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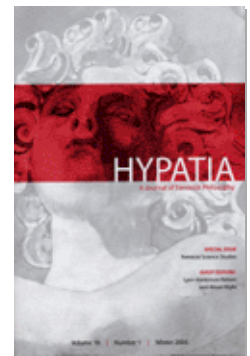
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Feminist Intersections in Science: Race, Gender and Sexuality Through the Microscope

LISA H. WEASEL

This paper investigates the mutual embeddedness of “nature” and “culture,” as well as the intersections between race, gender, and sexuality, in the story of the HeLa cell line as viewed by a practicing feminist scientist. It provides a feminist analysis of the scientific discourse surrounding the HeLa cell line, and explores how feminist theories of science can provide a constructive and critical lens through which laboratory scientists can view their work.

To date, one of the major projects of feminist science studies has been the critique of how assumptions about gender, race, and class become embedded in science through the inherent subjectivity of the human observer. Science is a social activity, and therefore it will bear the traces of human values, or so the story goes. Much important work has been done showing how this has been precisely the case: Bonnie Spanier's (1995) work on how metaphors of sex and gender biases enter into biological descriptions of molecules, genetics, cells, and subcellular organelles, demonstrating how cultural beliefs shape not only the content but the models and approaches taken by science; Emily Martin's (1987) analysis of the language surrounding birth and menstruation; Carol Cohn's (1987) enlightening essay on “How we learned to pat the bomb” as a sexy, unthreatening friend.

Yet while such work is important, inherent in this approach is a certain directionality, a sense that nature or our technological creations exist “out there,” and through the human activity of science somehow take on traces of culture. Recently, feminist science studies has moved in the direction of

embracing a more complex notion of how human values and the material world collide in science, represented by Donna Haraway's term "naturecultures" (2000, 105). This fusion of the terms "nature" and "culture" represents the complex intertwining, the inherent embeddedness, of the social and the material in the making of science that feminists need to take into account. Bringing these categories together in new ways, indeed breaking down some of the barriers between them as conventionally understood, can help to recast the divide that has developed in the past between practicing scientists and feminist critics (see Martin 1996). Within feminist science studies the time is particularly ripe for cultivating this new approach: more practicing scientists are engaging feminism in their work, and some science departments and programs are slowly expanding their vision to include attention to ways in which social and cultural forces are complicit in their studies.

Just as feminists have sometimes viewed nature and culture as separate, albeit related, entities in analyses of science, so too have we all too often failed to acknowledge the co-construction of categories such as gender, race, class, and sexuality within the tangled web of science. As Patricia Hill Collins says in her chapter "Moving beyond gender: Intersectionality and scientific knowledge": "Because it generally ignores how gender mutually constructs and is constructed by race, class, ethnicity, and other major systems of domination, feminist analysis of science may be similarly unable to recognize the embeddedness of its own assumptions" (1999, 263). Either ignoring altogether or separating out categories such as race, class, ethnicity, and gender for individual analysis can lead to skewed perspectives and fails to acknowledge the important ways in which social categories not only intersect but overlay one another. As feminist scholars of science look beyond the boundaries and divides that have shaped much of science and often our own work, we need to be attentive to the co-construction of categories that exists within these "naturecultures."

My own interest in feminist science studies grew out of my experiences as a practicing laboratory scientist and my growing awareness of the ways in which social categories such as race, gender, class, and sexuality were subtly infused into the work that I was involved in, yet I lacked a theoretical framework to critique or analyze their presence. Feminist theories of science, in particular Sandra Harding's concept of "strong objectivity," (1991) and Donna Haraway's wrestling with the concepts of "situated knowledge" and "the privilege of partial perspective" (1991) were particularly influential in this regard, as they seemed to offer a starting point for bringing critical feminist perspectives into the actual practice of science. I, like Haraway, "wanted a way to go beyond showing bias in science (that proved too easy anyhow) and beyond separating the good scientific sheep from the bad goats of bias and misuse" (Haraway 1991, 186). Working in a laboratory surrounded by peers, yet seemingly alone in my feminist outlook on our subjects, the abstract cells and genes and strands of DNA that made up my research, Haraway's emphasis on the "situatedness" of knowledge (1991),

and Harding's emphasis on bringing feminist perspectives to bear on science from within (1991), seemed especially encouraging. As Harding explains strong objectivity, "If the goal is to make available for critical scrutiny all the evidence marshaled for or against a scientific hypothesis, then this evidence too requires critical examination *within* scientific research processes. In other words, we can think of strong objectivity as extending the notion of scientific research to include systematic examination of such powerful background beliefs" (149).

What better place to begin a practice of strong objectivity than from within the confines of the laboratory itself? Similarly, Haraway's emphasis that "above all, rational knowledge does not pretend to disengagement: to be from everywhere and so nowhere. . . . rational knowledge is a process of ongoing critical interpretation among 'fields' of interpreters and decoders" (1991, 196) seemed to demand of me ongoing engagement in my field of research, yet a commitment to consistent critical interpretation and to my "split" position as a scientist and a feminist.¹

In this paper, my main goals will be to look at both the mutual embeddedness of "nature" and "culture" in a specific story of science and the mutual embeddedness of race, gender, and sexuality as they intersect in and with science. This paper represents an example, a case study perhaps, of what a critical feminist practice of science looks like from within the laboratory, from within the scientific research process, through a commitment to an ongoing critical interpretation in my split and contradictory role as both researcher and feminist critic. The specific scientific story expounded upon here highlights the intersection of race, gender, class, and sexuality as they have been viewed through the lens of biomedical science, indeed through my own eyes as a practicing laboratory researcher.

The first time I saw a HeLa cell² was some fifteen years ago, back in the 1980s. Newly inducted into an immunology research lab, I was embarking on my training as a cell and molecular biologist. Our laboratory was studying molecular pathways involved in immunological response, a compelling quest at the onset of the AIDS epidemic and one that remains pertinent, and at least partly unanswered, today. HeLa was not the main target of our research but was instead a laboratory workhorse, a human cancer cell line that although reputedly unreliable due to its long years in culture and subsequent accumulated mutations nonetheless grew fast and well and could be used as control for the "real" questions that we were asking.³ HeLa was an adherent cell line, which meant that it grew flat and stuck to the base of a plate rather than floating aimlessly in broth like some of the other suspension cell cultures that sat next to it on the incubator shelves, with names like Raji and RJ 2.2.5 derived from other patient lines we were studying immunologically.

Because our lab was large and well-funded, tissue culture cells were kept in a room of their own, specially designed for that purpose. The tissue culture room was one that needed to be kept meticulously clean, neat, and orderly, not only to

avoid contamination of the cell lines with pathogens but also to avoid mix-ups between the different cell lines themselves, which were kept carefully segregated in their own flasks and plates. After all, to the naked eye, indeed even through the lens of a light microscope, all the cell lines looked practically identical, appearing as soups of miniature transparent balloons against a background of broth, and thus were easily confused with one another. By day, our tissue culture room was watched over by two vigilant female technicians, one the wife of a postdoctoral fellow in the lab, the other a woman who had recently emigrated from the former Soviet Union. By night, a soft purple glow from a germicidal lamp filled the room, providing a safe and antiseptic atmosphere slightly akin to a hospital nursery. Even without much feminist probing, it was obvious that this room exuded a highly gendered presence, particularly when compared to the lab benches of the predominantly male postdocs and graduate students in the lab, littered with fermenting flasks of bacteria, radioactive biohazards, and stacks of scribbled notebooks.

Yet as Collins's (1999) quote earlier in this article reminds us, gender as a category never exists isolated and alone, and gender was not the only social category thriving in that tissue culture room, I was to discover. In the same ways that the cells in their cultures could easily get intermixed and mingled, categories of gender, race, and sexuality were also intersecting beneath the surface of the "naturecultures" alive in our tissue culture room.

Several years later, in 1991, two articles that appeared in a scientific journal brought this intersection to full fruition. The first of these articles was entitled "HeLa, a New Microbial Species," (Van Valen and Maiorana 1991); the title of the other, which appeared in the same issue, was slightly less straightforward: "From Metazoan to Protist Via Competition Among Cell Lineages." (Strathmann 1991).⁴ The crux of these articles was the conjecture that the HeLa cell line, due to its many years growing in culture, had strayed far enough from its physiological and genetic connection⁵ to the human from whom it was derived to demand denotation as a new species. Indeed, as one of the authors stated, "Species originate in diverse ways. HeLa cells are the best known cultured cells of human origin, here we propose, in all seriousness, that they have become a separate species restricted to a particular environment" (Van Valen and Maiorana 1991, 71). The other paper focused its speciation argument on HeLa's ability to live outside the body, stating that "HeLa cells (from a carcinoma of a human cervix) have been notably aggressive in invading tissue cultures and have extended their biogeographic range from North America across oceans to other continents" (Strathmann 1991, 68). Certainly, HeLa cells had migrated, as research subjects grown in laboratory incubators, between continents, but they had migrated not of their own accord, as this reading might imply, but between and through the hands of researchers, exchanged frozen in glycerol tubes or ferried across town in plastic Falcon flasks. Moreover, the type of new

species that these authors proposed was not merely a subdesignation of membership within the genus *Homo*, moniker of all things human and closely related, but a dramatic regression, back to the world of simple protists, amongst the likes of slime molds and algae. Strathmann pronounced that “after more than 5×10^8 years of stasis as metazoans, a genetic change can produce a cell lineage of effective protists in one saltatory evolutionary step”⁶ (1991, 68). Leigh Van Valen and Virginia C. Maiorana gave four distinct reasons for the designation of HeLa cells as a new species outside the genus *Homo*: “First, their genotype is very different. . . . Second, they occupy an ecological niche extremely different from that of humans. . . . Third, they persist and expand well beyond the desires of the human cultivators of cells, they are the weeds of cell culture. Of course they can’t interbreed with humans . . .” (1991, 72).

Even if I hadn’t strayed from my own scientific path during this time to dabble in the dangerous territory of feminism, these words would still have struck me. The HeLa I knew was a cell line derived from a human cervical carcinoma—that much was common knowledge to any researcher working with it, even merely as a control. The route from human carcinoma to novel microbe was not one uniformly accepted in evolutionary biology, calling into question the researchers’ designation of HeLa cells within the kingdom *Protista*, which somehow implied that evolution could take place backwards, retroactively transforming a complex metazoan into a primitive protist. And that is where my curiosity would have started and ended, with the science and with nothing else, had I stuck to the conventional scientific path laid out before me.⁷

Yet during these intervening years, as my scientific training proceeded, my interest had gradually migrated towards feminist analyses of science, toward an understanding of my work as a scientist as a meeting and mingling of nature and culture, infused with all the intricacies of gender, race, class, and sexuality embedded within that world. This interest gave me a lens beyond the merely scientific through which to view this speciation debate. It was here that I found I could bring the theoretical discussions of Harding and Haraway into my work and use them to examine science critically and in dialogue with the many players and forces that I saw as shaping my subject.

At about the same time that I had been getting to know HeLa cells in the laboratory, a reporter by the name of Michael Gold had been busy writing a book on the origin of these prolific cells. His book, entitled *A Conspiracy of Cells: One Woman’s Immortal Legacy and the Medical Scandal it Caused*, (1986) was not of the genre that I would necessarily come across in my traditional scientific training, and in fact I found this book merely by fortuitous happenstance, perched precariously amongst the other newly acquired books on a public library bookshelf. The conspiracy of cells that Gold described was no less the history of the HeLa cell line, from its pernicious beginnings in the cervix of a woman named Henrietta Lacks in Baltimore in the 1950s, to its vigorous growth as the

first primary cell culture to survive indefinitely in culture, and to its wondrous takeover of cell cultures all over the world due to its great proliferation and the ensuing scientific chaos that resulted from a culture threatening, as some put it, to “take over the world” (*Science* 1974, 1268). This history in itself is interesting, but between the pages of this tale of cellular conspiracy, something else caught my eye. It was a photograph of Henrietta Lacks, standing proud in her pre-cancerous days. And the thing that struck me about the photos was that Henrietta Lacks was black.

The race of Ms. Lacks, the uninformed and unconsenting “donor” of cells that gave rise to the HeLa cell line, played into a genetic conception of race at the time that was scientifically unfounded yet powerfully used to claim a racial identity for these cells that had “taken over the world” (at least the world of tissue culture). This in itself is a powerful statement about how metaphors of proliferation and miscegenation enter into and intersect with categories of race and gender in microscopic discourse, and this has been recently explored by Hannah Landecker in her essay “Immortality In Vitro” (2000). Yet what is also troubling from this perspective is the way in which the evolutionary debate within science over these cells, now given a “race” of their own through their connection to the individual Henrietta Lacks, is itself mutated by the contextualization of the debate within a socially derived gendered racial framework. Once race, gender, and sexuality enter into the HeLa story, the debate over whether or not the HeLa cell line, growing in culture now for half a century, represents a new species cannot be separated from the historical evolutionary debate over the origin of human races and the intersection of race and gender with sexuality.

Taking place more than a century ago, these debates over the evolutionary origin of human races pitted so-called polygenists—those who believed that human races represented different biological species—against so-called monogenists, who backed a conception of a single human species, albeit divided into differing races, tracing its lineage back to Adam and Eve (Gould 1981). To the monogenists, different races might belong to a single species, but they represented different degrees of degeneration from the original Biblical prototypes (who were implicitly assumed to be white). The debate between polygenists and monogenists was overlaid with a sense of scientific nationalism, for it was Louis Agassiz, an immigrant himself who rose to become one of Harvard’s historic professors of biology, who most vociferously championed polygeny—the idea of human races, blacks in particular, consisting of separate, inferior species (see Gould 1996). These were merely theories, of course, as data was hard to come by in this debate, but they grasped hold and stuck fast in a world churning from colonization and the recent end of slavery in the United States.

It is this scientific history, long since disproved and dismantled by contemporary evolutionary theory but still very much alive behind the scenes (Herrnstein

and Murray 1996), combined with the story of Henrietta Lacks herself, that transforms the current debate over the speciation of the HeLa cell line into one from which race and gender cannot be extricated. For now, knowing this history (which incidentally many scientists may not), we must question what it means to propose that cells taken from the cervix of an African-American woman without her consent are now proposed to represent a separate species—and not one more highly evolved because of its ability to live under such a variety of conditions, to offer such an essential function in so many scientific experiments around the world, but a less advanced scientific species, placing a piece of what once was Henrietta, a mother of five alive and well in the kingdom “animalia,” suddenly now amongst the likes of algae, amoebae, and euglena in the kingdom protista. And if any question exists that gender is absent from this intersection with race, the proposal that the new species be named “Helacyton gartleri,” after Stanley Gartler, one of the white male researchers who brought the cells to prominence in the laboratory, should quickly dispel that notion. In fact, in their proposed description of this new species, the authors specifically state, “The gender, like that of cytos, is neuter”⁸ (Van Valen and Maiorana 1991).

But the debate over the speciation of the HeLa cell line is not the only place where gender and race intersect in this scientific saga. Scientists have been perennially interested in the biological basis for the HeLa cell line’s longevity and stamina to survive and spread *in vitro*. All metaphors and meanings aside (as if this could ever be so), what is it biologically about these cells that have “transformed” them into the stable culture that can be found in almost every university and research laboratory around the world? The answer to this question is thought to hold an understanding of the biological basis of cancer, and so it is seen to be of great importance and therefore careful scientific study.

The fact that the HeLa cell line was derived from a cervical carcinoma provided researchers with some clues. Many cases of cervical carcinoma can be linked to the presence of a particular strain of Human Papilloma Virus, HPV 18 (Thomas et al. 2001). Human papilloma virus is contracted sexually, and an extremely high rate of infectivity has been documented amongst sexually active women, so much so that the presence of HPV is not particularly striking from a medical point of view.⁹ It is only the presence of a particular strain of HPV, HPV 18, that serves as an alert to the possible future development of cervical cancer. Other strains of HPV can result in the presence of genital warts, but in most cases, HPV coexists silently and inertly within the reproductive tract of many, indeed what is thought to be most, sexually active women.

Nonetheless, the stigma and confusion associated with any infectious agent transmitted sexually lurks behind the scenes and emerges in the public discourse about the HeLa cell line and its connection to Henrietta Lacks, enmeshed within the tangled web of science and technology. This is exemplified by Anne Enright’s description of surfing the Internet in her quest to learn about

Henrietta Lacks in the London Review of Books: "I'm in a series of sites that show me, if I want to know, how to detect the papillomavirus type 18 DNA in HeLa cells (using some nifty gel and a PCR machine). I *think* this means that Henrietta Lacks had genital warts. I *think* this means that she slept around" (Enright 2000).

And so the story comes full circle, the madly proliferating cells, now verging on becoming a separate and inferior species, linked at least in some readers' minds to the unbridled, infectious sexuality of a black woman from Baltimore. Is this mere coincidence? After all, the HeLa cell line could just as easily have been derived from a lung carcinoma from Herbert Langston, a middle-class bank teller from suburban New Jersey, or from the prostate cancer of Henrik Larson, a Scandinavian immigrant living in the Midwest, or from any other number of individuals whose first names began with the letters He and last names with La and were host to a pernicious cancer proliferating wildly within their confines. Then we might read the story differently, or might not tell it at all. After all, hundreds of thousands of cell lines live on in research labs around the world, each with their own identifying initials and life stories behind them, most completely unbeknownst to the researcher. The meanings that arise in this story of Henrietta Lacks and the HeLa cell line are linked to the intersections between science and society and among race and gender and sexuality, in the specific social and historical context that has given rise to the "natureculture" that is science. Perhaps the deepest lesson that this story teaches us is best articulated by biologist Richard Strathmann of the University of Washington, author of the article proposing the HeLa cell line's reverse evolution from human back to protist: "For a transformed cell lineage from a carcinoma to become a successful protist, it must establish a symbiosis with human biomedical researchers. For those interested in levels of selection, both competition among cell lineages and cultural evolution are elements in the success of these new protists. The memes¹¹ of the biomedical research community are interacting with genetically variant cell lineages in the origination and continued evolution of these "selfish cell lineages"¹² (Strathmann 1991).

It is this symbiosis between science and society, as represented by the intersections of categories such as race, gender, and sexuality within science, that I believe the story of the HeLa cell line and its link to Henrietta Lacks best represents. It also represents a symbiosis between science and feminism that allows such intersections to come to light, dialectically from within the practice of science rather than as an afterthought or attack against it. While this analysis of what a feminist engagement with science looks like from within the laboratory does not in the end prescribe what is to be done with the tangled history and current use of HeLa cells, nor does it paint a rosy picture of a science rescued by a commitment to feminism, it does offer hope for movement toward "a successor science project that offers a more adequate, richer, better account

of a world, in order to live in it well and in critical, reflexive relation to our own as well as others' practices of domination and the unequal parts of privilege and oppression that make up all positions." (Haraway 1991, 187).

By delving deeper into these intersections, feminist science studies can help us to more carefully excavate the depths of the "natureculture" that is science, and in this way lead us to both a better understanding of ourselves and of the world we live in.

NOTES

1. Feminism and science have often been seen as incompatible, if not actually as enemies, by members of both camps, leading to a feeling of split loyalties for those who identify as feminist scientists. Yet, as Haraway states, "the split and contradictory self is the one who can interrogate positionings and be accountable, the one who can construct and join rational conversations and fantastic imaginings that change history" (1991, 193).

2. HeLa cells are a human cell line derived from a human carcinoma, or cancer, grown in the laboratory.

3. In other words, we were not studying HeLa cells as the focus of our research but were only using them as a control for research questions we were asking that focused on other cells.

4. *Metazoans* are multicelled animals. *Protists* belong to a kingdom of simple organisms thought to resemble some of the earliest cells. The kingdom *Protista* includes organisms such as slime molds, dinoflagellates and the various algae.

5. Cells that grow in culture, that is, outside of the body, often have accumulated genetic mutations that allow them to grow under these conditions. They also take on different physiological properties, as they are no longer growing in the body but in artificially supplied media and dishes.

6. Saltatory evolution contends that the transition between species is not always a gradual, smooth process, but can happen in great bursts, "leaps," or saltations.

7. As alluded to earlier, feminist theory, or even mild feminist political identification, while becoming more prevalent within the ranks of science today, was certainly not an accepted hobby for a scientist, let alone a tolerable area of study, within the major traditional scientific institutions a decade ago.

8. Greek and Latin roots are used in many species names. It is unusual for the authors to specifically point out the gender of the root for their proposed naming. *Cytos* is the root meaning "cell"; thus, because the word for cell is gender-neutral, the authors justify the gender-neutral naming of the HeLa cell line species.

9. Human papillomavirus (HPV) is the most prevalent sexually transmitted infection in the world, occurring at some point in up to 75 percent of sexually active women (Groopman 1999).

10. The term "meme" was developed in the 1970s by sociobiologist Richard Dawkins in his book *The Selfish Gene* (1976). He proposed the meme as a cultural correlate to

the gene, an idea or cultural concept passed on through generations and inherited in the same way that genes are transmitted.

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12. The use of the term “selfish gene lineages” is a reference to Dawkins’s book *The Selfish Gene* (1976). This book proposes that genes drive every human bodily action—that they are in control, and that our bodies are merely robots driven by the selfishness of the genes.

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