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The Genetic Reinscription of Race

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Abstract

Critics have debated for the past decade or more whether race is dead or alive in "the new genetics": Is genomics opening up novel terrains for social identities or is it reauthorizing race? I explore the relationship between race and the new genetics by considering whether this "race" is the same scientific object as that produced by race science and whether these race-making practices are animated by similar social and political logics. I consider the styles of reasoning characteristic of the scientific work together with the economic and political rationalities of neo-liberalism, including identity politics as it meets biological citizenship. I seek to understand why and how group-based diversity emerges as an object of value—something to be studied and specified, something to be fought for and embraced, and something that is profitable—in the networks that sustain the world of (post)genomics today.

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INTRODUCTION

Upon completion of the first draft of the human genome, the heads of the private and public ventures declared the end of race as a valid scientific category. "Race," as argued in an editorial in the *New England Journal of Medicine*, "has become passé" (Schwartz 2001, p. 1393). The methodology behind the Human Genome Project (HGP) presumed human biological commonality: It was to be "*the* reference" sequence, generating the "genetic terms in which *all individuals* would be expressed" (M'Charek 2005, p. 6, emphasis added; Flower & Heath 1993).

The declaration of the death of race, however, may have been premature. Barely a year later, the pages of major medical and scientific journals were full of debates about the biological status of race and its usefulness in biomedical research and practice. Postgenomics[1] has become increasingly focused on genetic diversity identified along the classificatory lines of race.

Critics have argued for the past decade or more about whether race is dead or alive in "the new genetics." In the wake of the revolution in molecular biology in the 1970s and 1980s, social theorists have sought to understand the social identities that might be generated, imagined, and substantiated by this ever-expanding and increasingly powerful network of scientific research. In this debate, arguments regarding the status of race have been center stage. Is genomics likely to open up new avenues and groupings for identification—for example, group-based identifications organized around genetic risks for particular diseases (Rabinow 1996a)? Or as scientists investigate the genetic bases not just of physiological diseases but, in addition, of "propensities for" behaviors such as violence and criminality, is genomics likely to reauthorize race as a biological category now with the imprimatur of *the* scientific discipline at the turn of the millennium (Duster 1998, 2003)?

To explore more fully the relationship between race and the new genetics, we need to shift the terms of the debate. Given the prevalence today of race in the practices of biomedicine, pharmacogenomics, forensics, population genetics, and a variety of other genomic and postgenomic fields, it would seem that those scholars who argued for the revalidation of race were correct. The new molecular biology and its attendant practices of biotechnological intervention are giving race a new lease on life. But that observation raises more questions than it resolves. We need to explore what race is, how it is configured and how and why it is interpolated in the contemporary practices of the genomic and postgenomic sciences. Is this "race" the same scientific object or concept as that produced at the turn of the twentieth century? Is it generative of and party to the same kinds of social and political logics and practices?

In this review, I analyze the meanings, invocations, and effects of race in particular fields of contemporary postgenomics by examining the scientific, social, and political-economic contexts of its deployment. I do so with a focus on the United States and on the central network of postgenomic scientific practices: the world of biomedicine. (I take a few detours through the field of population genetics without which the work around race in biomedicine cannot be understood).[2] I ask,

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[1] Postgenomics refers to a network of epistemologies, practices, and technologies. Whereas genomics is generally taken to refer to the era—and practices—of mapping the human genome, postgenomics refers to work on gene function and expression that has emerged as the next phase in molecular biological work. Some fields remain, strictly speaking, genomic rather than postgenomic: concerned with mapping and identifying specific polymorphisms rather than with their function (e.g., forensic genetics, most aspects of population genetics).

[2] I do not presume that my argument will hold true across all disciplinary locations. One of the striking things about the science-studies literature on (post)genomics is that it tends to consider the field as a single domain, rather than thinking about questions—for example, is race being reinstantiated in (post)genomic practices?—from the perspective of different disciplines, each of which may give a (partially) different answer to any given question. If we have learned anything from decades of the new history and

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why and how, at the close of the twentieth century, does group-based diversity emerge as an object of value in the networks that sustain the world of postgenomic medicine—something to be studied and specified, something to be fought for and embraced, and something that is profitable? In considering these questions, my analysis begins but does not end with the question of classification. I explore other evidentiary logics that are also at work in scientific practices today and consider how they compare with those of the discipline of race science. In addition, I discuss the political economy of genomics (as finance/speculative capital) and the political rationality of neoliberalism to understand how they respectively structure the meaning of race in science and society. Specifically, what is the relationship between neoliberal citizenship and "biological citizenship" (Petryna 2002) and what insight does that relationship lend toward an understanding of race in the new genetics?

THE ARGUMENT FROM CLASSIFICATION

There is an ongoing debate in scientific journals over the usefulness of racial categories in biomedical research and in clinical practice. Do existing racial categories reflect meaningful biological differences and thus supply biomedically useful information (Burchard & Ziv 2003; Phimister 2003, although Phimister is more cautious than the others; Risch et al. 2002)? Or do they signal cultural distinctions that are misrecognized as biological differences (Cooper et al. 2003, Feldman et al. 2003, Foster & Sharp 2002, Kaufman & Cooper 2001, Schwartz 2001, Swallen 2003)? Moreover, can one rely on such group-based distinctions when diagnosing and treating an individual patient (Cooper et al. 2003, Feldman et al. 2003, Schwartz 2001)? In relying on data generated by the field of population genetics to assert or contest the (medical) significance of group-based genetic differences, all parties to this medical debate share a specific goal: the identification of the genetic basis for the risk of particular diseases as part of progress toward the development of personalized medicine, that is, medicine that considers the specific risk factors of individual patients (Phimister 2003, Risch et al. 2002; see also Sunder Rajan 2005, 2006). That is the promise of postgenomic medicine. The question is how best to get there.

Arguments for or against the use of race in biomedical research involve disagreements about whether race is a good or bad "surrogate" (Phimister 2003) for sequencing every individual's genome, given the financial and technical impossibilities of actually doing so at the current moment. As Montoya argues, researchers' claims about race are not necessarily or always a commitment that those distinctions represent unquestionably clear "biological differences. Theirs . . . [can be] . . . a pragmatic claim" (Montoya 2007, p. 98). In effect, this ongoing debate concerns the medical efficacy of the racial categories and the practices of classification that originated, in their scientific instantiation, in the work of natural historians and race scientists of the eighteenth and nineteenth centuries. Which "style of reasoning" (Hacking 2002), then, characterized race science, and how does it compare with that which characterizes race making in the postgenomic sciences today?

Racial thought, as is well known, emerged long before the rise of race science in the nineteenth century. Race emerged with modernity (in sixteenth-century Europe) when, as Goldberg argues, "the forms exclusions could assume" changed radically from those that characterized the medieval Christian world (1993, p. 16). Race materialized as a fundamental technology of exclusion, which, like racism itself, is not a "singular and passing" concept or set of practices but a constantly transforming one (Goldberg 1993, p. 8). Race,

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sociology of science, it is that the sciences are disunified; even single disciplines are composed of subfields, which are themselves made up of "local" laboratories, traditions, and practices. It is worth keeping that lesson in mind when thinking about race and the new genetics.

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moreover, is what Goldberg calls modernity's "central paradox": "The more explicitly universal modernity's commitments [to a universal human Subject], the more open it is to and the more determined it is by the likes of racial specificity and racist exclusivity" (p. 4). And that paradox, of course, emerged within the context of Europe's economic and political expansion across the globe (Goldberg 1993, 2001).

Beginning in the eighteenth century, naturalists—Carl Linnaeus, G. Buffon, Johann Friedrich Blumenbach, to name a few (Farber 2000)—generated classificatory schemes of human kinds, part and parcel of a characteristically Enlightenment project that sought to find order in nature—or, perhaps more accurately, to dominate nature through reason (Banton 1979, Farber 2000, Goldberg 1993, Stocking 1968). In the mid-to-late nineteenth century, race became a sustained object of scientific research: Scholars conducted empirical studies that sought to quantify phenotypic differences that simultaneously characterized racial groups and were believed to generate the civilizational and cognitive distinctions between them. Researchers produced the scientific truth of race through its measurability (see especially Gould 1981; see also Banton 1979, Barkan 1992, Stepan 1982). Race thinking was typological thinking. It was a taxonomic enterprise that involved collecting measurements and specimens. Race science generated more and more data on the basis of which racial differences were specified and demonstrated, garnering a body of scientific evidence regarding those differences believed to index the distinctions between "natural kinds": Race differences were tantamount to species differences and they were not to be crossed (Haraway 1989, 1997b). As is well documented, this scientific project was entangled with and constitutive of the practices of empire in the late nineteenth and early twentieth centuries when both the discipline of race science and the political project of imperialism reached their zeniths. In addition, race science was central to the politics of various European and American nation-states as they grappled with the "problem" of immigration (of populations considered "non-White") and as they struggled to define and to demarcate the boundaries of inclusion and citizenship (Baker 1998, Goldberg 1993, Haraway 1989, Kevles 1985, Stocking 1987, Stoler 1995).

In a now conventional but, as we shall see, problematic history of the fall of race as a scientifically valid category, the shift from "race" to "population" occurred in the wake of World War II and the horrors perpetrated by the Nazi regime. Typological thinking was replaced by statistical thinking, the differences between human groups became relative ("clinal"), and the scientific project shifted from classifying human groups to understanding the processes of biological selection involved in human history (Banton 1979; Haraway 1989, 1997b; Stepan 1982; Stocking 1968; for an earlier date for the transition, see Barkan 1992; for a detailed account of the longer-term development of biological thought, see Mayr 1982). And contra race science's argument about the deleterious effects of race-crossing, gene flow between populations was both the norm and the evidentiary terrain for studying the history of human origins, migrations, and kinship. No longer ordering human groups along a culturally evolutionary grid, population geneticists studied the processes that enabled populations to adapt and survive. The race concept, as this historical narrative has it, moved into the social domain, persisting as a politically powerful classificatory regime that is no longer legitimized by the biological sciences.

Recent scholarship has challenged the sharp demarcation between race thinking and population thinking that this history has drawn. The race concept was not simply abandoned, not even by the UNESCO Statements on Race, which have long been read as iconic of the shift. Reardon, for example, shows that the documents did not deny the reality of race as a biological concept. [The second Statement does not even deny the possible

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significance of race in generating "meaningful" human differences (Reardon 2005; UNESCO 1952a,b)]. In addition, scholars have argued that the shift from typology to gene frequencies and probabilities did not necessarily free population genetics from the political and ethical limits of race science: There is no reason why racism requires typological distinctions between human kinds. Probabilities can be enough (Gannett 2001, 2004). Its genealogical origins in the practices of race science continue to haunt population genetics even now.

"Race" as a concept, as an object of scientific inquiry and as a technology of biological research, has a history. The race concept persisted as a subject of debate well after the 1950s (Lieberman 1968, Lewontin 1972, Montagu 1965, Silverman 2000), was considered a meaningful concept by most physical anthropologists even in the 1980s (Stepan 2003), and continues to be debated today (Cartmill 1998, Goodman & Hammond 2000, Keita & Kittles 1997, Kittles & Weiss 2003, Marks 2002, 2005a,b; Templeton 1998). That, however, does not mean it is quite the same concept, object, or technology. What then might race index and do in postgenomic medical practices?

The Molecularization of Race

Alongside the rise of the "molecular vision of life" in the early twentieth century (Kay 1993), the scientific concept of race began to make a transition from a phenotypic phenomenon to an increasingly genotypic one. Scholars have analyzed the implications of that reconfiguration through the history of sickle-cell disease (in the United States). In the early to mid-twentieth century, sickle-cell disease was understood to be a black (or negro) disease: Scientists believed it manifested only in Africans or those of African descent (see Tapper 1995; Wailoo 2001, 2003). In addition, sickle-cell anemia came to be understood as a "molecular disease" (Wailoo 2001, p. 5), in fact the first disease to be so designated: Linus Pauling, a physical chemist and founder of the discipline of molecular biology (Kay 1993), suggested a molecular mutation in the hemoglobin was the source of the disease (Wailoo 2001, p. 5). At the meeting point between these two definitions of the disease—a black disease on the one hand, a molecular disease on the other—the commitment to race as a molecular attribute took form.

If sickle-cell disease is a black disease, how could physicians account for the fact that they were repeatedly presented with patients who had sickle-cell disease but who were white? As historians of science have demonstrated, medical practitioners engaged in a variety of practices to resolve this contradiction, none of which involved questioning the original assumption that sickle-cell is a black (race-based) disease. They tried to identify an "unknown" black ancestor in individual genealogies. When that failed or seemed implausible, they turned to population histories: Might southern Italians and Africans have mixed at some point in the distant past? Having sickle-cell anemia became the basis for the social diagnosis of being black (or only "apparently" white) (Tapper 1995), a diagnosis that fit well within a racial regime in which blood-quantums—the "one-drop rule" as it was often named and its convergence with the principle of "hypodescent"—assigned persons to the racial category of black (see Dominguez 1994, Palmié 2007).

With the molecularization of the life sciences, so too has the molecularization of race continued apace. In contrast with the practices that characterized a phenotypically based race science, establishing the correlation of disease risk and racial difference in today's molecular biological laboratories involves "reading race in the DNA" (Fullwiley 2008) and, in turn, it involves classifying DNA "ethnoracially"[3]

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[3] Montoya (2007) uses the term ethnoracial to signal the ways in which scientific practices dissolve the distinction between "ethnicity" and "race" long debated in the discipline of sociocultural anthropology. As he shows, establishing biogenetic similarity often involves

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(Montoya 2007; see also M'Charek 2005). The logic of reading race via that molecular optic in the contemporary research practices of postgenomic medicine diverges from that which guided either the typological thinking of race scientists or the molecular logic of diagnosing blackness via sickle-cell disease earlier in the twentieth century.

Ancestry Information Markers (AIMS) is one technology for reading race in the DNA. (It is currently available as a commercial product for forensic and biomedical researchers, among other potential clients). AIMS was designed to identify genetic markers that could distinguish one "continental" group from another (Shriver et al. 1997, 2003, 2005; **http://www.dnaprint.com/welcome/home/index/php**). More specifically, ancestry markers are designed and used to determine just how African, European, and Native American and sometimes East Asian a particular group actually is (Fullwiley 2008). Scientists use ancestry markers to "calculate very precise admixture percentages" (Fullwiley 2008). For example, of what "degrees" of African, European, and Native American ancestry are Mexican and Puerto Rican "ethnicities... made-up" (Fullwiley 2008)?

Some scholars argue for a continuity between the contemporary scientific and social focus in the United States today on admixture and the obsessions in 1930s Europe with races and admixture (see Duster 2003, Fullwiley 2008). Note, however, ancestry markers are not used to discover someone's "true" race. Given the logic of the technology itself, this cannot be its aim: admixture—or race-mixing, in an older parlance—is a presumed biological fact. (Although positing "mixing" requires heuristically that there remain primary, nonmixed races—in some imagined past or other place). Instead, ancestry markers are used, for example, to understand the Puerto Rican population's risk for asthma—a risk analyzed in terms of ancestral populations believed to have either a "harmful (exacerbating) or [a] helpful (mitigating) effect on asthma severity as well as on frontline drug response" (Fullwiley 2008). Or, with regard to a research project on Mexican Americans and diabetes, to take a second example, according to one scientist "there is strong evidence that Mexican Americans living in the barrio have considerably more Native Amerindian genetic admixture and as a result may have higher genetic susceptibility to diabetes" (quoted in Montoya 2007, p. 105).[4] In contrast to the one-drop rule—the presence of one black ancestor—that enabled physicians to diagnose "white" patients suffering from sickle-cell disease as "black," the fact of presumably Native Amerindian genetic markers identified in the genomes of a specific Mexican American population makes neither the population nor its individuals "in actual fact" Native Amerindian or only "apparently" Mexican(-American). Or more in line with the history of using the one-drop rule to police the boundaries between white(s) and black(s), the fact of African ancestry in the Puerto Rican population does not render Puerto Ricans actually black. Presumably, evidence of admixture provides some (historically-) biologically useful information in calculating disease risk for a particular population. [This biomedical paradigm imagines that treatment protocols will be tailored to individual patients by calculating each person's individual risk on the basis of "genetic factors" on the one hand (calculated on the basis of both "racial" and "familial" ancestry) and environmental factors on the other (see Risch et al. 2002).]

In this domain of postgenomic medicine, admixture does make a difference. But it

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"conscripting" social history "into the genetic rationale" (see p. 97). Montoya's article also illustrates that racial categories have shifted (perhaps, proliferated) over time in the United States, even as the primary divisions between white, black, Asian, and Native American persist.

[4] As many scholars have argued, genetic-based explanations sideline the socioeconomic conditions that lead to different disease incidences in white versus minority populations in the United States, asthma and diabetes being two oft-cited examples (see especially Montoya 2007; see also Fullwiley 2008).

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matters neither for discovering (or litigating) someone's "real" race (see Dominguez 1994, Hickman 1997) nor to lamenting, demonstrating, and controlling the deleterious effects of miscegenation (Hart 2000, Kevles 1985, Proctor 1988). And recognizing that distinction forces us to reckon with—and to put center stage—those practices of race science and of racial politics of an earlier era that exceeded the logic and work of classification. Even if classification formed its foundation, race science entailed other, equally fundamental styles of reasoning, ones concerned with (biological) cause and (biological and cultural) effect(s). Moreover, the practice of calculating admixture percentages brings into focus the fundamentally statistical nature of postgenomic fields of (medical) practice. These are sciences invested in probabilities and risks.

Risk is the primary epistemological rationality of postgenomic medicine. Its notion of risk diverges from the commitment to biological determinism that grounded race science and the relationships between nature and culture that race science produced. And if risk is the most important epistemological commitment in the postgenomic scientific enterprise, so too is it fundamental to postgenomic medicine's economic rationality. In the worlds of biotechnology and pharmacogenomics, profit remains suspended in potential, projected into an imagined future of, for example, gene therapy and genetically tailored medicines (see Sunder Rajan 2005, 2006). Moreover, as demonstrated below, these economic and epistemological logics converge with political rationalities and practices characteristic of the neoliberal age—an emphasis on self-care and individual moral responsibility, the prominence of identity politics as a key space for racial politics. Out of the entanglement of these various fields of scientific and social practice emerges a racial politics quite distinct from that of race science and the social projects of which that work was a constitutive part.

NEOLIBERALISM I: RISK, CITIZENSHIP, AND THE SUBJECT OF POSTGENOMIC MEDICINE

For critics of the politics of race in the new genetics, the specter of eugenics looms large. As scientific and popular literatures propagate the "gene myth" (Hubbard & Wald 1993), scholars have argued, biological reductionism gains renewed authority, providing all too simple answers to social problems such as alcoholism, mental illness, and crime (Duster 1998). Are we witnessing the resurgence of eugenics in new (genomic) clothes?

Born out of Darwinian evolutionary theory and Herbert Spencer's theory of the development of human society, eugenics was concerned with questions of "fitness," "degeneration," "race suicide," and the "germ plasm" (Kevles 1985, Proctor 1988, Stepan 1991). According to Francis Galton, the first to name this field, "Eugenics is to operate with the workings of nature by securing that humanity shall be represented by the fittest races. What nature does blindly, slowly, and ruthlessly, man may do providently, quickly and kindly" (quoted in Pickens 1968, p. 27). Galton wanted to ensure that "superior people maintain a statistical advantage over inferior elements of the population" (p. 28).

A social and not just a biological science (Proctor 1991), eugenic thinking was statistical thinking (Hacking 1990). But it was a form of statistical thinking that took the collective, the "good of the race" as its "central ideological value" (Haraway 1997b, p. 321; see also Rose 2001). Eugenicists conceived of health as "fitness," and they focused on the fitness of "the national population *en masse*" (Rose 2001, p. 5). By the early decades of the twentieth century, eugenicists—in Germany, Great Britain, the United States, or Latin America, for example—feared for their respective nations' "germ plasm[s] . . . the hereditary material passed from generation to generation" (Pickens 1968, p. 59). They were concerned

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not to let "the unfit—by means of altruism and sentimental charity—increase and... control society" (p. 59). And quite centrally, if one wants to compare eugenic practices with the practices of postgenomic medicine, the categories of "altruism and sentimental charity" included medical care and intervention. Eugenic thinkers warned against medical care for "the weak," which was seen to benefit the individual at the expense of the race (see Proctor 1991).

If the nation stood at the center of the eugenic imaginary, it was the state that took primary responsibility for ensuring the nation's fitness (Rose 2001), although admittedly eugenics did not rely on state intervention alone (see Kay 1993). The state promoted "positive" and "negative" eugenic practices alike: forced sterilization, immigration restriction (especially in the United States), the "encouragement" of fertility among eugenic individuals and classes [although in reality, positive eugenics took back stage to the negative eugenics (Kevles 1985)], and of course, in its Nazi instantiation, wholesale killing of "unfit" individuals and races (Gudding 1996; Kevles 1980, 1985; Lifton 1986, Proctor 1988). Eugenics was a nation-state-centered project in which both coercion and consent were involved from the very start (Rose 2001). [It is misleading, therefore, to draw a distinction between eugenics and genetic counseling today on the grounds of positive versus negative eugenics. In addition, it would be mistaken to equate eugenics with right-wing politics. Eugenics was often championed by progressives who sought to rein in the excesses of laissez-faire capitalism (Graham 1977, Kay 1993, Kevles 1985, Pickens 1968, Proctor 1991).]

By way of contrast with eugenics, postgenomic medicine focuses not on the race or nation but on the individual (Haraway 1997b, Rose 2001; see also Proctor 1992 for a sustained comparison between eugenics and genomics). Even as it reifies race, postgenomic medicine constructs itself as interested ultimately in individual health. Its medical (and economic) vision is to develop "therapy tailored to individual genetic profiles" (Sunder Rajan 2005, p. 20). The question is, which factors contribute to those individual genetic profiles? Is race an important contributor? Or is there no biological—here, genetic—basis for what we call "race"? Moreover, postgenomic medicine and the kinds of (imagined) interventions on which it is predicated do not presume the state to be the key actor in "ameliorating" ill health or other social problems. Postgenomic medicine operates in a neoliberal economy characterized by the reentrenchment of the welfare state, the deregulation of industry, and in this instance, the privatization of biological research. And one consequence of biological research as private enterprise is the development of national-genetic databases (for example, in Iceland) designed to foster economic activity and to attract foreign investment. (Some) national gene-pools emerge as potentially very valuable commodities (see Palsson & Rabinow 1999; see also Haraway 1997b).

Epistemologically, genomic medicine might be summed up best as involving the "medicalisation of symptomless at-risk states" (Davison 1996, p. 327). The HGP aimed to identify the genetic bases of (primarily chronic) diseases, a goal further pursued by the Human Genome Diversity Project and, subsequently, the Haplotype Map project which were designed to study population-level genetic diversity. [Critics of the HGP's initial design argued that it had failed to represent adequately the genetic profiles of nonwhite, non-European populations. They argued that it was not useful for understanding disease risks of non-European individuals (Int. HapMap Consort. 2003; Lock 1994, 1997; M'Charek 2005; Reardon 2005).] But the identification of genetic mutations—and their identification in individuals through genetic testing, either now or as imagined in some techno-genomic future—is not the same as arguing that someone has or even necessarily will develop a particular disease. Genetic information only rarely

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tells a patient or prospective parent that she or her progeny will develop a particular illness, and even then, time of onset and the question of severity remain uncertain. This is a medical paradigm organized around the notion of the "potentiality for illness," "the risk of future pathology" (Sunder Rajan 2005, p. 23). In contrast to identifying some persons or groups as "pathological" or "unfit," postgenomic medicine abandons an earlier binary of the normal and the pathological (Canguilhem 1989, 1994) by transforming "healthy" persons—all persons, in effect—into "patients-in-waiting" (Sunder Rajan 2005, pp. 23–24), even if some persons are far more risky than others (as carriers of those few disease-causing mutations that have been identified to date).

This style of reasoning generates uncertainty (see Davison 1996, Rose 2001). It is not the evidentiary or causal logic of biological determinism. In contrast with scientific racism, which presumed that "the empirically real exhausts the ontologically possible" (Proctor 1991), postgenomic medicine generates probable outcomes. And, quite crucially, it presupposes that the "ontologically possible" can be changed (see Haraway 1997b; Rabinow 1996a, 1999; Rheinberger 1995). The goal—the promise—is to be able to make "calculated interventions that prevent something happening, alter the way something happens, make something new happen in the cellular processes themselves" (Rose 2001, p. 16).

But this emphasis on postgenomics as biotechnology, on the expert as he/she who intervenes, sidelines a central component of the political rationalities and practices within which genetics, race, and disease operate today. The concept of the individual at medical risk also presupposes a distinct moral economy that calls on the patient-in-waiting to act responsibly by tailoring her lifestyle to the specific genetic risk that she bears (Davison 1996, Novas & Rose 2000, Rabinow 1999, Rabinow & Rose 2006).

Many social theorists have argued that risk is a prominent rationality in neoliberal economies and its attendant techniques of rule and forms of citizenship (Beck & Ritter 1992, Calhoun 2006, Giddens 1999, Knorr-Cetina and Preda 2005, Li Puma & Lee 2004). At the intersection of the broader political rationality of the neoliberal age (of which risk is a part) and the risk logic of postgenomic medicine it becomes most evident how racial thinking in postgenomics diverges from a commitment to biological determinism. We need to analyze the convergence of this biomedical paradigm with the ideal of neoliberal citizen-subjects as "rational, calculating creatures whose moral autonomy is measured by their capacity for 'self-care'—that ability to provide for their own needs and to service their own ambitions... [an] individual who is fully responsible for her/himself" (Brown 2003).

Knowledge of genetic risks may well lead to discrimination, social stigma, and medical, psychiatric, and legal surveillance (Gostlin 1991, Hubbard & Wald 1999, Lee et al. 2001, Nelkin & Tancredi 1994). But that is not the only place it leads. Genomic medicine operates in a state in which welfare and public assistance have been radically restricted. It "operates in a political and ethical field in which individuals are increasingly obligated to formulate life strategies to seek to maximize their life chances, to take actions or refrain from actions to increase the quality of their lives, and to act prudently in relation to themselves and to others..." (Novas & Rose 2005, p. 487). Within that moral economy and political rationality, the forms of "social abandonment" (Biehl 2005) that emerge in this neoliberal era of postgenomic medicine will be borne less out of a belief in biological determinism (that persons are necessarily going to be violent or that they will inevitably get sick) than out of the condemnation of irrational or immoral behavior and the persons (and groups) to which such behavior is affixed. If in neoliberalism "rational action" is not just an ontology but, quite

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fundamentally, also a norm to be adhered to in all spheres of human life (Brown 2003),[5] then those citizens who fail to perform that norm—to act prudently to avoid or at least try to deter the "diseased" outcome indicated by their genetic profiles—are citizen-subjects and patients worthy of moral reprobation (see, for example, Rapp 1999). And they might well be citizen-subjects whose social abandonment—whether through exclusion from medical coverage or enclosure within prisons—will be seen as morally justified. Although not an outcome of any simple "biological reductionism," the consequences—and the consequences in a persistently racist society—are potentially no less discriminatory and certainly no less violent.

Exclusion, however, is not the only end point of these scientific practices that continue to foreground—even as they reconfigure the meaning of—race. After all, the political impetus for including race, for insisting on diversity in the conduct of postgenomic medicine, comes in large part from people who organize or identify as minorities (including physicians/researchers) and who demand the right to equal treatment: Medicine has met identity politics, and out of that meeting point novel practices of both race and medicine (as "expertise") have been borne.

NEOLIBERALISM II: RIGHTS, COMMERCE, AND THE POLITICS OF IDENTITY

During the past few decades of the twentieth century, identity politics emerged as the most prominent form of oppositional politics in the United States. [How effective it is has been is widely debated by scholars (see Appiah 2005, Brown 1995, Connolly 2002, Farred 2000, Michaels 2000)]. Based on the assertion of "public identities," that is, a claim on the basis of who "I am" (Brown 1995), identity politics represents an effort toward self-definition, an attempt to define one's own "political profile" in response to forms of politics—of the Right and of the Left—that denied the relevance of claims of race, gender, and sexuality in the public domain. Within the context of the history of race in U.S. society—and remaining within that racial economy—identity politics has sought to reclaim race; it has fashioned a politics that, in the name of a history of "injury" (Brown 1995), demands both rights and redress. Such movements have fought for "protection," for example, for "legal or policy sanctions against 'harassment' or 'hate speech'" (Brown 1995, p. 21). And demands for "protection"—more broadly, demands for recognition and for inclusion—have extended to matters of health (Wailoo 2001). Identity politics has met "vital politics" (Rose 2001) or what Petryna (2002) has called "biological citizenship": the linking of citizenship and rights to questions of "bare life" (Agamben 1998), to matters of health and disease and to questions of bodily injury (Petryna 2002; see also Dumit 2004, Rose 2001, Ticktin 2006; on genetics and identity politics, see also Brodwin 2002).

In the 1980s and early 1990s the "underrepresentation" of women and "ethnic minorities" as "subjects in clinical research emerged as a recognized social problem in the U.S." (Epstein 2004a, p. 186). The year 1985 saw the creation of the Office of Minority Health within the Department of Health and Human Services (Kahn 2004). In 1997, the same year that President Clinton publicly apologized for the Tuskegee Syphilis Study (Kahn 2004, Reverby 2000), the federal government passed the Food and Drug Administration Modernization Act, which required the Secretary of Health and Human Services to develop guidelines for "the inclusion of

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[5] Brown (2003) argues that what is distinctive about the political rationality of neoliberalism as opposed to classic liberalism is the extension of the "entrepreneurial logic" to all human activities. "Whereas classic liberalism articulated a distinction, and at times even a tension, among the criteria for individual moral, associational, and economic actions (hence the striking differences in tone subject matter and even prescription between Adam Smith's *Wealth of Nations* and his *Theory of Moral Sentiments*), neo-liberalism normatively constructs and interpolates individuals as entrepreneurial actors in every sphere of life."

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women and minorities in clinical [drug] trials." In 2002, the Centers for Disease Control and Prevention appropriated $747,472,000 for "minority health" (Kahn 2004). This move toward funding minority health—for using race as a category in the various domains of postgenomic medical research—has received widespread support among minority physicians (see Fullwiley 2008). For example, in 2001, NitroMed, the company marketing BiDil, gained support from both the Association of Black Cardiologists and the Congressional Black Caucus for federal approval of BiDil as a drug to treat heart disease in African Americans, the first racially tailored drug. (Researchers argued that BiDil was effective particularly in African American patients suffering from heart disease, thus positing a different biology to that now-distinct disease) (Kahn 2003, 2004, 2005). And in 2003, Howard University announced its intention to build the first DNA database on people of African descent with a view toward "jump-start[ing] an era of personalized medicine for black Americans" (Kaiser 2003, p. 1485).

What has been jump-started at this juncture of vital politics and federal recognition is the commodification of race in the world of biomedicine. After all, the subjects of postgenomic medicine are not just patients-in-waiting. Within the speculative logic of the "high-tech market terrain in the United States" that structures the world of biotechnology and the vision of personalized medicine, those patients-in-waiting are "always already consumers-in-waiting" (Sunder Rajan 2006, p. 22). One of the signal characteristics of the new genetics is its integration into what Haraway (1997b) has named "the New World Order, Inc." In short, postgenomics is a distinctly neoliberal science in terms of its economic—its commercial—structure.

The commercialization of molecular biology began long before its promise was (or is) realized or even realizable. With the emergence in the late 1970s and early 1980s of recombinant DNA technology and the potential of genetic engineering to manipulate life, the "cloning gold rush" began (Wright 1986, p. 36). As these technical abilities met the transformation of the economic and political environment (deregulation), the distinction between basic and applied research collapsed and the privatization of the practice of molecular biology followed suit (Wright 1986, Haraway 1997b; see Sunder Rajan 2005, 2006 for a somewhat different history). (As Kay (1993) has noted, the blurring of the boundary between basic and applied research was endemic to the field of molecular biology from the start. Nevertheless, the 1980s saw a qualitative shift with the field's commercialization.) A scientific field that is largely technology driven, postgenomics is part and parcel of the domain of speculative finance. The world of biotech and pharmacogenomics is risky business: Its market value is hitched to a promise of treatment options (pharmaceutical and other) that are as yet largely imagined, for example, the potential of stem cell research in the treatment of a host of conditions such as Huntington's disease or type 1 diabetes or the possibility of gene therapy in curing cancer (Sunder Rajan 2005, 2006). "Biovalue" structures this increasingly commercialized world of molecular biology: the production of both use value (in the form of medical treatments, for example) and surplus value out of vitality itself (Waldby 2002; see also Rabinow 1996b, 1999; Sunder Rajan 2006).

Race emerges within this world of biovalue as a potentially profitable commodity. Market rationalities drive the very production of race as both biological difference and commercial product (Kahn 2004). And as various scholars have cautioned, the development and marketing of race-based drugs have far-reaching consequences for the politics of race. Drugs, after all, must be approved for a specific use by a branch of the federal government. The patenting of drugs requires federal recognition, and giving federal recognition to a drug such as BiDil implies recognizing the biological reality of race: The federal government

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recognized as valid drug company claims to have identified a specific-race based illness, in this instance, congestive heart failure in African Americans that is responsive to BiDil in a way that congestive heart failure in white patients is not (Epstein 2004a,b, Kahn 2004). The state, then, at the same time as it concedes the possibility of "hybrid" identities [self-designations of bi- or multiracial status on the federal census (see Warren 2000)], reinscribes the biological reality of race in the domain of bodily difference. But perhaps that fact is not very surprising: To adapt Michaels's (2000) argument regarding "identity" and "difference" to the specific instance of race, "to choose between... fixed or mobile (or one might add... between pure and hybrid) is to choose between two different accounts of... [race]. And to choose between two different accounts of... [race]... is already to have chosen... [race]... itself" (pp. 651–52).

The state's involvement in this process, nevertheless, does not render contemporary race politics simply a politics from above. Citizens have made demands on the state for federal recognition of racial difference, including in matters of health; medical researchers (many of them self-identified as minority researchers) pursue population-level differences to redress the imbalances in medical research and clinical practice (see Burchard & Ziv 2003, Risch et al. 2002; see also Fullwiley 2008). And all this occurs within a reshaping of the politics of expertise and doctor-(potential) patient relationships. Patient (in-waiting) groups have come to fund, demand, and shape research as they become more actively involved in their own diagnoses and treatments as well as in life decisions regarding whether to have children in general or whether to have this particular child (see Rapp 1999, Dumit 2004, Rabinow 1999, Rose 2001, Taussig et al. 2003). Understanding the reinscription of race in the era of postgenomics requires giving an account of this complex world of scientific logics and political rationalities, the practices of the state and of its citizens, the promise of postgenomic medicine, and the networks of patient groups. It requires that we think about race as an object and technology of scientific inquiry and as a political and cultural practice in the era of a privatized, speculative market for molecular biology in a neoliberal state.

POSTSCRIPT: THE NATURE OF RACE

The argument about race and the new genetics rotates around a larger debate about nature in the practices—and in the era—of biotechnology. Has the ability to intervene—to (re)make "life itself" (Franklin 1995), to cross the boundaries between species—rendered nature artificial? Has molecular biology in its biotechnological instantiation taken apart the modern nature/culture divide, no longer enabling us to presume nature is outside of culture and the ground on which our social orders (our hierarchies of race and sex, quite specifically) are built (see Haraway 1997a,b; Pottage 2002: Rabinow 1996a, 1999; Rheinberger 1995)? The reinscription of race in postgenomics must lend pause to this argument: Those most fundamental categories of nature—of biological difference—have not been undermined as such analyses foretold.

Nevertheless, such arguments raise important questions that we do need to address. We may not have traveled "beyond nature and culture" (Rheinberger 1995), but we may also no longer know what nature is understood to be. Insofar as race is not the same thing as it once was (despite classificatory continuities), arguing for the reinscription of race in postgenomic practices raises a whole host of questions that we have barely begun to consider. Quite centrally, it raises questions about the character of "nature" today. We need to consider the possibility that although the "biological" remains culturally and politically significant, although it may well be understood to tell us something (more) true about ourselves, this may not be the same biology by which racial others (and women) were bound—and

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by which they were debarred from the rights of full citizenship (Stepan 1998)—in late-nineteenth century liberal nation-states, for example. Nature too, and not just the concept of race, has a history (Daston 1992, 1998). And what nature—the biological—is understood to be and to do may well differ not just across time but between the various disciplines that form the network of the postgenomic sciences today (on genetic anthropology, see Abu El-Haj 2007). The same of course is true of race.

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