allowed investigators to obtain FDA approval while using smaller clinic trial with less stringent guidelines. Kahn describes investigators model as one "exploits race to gain regulatory and commercial advantage, while ignoring its power to promote a regeneticization of racial categories in society at large" (737). Kahn also challenges the popular idea that BiDil is a form of pharmacogenetics, or personalized medicine. This article highlights the economic and regulatory factors that are part of decisions that reify racial categories. Unlike studies that Fausto-Sterling reviewed, the investigators in the BiDil clinical trial do not make claims that there are racial differences, however, the approval of BiDil to treat 'black' patients suggests that there is scientific evidence of significant biological differences among racial groups that merit the use of different medical treatments.

Launius, R. D. (2007). The public history of science American memory, culture wars, and the challenge of presenting science and technology in a national museum. *The Public Historian*, 29(1), 13–30. [critical_analysis_of_the_history_of_technology_and_science]

In this article, Roger Launius explores the challenges of presenting science and technology within the context of historical preservation. Launius questions the ways in which the Smithsonian often interchanges technology and national identity, without examining complexities and diversity of perspectives that make the representation of modern science less of an absolute truth than an interpretation.

Launius proposes a series of questions that ask the reader to reflect upon knowledge claims, values, perspective and expertise. He asks the reader to engage in a task similar to the one suggested at the beginning of this course. [HER]

**This article was a perfect find for my last bibliography entry.

“Lessons in Learning: The cultural divide in science education for Aboriginal learners.” Canadian Council on Learning. [http://www.ccl-cca.ca/CCL/Reports/LessonsInLearning/LinL20070116_Ab_sci_edu.htm**](http://www.ccl-cca.ca/CCL/Reports/LessonsInLearning/LinL20070116_Ab_sci_edu.htm) (accessed March 4, 2009).**

Using a combination of census data, testing results and recent research, this article demonstrates how sharply under-represented Aboriginals are in the science and engineering fields in Canada. According to the research and statistics, the article concludes that the reason for the the under-representation is an educational one: compared to the non-Aboriginal population, Aboriginals are not only under-represented in science and engineering occupations but the percentage of Aboriginal students who study in science-related fields in post-secondary settings and those who take advanced high school science classes is also far less than the non-Aboriginal population, including other ethnic minorities. The study proposes that the reason for such disparity is cultural:

“The Aboriginal world view sees people, landscape and living resources as a spiritual whole. In contrast, the Western science approach seeks greater understanding through breaking apart the whole and analyzing it into its smallest parts. These cultural differences can create difficulties for Aboriginal students in classrooms dominated by the Western science perspective.”

The article proposes integration within science classrooms of Aboriginal content and a flexibility which allows local knowledge along with textbook knowledge to be incorporated into the classroom, without demanding that content and knowledge be inserted into previously-established Western science frameworks. Consultation with local Elders is recommended for such an project of integration. The article also describes current initiatives which are already integrating Aboriginal perspectives into their curricula and which are researching ways – along with industry partners – that would encourage Aboriginals to pursue further undergraduate and graduate education in scientific fields.

[Martin, B](http://www.uow.edu.au/arts/sts/bmartin/pubs/93sthv.html) (1993). "The Critique of Science Becomes Academic." Published in *Science, Technology, & Human Values*, Vol. 18, No. 2, Spring 1993, pp. 247-259. - Accessed on February 22, 2009 at : <http://www.uow.edu.au/arts/sts/bmartin/pubs/93sthv.html>

[STS_History, action_research]

Martin traces the major trends in the research of the social critique of science from the 1960s to the writing of the article. Primarily he questions the increasing disconnect between the field and the subjects it studies especially the depoliticization and dematerialization of its concerns. The piece touches key debates and seminal works. He also provides concrete recommendations towards reconnecting the academy with the field.

[annotated by fms]

Martin, Emily. (1987) *The Woman in the Body: A Cultural Analysis of Reproduction*. Boston: Beacon Press. Martin discusses women's bodies by using the metaphor of the machine. The machine, she claims, produces culture's perception of normalcy with its systematic mechanisms. A machine runs regularly; women, she claims, do not. Thus, she claims that like other mechanisms of the body, such as the heartbeat, women's body and their impossibility to attain normalcy, should be alluded more to a chaos model than to a machine. In doing so, unattainable standards for women will be eradicated.

Mody & Kaiser, Scientific Training and the Creation of Scientific Knowledge

The first question Mody & Kaiser ask: why scientific training, and how should it proceed? The authors describe various aspects of the culture of science -- modes of working, means of communication, and the "moral economies" (values or norms of the field) -- that are and are not included in scientific training, as well as the power structure imbedded in and transferred by that training.

[pad]

This comprehensive handbook attempts to summarize the state of gender studies not only by examining the crucial research of the past decade, but by encouraging thinking about how the questions central to studying gender have themselves changed. Building on the work started by the contributors to this volume's predecessor, (*Analyzing Gender*, Sage 1987), editors Myra Marx Ferree, Judith Lorber, and Beth B. Hess reflect on the advances of gender scholarship during the past decade with its emphasis on all levels of social structure from the most macro to the most individual. *Revisioning Gender* is a step, albeit a tentative one, toward constructing a new analytical approach for the social sciences, one that calls into question disciplinary boundaries and the specific agendas that may be entailed within them. The editors, and the contributors to this important volume, illustrate how the use of gender by scholars in various and overlapping fields of study has helped alter concepts and research designs. The goal of this volume is to present, and encourage, the debates that advance the study of social science.

Morning, Ann. 2008. "Reconstructing Race in Science and Society: Biology Textbooks, 1952-2002." *American Journal of Sociology* 114:S106-S137.

This article bridges the gap between basic scientific research and popular understandings of science. While Fausto-Sterling examines unfounded assumptions in basic science research, Morning takes a look at how science is presented to the public through her study of high school biology textbooks. In this study she conducts a content analysis of the mention of race in biology textbooks during the years 1952 to 2002. She finds that while there was a decline in the mention of race from the 1950s to 1990s, there has been a recent increase since the 1990s. Unlike earlier discussions of race, however, recent text books discuss race almost entirely in terms of genetics. This article is a useful piece for thinking about the ways that genetics serves as a vehicle for justifying discussions of biological race. This article provides a unique lens into analyzing scientific knowledge that is disseminated to the public. The use of genetic explanations for racial difference permeates popular explanations of science as well as formal scientific knowledge. How significant are the messages about race that students learn through their biology textbooks?

Oldenziel: Man the Maker, Woman the Consumer: The Consumption Junction Revisited [pad]

The author provides some historical context for the perception of women as consumers of science, engineering, and technology rather than agents of invention and production themselves. Rather than debunking the female-consumer perception, Oldenziel makes the case for redefining the boundaries between production and consumption, pointing out that women as informed and activist consumers who have influenced the production of useful and robust technologies. She suggests that Ruth Schwartz Cowan's 1987 thesis* -- that consumers should be considered imbedded in any analysis of the development of new technologies -- should be applied to analysis of women's roles in the production of science and technology.

- see "The Consumption Junction: A Proposal for Research Strategies in the Sociology of Technology," in: *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Cambridge: MIT Press. accessed February 20 from <http://books.google.com/books?id=SUCtOwms7TEC>>

Okie, Susan. "Crack Babies: The Epidemic That Wasn't." New York Times. January 28, 2009.
http://www.nytimes.com/2009/01/27/health/27coca.html?_r=1&scp=1&sq=crack%20babies&st=cse

-This article talks about new research that largely disproves the myth of the "crack baby" that emerged in the 1980s and 1990s. New research suggests that doing prenatal cocaine exposure does about as much damage as prenatal exposure to tobacco, and less damage than exposure to alcohol, to the fetus. It's particularly interesting because Okie pretty explicitly critiques the morally loaded debates the encircled the idea of the "crack baby" in the 1980s and 1990s.

-A little background: This mythology predicted that "crack babies"—children born addicted to cocaine because their (black, poor, urban, "welfare queen") mothers were abusing the drug during pregnancy—would be so developmentally altered by the drug that they would grow up to be the anti-social drug dealers, gangsters, murderers and rapists of the future. These babies were particularly terrifying because, so biologically altered, the mythology goes, they would have no hope for recovery and would become the absent (because imprisoned) black men (it's important that these babies were largely gendered male) of the 2000s. This is an obvious case of the intersection of science and politics and normative morality.

-Particularly interesting to my inquiries because this article purports to un-do some pretty major stereotypes about black women/families through new scientific data. Some of the science really seems to do this! But the writing also does quite a lot of reinscribing of these tropes (for example, the article emphasizes the "programs," not the self-determination of formerly addicted mothers, as saviors of children born addicted to cocaine).

-Also deals in the nature/nurture debates (is it exposure in the womb, or environment in which one grows up that determines a child's development?)
(EAO)

Ortner, Sherry B. (1974). Is Female to Male as Nature is to Culture? In M. Z. Rosaldo and L. Lamphere (eds) *Woman, Culture and Society*. Stanford, CA: Stanford University Press, pp. 68-87

In one her most seminal works, Ortner poses the title question as a lead-in to the claim that females were oppressed because of their roles as child bearers and caretakers. As such, men were free to go out and create culture, thus controlling the production and dissemination of all knowledge. Essentially, Ortner claims that women's initial oppressions begins with the constraints of her physical body and that, like de Beauvoir said, ".... the woman is adapted to the needs of the egg rather than to her own requirements". This has not only explained why culture is often exalted above nature, but also why women have not had an integral role in its production.

Parkinson, S. (2004). Corporate Influence on Science and Technology: Speech. Retrieved on February 2, 2009 from <http://www.sgr.org.uk/SciencePolicy/SpeechGreenParty004.htm>
[scientific_ethics] [industrial_influences]

This link provides the reader with a transcription of Dr. Stuart Parkinson's speech given at the Green Party Spring Conference on March 13, 2004. Parkinson focused on industrial influences within science and technology. These corporate agendas often promote economic achievement over environment, public health and social responsibility. Dr. Parkinson describes ten methods large corporations use to influence science and technology, which include funding university research and privately funded in house research. He continues to address how industrial influences affect science and technology, looking specifically at both conscious and unconscious biases woven within the fabric of corporate funded research. This relates directly to the case presented by [Haraway](#), specifically when she questions, "What gets to count as nature [or in this case science and technology] for whom and when? And how much it costs to produce nature at a particular point in history, for a particular group of people." Additionally, the transcription of this speech helps us link science and culture by examining the influence of capitalism (outside social context) within the realm of science, which many assume is completely objective. (HER)

Preves, Sharon E. (2000). *Intersex and Identity: The Contested Self*. New Brunswick, New Jersey: Rutgers University Press

While Preves work focuses on the contentious issue of intersexuality and how it should be treated, she was also one of the first to speak with intersexed individuals to get their perspective, including how they cope with their conditions and how they perceive their own identities, often times in contrast to medical diagnoses. This book offers a rare glimpse into the world of intersex by the individuals who live it. In sharing intersex voices, Preves challenges, like so many others, the restrictive binary gender categories we live by.

Reardon, Jennifer (2004) "Decoding Race and Human Difference in a Genomic Age" Differences 15:3 pp38-65.

Reardon looks at how scientific research is used within a context of social constructions and challenges the ascertain that science is a simple "reflection of nature." Specifically she looks at the use of genomic research and concepts of race. She then traces the interaction between "truth" and "ideology" regarding race and science. Even the statements within population science that assert that race is meaningless is part of the social constructs of science and society. She argues that the resurgence of a biological basis to race can be traced in part back to various UNESCO statements on race. The first of these statements urged to construct race was a result of geographical isolation. That is should be based on shared physical, not mental characteristics and interpreted at the population level. Additionally race should not be hierarchically ordered and understood as a dynamic aspect. The second statement added that differences may occur between human groups, but that these differences may be less than differences between individuals within a particular group. The Human Genome Project raised new questions regarding race. Long believed relationships between phenotype and genotype were beginning to show greater gene similarity than the surface differences implied. At the same time, a push to reconstruct racial definitions based on gene differences rather than physical characteristics was growing. Yet this type of reworking of racial understanding creates confusion as it butts against long-standing social constructions of race.

[annotated by FMS]

Reardon, Jenny (2005). *Race to the Finish*. Princeton, NJ: Princeton University Press. 237 pp.

In this balanced, historical study of the Human Genome Diversity Project, Jenny Reardon discusses not only the history and important players involved with the controversial genome project but also explains why this purportedly benign and charitable project raised such global alarms, especially within Indigenous communities. Research methods, ethical and religious values, knowledge systems, histories of peoples, and whole world-views clash in this book and readers are left wondering how the scientists involved in the project could have overlooked such obvious and meaningful differences across cultures. The book then, would be worthwhile for any scientist involved or looking to be involved with Indigenous communities or for any activist and advocate of Indigenous peoples. Six stars out of Five!

Roberts, D. (1997). *Killing the black body: Race, reproduction and the meaning of liberty*. New York: Vintage

Dorothy Roberts examines the various ways black women's bodies and reproductive rights have been controlled and oppressed by social and governmental institutions; including science and technology. Her thorough book explores the regulation of black women's bodies from the era of slavery to modern reproductive technology. Roberts uses cases of coerced sterilization to illustrate the very different roles science and reproductive technology played in the lives of black and white women. While middle class white women were gaining more reproductive liberties, women of color and poor women were being sterilized in an attempt to limit "undesirable populations." Roberts also address the ways in which the 1990s birth control Norplant was targeted to low income women. She found that Norplant engaged in a 2.8 million dollar campaign to distribute the product to low income women. In addition, many states offered low income women financial bonuses for having the implant. The majority of these women were never told of the side effects, which included cysts, swelling of the ovaries, hair loss and depression. While this is only brief look at two of the issues covered in Robert's text, they are important in understanding how science and technology can simultaneously benefit one population and oppress another. (HER)

Roche, RA and Annas, GJ (2007). "New Genetic Privacy Concerns," Genewatch, 20(1). Accessed on March 28, 2009 at <http://www.gene-watch.org/genewatch/articles/20-1RocheAnnas.html>

Examines the issues of establishing a US biobank that would contain a wealth of genetic information. The potential establishment of such a bank raises questions of both ownership and privacy. Individuals may not be fully aware of the full potential worth or use of DNA samples they may provide to such a bank. The use of such material reaches beyond the individual to members of their extended family as well. It is unclear and court cases suggest that ownership may be transferred to researchers. The expansion of commercial testing facilities have complicated these issues of privacy and ownership.

[annotated by FMS]

[Rose, H](#) (1994). *Love, Power and Knowledge: Towards a Feminist Transformation of the Science*. Bloomington, IN: Indiana University Press.
[women_knowledge, women_in_science, feminist_perspectives]

Rose begins with the history of the science and technology studies field with a strong nod to the radical science movement. Based in theories of feminist realism that argue that “good science” is possible, she also acknowledges the contributions of her postmodern feminist colleagues who argue for subjective and always contestable. Rose explores the need to reconnect rationality to responsibility, love and caring and to place knowledge within a social context that is multiple and complex. Rose explores the very real constraints faced by female scientists and argues that this exclusion has led to a disembodied science, disconnected from experience and practice. The book examines real women confronting the real challenges of creating and knowing science informed by their lives.

[annotated by FMS]

Rose, Nikolas (2001). "The Politics of Life Itself." *Theory, Culture & Society* 18(6):1-30. <http://tcs.sagepub.com/cgi/content/abstract/18/6/1>

Rose examines the place of science in society, and the evolution of personal biology to become another aspect of human politics. He is especially interested in the "contemporary resurgence of biological and genetic accounts of human capacities and incapacities," i.e., genomics and disease diagnosis. This article (precursor to his book of the same name published in 2006) describes three aspects of this new biopolitics: risk politics, molecular politics, and ethopolitics. This summary is focused on the article as it is relevant to [GRST09Case 3](#), examining the context of genome analysis.

- Biopolitics as risk politics. When a person has their genome analyzed, they are entering into the world of risk politics, where their results are used to assess their risk as part of a group as well as riskiness as an individual. This information is applied for the purposes of managing the risk via a range of interventions. This "risk profiling" is used by insurance companies, medical researchers, and the expanded "pastoral power" of associations, committees, and government agencies to make decisions for the individual, their community, and their larger group, belying their "espous[al] of the ethical principles of informed consent, autonomy, voluntary action, and choice, and non-directiveness." Overshadowing and intrusive monitoring and surveillance is one outcome of testing, a sign of risk politics in action.
- Biopolitics as molecular politics. Our contemporary vision of our body is different from the 19th-century perspective: In the 1800s, life was the body as a whole, operating in the context of culture. In the 1900s, life became molecular, operating in the context of the human genome. This shift has led to the commodification of life, with genes, genomes, and genetically modified organisms in the control of the funders and corporations who hold the keys to problem-solving and advances in this arena.
- Biopolitics as ethopolitics. Finally, the author describes the confluence of health and beauty with success and happiness, where the self is directly equal to the body, and "fitness" describes both emotional and physical aspects of a person.

Rose closes with a call for attention to the modern aspects of the politics of life, where individuals are assigned "biological citizenship," and "the biological lives of individual human beings are recurrently subject to judgments of worth," event by the individuals themselves.

Margaret Rossiter's landmark volume draws back the curtain on the role(s) of women in science leading up to WWII. The thorough study examines women's entry into universities and treatment at the hands of male scientists, careers in government and academia, and the impact of the feminist movement on the opportunities open to women.

Some take-home messages from this volume include:

- there were far more women scientists in this period than most people realize.
- women did well just to gain employment as scientists at all, let alone garner recognition for their accomplishments.
- women scientists during this period generally chose one of two tacks for making progress in their chosen field: going along to get along, or making noise and facing marginalization.

See [Rossiter 1995](#) for an overview of Volume 2.

Margaret Rossiter's second volume on the history of women in science in America (see [Rossiter 1982](#) for an overview of Volume 1) is subtitled "Before Affirmative Action," describing the period through 1972. Like Volume 1, her scholarship is impressive, and the vast amount of research behind this book is evident.

Rossiter describes the conditions that led to a decline in the number of women employed as scientists after WWII, an otherwise golden period for science and technology:

- Displacement by returning veterans.
- New antinepotism laws and tenure practices in universities.
- Attempts to convert home economics to "more professional" (i.e., male-dominated) status.
- "Upgrading" teachers' colleges and other "normal schools" to university status.

Royte, Elizabeth (2008). The Caged Bird Speaks. Retrieved on February 4, 2009 from http://www.nytimes.com/2008/11/09/books/review/Royte-t.html?_r=1&scp=1&sq=%22The%20Caged%20Bird%20Speaks%22&st=cse

Royte reviews Irene Pepperberg's memoir about Alex, the African Grey Parrot, and their work together on nonhuman communication. Royte comments on Pepperberg's need to prove herself to the scientific community, implying that Pepperberg's gender as well as her choice of scientific study generated skepticism about her findings and suggests that there was something "tragic" about Alex's life as a study subject. The article draws attention to the distinction between objective scientific research-- and writing -- and the emotional attachment between woman and bird which Pepperberg is finally able to express in the form of this memoir. The article also subtly challenges the ethics of science's insistence on objectifying its object of study. (AV)

Rubin, Gayle. (1975). *The Traffic in Women: Notes on the "Political Economy" of Sex in Feminist Theory: A Reader*, 2005,

In this essay, Rubin attempts to pinpoint the locus of female oppression, especially those social mechanisms which are responsible for it. She suggested that there was a "sex/gender system" at work which she defines as "the set of arrangements by which a society transforms biological sexuality into products of human activity, and in which these transformed sexual needs are satisfied". In doing so, Rubin leverages the work of previous theorists, including Marx, Levi-Strauss (exchange of women) to show how women have been subverted within various frameworks, but also reinterprets their theories to more fully explain the female situation.

A Study on the Status of Women Faculty In Science at MIT (1999). Retrieved on February 9, 2009 from <http://web.mit.edu/fnl/women/women.html#The%20Study> [women_in_academia]

This 1999 study examines how the Committee on Women Faculty came to be established in the School of Science at MIT. The initial unofficial study, which was reported only ten years ago, found that women in junior faculty position were optimistic about their futures and careers at MIT. Although, many worried about how they would combine their personal and professional lives, most junior faculty members were content in their positions. In contrast, tenured women felt excluded and marginalized. This loss of a positive outlook increased as women progressed in their careers. Tenured women felt marginalized by differences in salary, resources and awards compared to their male colleagues. Additionally, in 1994, the number of women in faculty positions in the School of Science at MIT (8%) had remained static for a period of at least ten years. The informal study led to the creation of the Committee on Women Faculty in the School of Science. This committee began taking immediate action to create a collaboration between faculty and members of the administration to address the needs of women in the School of Science at MIT and serve as a model for other marginalized populations within the university. (HER)

Shostak, Sara, Conrad, Peter, and Horowitz, Allan. 2008. "Sequencing and Its Consequences: Path Dependence and the Relationships between Genetics and Medicalization." *American Journal of Sociology* 114: S287-S316.

Although this article does not directly address racial difference or assumptions about race, it is directed toward concerns about how genetic information will be used. This article questions an assumption made by social science studies of genetics. The assumption is that findings for genetic markers are accompanied by increased control over those conditions by the medical profession (medicalization). Sociologists who study medicalization tend to criticize the way that biomedicine increasing controls the treatment and explanation of conditions, such as alcoholism and normal sadness, that may also have social causes. (This is a strikingly less expansive understanding of social conditions than Fausto-Sterling uses). Authors argue that the impact of genetic findings on medicalization depend on the medical condition under consideration. They use case studies of three conditions for which genetic markers have been identified: depression, homosexuality, and sensitivity to chemical exposure. They argue that for each condition, the use of genetic findings have had a different impact depending on the role of medical professionals, patient groups, and where the condition was in the process of medicalization. This article is useful because it provides one model for considering the impact of genetic findings on the trajectory of conditions, how conditions are understood, and the ways that people with those conditions are treated. I include this article because it speaks to the debate on genetics within sociology. This article is helpful in contextualizing the use of genetic information within the broader context of medicine and social advocacy. New genetic knowledge does not simply create new understandings of a condition. Rather genetic knowledge is worked into pre-existing knowledge about medical or social conditions.

Teman, Emily. The Medicalization of "Nature" in the "Artificial Body": Surrogate Motherhood in Israel. *Medical Anthropology Quarterly*, Volume 17, Issue 1

Springboarding off the understanding of motherhood as connected to nature, Teman looks at the medicalization of the mother category in Israel, using surrogacy as her locus of investigation. She examines the personal agency of surrogate mothers, as well as redefines the surrogate body as artificial and locates nature in the commissioning mother's womb. By doing so, Teman showcases how surrogacy in Israel is exalted as a means for women to achieve normal and natural reproduction.

Valiverronen, Esa (2001). "Popularisers, Interpreters, Advocates, Managers, and Critics: Framing Science and Scientists in the Media." pp 39-47 In: *Nordicom Review* 2/2001 (Ulla Carlsson, Ed.). 102pp Accessed 3/17/2009 at http://www.nordicom.gu.se/?portal=publ&main=info_publ2.php&ex=34&

Valiverronen (2001) examined media coverage around a debate regarding sustainable forestry practices in Finland. He identified seven roles for scientists:

Roles Functions

Popularizer Presenting new research results

Interpreter Interpreting new phenomena and problems

Advisor/Advocate Making and commenting on policy claims

Promoter Raising funds or promoting research

Manager Rendering account for use of public funds

Critic Commenting on research results

In a broad sense, scientists who serve in any of these roles could be called scientist-activists. Each role requires the scientist to step out of their narrow research-oriented frame and the comfort of the traditional culture of science to engage in greater society. However, Valiverronen's functional categories – developed on the basis of a single-issue case study – restrict the range of scientist-activism. Many scientists have stepped beyond specific scientific issues to influence broader policy and issue arenas, for example social and environmental justice, peace work, and politics.

The authors generate knowledge claims based on a review of the literature on genomic and phenomic differences between humans and non-human hominids (NHH, esp. chimpanzees), and essentially ask the question, can the phenotypic differences be explained by genetic differences?

After a survey of the (generally inconclusive) scientific evidence of scarce genetic differences between humans and NHH, the authors make a case for influence of culture and behavior on the human phenome. They argue that Baldwinian evolution (where learned behaviors become hard-wired in the genes over time) and Wallace's conundrum (regarding the problem of adaptations that only become advantageous under future conditions) should be considered as we try to link genome-phenome information.

One more note -- twice in the article, the authors lament a "recent" National Institutes of Health ruling that will end captive breeding of NHH. They contest the decision on the basis that "studies that can be ethically done in humans can also be done in other hominids, of course with appropriate mechanisms for protection of individual rights and dignity." This more-than-an-aside points to another potential area of research(!)

Wailoo, Keith. 1997a. "'Chlorosis' remembered: Disease and the Moral Management of American Women." in *Drawing blood: technology and disease identity in twentieth-century America*. Baltimore: Johns Hopkins University Press.

In this chapter, Wailoo examines the relationship between technology and disease and the ways that technology can change understandings of disease. By examining chlorosis, w women's disease characterized by "poor appetite, gastric disturbance, and faint green pallor" (17) between 1880 and 1910. Explanations of chlorosis changed during this period. Initially it was thought to result for late marriage and later from overwork or being over educated. At this time, Wailoo argues, "institutionalized moral management" was the realm of the doctor, who might tell a patient when and what to eat. New technologies in hematology (hemoglobinometers and hemacytometers) made it possible to replace chlorosis with "more precise categories of blood diseases". There continued to be debates among doctors about whether what was seen in the blood with these instruments were symptoms of the disease or the disease itself. This tension also involved questions about the role of the doctor, as "moral guide" or "clinical manager". Similarly debates about the cause of the disappearance of chlorosis, some attributing it to the end of the Victorian society (which involved hardship and constraints for women) while others attributed it to new technology.

In the 1940s, drug companies became more influential in influencing medicine and iron pills, which were widely prescribed, replaced the diagnostic tools used previously. Wailoo states, "iron deficiency became characterized as an elemental fact of womanhood" (41). Medical writings continue to portray women as naturally limited, particularly after puberty. Wailoo argues that "the identify of chlorosis had also become closely bound to the attitudes of the modern hematologist and his use of iron to paint a deterministic, but culturally compelling, portrait of physiological womanhood" (43). He describes this as an interaction between "technologies, gender ideals, and a changing culture of medicine" (44). The use of one technology over another, he argues, is a result of this interaction between "broader assumptions about professional identity, patients' identity, and the nature and location of disease" (45).

Wailoo, Keith. 1997b. "Detecting 'Negro Blood': Black and White Identities and the Reconstruction of Sickle Cell Anemia." Pp. 134-161 in *Drawing Blood: Technology and Disease Identify in Twentieth-Century America*. Baltimore: Johns Hopkins University Press.

This chapter examines the particular configuration of new technologies and social forces that shaped the identity of the “disease of ‘Negro blood’ (today called sickle cell anemia). The concept of blood, Wailoo argues served a similar function that genes serve today in that it captured ideas about heredity and kinship. There are two identities for sickle cell anemia that arose in the twentieth century: the Mendelian thesis (pre-WWII) and the molecular thesis (post-WWII). These two theories are closely linked to the technologies used to diagnose the disease as well as the historical time period of the diagnosis. The diagnosis using Emmel’s technique captured carriers of the trait as well as those with the disease without distinguishing between the two. Diagnosis of the disease occurred independently of the clinical profile, whether patient showed symptoms of the disease. This understanding of the inheritability of sickle cell anemia was used to encourage fears about miscegenation and concerns about the productivity of workers.

Wailoo, Keith. 2001. *Dying in the City of the Blues: sickle cell anemia and the politics of race and health*. Chapel Hill: University of North Carolina Press.

In this book, Wailoo traces the history of sickle cell anemia through the scientists that studied the condition, political and social groups that spoke publicly about the disease, and the flow of medical research funding to study the illness. This historical analysis seeks to explain how sickle cell anemia went from being an invisible to highly politicized disease. As Wailoo notes in the introduction, this study is unique in that it focuses not on the medicine or “features” of a disease, but rather on the patient experience of disease. Wailoo places medical and “scientific” changes in understandings of sickle cell anemia within the economic, political, and racial climate of the 19th and 20th centuries. Wailoo’s site of historical analysis is Memphis, Tennessee, the location of the first sickle cell clinic, using primarily accounts from scientists, politicians, activists, and others that lived or frequented through Memphis. An important concept in this book is the “comodification” of disease. Wailoo uses the term commodity to demonstrate how disease is part of an exchange relationship “where disease concept and illness experience acquired value and could leverage resources, money, or social concessions” (9) . Part of this concept involves the value of the sick body for the economy as in the case of African Americans under slavery and for the instruction of medicine in the 19th and increasingly 20th century. He argues that at different points in history and for different actors, sickle cell anemia had varying exchange value. This concept of comodification allows us to think about the ways that health care institutions and clinical research are implicated in broader economic and political systems. This book is an excellent site to begin examining the contingency of disease.

Washington, H. (2006). *Medical Apartheid*. New York: Harlem Moon.
[scientific_racism]

Harriet Washington's book *Medical Apartheid* explores the intersection between race, social justice and medical/scientific studies. Washington begins by exploring the Tuskegee Syphilis Study, a 40 year long public health project that studied but did not treat Black men with syphilis. Washington argues that while this study might be the most infamous it was hardly the first or even most inhumane abuse of Black men and women by the medical community. She cites other examples such as the testing of small pox vaccines on Blacks, the use of Black prisoners as test subjects, and the current global exploitation of Black bodies in Africa as test subject for pharmaceutical companies. Washington also examines the use of Black men and women in the development of genetic science. She states that federal and state forensic DNA databases contain a disproportionate number of samples from African Americans. Since genetic samples carry information about a subject's health making blacks particularly vulnerable to the exposure of sensitive medical information. Washington concludes that while the experimentation on Black bodies is less invasive, the exploitation of Black men and women still continues today in the name of science and medical development. [HER]

WHO is the directing and coordinating authority for health within the United Nations system. It is responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries and monitoring and assessing health trends. In the 21st century, health is a shared responsibility, involving equitable access to essential care and collective defence against transnational threats.

Welborn, V & Kanar, B (2000) Building Science Literacy. Accessed on February 4, 2008 at <http://www.library.ucsb.edu/istl/00-winter/article2.html>

This piece provides an overview of literature related to science literacy as a guide in building a solid scientific resource for a science-based website. Working from concepts of information literacy discussed by Shapiro and Hughes (1996), the article proposes that science literacy should include these dimensions with respect to science information - tool literacy, resource literacy, social-structural literacy, research literacy, publishing literacy, emerging technology literacy, and critical literacy. The author then focuses specifically on the first three dimensions (tool, resource and social-structural literacy) to show how a specific web resource for a specific science topic might be assessed.

[annotated by FMS]

Wertheim, Margaret. "The Way of Logic." *New Scientist* 148 (December 2, 1995) 38-41.

This article is a brief summary of the research thrust of Helen Verran, an Australian researcher of the Yolgnu people of northern Australia. Verran has also been inducted into the Yolgnu tribe and charged with sharing their system of knowledge with the non-Aboriginal world. According to this article, Verran's research demonstrates not just the epistemological framework of the Yolgnu but how that framework is also consistently logical, as logical as any Western scientific view. To demonstrate this, Verran compares the number system with the Yolgnu kinship system, explaining how the kinship system can be used to explain relationships of the natural world just like mathematics can. The purpose Verran's research is to see "the world through different eyes, she says, [so that she] can help [non-Yolgnu] see more clearly how [their] own science was constructed.

Winner, L. (1986). Do artifacts have politics? *The whale and the reactor: A search for limits in an age of high technology*. Chicago: University of Chicago Press, 19-39. Retrieved February 20, 2009 from <http://74.125.45.132/search?q=cache:pLV9pfQyzuAJ:zaphod.mindlab.umd.edu/docSeminar/pdfs/Winner.pdf+do+artifacts+have+politics&cd=1&hl=en&ct=clnk&gl=us>
[technical_politics]

This chapter from Winner's 1986 book, *The Whale and the Reactor: A Search for Limits in an Age of High Technology*, questions if technical objects embody political properties. Winner suggests that, without mystifying human artifacts, it is necessary to recognize the ways in which technology both shape social and economic agendas and at the same time are shaped by these same forces.

To examine this issue, Winner begins by looking at the design of bridges in Long Island, New York. Winner found the design of these bridges produced a very political social effect; the height of the overpasses made public transit on these roads nearly impossible. Therefore, racial minorities and low-income populations, who typically used public transportation, were kept off the roads.

Winner cites the atom bomb as the most obvious example of a human artifact with an embodied political agenda. He describes the bomb as authoritarian and independent. He concludes that the social structures that maintain this political technology must find ways to manage it since the bomb has a character independent of its rulers.

It is no surprise that Winner concludes that some technical systems are intertwined in conditions of politics. Furthermore, he argues, based on the examples presented in the chapter, that a number of technical artifacts embody political properties that shape the social and economic systems of an era.
[HER]

Zimmermann, B. (2005). Technology is culture: two paradigms. *Leonardo Music Journal*, 15, 53-57. [musical_technology, technology_and_culture]

Zimmermann's study of musical technology in China between 2001 and 2004 is an excellent example of the infusion of science, culture and the arts. Through this article, the reader can see the ways in which science, technology, nation and even gender are always intersecting with the creation of popular and art music. While the author focuses his study on accumulation of decisions and struggles against difference, Zimmermann's article also proposes key themes in understanding the strong connection between the arts and sciences. (HER)