**21A.240
Race and Science
Spring 2004 MIT**

**PART 2: REFORMULATING RACE: MAKING AND REMAKING THE IDIOMS OF SCIENCE
Lecture 11. April 22**

paper topics; papers at end of class; handout Takaki

African-American Technoscientific Histories and Afrofuturist Projects

Today, we're looking at African-American history and identity in relation to science, engineering, and mathematics. The readings fall into roughly two categories,

1. the traditional history and policy papers —Hine on black women physicians, Manning on Ernest Everett Just and funding, Malcolm on increasing the participation of black women in science and technology, and the interview with MIT physicist Shirley Jackson.

These are accounts of the struggles of African-American women and men to make it in medicine, biology, and physics. Some of these stories — particularly that of the Black Women Physicians — have a kind of "we shall overcome" flavor to them — stories of people coming up out of the legacies of slavery, segregation, discrimination: overcoming obstacles. The Malcolm and the Jackson interview spell out how obstacles to scientific achievement are created, and focus attention on dismantling them, not just overcoming them.

So, basically we have — recalling the four different claims about the effects of race/racism on science — which were

     1. CRITIQUE OF UNDERREPRESENTATION

     2. CRITIQUE OF RACIAL "BIAS"

     3. CRITIQUE OF RACIALIZED VIEWS OF NATURE/TECHNOLOGY IN DOMINANT WESTERN SCIENCE

     4. CALL FOR ALTERNATIVE HISTORY OF SCIENCE OR ALTERNATIVE SCIENCES

We have the first two critiques of the racial economy of science represented here. The substance, again, of these critiques is that people who have been racially subordinated have been and often still are largely excluded from the practices of science, which happens to be a highly authoritative way of knowing with a great deal of social power. And this "biases" the outcome of scientific work — most starkly of course when it comes to the sciences that treat of human difference. These readings don't question the enterprise of science itself.

2. the second set of readings, the Fouche and the Eglash and Bleecker are more radical, trying to rewrite what counts as the history of science itself. Fouche,

through the example of DJing and of the repurposing of the turntable from a device of musical reproduction to one of production, explores the ways African Americans have responded to and transformed dominant technologies, using what he calls "vernacular technological creativity" — a kind of creativity that he says is "rooted in black cultural and aesthetic priorities"

Eglash and Bleeker go further, arguing that reexamining the history of science through the lens of African history can reveal that there are African lineages for key concepts in dominant mathematics and science. They forward the argument, for example, that BINARY coding has a history in African counting and gaming systems that may have influenced the history of logic in Europe.

So, Fouche and Eglash and Bleecker recall the critique from alternative history, the idea that racism has <u>prevented</u> proper historical inquiries into the origins and influences of tools and theories in Western science, directing our attention away from, say, the influence of indigenous knowledge systems in the history of mathematics and astronomy, distorting an accurate accounting of where ideas and practices have come from.

So, this is how I'd characterize our readings for today. Let me take up some of these themes in a brief lecture.

<u>REPRESENTATION AND THE WE SHALL OVERCOME NARRATIVE</u>

Hine, Darlene Clark. 1993. Co-Laborers in the Work of the Lord: Nineteenth Century Black Women Physicians. In The "Racial" Economy of Science: Toward a Democratic Future, Sandra Harding, ed. Bloomington: Indiana University Press, pp. 210-227.

> This is a story about women who succeeded against great odds to become doctors. a story of women worthies, inspirational, role model tale. this article does not so much question the constitution of medicine itself (for that, we could look to Terry Kapsalis' story of the speculum) but is mostly concerned with (important!) issues of <u>enfranchisement</u> (one reason the 14th amendment figures in).

> at the same time, we do learn about the specific ways these people integrated medicine into their lives; we learn that many black women physicians practiced at home and so medicine could be made consonant with gender expectations.

> but "It is reasonable to conclude that the convergence of the triple forces of racism, sexism, and professionalization resulted in a significant *reduction* in the number of black women physicians in the 1920s."

> this meant that the home/office distinction, for one thing, solidified and these women could no longer practice at home.

> Race and gender expectations often marginalized the practices of these medical people. Hines' story is one of <u>recuperating</u> these stories.

Manning, Kenneth. 1993. Ernest Everett Just: The Role of Foundation Support for Black Scientists 1920-1929. In The "Racial" Economy of Science: Toward a Democratic Future, Sandra Harding, ed. Bloomington: Indiana University Press, pp. 228-238.

> Marine biologist Just worked too hard trying to keep all the demands placed on him as a person, as a representative of his "race". But he overcame!

Malcolm, Shirley. 1993. Increasing the Participation of Black Women in Science and Technology. In The "Racial" Economy of Science: Toward a Democratic Future, Sandra Harding, ed. Bloomington: Indiana University Press, pp. 249-253.

> this piece, of course, as a piece of policy writing, seeks to understand how "obstacles" come into being and rather than thinking about how these might be "overcome," pitches the proposal at more proactive level of <u>dismantling</u> obstacles.

> "Black women received a smaller proportion of their science degrees in the fields of engineering, mathematics, and physical sciences than women of any other racial/ethnic group." <u>why?</u>

> "inadequate preparation in mathematics and lack of exposure to topics in the physical sciences and technology consistently from pre-K throughout the educational pipeline."

> Malcolm proposes several things that can be done, including

> • math and science throughout the "pipeline"
> • hands-on involvement through activities such as science fairs and projects
> • contact with role models who are minority women
> • availability of appropriate career information
> • early exposure to research
> • address race, gender, and culture issues
> • work experience
> • support by peers (which means that peers need to be there!)

> some <u>websites</u> of interest, Faces of Science, CS of Af Diaspora, Black Geeks

> Now, what these wesbites assume is that Afrodiasporic people, robbed of memory and history through colonialism, <u>chattel slavery</u>, and segregation, have a history separate from the history of mathematics, computer science, etc. but that this should not prevent them from participating in these universal human enterprises. So, many of these websites are concerned with producing <u>ROLE MODELS</u>.

> People like JUST, MORGAN, HARRIS, JACKSON

Williams, Clarence, ed. 2001. Interview with Shirley A. Jackson. In Technology and the Dream: Reflections on the Black Experience at MIT, 1941-1999. Cambridge: MIT Press, pp. 220-230.

While this kind of attention to scientists who struggled in a racist society is IMPORTANT and ESSENTIAL, it's also not the only way to come at the question of African Americans and science.

Much of thus work poses the question of African-American, Afrodiasporic participation as ONE OF ABILITY. So, on the "Faces of Science: African-Americans in the Sciences" page, an excerpt from "Graduate Education Opportunities for African-Americans in Chemistry" argues that low numbers of Afro-Am chemists "DO NOT reflect any lack of *inherent capability* in chemistry by African Americans" — which poses the issue in response to, but also in terms of, the racist framework that would claim that blacks are intellectually inferior to whites.

Look at <u>TECHNOLOGY AND THE DREAM</u>

<u>ALTERNATIVE HISTORIES and FUTURES</u>

There's another way of thinking about this. Has the erasure of history suffered by the Afrodiaspora also extended to an erasure of histories of science? How does the history of science relate to the histories of people of the Afrodiaspora?

AMUCHMA newsletter, explicitly concerned with retrieving history.

Let me give you another data point for this kind of historio-graphical enterprise. You may recall from our reading that Boas spoke on the history of Africa at Atlanta University in 1906, at the invitation of W.E.B. Du Bois.

Thinking about another HISTORY.

You'll recall that Londa Schiebinger, in the chapter of hers that we read called "Who Should Do Science," gave us ample examples of how people from racially marginalized positions were excluded from science — and how standard history of science became EUROCENTRIC.

What if we started with African history? This is where the Eglash and Bleecker article "The Race for Cyberspace" comes in:

Eglash, Ron and Julian Bleecker. 2001. The Race for Cyberspace: Information Technology in the Black Diaspora. Science as Culture 10(3):353-374.

> Eglash and Bleecker complicate a simplistic association of technology with European culture, which then dominates or is appropriated by Afrodiasporic people.
>
> As they put it in their intro:
>
> "Focusing on the black diaspora, we broaden the category of 'information technology' to show how traditions of coding and computation from indigenous African practices and black appropriations of Euro-American technologies have supported, resisted, and fused with the cybernetic histories of the west, and provide a strong source for changes in reconstructing

identity, social position and access to power in communities of the black diaspora." (p. 353).

Let me unpack what this means.

On page 356, Eglash and Bleecker quote the title of African American poet Audre Lorde's poem "The Master's Tools Will Never Dismantle the Master's House"

The standard way to interpret this is: the tools of science, because they have origins in the same Western science that produced racism, cannot be used for black or African American cultural priorities.

But, as we've seen — particularly in Stepan and Gilman — people can and do take up these tools to resist or refashion their lives.

Further, we can ask the question: did the Master actually make all the tools?

They argue that "it is important, when examining the appropriation of technology, to consider not only the down side of appropriation — the possible disadvantages of attempting to 'use the master's tools' — but also the fact that Africans already had many technologies to begin with, and thus some of the supposed appropriations may have had African influences in their own histories of invention." (p. 357)

We can go back in history, not just to find worthy precedessors for today's scientists, but also go back to see whether standard histories of science obscure, for example, African and Afrodiasporic contributions to the production of math, science, engineering.

Eglash and Bleecker give us one example, more fully documented elsewhere:

That mathematical BASE 2, binary notion, may have African histories

> The modern binary code, essential to every digital circuit from alarm clocks to super-computers, was first introduced by Leibnitz around 1670. Leibniz had been inspired by the binary-based "logic machine" of Raymond Lull, which was in turn inspired by the alchemists' divination practice of geomancy. But geomancy is clearly not of European origin. It was first introduced there by Hugo of Santalla in twelfth century Spain, and Islamic scholars had been using it in North Africa since at least the 9th century, where it was first documented in written records by the Jewish writer Aran ben Joseph. The nearly identical system of divination in West Africa associated with Fa and Ifa was first noted by Trautmann.

> Base 2 calculation ubiquitous in West Africa — in practices like sand divination

> Eglash argues in AFRICAN FRACTALS that there is evidence that traveled into Europe — then Christendom — through geomancy (note that math and particularly what we would call probabilistic math was

still part of religion), from which people like Ramon Lull picked it up. Then Leibnitz

Did it happen this way? There is some good evidence, but it's hard to know for sure because of who has told the history of mathematics _ and indeed, the definition of WHAT COUNTS as math at all.

Fear of 0.

In addition to the question of revisiting the history of science, there is also the matter of appropriating the master's tools, engaging in what Fouche calls "vernacular technological creativity"

This comes to life in

AFROFUTURISM.

an alternative future, locating liberation in possible futures marked by technologies deployed for purposes culturally sympathetic to Afrodiasporic practice, culture, and history (which may nonetheless exceed it)

examples? Outer space as a zone of liberation (Sun Ra, Parliament Funkadelic); see Public Enemy's *Fear of a Black Planet*, a CD cover that racializes the planet (as against the whole earth pictures usually used to depict 'one world'). The spaceship as mothership as mother Africa/mothership connection.

Utopias that prominently feature blackness as a value to be celebrated. Not like the SimCity erasure of race that makes cities according to the white imagination.

Promise? "What is significant for the Afrofuturist movement — artists and inventors alike — is the ability to reveal the relations of social power in the construction of technoscience. It is the ways in which this syncretism can politicize information technology that make Afrofuturism a powerful technocultural syncretism." *What do they mean?*

Limits? "If there is a downside to the Afrofuturist movement, it is the tendency to dwell too much in the imaginary spaces created by fiction and music, rather than work at fusing these domains with functional science and technology."

Eglash and Bleecker characterize Afrofuturism as Postmodern

The racial content of "double consciousness" "has become etherialized and has spread throughout the milieu I like to call electro-modernity." The color line as the line of code?