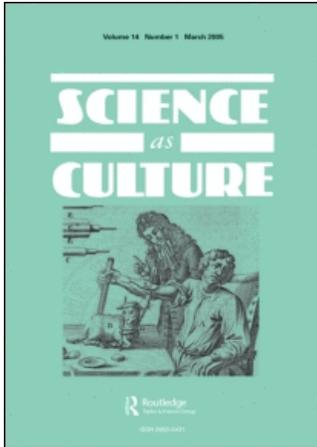


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Is Race Still Socially Constructed? The Recent Controversy over Race and Medical Genetics

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ABSTRACT *Current controversies in the field of genetics are provoking a reassessment of claims that race is socially constructed. Drawing upon Bruno Latour's model of how to analyse scientific controversy, this article argues that race is 'gaining in reality' in such a way that renders claims about its social construction tenuous and uncertain. Such claims can be seen as failing in two key regards. The first relates to changes in the way genetics is practised and promoted, which are undermining the stability of fundamental assertions that there is 'no biological basis for race' or that 'race does not exist'. The second involves the confusion of analytical domains in making assertions about race. This problem stems from investing genetics research with hopes that it would reveal the 'truth' about race. This confidence has led to equating the 'cultural' with 'bias', while ignoring the cultural dynamics which shape race. Subsequently, I argue for making a domain claim for the primacy of cultural analysis that does not simply dismiss the possible relevance of biology or genetics to racial issues.*

In fact it is generally recognized today that no scientific definition of race is possible (Du Bois, 1915).

The concept of race has no genetic or scientific basis (Venter, 2000).

We believe that identifying genetic differences between races and ethnic groups, be they for random genetic markers, genes that lead to genetic susceptibility or variation in drug response, is scientifically appropriate (Risch *et al.*, 2002).

The scientific status of race is once again subject to intense debate in the United States. A controversy is growing over long-established claims that race is a social construct rather than a biologically based concept. The primary site where this contest is being waged—in the field of genetics—is notable in that, until quite recently, genetics provided a firm ground for critiquing racial thinking and racist beliefs about linkages between an

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individual's phenotype and their personal characteristics and abilities. But challenges to the apparent scientific consensus on the biological insignificance of race are also emerging from the practice of clinical medicine, and they have the potential to impact how epidemiological research and public health interventions are conducted. This controversy, as well, is enveloping the very notion of social construction, which has been fundamental both to work in science studies and to numerous political claims concerning a variety of naturalized identities.¹ Savvy political commentators are taking new findings by geneticists and directly assailing both social constructionist perspectives and their alleged influence in shaping policies redressing racial inequalities.²

In reviewing the controversy over race and genetics, this article re-evaluates the basis for making social constructionist claims about race. Rather than rushing to defend or reiterate such claims, I raise the prospect that social constructionist assertions are not effectively formulated in relation to race. Two problems loom large in such formulations. Firstly, they are generally predicated upon an effort to delineate emphatically the 'social' and the 'biological'. Secondly, these assertions, in practice, often lead us away from a broader cultural understanding of how and why race matters. In examining these problems, I draw upon aspects of Bruno Latour's approach to scientific controversies. Latour proves useful because, in the course of developing a model for analysing scientific controversies, he also formulates a striking critique of the notion of social construction. This critique has strong bearing on how such claims are made in relation to race. Applying Latour's approach to a detailed assessment of the evidentiary disputes regarding linkages between race and genetics highlights the fact that geneticists' claims about the scientific status of the race concept actually proceed from an acknowledgement that race is a social construction. Indeed, their ability to generate factual claims about the biological impact of the social construction 'race' is perhaps the clearest indicator that the basis for, and the presumed impact of, assertions that race is socially constructed need to be drastically rearticulated.

Social Construction Assailed

In a widely publicized editorial in the *New York Times*, Armand Leroi, an evolutionary biologist at Imperial College, trumpeted the return of 'racial science', declaring 'that races clearly do exist' and that 'the consensus about social constructs is unraveling' (Leroi, 2005). When Vincent Sarich, an emeritus anthropologist at the University of California, Berkeley, and Frank Miele, senior editor of *Skeptic* magazine, asserted that 'race is a valid biological concept', in *Race: The Reality of Human Differences* (2004), they did so by specifically challenging 'the view that race is a mere social construction', which 'has come to be invoked as the justification for public policies based on racial privileges' (p. xi). The influential political commentator, Charles Murray—whose work did so much to undergird public and intellectual arguments against welfare and affirmative action in the 1980s and 1990s³—points to 'several analyses [that] have confirmed the genetic reality of group identities going under the label of race or ethnicity' as proof that his previous assertions about measurable difference in intelligence between whites and blacks were right all along (Murray, 2005). On this basis, Murray calls for a repudiation of social constructionist views, which he believes 'will require us to jettison an apparatus of laws, regulations, and bureaucracies that has been 40 years in the making' (p. 22). Even sociologist Troy Duster—perhaps the most notable and trenchant proponent of a

social constructionist stance regarding race (Duster, 1990, 2001)—similarly sees this moment in the US as representing ‘a remarkable fracture of the scientific consensus about race’ (Duster, 2005a, 2005b).

The Roots of Social Construction

The assertion that ‘race is a social construction’ derives from an array of sources that, in turn, reflect the variety of perspectives that go under the label social construction. This assertion often directly draws upon critiques made in the early 1900s by W.E.B. Du Bois and Franz Boas, among others, that challenged the biased work of scientists who sought to establish that ‘racial characteristics’, such as intelligence, were innate and inherited (Boas, 1912; Dubois, 1915). This view of race also stems from work by geneticists in the mid-1900s that, for political and scientific reasons, energetically refuted eugenics research that culminated in Nazi programmes for racial hygiene (Montague, 1942). Arguments that race is socially constructed also derive from the work of historians who track the shifting criteria and political rationales for schemas of racial classifications (Haney-Lopez, 1994). But the claim that race is socially constructed is also made today by epidemiologists and others in the field of public health who see social and environmental factors as the root cause of current racial health disparities (Krieger, 2004). This public health perspective is generally bolstered by findings in genetics from the 1970s, which demonstrated that there is far greater genetic diversity within what are commonly construed as races than exists between these groups (Lewontin, 1972). Taken in concert, these views on the social construction of race range from regarding it as a ‘folk concept’ or ideology (Harrison, 1999) that has improperly informed scientific research to asserting, on either biological or genetics grounds, that ‘races do not exist’ and that this concept ‘prevents us from understanding the nature and meaning of human biological variation’ (Brace, 2005, p. 4; Long & Kittles, 2003; Livingstone, 1962).⁴

The Uncertain Future of Social Construction

The stakes in this debate for those who hold a social constructionist view of race⁵—a stance that is informed by both diligent and incisive critical assessments of scientific claims as well as recognitions of the impact of social forces on racial conditions ranging from health to economic mobility⁶—are incredibly high. Hence, recent claims concerning the possibility of a genetic basis for racial identity have been met with a surge of criticisms assailing the evidentiary, methodological, and theoretical bases of this contentious research (Reardon, 2004; Fausto-Sterling, 2004; Braun, 2006; Sankar, 2006). Notably, the Social Science Research Council convened an impressive array of anthropologists, geneticists, epidemiologists and historians of science to critically assess the scientific status of claims concerning the biological basis of race.⁷ These critical commentaries largely reassert that race is socially constructed, and they assail recent claims by geneticists regarding race as a return of ‘scientific racism’.

These are important and insightful responses, but the starting point for this article is somewhat different in that it begins with an acknowledgement that the social constructionist assertions about race have certain limits and pitfalls. Reasserting ‘social construction’ and invoking the spectre of an atavistic ‘return’ of racist science are not a sufficient basis for critically assessing either the novel research techniques or the subtle interpretive work

involved with producing 'race' in the current context of new research in genetics. Nor is this a wholly effective means for understanding the process by which, despite the contested nature of these evidentiary claims, 'race' is currently 'gaining in reality', to borrow a phrase from Bruno Latour.

Until recently the assertion that 'race is a social construction' has served as a form of interdiction against scientific research that purports to study biological differences between human racial groups. But that form of interdiction now appears to be dissolving; whether it will be reconstituted or not is open to question. In this political moment, when such rapid advances in genetics are both challenging and reaffirming fundamental beliefs about human identity, it is important not just to reassert social constructionist claims regarding race, but to consider how they may be formulated differently and more effectively. In doing so, I make use of the work of Bruno Latour, both for the critical purchase he develops on scientific controversies and for his suggestions regarding the wholesale scuttling of social construction arguments.

A Latourian Perspective

Latour offers several useful angles onto the current controversy over the role of race and genetics. His approach to science studies provides a model for framing the complex dynamics of such scientific disputes. As well, he develops a basic formula for comprehending how such controversies resolve, one that has a bearing on understanding the way geneticists' claims concerning race are gaining a wider audience even though they remain contentious. But perhaps the most relevant aspect of Latour's work is his somewhat dramatic gesture of discarding the notion of 'social construction' altogether. In his early efforts at formulating a science studies approach, the concept was of fundamental importance, as indicated by the title of his 1979 ethnography, *Laboratory Life: The Social Construction of Scientific Facts*. But in more recent reflections on the negative reception of work in science studies by the very scientists who are being studied, Latour concluded that the phrase and concept need to be jettisoned.⁸

Latour rejects 'social construction' for a variety of reasons,⁹ but a primary impetus stems from his recognition that the concept distorts more than it reveals about the process by which scientific claims about the world become persuasive and accepted as authoritative. This criticism pertains to the controversy over race and genetics in that assertions of its social construction are often wielded to foreclose any effort to link race with the biological. Because this occurs in a fraught zero-sum game over the 'reality' of race, social construction often amounts to an assertion that there simply is no biological basis for this concept. This leads to the type of weakness targeted in the kinds of political attacks advanced by Murray and Leroi: that a social constructionist perspective on race could be undermined by the establishment of any biological linkage to the concept of race. Rather than further reify an untenable bifurcation of the 'social' and the 'biological', Latour opts to forego the use of the phrase 'social construction'.

Gaining in Reality

In its place, Latour tracks 'the circulatory system of scientific facts', which refers to the nuanced processes of *articulation* and *translation* and by which objects can be seen as either 'gaining' or 'losing' reality. Through the process of articulating and translating

scientific objects and concepts, Latour argues that entities gain credibility and tangibility as they are made to appear and perform in expanding networks, within and outside of laboratories.¹⁰ 'An entity gains in reality if it is associated with many others that are viewed as collaborating with it. It loses in reality if, on the contrary, it has to shed associates or collaborators' (Latour, 1999, p. 158). This perspective is useful in regards to the current controversy over race and genetics because it offers a different analytical approach, one that promises greater 'realism', according to Latour, and that might be more effective in discerning how 'race' is debatably being refashioned as a 'scientific concept'. At the very least, the notion that race is 'gaining in reality'—despite the prolific and authoritative assertions that it is instead socially constructed—heightens the recognition that new means of critical analysis are necessary to keep pace with the proliferation of genetic statements involving race.

Limits to Latour's Approach

However, in making this case, I do not argue that Latour's approach offers a perfect solution to the challenge of effectively assessing current efforts to establish race as a scientific concept. Rather, I disagree strongly with one of his key suggestions—to forgo the use of the concept of the 'social' entirely, in order to do away with the artificial divide between 'science' and 'society'. In assessing the applicability of Latour's approach to the debates over race and genetics, I take issue with his dismissive characterization of social analysis and argue, instead, for retaining and reformulating cultural analysis as it pertains to scientific statements and claims related to race. I differ with Latour, too, in that I argue for reformulating assertions about the social construction of race by more sharply delineating what is *cultural* about race, rather than predicating these assertions on discrediting biological research. This approach diverges from many previous statements on the social construction of race because it stems from a recognition that genetics is not going to provide the basis for either proving or disproving the 'social' reality of race. Instead, the clear delineation of the cultural dynamics—determining belonging, establishing identity, policing against difference—needs to be the basis for reformulating authoritative statements about whether or not or how race exists.

Race in Current Scientific Practice

The important matter is that, despite many authoritative and articulate assertions that 'race is a social construction', race is gaining in reality in the realm of scientific research. This can be seen in a variety of ways. In lab settings, as Amade M'Charek observed in his ethnographic study of the Human Genome Diversity Project, race 'has become routinized in daily practices', even though, to researchers, 'nothing strange seems to be going on' when race materializes in this manner (2005, p. 177). Duana Fullwiley similarly reports from her ethnographic work on the 'molecularization of race' in current genetics research that 'this happens through the practices of recruitment, storage, organization, and reporting that rely on sorting DNA by US racial population differences for pharmacy' (2007, p. 4). As well, Sandra Lee describes an 'infrastructure of racialization in biomedicine and drug development research' that 'includes research on human genetic variation that maps genes to social categories of race, the pervasive use of race as a proxy for risk in clinical medicine, and the search for new "racially inscribed" market niches by the pharmaceutical industry'

(2005, p. 2133). The cumulative effect of such practices stretch far from the lab and are evident in the manifold uses of DNA technologies linked to race, which are the concern of the final section of this paper.

Competing Claims Over Race and Genetics

Amidst fanfare generated by the completion of the human genome project in the summer of 2000, leaders of this massive international undertaking seized the moment to make a few pronouncements about the broad significance of this genetic map of humanity. Prime among these was a basic claim about race, one that only seemed to underscore established knowledge in both genetics and anthropology. Craig Venter, then president of Celera Genomics (the private company that competed with publicly funded scientists from around the world in mapping the human genome), enthusiastically proclaimed that ‘the concept of race has no genetic or scientific basis’ (Venter, 2000).¹¹ Venter later forcefully reiterated this position in response to media reports about BiDil, a new drug that heralds the emergence of ‘race-based pharmacogenomics’ (Stolberg, 2001). Venter dismissed the scientific soundness of studies on this drug and stressed again that ‘there is no basis in the genetic code for race’. This definitive, succinct claim appeared simply to endorse what physical anthropologists and geneticists who spoke publicly on the subject of race had been saying for several decades (Montague, 1942; Livingstone, 1962; Brace, 1964; Lewontin, 1972). Hence, the new era of genetics seemed to build seamlessly on the previous order of knowledge (Institute of Medicine, 1999).

This consensus view was further ratified by a series of editorial assertions made in premier science journals in the United States. An editorial in the *New England Journal of Medicine (NEJM)* emphatically proclaimed that ‘race is biologically meaningless’, that ‘race is a social construct, not a scientific classification’, and declared ‘instruction in medical genetics should emphasize the fallacy of race as a scientific concept and the dangers inherent in race-based medicine’ (Schwartz, 2001). As well, an article in *Nature Genetics* arguing that ‘commonly used ethnic labels are both insufficient and inaccurate representations of inferred genetic clusters’ was followed by an editorial promoting a ‘race-neutral’ methodology in phase III clinical trials testing drug efficacy in different groups of patients (Editorial, 2001; Wilson *et al.*, 2001). These claims resonated easily with an editorial in *Science* that dismissed ‘the myth of major genetic differences across “races”’ on the basis both of current genetic evidence and ongoing research (Owens & King, 1999).

Challenges to the Consensus on Social Construction

Taken together, these statements worked to affirm a seamless suturing of an earlier era of genetics—before the sequencing of the human genome—with the emergent period, one that features distinctly new techniques and methods for analysing human genetic variation. At the core of this affirmation was the assertion that the consensus concerning the biological insignificance of race would carry over into the new age of genetics. But rather than stabilizing this meticulously assembled and widely promoted view that there is no biological basis for race in our genetic code, these assertions instead provoked a series of counter claims based upon a range of examples and evidence that suggested, instead, that race indeed has significance in a physiological sense. Not only are race and biology linked,

certain geneticists and clinicians boldly argued, but this linkage is potentially crucial to understanding the widespread racial health disparities in the United States.

The foremost figures challenging the consensus view that ‘race is biologically meaningless’ are population geneticists Neil Risch, at Stanford University, and Esteban Gonzalez Burchard, at the University of California, San Francisco, as well as Elad Ziv, in the Department of Medicine, at the University of California, San Francisco, and Hua Tang, a biostatistician at the University of Washington. Their efforts, published in scientific journals and addressed primarily towards fellow geneticists and epidemiologists, are mirrored by the work of Sally Satel, a fellow at the American Enterprise Institute, and the aforementioned Armand Leroi, writing in public forums like the op-ed pages of the *New York Times* to frame this new work in genetics specifically as assailing the ‘social construction’ view of race.

Should Medicine be ‘Colour Blind’?

Direct challenges to the view that there is no biological basis for race were published by Satel, Risch and Burchard in the summer of 2002. Satel opened her op-ed essay in the *New York Times*, ‘I am a Racially Profiling Doctor’, by announcing,

In practicing medicine, I am not colorblind. I always take note of my patient’s race. So do many of my colleagues. We do it because certain diseases and treatment responses cluster by ethnicity. Recognizing these patterns can help us diagnose disease more efficiently and prescribe medications more efficiently (Satel, 2002).

Satel’s immediate target was the *NEJM* editorial by Richard Schwartz affirming that ‘race is biologically meaningless’, but her contention also functions as a challenge to prevailing ‘colour blind’ approaches in public policy and discourse (particularly in relation to topics like ‘intelligence’ and ‘crime’) by buttressing the view the race cannot be ‘ignored’. As she herself acknowledges, saying things like ‘I am not color blind’ or admitting that you ‘take note’ of race retort certain political stances on the importance of race—a point she made plain in essays in *Atlantic Monthly* and *Policy Review*. Satel acknowledges that ‘to a growing number of critics, this statement is viewed as a shocking admission of prejudice. After all, shouldn’t all patients be treated equally, regardless of the color of their skin?’ But she juxtaposes this position with the apparent significance of race in the realm of clinical practice, where, as she relates, doctors commonly take more than passing interests in the race of their patients and attribute it with some significance.

Risch and Burchard similarly target the ‘colour-blind’ doctrine in their attack on the consensus view on race by challenging the above cited editorial assertions in *Nature Genetics* and the *New England Journal of Medicine* that ‘race is biologically meaningless’. They highlight recent work on haplotype variation (patterns of DNA polymorphisms on a single chromosome that are inherited together) and linkage disequilibrium (referring to the non-random frequency of two genes appearing in close proximity on the same chromosome), which taken together provide a basis for analysing the migration of specific genetic mutations over time and space. Based on these recently developed forms of analysis, they assert that it is ‘both counter intuitive and factually incorrect’ to claim any longer, as the editorial in *Nature Genetics* had stated, that ‘genetic data . . . show that any two individuals within a particular population are as different genetically as any two people selected from any two populations in the world’.

This position directly counters the view that the greater degrees of genetic variation *within* rather than *between* purported racial groups discounts the usefulness of the concept of race as a reliable, objective means for delineating human populations. Citing the ability of geneticists to generate and analyse discrete clusters of human genetic diversity, Risch and Burchard argue that ‘two Caucasians are more similar to each other genetically than a Caucasian and an Asian’ (Risch *et al.*, 2002, p. 5). Risch and Burchard additionally argue that ‘a “race-neutral” or “color-blind” approach in biomedical research is neither equitable nor advantageous, and would not lead to a reduction of disparities in disease risk or treatment efficacy between groups’ (Risch *et al.*, 2002, p. 11).

Debate Over Race and Genetics Enjoined

Their arguments were afforded journalistic coverage in *Nature*, in an article that paired further elaborations on this point by Risch with expressions of concern from leaders in the field such as Francis Collins, director of the National Human Genome Research Institute, at the National Institutes of Health. Collins acknowledged the relevance of genetic clustering to medical research, but he questioned framing these results using racial labels, both because ‘the highly charged terminology of race . . . is open to broad misinterpretation’, and because there is another preferable terminology provided by ‘geographic origin of ancestors’ or, quite simply ‘ancestry’ (Wadman, 2004). Collins raises important concerns, but they have scarcely impacted the subsequent course of these contentious claims about possible linkages between genetics and race. To understand why, I turn now to a key moment in this controversy when these geneticists faced off against a few of their critics in a debate in the *New England Journal of Medicine* in 2003.

This exchange features a restatement by Burchard and Risch of their case for the relevance of race to genetics and a sharp critique of this position by epidemiologists Richard Cooper (chair of the Department of Preventive Medicine and Epidemiology at Loyola Strich School of Medicine), Jay Kaufman (at the University of North Carolina School of Public Health), and Ryk Ward (University of Oxford, now deceased) (Cooper *et al.*, 2003). These competing articles provide a succinct overview of the central points of contestation and highlight reasons why restatements of a social constructionist stance regarding race appear to be of increasingly limited effect as a basis for countering claims by geneticists—limits that Latour similarly found frustrating in his efforts to analyse scientific practice. In considering two important aspects of this exchange—the issue of whether race can be a scientific concept and whether there is evidence for a genetic basis to racial identity—I draw upon concepts that Latour mobilizes in place of social construction: *articulation* and *translation*. Regarding the first point of contention, Burchard and Risch are articulating ‘race’ in a scientific framework, despite Cooper *et al.*’s counter argument that such usage is unfounded since race is, rather, a social construct. On the second matter, Latour’s notion of translation helps to highlight the surprisingly tenuous basis by which Burchard and Risch are attempting to reinterpret previous research in genetics. Taken together, these concepts provide a close reading of the process by which race is gaining in reality and of the ways this ‘reality’ is fragile and subject to contestation.

Articulating Race in a Scientific Framework

The status of race as a scientific concept hinges, in part, on what counts as good science. Risch and Burchard set these terms in their first challenge to the consensus that race has no

biological significance by asserting, 'in our view, much of this discussion does not derive from an objective scientific basis' (Risch *et al.*, 2002, p. 1). In contrast, they maintain that their race-conscious approach possesses the very objectivity that the consensus position lacks. Risch and Burchard argue 'that from both an objective and scientific (genetic and epidemiologic) perspective there is great validity in racial/ethnic self-categorizations, both from the research and public policy points of view' (Risch *et al.*, 2002). Furthermore, they warn that if the consensus is not overturned, scientific progress itself is at risk. Avoiding an attention to race, they underscore in the *NEJM* article, 'will simultaneously retard progress in biomedical research and limit the effectiveness of clinical decision making' (Burchard *et al.*, 2003, p. 1171). They further assert, 'we believe that ignoring race and ethnic background would be detrimental to the very populations and persons that this approach allegedly seeks to protect' (Burchard *et al.*, 2003, p. 1174). Though they acknowledge both the history of misuse of race-based science and the potential negative impact of such claims on an array of current social issues, they insist that such attention to race is both good science and of greater social value than its potential social costs.

The Return of Scientific Racism?

Cooper, Kaufman, and Ward counter each of these sets of claims regarding the scientific basis for uses of race in genetics research. Similarly to Risch and Burchard, these critics also target a lack of scientific rigour and clarity in their opponents' work. But instead of representing 'progress', they assert that this research is making scientific practice regress, repeating the mistakes of 'scientific racism' by 'mixing social and biological ingredients in varied proportions', which plays into 'the hands of demagogues who want to justify racism and eugenics' (Cooper *et al.*, 2003, p. 1166). For Cooper *et al.*, interpreting genetic variations in persons and populations 'within the existing framework of race, as was done in the case of eugenics, violates the principles that give science its unique status as a force outside the social hierarchy, one that does not take sides in factional contests' (2003, p. 1169). Cooper *et al.*'s depiction of science as 'outside the social hierarchy' as an ideally neutral, disinterested entity, is one that Latour—among many others involved in science studies—strongly challenges, a matter that I will address below. But the crucial point for Cooper *et al.* is that the alleged 'discovery that races exist is not an advance of genomic science into uncharted territory; it is *an extension of the atavistic belief* that human populations are not just organized, but ordered [emphasis added]' (2003, p. 1169). That is, rather than representing the advance of scientific progress, genetics research involving race is only a 'return' of previous unfounded efforts to ground racist belief in scientific authority.

Cooper *et al.* further challenge the scientific basis for claims linking race and genetics by pointing to the array of social interests, historically and contemporarily, that form a type of bias warping research practices and findings. The core issue they raise concerns the overwhelming interest in positing 'genes' as an explanation for an array of social problems, which extends well beyond topics linked to race.

Genes are regularly proposed as the cause when no genetic data have been obtained, and *the social and biologic factors remain hopelessly confounded*. Even when molecular data are collected, causal arguments are based on nonsignificant findings or genetic variation that does not have an established association with the disease being studied. Coincidence is not a plausible explanation of the widespread occurrence of this

practice over time and across subdisciplines. The correlation between the use of unsupported genetic inferences and the social standing of a group is glaring evidence of bias and demonstrates how race is used both to categorize and to rank order subpopulations [emphasis added] (Cooper *et al.*, 2003, p. 1168).

'Bias', a most critical claim in assailing scientific status, is borne out for Cooper and colleagues by the enduring social impact of such practices. The most glaring aspect of these practices is that scientific efforts at making racial distinctions or observing racial differences have consistently been directed almost exclusively towards positing and/or finding something qualitatively different or distinctive about 'black people'.¹²

Separating the Social from the Biological

In attempting to refute the argument that race can be used in scientific research, Cooper *et al.* fixate on maintaining a clear delineation between 'social' and 'biological' domains. They regard the fact that 'the social and biologic factors remain hopelessly confounded' in genetics research as a basis for dismissing efforts to establish a scientific usage for race in genetics. They argue from a social constructionist perspective that 'race as a social category is not a useful predictor of health outcomes' (2003, p. 1169). Rather, such usage

is the product of an arranged marriage between the social and biological worlds. Although it seems to travel back and forth between these parallel universes, it maintains a home in both. From the social sphere, race has inherited certain attributes that cannot be alienated from its meaning, no matter how hard we might try (Cooper *et al.*, 2003, p. 1169).

Indeed, since they accede to the statistical accuracy of the methods employed by Risch and Burchard—which, as noted above, Francis Collins does as well—this alleged inability to properly demarcate the 'social' and the 'biological', in regards to race, looms large. But, interestingly, this stance misses a key aspect of Risch and Burchard's assertions, an aspect that Latour argues generally goes largely unrecognized in science studies analyses.

Incorporating a Social Construction within a Biological Framework

Latour points out that scientists actually make a habit of disregarding the distinction between the 'social' and the 'biological'. 'Scientists not only blur, in their daily practice, the boundary between their pure esoteric science and the impure exoteric realm of society, they also blur the boundary between the domain of discourse and what the world is like' (Latour, 1979, p. 92). Burchard *et al.* proceed precisely in this fashion in articulating race in the context of genetics research. In doing so, they not only accede that race is a social construction, they assert it is a 'sociocultural construct with biological ramifications' (Burchard *et al.*, 2003, p. 1171). This position is perhaps partly attributable to the fact that the research on race they cite generally relies upon definitions established by the US Census Bureau. But it also reflects a view that such a connection to the 'social' does not compromise the scientific status of their claims. As they explain in some detail,

Unlike a biologic category, such as sex, racial and ethnic categories arose primarily though geographic, social, and cultural forces and, as such are not stagnant, but

potentially fluid. Even though these forces *are not biologic in nature*, racial or ethnic groups do differ from each other genetically, which has biological implications [emphasis added] (Burchard *et al.*, 2003, p. 1171).

What matters for Risch and Burchard is that the social construct of ‘race’ becomes increasingly well articulated as its formulation in laboratory settings generates a successful series of claims regarding the performance of genes. These performances, in turn, are effectively linked to activities outside of the laboratory—in particular, clinical practices, doctors’ beliefs about treating patients, and what ‘everybody knows’ about race based on their ability to ‘see’ it legibly written on the faces of everyone else. In the face of this accelerating process of articulation, reassertions that ‘races do not exist’ will have an increasingly limited impact on how the status of this evidence is accepted or promoted to a larger public audience.

Translating Evidence for a Genetic Basis for Race

As in any scientific controversy, what matters a great deal in this dispute is the question of evidence for a genetic basis for racial identity. In considering this aspect of debate, the analytical concept of translation that Latour additionally hones as a replacement for ‘social construction’ works quite effectively. As in most scientific controversies, the central focus in these debates is on the evidence, or, rather, on whether there is any evidence at all. Notably, the editorial accompanying these two articles in the *New England Journal of Medicine* in 2003 struck a neutral or equivocal position on this crucial matter. Elizabeth Phimister, in considering both claims and counter claims, observes, ‘Cooper *et al.* say that there is little evidence that the risk of common diseases is determined by race-correlated genes variants, whereas Burchard *et al.* argue that such evidence does exist’ (Phimister, 2003). Nor has the question of whether or not such evidence exists been authoritatively determined by many of the subsequent editorials that summarized this dispute in other medical and scientific journals in the United States (Havranek & Masoudi, 2004; Washington, 2004; Barr, 2005; Group, 2005; Krieger, 2005; Wang, 2005).

Even if, as Latour warns, it cannot be expected to settle the dispute, the process of assembling an evidentiary basis for these arguments offers an intriguing glimpse into two aspects of the work of translation involved with making genetics-based claims about the relevance of race to health and science. The first involves a notable shift in how genetics research is both conducted and addressed to larger professional and public audiences, by way of new assertions about its relevance specifically to race and health. The second stems from how this re-articulation of the relevance of genetics hinges upon a contentious reconstitution of its central object of study from ‘populations’ to ‘race’ (Gannett, 2003). In both these regards, following the work of translation opens a view onto the ongoing process by which some geneticists are attempting to articulate race in a scientific framework, regardless of whether critics maintain that race is a social construction.

Three Lines of Evidence

Burchard *et al.* assert that their claim—that ‘studies in population genetics have revealed great genetic variation within racial or ethnic subpopulations, but also substantial variation among the five major racial groups’ (2003, p. 1172)—is supported by three lines of

evidence. This statement appears straightforward and substantive, yet it masks a fairly dramatic and questionable shift in how research and findings in population genetics relate to much broader areas of interest, such as public health and pharmacology. Burchard *et al.* first assert that ‘investigators studying the population genetics of indigenous groups from around the world have constructed ancestral tree diagrams showing branching relationships among the various indigenous groups’ (2003, p. 1172). Ancestral tree diagrams—a form of statistical analysis that uses gene variations to reveal diverging branching relationships among various populations—derive, in part, from the work of Luca Cavalli-Sforza (1971)—a pre-eminent figure in population genetics and a key leader of the Human Genome Diversity Project—and A.W.F. Edwards (Cavalli-Sforza, 1963). Despite the fact that humans are mostly homogenous genetically and differences between regional populations are modest, patterns of difference have been discerned and used as a basis for reading evolutionary processes.¹³ Burchard and Risch claim that ‘these studies have been consistent in showing that the human population has major branches corresponding to the major racial groups, with subbranches within each racial group associated with indigenous groups’ (2003, p. 1172).

Translating from ‘Populations’ to ‘Race’

The striking aspect of this assertion is that of the three studies cited to support this claim, not a single one actually refers to ‘race’ in their texts. The studies in question all involve efforts to measure human evolution via the analysis of DNA polymorphisms, yet ‘race’ is absent from their research designs, data gathering, and conclusions. What is concealed in this citational gesture, then, is that Burchard *et al.*, in making their claims about the ‘fact’ of genetic differences between races, are engaged in an active process of translating and differently construing genetics research done under the rubric of ‘populations’ into another register, one that is framed instead in terms of ‘race’. However, the terms at play here, ‘populations’ and ‘races’ are not synonymous; in fact, their usage reflects a significant shift in how genetics research is organized, which arose in the 1950s and 1960s and may now, in turn, be changing again (Reardon, 2005).

The size of the gap between these two modes of organizing and interpreting genetic data on human evolution is clearer still in the second line of evidence cited by Burchard *et al.*—a method for producing ‘genetic clusters, which has been applied to persons of diverse ancestry, with a focus on genotypes at multiple genetic loci’ (2003, p. 1172). Actually, there is a good deal of methodological overlap with the studies listed in the previous citation; indeed, one of the four articles is also by Luca Cavalli-Sforza (1997). But these studies—appearing in *Nature Genetics*, *Science*, and *American Journal of Human Genetics*—are apparently linked together as initial efforts to direct an interest in human genetic variation towards epidemiological matters and questions concerning varied forms of drug response. Burchard and Risch *et al.* bundle these studies together to substantiate their claim that there is genetic variation between races: ‘These analyses have also consistently resulted in the delineation of major genetic clusters that are associated with *racial* categories’ [emphasis added] (2003, p. 1172). Yet, in these articles as well, ‘race’ is not explicitly featured as a topic or subject of discussion. It might, thus, be tempting to dismiss Burchard *et al.*’s evidentiary claim as a further example of the social construction of race. But such a conclusion risks drawing attention away from the actual

ongoing process of translation, which, as Latour notes, is a fundamental dimension of scientific knowledge production.

'Race' as a Suitable Proxy

In this regard, as well, it is important to acknowledge that it is not a fanciful stretch to consider these articles as, in some ways, *about* race, even though they do not use the term. The article by Stephens *et al.* in *Science* (2001) develops its population sample by relying upon definitions from the US Census Bureau to record participants' ancestry. Most notably, another article, by Rosenberg *et al.*, also published in *Science* (2002), in claiming that 'self-reported ancestry' provides a suitable proxy for 'genetic ancestry', has become a touchstone in the efforts to argue that there is a genetic basis for race. The Rosenberg article was quickly publicized as proving this claim though, again, race was not an explicit part of the research design or conclusion—which underscores the enormous social interest in naturalizing the category of race. Nicholas Wade, in reporting on the Rosenberg study for the *New York Times*, was able to coax one of the researchers into publicly commenting on the racial significance of these findings, even though the published report studiously avoided such assertions. Strikingly, Wade went further still beyond the specific claims of the study to conclude that these findings challenge social constructionist perspectives on race, declaring, 'the new medical interest in race and genetics has left many sociologists and anthropologists beating a different drum in their assertions that race is a cultural idea, not a biological one' (Wade, 2002).¹⁴ The interpretive move by Burchard and Risch seems restrained in comparisons to such spins, but it too evidences an intense interest in translating research done on 'populations' to make it apply to debates about 'race'. Understanding this interest requires some historical perspective on the rapidly changing terrain of genetics research.

Historical Background on Genetics

One of the founding gestures of the field of population genetics as it emerged from the broad domain of biology was in ostensibly shifting attention in the study of human evolution from 'race' to 'populations' (Stepan, 1982; Kevels, 1985; Barkan, 1992). This shift was, in one regard, political, and part of efforts by scientists in the post World War II to repudiate the legacy of scientific racism that culminated in the horror of Nazi eugenical practices. But it also stemmed from an alteration in how geneticists conceived their core subject of study—human genetic diversity (M'Charek, 2005). In place of 'race'—which entailed a host of typological assumptions that used visible physical difference to delineate supposedly qualitatively distinct human groups—geneticists turned to 'populations', a unit of analysis with vaguely defined boundaries and predicated upon the recognition that genes flow across human groups.

Where previously biologists and anthropologists had regarded race in a phenotypic or morphological register, population geneticists defined their subject statistically and genetically, regarding individuals as embodiments of the great expanse of human genetic variation. The thoroughness of this reconfiguration of subject matter may be unclear in retrospect (Gannett, 2003; Mielke, 2006), but quite clearly, founding and influential figures such as Theodosius Dobzhansky, Julian Huxley and J.B.S. Haldane, as well as Luca Cavalli-Sforza, promoted or pursued this shift for decidedly anti-racist reasons to preclude further scientific research on this subject (Reardon, 2005).

Developments in Physical Anthropology

This alteration in population genetics did not occur in an intellectual vacuum. A primary influence came from physical anthropology, which was also undergoing a similar transformation concerning its central object of analysis. Building on an intellectual and political edifice erected by Franz Boas' various challenges to scientific claims about race, physical anthropologists used genetics research to reject emphatically the notion that 'race' played any useful role at all in science. These assertions were made prominently by Ashley Montague (1942), Frank Livingstone (1962), and C. Brace Loring (1964), and they seemed to be further ratified by similar sounding claims made at the time by population geneticists. Indeed, when Richard Lewontin used genetic analysis to assert that 'racial classification is now seen to be of virtually no genetic or taxonomic significance' (1972, p. 397), it appeared that geneticists and anthropologists were in accord on the biological insignificance of race.

This apparent unity masked a fundamental difference in the claims about race being made within each discipline. As Jenny Reardon relates in her history of the rise of genomics research,

human population geneticists, like Luca Cavalli-Sforza, took their argument one step further. They argued that independent of genetic analysis, physical traits commonly used to distinguish races (e.g. head form and skin color) revealed nothing about human biology and the evolution of the human species. In other words, drawing upon distinctions made possible partially through the advent of molecular biology, population geneticists crafted new discursive resources that enabled them to join lawyers, government officials, and even many social scientists in arguing that race, when it is held to be merely a cluster of visible physical traits, is meaningless—both in science and society (2005, p. 56).

But, as Reardon further explains, this stance regarding the insignificance of physical differences to understanding underlying biological traits was not predicated on jettisoning 'race' entirely from the emergent study of human populations.

Reformulating the Race Concept

Geneticists who recognized the conceptual and political problems surrounding 'race' were, at the same time, ambivalent about forgoing any use of the term entirely. As Reardon further comments,

instead of arguing that race did not exist, or that concepts of race had no utility in science, those population geneticists and physical anthropologists most celebrated for their anti-racist goals—like Dobzhansky and Montagu—were often arguing for a reconceptualization of race (2005, p. 56).

This reconceptualization featured the much-heralded shift from discussing 'races' to studying 'populations' instead. As recently as 1994, Cavalli-Sforza, in relation to his role in the Human Genome Diversity Project, advocated abandoning the category 'race' in favour of 'group' or 'population' (Reardon, 2005, pp. 4–5). So it is Cavalli-Sforza's

article from 1997 that stands out in the citation by Burchard and Risch, grounding their claim that racial categories are substantiated by genetics research. Risch and Burchard, in doing what their peers in recent past decades were wont to do (articulate research findings in a very public manner in relation to race), apparently see no obstacles in translating evidence produced in terms of ‘ethnicity’ or ‘populations’ into racial registers. But what exactly is the conception of race at play here? Is it a ‘return’ of scientific racism, as Copper *et al.* and others have charged? Or is it perhaps a novel conceptualization of human difference using the archaic label, ‘race’? These questions are not simple to answer, but the contours of an adequate reply can be fleshed out by considering the third line of evidence cited by these researchers.

Linking Alleles and Race

Burchard *et al.* argue that another evidentiary basis for the genetic significance of race derives from studies using the frequency of alleles (genetic variants) at both microsatellite and single-nucleotide-polymorphism (SNP) markers to map the distribution of genetic difference onto racial groups. The rationale in this approach—which, it should be noted, is not entirely distinct from the second method they cite—is that variants with low frequencies are not likely to be shared by members of different racial groups and thus ‘are more likely to be race-specific’. Thus, alleles that appear with a frequency of 20% or higher in one racial group are likely a variant shared with other racial groups. But an allele that appears with less frequency is potentially a ‘race-specific’ variant. From this analytical perspective, Africans appear as the most distinct group, since Africa is the place of origin for humanity. As Burchard and Risch explain, ‘the race-specificity of variants is particularly common among Africans, who display greater genetic variability than other racial groups and have a larger number of low-frequency alleles’ (2003, p. 1172). All other ‘continental groups’ have more limited forms of genetic diversity, with African Americans notably differing in terms of genetic composition from Africans generally. This approach, though, can distinguish African from European populations, and can be used to bring greater refinement to racial assignments based on the number of microsatellite loci used to sort individuals.

As with the second line of evidence cited by Burchard and Risch, there is an enormous amount of translation going on here that is not apparent in the citation. But their claim is also very revealing of how much has changed in genetics since Lewontin used genetic analysis to argue ‘that our perception of relatively large differences between human races and subgroups, as compared to the variation within these groups is a biased perception’ (1972, p. 397). In part, what has changed are the technical and analytical dimensions of genetics. Enormously enhanced computing power (and, in particular, the computer programme STRUCTURE) now allows researchers to compile and manipulate much larger genetic samples and, in turn, disaggregate data into more refined groupings. As well, geneticists now address the task of analysing human evolution via sampling short segment DNA markers instead of focusing on single genes. The current ability to generate and define genetic clusters that appear to match the social notion of ‘racial’ groups derives from the larger number of markers used (377 autosomal microsatellite markers in the Rosenberg study cited above). Interestingly, the analytical developments that Lewontin trumpeted—enabling geneticists ‘to assess directly and objectively the genetic variation among individuals on a locus by locus basis’ (1972, p. 382)—have developed to the

point that some geneticists are reassessing the central tenet of his conclusions about human genetic diversity.¹⁵

Revisiting the Genetic Basis for Social Constructionist Claims about Race

Lewontin originally concluded that the discrepancy between the enormous amount of genetic variation that fell within presumed racial groups (85%) and the modest amount that appeared to differ between these groups (6%) meant that ‘no justification can be offered’ for the continued use of racial classification by geneticists (1972, pp. 396–397). But he also allowed that, ‘all things considered, then, the 6.3% of human diversity assignable to race is about right . . .’ (1972, p. 397).¹⁶ What has changed is the recognition that, however modest the proportion of intergroup variation might be, it still represents millions of possible gene combinations. Geneticists are also now able to demonstrate that, though modest, the genetic variation between ‘groups’ is highly structured, enough so that it is possible to allocate individuals to continental (or ‘racial’) categories on the basis of genetic similarity (Bamshad *et al.*, 2003). This development, and the research upon which this third line of evidence rests, involves the ability to make identifications of genetic population clusters that match self-reported ancestry.

Rosenberg and Pritchard claim that ‘analysis of multilocus genotypes allows inference of genetic ancestry without relying on information about sampling locations of individuals’ (Rosenberg *et al.*, 2002). Still, as a variety of critics have pointed out, this ability rests upon questionable sampling schemas that purposefully exaggerate the ‘clarity’ of purported racial clusters by drawing samples from maximally distant geographical sources (Long & Kittles, 2003; Bamshad *et al.*, 2004; Graves, 2004; Bolnick, in press). Such critiques may well illustrate the constructedness of this evidence, but they do not necessarily address the further work of translation going on in such claims, which specifically is directed toward linking the ‘social’ and ‘biological’ domains.

When Burchard *et al.* claim ‘self-defined ancestry is very highly correlated with genetically defined clusters’ (2003, p. 1172) they are asserting that a social construction is tightly bonded to a genetic dimension. The effort at translation here appeals to enduring interests in exactly grounding social classifications into the realm of ‘nature’ (Levi-Strauss, 1966; Strathern, 1992). But are such genetically defined clusters what people think of when they are asked to define their ancestry? Neither the original race theorists, such as Johan Friedrich Blumenbach, who coined the term, ‘Caucasian’, or Carl Linnaeus, nor most people confronting ‘race’ in their everyday lives, would likely recognize the range of variability and complexity in gene frequencies as inherently ‘racial’. That a genetic variant like factor V Leiden, which confers an increased risk of venous thromboem disease, occurs in about 5% of white people but only rarely appears among East Asians and Africans seems strikingly tenuous or meagre in relation to the emphatic assertions people commonly make about racial differences. That the allele APOE—associated with increased risk of Alzheimer’s disease and relatively common among all racial and ethnic groups—varies in frequency among white and black populations by 14% and 19%, respectively, and is hence regarded as illustrating the significance of race, seems discordant with the types of claims about racial groups posited, historically or currently, in a range of public forums. In each of these regards, it is not the constructedness of the evidence that matters quite as much as the question of the strength and soundness of the work of translation.

To answer this question, though, involves assessing the social relevance of this research and the claims that it has been used to generate.¹⁷ But this would seem to imply reinscribing a line that Latour is quite keen to demolish, the one that ‘artificially’ delineates the ‘social’ from the ‘biological’. Is it possible to pursue this line of questioning without reinscribing a demarcation between the ‘social’ and the ‘biological’? I think it is, but it involves, at the same time, diverging somewhat from Latour’s model for analysing scientific controversy. In the section that follows, I first make use of Latour’s perspective on how scientific objects ‘gain in reality’, and then I pursue a somewhat different analytical tactic than the one he promotes by turning again to the important question of how to make sense of the ‘social’ in all of this.

Qualifying a ‘Biological Connection’ for Race

The status of the claims, ‘the concept of race has no genetic or scientific basis’ or that ‘race is biologically meaningless’, continue to be debated. While these assertions and their counter claims are vociferously maintained by their respective adherents, more researchers and commentators are drawn into the effort to make sense of the core dispute. As well, these statements are now being matched or countered with a host of additional claims and qualifiers. One such comment was made by Francis Collins, Director of the National Human Genome Research Institute, regarding an important conference sponsored by the National Human Genome Center, at Howard University (Human Genome Variation and ‘Race’, 15 May 2003), which took up the debate as delineated by Burchard *et al.* and Cooper *et al.* The potted version of this comment, the aspect of it that has great bearing on how people make social constructionist claims about race, goes as follows: ‘it is not strictly true that race or ethnicity has no biological connection’ (Collins, 2004, p. S13). It certainly matters that this claim follows from the assertion that, ‘it is essential to point out that “race” and “ethnicity” are terms without generally agreed-upon definitions’ (p. S13); as well, it is important to take this claim in its immediate context:

Increasing scientific evidence indicates that genetic variation can be used to make a reasonably accurate prediction of geographic origins of an individual, at least if that individual’s grandparents all came from the same part of the world. As those ancestral origins in many cases have a correlation, albeit often imprecise, with self-identified race or ethnicity, it is not strictly true that race or ethnicity has no biological connection (Collins, 2004, p. S13).

And, as well, it matters to regard the qualifier that follows these assertions:

It must be emphasized, however, that the connection is generally quite blurry because of multiple other nongenetic connotations of race, the lack of defined boundaries between populations and the fact that many individuals have ancestors from multiple regions of the world (p. S13).

But all of these qualifiers, considerations, and elaborations have a way of getting lost in the frenzy.

Editing Out the Qualifiers

An excellent example is the above-mentioned editorial by Leroi, in which he reported on the academic event in which Collins made his remarks. Leroi used these proceedings to trumpet the return of 'racial science' and the crumbling of the consensus 'social construction', largely because researchers can now demonstrate 'that races clearly do exist' (Leroi, 2005). In honing this succinct conclusion, he exactly eschews the contextualizing aspects of Collins' comments, as well as the work of a number of presenters whose research proved the exact opposite point. 'Beneath the jargon, cautious phrases and academic courtesies', Leroi wrote, summarizing the proceedings, 'one thing was clear: the consensus about social constructs was unraveling. Some even argued that, looked at the right way, genetic data show that races clearly do exist' (2005, p. 21). This reflects one of the basic points Latour makes about how scientific controversies resolve:

As I have shown many times, a convenient marker of the appearance of a scientific fact is the modifier drops entirely and only the dictum is maintained. The elimination of these modifiers is the result and sometimes the goal of scientific controversy (Latour, 1999, p. 93).

The question then is what bearing Leroi's 'dictum' 'that races clearly do exist' will have on the various political, philosophical, and historical arguments about the social construction of race?

Again, Latour's approach offers some insight here, particularly in his insistence that 'reality' is not the final arbiter that resolves these controversies; rather, what counts as real is partially constituted or reconstituted in the course of such disputes. Latour demonstrates this perspective in his analysis of the debates between Louis Pasteur and Felix Archimede Pouchet in the 1860s over the existence of spontaneous generation. As Latour observes, 'Spontaneous generation was a very important phenomenon in a Europe devoid of refrigerators and ways of preserving food, a phenomenon anyone could easily reproduce in his kitchen, an undisputed phenomenon made more credible by the dissemination of the microscope' (1999, pp. 153–154). Pasteur claimed to have disproved spontaneous generation through his bacteriological experiments, but Pouchet, who attempted and failed to reproduce Pasteur's results, reasserted what 'everyone' believed to be true. In analysing this dispute, Latour brings into view the immense social and political apparatuses that came to bear on this controversy and, in the end, resolved it in Pasteur's favour. The analytical trap that Latour seeks to avoid—one that obscures the importance of all the additional social dimensions and accoutrements—is that of assuming Pasteur's ferments were there all along, just waiting to be revealed. Via the concept of 'relative existence', we instead 'follow the entities without stretching, framing, squeezing, and cutting them with the four adverbs never, nowhere, always, everywhere'. As Latour explains, 'if we use these adverbs, Pouchet's spontaneous generation will *never* have been there *anywhere* in the world', and it would lead us to assume that 'Pasteur's ferments carried by the air, however, had *always* been there, all along, *everywhere* . . .' (1999, p. 156) What Latour offers instead, in rejecting these adverbs, is a way of grasping how reality is actually generated in the course of producing scientific evidence, claims, and counter claims.

This approach matters a great deal when weighing whether or how current methods of DNA sampling and statistical analysis of SNPs relate to claims, practice, and beliefs

involving race, historically, currently, or in future uses of the concept. Latour's model—which follows the process of articulating and translating propositions, whereby entities gain credibility and tangibility as they are made to appear and perform in expanding networks, within and outside of laboratories—lets us consider whether, instead of finally and truly making race appear, these genetic techniques are rather creating a reality for race. 'An entity gains in reality if it is associated with many others that are viewed as collaborating with it. It loses in reality if, on the contrary, it has to shed associates or collaborators' (Latour, 1999, p. 158). In these debates over the scientific status of 'race', we can exactly see it gaining reality as it is articulated in relation to forms of genetics research and statistical analysis. Though much critical effort has been directed towards assailing the evidentiary basis for geneticists' claims about race, the question of whether or not it continues to gain in reality is not entirely contingent on the kinds of debates over evidence reviewed here. Rather, it hinges upon whether these articulations extend to propositions about race already in circulation outside of laboratories.

Why Race is Gaining in Reality

Latour's model of a series of 'loops' through which scientific facts circulate as they achieve stability and greater coherence effectively demonstrates the dynamic by which race is 'gaining in reality' even as this controversy rages. Though claims about race are subject to scathing and incisive criticism, these geneticists not only continue to produce similar findings but have notably extended their networks of sympathetic colleagues and researchers. Further evidence continues to be generated because, as Latour would emphasize, an expanding network of fellow researchers is drawing more adherents to these basic claims. Neil Risch and Hua Tang later (2005) co-authored an article in the *American Journal of Human Genetics*, along with 10 new researchers/co-authors, who had not participated in their previous publishing efforts. These researchers, drawn from a wide array of institutions—from Hawaii to Michigan, and San Diego to Minnesota—participated in generating findings that indicate 'a near perfect correspondence' between genetic clusters and commonly used racial/ethnic labels (2005, p. 273 +). This article continues the line of arguments, first, that 'colour blind' approaches risk missing important information and, secondly, for the apparent ability of genetic clusters to demonstrate independently the reality of racial identity. Risch, Burchard, Tang and Ziv, also extended both this line of data production and their collaborative network in being joined by 21 additional co-authors in a genetic study of Latinos published the following year in *Human Genetics* (2006).

Linking Race and Genes in the Media

But far distant from the lab, 'race' is also gaining in reality in the sense that DNA testing is increasingly assumed by the public at large to reveal racial identity. This perception is sustained both by forensic science and the dramatization of forensics in hugely popular television shows in the United States, such as *CSI: Crime Scene Investigation*, in which victims and suspects both are readily profiled in terms of race. Forensic tests that use non-coding regions of DNA have moved quickly from aiming to identify a particular individual (using 13 areas on a molecule where the DNA sequence varies widely among individuals) to focusing on profiling the genetic ancestry of an unknown suspect. Most of the attention

the latter technique has generated in the media entails the apparent ability to project a suspect's racial identity based on DNA.

Companies such as DNAPrint Genomics initially received much publicity for redirecting police in Baton Rouge, Louisiana away from seeking a white suspect in relation to a series of rape/murders to looking instead for a black man. The later arrest and conviction of Derrick Todd Lee, a black man with previous arrests for burglary and stalking, seemed to underscore both the reliability and importance of this scientific method for police work.

However, as typically occurs when such techniques receive public attention, the ambiguities and uncertainties involved with accurately aligning visual characteristics with percentages of genetic ancestry generate very little attention in press coverage. DNAPrint Genomics fleshes out the gap between genetic probabilities and the range of physical appearances of real individuals by sending photographs of people whose ancestral profiles match those of the sampled DNA. But in terms of asserting their claim to this method's reliability and relevance, much of the rationale publicly expressed in support of matching genetic ancestry with physical appearances and visual traits is that this technology simply matches the social reality of race. As Mark Shriver, an anthropological geneticist at Penn State University who serves as a consultant for DNAPrint Genomics explains, what matters is 'the reality that people often describe each other in terms of race. We're saying: let DNA be the witness' (Willing, 2005).

Genetic Ancestry Testing

Yet another interesting aspect of how DNA testing in the public sphere is gaining in reality is in the numbers of African Americans who are increasingly drawn into participating with projects that are producing genetic knowledge concerning race, either individually or as part of institutional endeavours. Fuelled in part by the dramatic and well publicized demonstration of the revelations that Thomas Jefferson had sired a child with Sally Heming, a slave on his Virginia plantation—one whose descendants had long claimed such a lineage, though their assertions were roundly dismissed—black Americans in large numbers have been paying from \$130 to \$650 for tests of either their paternal (using markers on the Y-chromosome) or maternal (using sequences of mitochondrial DNA) heritage. As Amy Harmon reports, 'The DNA tests are fueling the biggest surge in African-American genealogy since Alex Haley's 1976 novel, *Roots*, inspired a generation to try to trace their ancestors back to Africa'. Using companies such as African Ancestry and AfriGeneas, over 100,000 African Americans have resorted to some form of DNA testing in order to traces their ancestral links back to particular tribes or ethnic groups.

Though geneticists dismiss the reliability of being able to establish such links with certainty via genetic genealogy (Ely *et al.*, 2006), African Ancestry, with more the 22,000 DNA samples from approximately 400 indigenous African groups, claims that their matches reflect at least 90% accuracy (Bolnick, 2007). Test results have poignant and powerful impacts in people's lives, influencing and sometimes deeply transforming familial and social relations.¹⁸

In addition to the wide cultural pattern of these individuals seeking to substantiate aspects of racial identity via genetic testing, African Americans are also being drawn into participating in generating this type of racial data by way of institutional efforts, such as the National Human Genome Research Center (NHGC) at Howard University, an historically black college in Washington, DC. Amidst the emergence of many

independent DNA and tissue banks, often generated by private hospitals and companies, the Howard University project promotes itself as being the only one with a singularly African American 'biobank'. Citing some of the same rationales as those posited by Risch and Burchard—from disparities in disease rates and health care for blacks, as well as their under-representation, historically and currently, in medical research—founders of the programme, such as Dr Floyd Malveaux, make an explicitly racial case for soliciting participants in this project. 'We want to make sure as genetics moves forward', Dr Malveaux relates, 'that we are part of that process'. One of the goals listed as part of the programme's mission statement makes this interest explicit and paramount: 'To optimize participation of African Americans and other African Diaspora populations in the generation, interpretation, application, and utilization of human genetics/genome information'.¹⁹ Because organizers—fearing that 'black people are in danger of being left behind at the newest frontier of medical research'—have framed and solicited participation in the project in terms of a singularly racial rationale, this has left them open to critics' charges that the Center perpetuates race-based science and medicine. The response to such charges, interestingly, invokes what critics 'already' know: that race is socially constructed. As Charmaine Royal and Georgia Dunston explain in countering this criticism:

The NHGC posits that the term 'race', as applied to humans, is incorrectly used. Traditional 'racial' designations in humans are not bounded, discrete categories but are fluid, socially defined constructs that have some poorly understood correlations with various biological elements and health outcomes (Royal & Dunston, 2004, p. S6).

Such an invocation, though, in no way hinders these representatives from the NHGC from reiterating the racial rationale behind the Center's goal 'to broaden the base and active participation of African Americans and other grossly underrepresented African Diaspora populations in the human genome arena' (Royal & Dunston, 2004, p. S6).

Jettisoning Social Construction

Each of these sites involving genes and race—from forensic work to genetic genealogy to large-scale database and 'biobank' projects—seem to affirm exactly the point that remains most contentious in the debate discussed above: that racial identity is both social and grounded in biological 'nature'. In this regard, they each are further examples of how race is 'gaining in reality' and, as such, underscore Latour's case for jettisoning the notion of 'social construction'—that this phrase seems hardly adequate to the analytical task of responding to these developments. At the same time, though, aspects of these processes highlight the fact that Latour's suggestion of doing away altogether with the 'social' as an analytical register is also inadequate, and that is because the 'reality' in question is so emphatically 'social'. The basis, motivation, and orientation for each of these projects derives from fundamental cultural dynamics—seeking justice, establishing identity, and determining belonging. Perhaps it is almost too obvious, as well, that these dynamics involve quite basic cultural activities such as classification and categorization (Bowker & Star, 1999; Allen, 2000).

This cultural dimension does not simply manifest as we move 'out' from the lab; rather, it extends to the very core of the genetics research that has fuelled this debate. When Burchard and Risch delineate the 'genetic' in contrast to the 'social', they hold up an

odd entity—mating patterns—as the core of the reality that concerns them. ‘From the genetic perspective’, they assert in their article reaffirming the biological basis for race, ‘the important concept is mating patterns’ (Risch *et al.*, 2002, p. 3). Again, in the later article in the *New England Journal of Medicine*, they assert, ‘from the perspective of genetics, structure in the human population is determined by patterns of mating and reproduction’ (Burchard *et al.*, 2003, p. 1169). Yet these assertions rather underscore how deeply ‘culture’ shapes the ‘genetic’, for there are few matters more influenced by cultural rules, practices, and beliefs than how people decide whether or with whom to mate. Thus, agreeing that race is fast accruing a certain ‘reality’ does not absolve us of either the ability or the necessity of analysing the cultural dimension of this development.

What to Do with the Social?

Latour does not offer us much guidance on what to do with this dimension because, in his rush to reject ‘social construction’, Latour advocates entirely rejecting the distinction of ‘science’ and ‘society’. He asserts that, ‘science studies could be defined as the project whose aim is to do away with this division altogether’ (1999, p. 85). In place of these ‘polemical entities’ (p. 294), he promotes other pairings, such as ‘humans and nonhumans’, which are brought together in a ‘collective’ by scientific practice, which in turn undermines the contrast between ‘nature’ and ‘politics’. Regarding the disputes considered here, his key assertion is that, ‘society cannot be part of our final vocabulary’, because, ‘in order to regain a sense of realism in the study of science, *one has to abandon the notion of society altogether*’ (p. 112). This gesture does not offer much analytical advantage when the feature issue is a concept like race which, as most participants involved acknowledge, begins as a ‘social construct’ and then is incorporated as a means for making sense of the ‘biological’. Nor does it help in considering the question of why this concept has been chosen over other less contentious terms, nor does it offer any advantage in explaining why this intense interest in race exists at all. Latour’s gesture is effective as an initial effort to move beyond a version of ‘social construction’, but it offers surprisingly little guidance in articulating the form of analysis that must follow in its wake.

This shortcoming in his model is sharply evident concerning the ‘loop’ that he considers most important—the ‘conceptual’ loop at the heart of the circulatory system of scientific facts, which in this case is the ‘social’ notion of ‘race’.²⁰ This core loop—which keeps all the others together, strengthens their cohesion and ‘*accelerates their circulation*’—is more commonly regarded as the ‘scientific content’ or ‘concept’. Surprisingly, succumbing to a metaphor that has long been used to police the boundaries between the natural and social sciences, Latour identifies this loop as the ‘hardest’. ‘It is hard’, he writes, ‘because it has to hold so many heterogeneous resources together’ (Latour, 1999, p. 108). Elaborating on this point, Latour expounds,

hard disciplines need bigger and harder concepts than soft ones, not because they are more remote from the rest of the world of data, colleagues, allies, and spectators—the four other loops—but because the world they churn, steer, move, and connect is vastly bigger (Latour, 1999, p. 108).

But it should be evident from all of this discussion that there is nothing remotely ‘hard’ about ‘race’, in that, as Cooper *et al.* pointed out, no participant in this debate has yet

offered a quantifiable or biological-based definition of race. Nor can there be in any way construed an essential character or quality of 'race' from a genetics perspective because it is used to refer to fluctuating frequencies and differential rates and flows of genes across uncertain social boundaries.

What Happens without 'Social Construction'?

Rather, 'race' is at the core of these disputes, not because of its 'hardness' but because of its 'softness'—its ambiguity and variability, which allow people to use it in such malleable and conflicting manners. The history of peoples' political and social obsessions with observing and recording it, as well as proving or disputing that it exists, is primary evidence of 'its' inherent mutability. History, politics, and culture are the forces that have placed race in Latour's core loop, and without a perspective on the 'social', these influences will remain unintelligible and invisible. Without this social dimension, how is it possible to explain why, today, some geneticists promote the use of an historically freighted, vaguely defined concept in place of a fairly neutral, more easily delimited term like 'ancestry', which several geneticists have argued would be a much better term to use (Bamshad *et al.*, 2004)? But is it possible to bring this 'social' dimension to bear regarding the disputed status of a biological basis to race without primarily reasserting or dogmatically insisting that race is socially constructed?

An affirmative answer to this question depends, first, on recognizing how much is at stake, politically and socially, in foregoing this claim. These stakes can be partially glimpsed via the statements from Charles Murray quoted above, but they can be recognized more broadly, too, by considering the historical importance of discrediting 'scientific racism' (Kevels, 1985; Smedley, 1993; Baker, 1998). Secondly, this requires acknowledging how important biological claims have been to the work of racial domination and exploitation. From the earliest developments of colonialism to the current, emergent operations of biocapital, efforts to differentiate populations and subpopulations in biological terms are the basis by which racialized pools of labour are constituted and manipulated (Rajan, 2006). Current assertions that race is socially constructed do important work by keeping both this history and these contemporary misuses of race in view, while also challenging the evidentiary ground for making claims about linkages between race and genetics. The problem with this assertion, though, is that since it typically makes its starting point the discrediting of biological claims—and because it gives such weight to historical aspects of racial classification—'social construction' generally offers meagre guidance in comprehending the cultural dynamics at work in racial matters.

Why Saying 'Socially Constructed' Stops Being Effective

There are at least two countervailing points to the admitted importance of social constructionist claims about race. The first is that saying 'socially constructed' these days really amounts to not saying much at all. As philosopher Ian Hacking somewhat caustically observes, 'an all-encompassing constructionist approach has become rather dull—in both senses of the word, boring and blunted' (1999, p. 35). Hacking argues that both the pervasiveness of this assertion and its lack of conceptual depth portend the intellectual exhaustion of this fundamental starting point for critical approaches to a range of politicized subjects. To illustrate this exhaustion, Hacking (1999) simply asks, what isn't

socially constructed these days? This leads to the second counterpoint. From an anthropological perspective, everything pertaining to humans is socially constructed (Schneider, 1980). The very distinction between ‘biological’ and ‘social’ that so bedevils debates about race is founded on a categorical cultural distinction between society and nature. The problem, in this regard, is that claiming ‘race is socially constructed’ makes a special problem of ‘race’, setting it over and against ‘everything’ else that might be so designated as cultural or social. As a result, the larger cultural dynamics shaping the significance of race is becoming increasingly hard to recognize, in part because debates about race become fixated on the question of whether the fundamental biology of human differentiation and similarity is being distorted in a biased manner. Indeed, owing largely to Lewontin’s earlier critique, such uses of race are singularly construed as a form of ‘bias’ (and, by association, prejudice and racism), which further undercuts the basis for regarding such uses as deriving from basic cultural dynamics.

Another consideration here is that, following from Lewontin’s earlier work, social constructionist arguments have been based on a confidence that the ‘reality’ of genetics would solve the problem of social (mis)conceptions about race—a confidence in the power of scientific objectivity that is equally evident in the work of Risch and Burchard. This dependence on genetics to show the ‘reality’ of race, either in ‘social’ or ‘biological’ terms, has led to a diminished recognition of the cultural dynamics at work in constituting and reproducing race. To develop a more incisive cultural analysis of race, though, we have to accept that genetics is not going to provide the basis for either proving or disproving the reality of race. Rather than deploying ‘social construction’ to reassert a distinction between the ‘biological’ and the ‘social’ or to assail the return of ‘atavistic beliefs’ about race, the more important move is to establish the primacy of cultural dynamics at work in shaping not just the genetic evidence and its interpretation, but the very interests and desires related to race that inform how this controversy unfolds both within and outside of the lab.

Conclusion

The effectiveness of using social constructionist claims as a basis to critique genetics research on race is diminishing. If the goal is to convince people that culture is the primary basis for the significance of race, these claims can be seen as failing in two key regards. The first, as I have tried to illustrate here, stems from how changes in the way genetics is practised and promoted are undermining the stability of fundamental assertions that there is ‘no biological basis for race’ or that ‘race does not exist’. Secondly, since most social constructionist approaches are fixated on the biological or genetic domain as a means of discrediting assertions about race, they provide scant basis for guiding people in understanding the dynamics pertaining in the cultural domain. Furthermore, these claims perhaps unintentionally promote a view of the cultural, as an analytical domain, that is largely equivalent to ‘bias’ or distortion. In place of reassertions that ‘race is socially constructed’, then, I am promoting two different strategies. The first draws upon Latour’s approach to analysing scientific controversies, which features a renewed, critical attention to how scientific claims are being made about race. The second involves making a domain claim for the primacy of cultural analysis in matters of race that is not predicated first and foremost on a dismissal of the possible relevance of biology or genetics to racial issues.

What advantages are gained by following Latour in acknowledging that race is 'gaining in reality'? First and foremost, this stance confronts critics with both the ineffectiveness of certain aspects of social constructionist claims and the need to engage the wider array of settings in which beliefs about a genetic basis for race are taking hold. Applying Latour to this controversy makes apparent that the work of articulation and translation by geneticists in relation to race proceeds perfectly well in the face of claims about its social construction. By instead regarding 'reality' as a partial outcome of these controversies, rather than their final arbiter, Latour's approach allows for a continued critical focus on the production of factual claims about linkages between race and genetics. But it does so without depending on genetic proofs to establish, first, that there is a social basis for race. Moreover, it offers an excellent means for keeping all the modifiers and conditionals in place regarding race—those that Francis Collins highlights in his reassessment of claims linking race and genetics, and those that Armand Leroi seeks to dismiss.²¹

But the key advantage arguably lies in avoiding the analytical trap that Latour identifies—that of the four adverbs: never, nowhere, always, everywhere. Allowing that race is 'gaining in reality' is not an admission that it is now proved to have 'always' been there or, for that matter, that you can find it now 'everywhere'. Rather, this stance affords a close attention to the tenuous, specific sites where 'race' is being produced in labs and everyday life, and brings a heightened awareness to the contingency of these productions without ruling them out of relevance entirely. Moreover, it underscores that the work of translation and articulation pursued by geneticists in relation to race is in questionable correspondence with what people have meant or said about race in the past, when scientists believed it was a typological, formal aspect of human identity linking behaviour and capacity to phenotype. Most importantly, though, critiquing this work does not then entail the untenable assertion that there will 'never' be a basis for linking genes and race or that there is 'nowhere' that links between biology and race might be considered relevant.

Where I differ from Latour's approach is in his suggestion that we forego entirely the analytical concept of culture. Though there may be no absolute basis for delineating the 'social' and 'biological' in any essential regard, as he argues, these do represent contrasting analytical approaches and methods, each of which are competing for priority in regards to race. Latour may, in a sense, be fairly charged with taking 'culture' for granted. Focusing on the 'loops'—the materials and practices of scientists—allows the register of culture informing these activities to slip from view.

But this point pertains to the critical discussions of race as well. Instead of making 'race' a special case for a set of deconstructive gestures, we need to see it, as well, as a product of basic cultural dynamics active in the key processes of sorting out belonging and difference among peoples who, in most regards, are far more similar than different (Hartigan, 2005a). Thus, by both promoting and pursuing cultural analysis broadly, it is much easier to attend carefully to the process by which we find and render any dimension of human difference meaningful (Hartigan, 2005b). Regaining or retaining the ability to speak authoritatively about race should not be predicated on making assertions about the biological or genetic domain, but rather by establishing the primacy of the cultural domain in explaining how and why race matters.

Jonathan Marks notes, in response to the claims reviewed above for the existence of race, that

anthropology is predicated on human differences—if everyone were the same, there could be no anthropology. At issue is the pattern or structure of those differences.

They seem to be principally cultural, and those that are not cultural are principally polymorphic and clinal. After taking away the differences that aren't cultural, polymorphic, or clinal, there certainly isn't much left, and you probably wouldn't want your health care predicated upon it (Marks, 2005).

In this regard, the stakes in these debates need to be reformulated in recognition that the contest here is very much over analytical domains—what can genetic analysis tell us about race versus what cultural analysis can explain? And there is no better argument for both the importance and relevance of cultural analysis in this case than the fact that those who are challenging the previous consensus about the lack of a biological basis for race primarily emphasize the ability of genetics to align with social perceptions. As Leroi makes the case for pursuing race-conscious science, the first 'benefit' he asserts is that this 'would remove the disjunction in which the government and public alike defiantly embrace categories that many, perhaps most, scholars and scientists say do not exist' (2005, p. 21). When the claims for the relevance and import for 'biological' data apparently rest upon their ability to match social categories and perceptions, then it is very easy to see that cultural analysis has a primary bearing on these matters.

Upon reflection, it is surprising that, in the face of such massive new power to depict and analyse distinctive segments of human populations and genes in a manner tailored to answer specific concerns or address detailed questions, some geneticists would choose instead to fetter this profound ability with the lunky, archaic apparatus of racial classification. The motives behind such choices lay beyond this essay's scope. Nor can I adequately address why geneticists like Risch and Burchard privilege 'race' over viable (and far more neutral) concepts like 'ancestry', which arguably would work far better as a basis for designing, conducting, and publicizing such research (Bamshad *et al.*, 2004; Bolnick, in press). Nor is there room to tackle the question of why so little attention is directed in this debate to the substantial epidemiological literature delineating the ways that social and economic inequality negatively impacts health and profoundly shapes the racial divide in terms of health outcomes, access to health care, and life chances (Krieger *et al.*, 1993; Krieger, 1994; Williams & Collins, 1995; Williams, 1997; Krieger, 2004). For that matter, why 'genes' should so dominate explanatory frameworks when there is so little that can be certainly attributed to genetics in relation to race but so much that is well documented regarding the effects of social inequality, also exceeds the limits of this paper (Goodman, 2000; Sankar, 2004). I bring up these issues in closing as a means to indicate exactly the direction to turn in order to recognize and make the case anew for the importance of culture in all of this.

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Notes

¹'Social construction' is a sprawling and widely-deployed concept that resists succinct definition, but this has not prevented it from being confidently referenced as a term that encapsulates diffuse political and intellectual sensibilities. There are a variety of ways to compose a genealogy of the term, social

construction, but most can be traced through Berger and Luckman's, *The Social Construction of Reality* (1966). Berger and Luckman characterized 'reality' as constituted by a social system of actors who generate representations of each other's actions that then become habituated into roles. Based on this model, social construction is used to analyse how objects that appear natural and real are composed of social perceptions and constituted by social actions. Social construction is also used to draw attention to the impacts of social forces and environmental factors in shaping human health and well being (Kreiger, 1994). For an overview of this expansive analytical concept, see Gergen (2001).

²Despite the nuanced and varied uses of social construction in articulating research perspectives, these approaches have been caricatured as an all-encompassing 'school of thought' in a variety of charged polemics (Bauerlein, 2001; Shapiro, 2002).

³See *Losing Ground: American Social Policy, 1950–1980* (1984) and *The Bell Curve: Intelligence and Class Structure in American life* (1994).

⁴The status in anthropology of the long standing claim that 'races do not exist' has been the subject of intense assessment as to how widely and uniformly it is accepted by physical anthropologists (see Littlefield *et al.*, 1982; Cartmill, 1999; Lieberman *et al.*, 2003).

⁵The primary concern of those holding a social constructionist stance on race has been to foreclose or dismiss an attention to the biological, in part from an historical awareness of the generally discredited efforts of scientists in the 1800s and much of the 1900s to make authoritative statements about the inherent characteristics of African-descended peoples (Barkan, 1992). But this stance also stems from a conviction that the social realm is the origin of racial perceptions and hence the real ground where racial inequalities and disparities, which geneticists aim to examine, are generated.

⁶For an historical account of the waxing and waning of efforts to use race as a scientific concept in the United States, see Smedley (1993) and Baker (1998).

⁷See, 'Is "race" real?', a Web forum organized by the Social Science Research Council, available at: <http://raceandgenomics.ssrc.org/>.

⁸As Latour explains, 'the more we in science studies showed the constructivist character of science, the deeper was the misunderstanding between us and our scientific friends. It is as if we were undermining science's claims to truth' (1999, p. 115).

⁹Latour delineates the following problems with the 'use of the words "construction" and "fabrication"' in science studies. 'First, although "construct" and "fabricate" are terms for technical activities, it happens that, under the pens of sociologists and philosophers working within that narrow space that the modern settlement has allowed them, technology has been rendered almost as obscure as science. Second, this account implies that the initiative of action always comes from the human sphere, the world itself doing little more than offering a sort of playground for human ingenuity. Third, speaking of construction implies a zero-sum game, with a fixed list of ingredients; fabrication merely combines them in other ways. Finally, and this is much more worrying, the old settlement has kidnapped the notions of construction and fabrication, turning them into weapons in a polarized battle against truth and reality. All too often the implication is that if something is fabricated it is false; likewise, if it is constructed it must also be deconstructible' (1999, pp. 114–115).

¹⁰Articulation is a concept Latour hones in the process of trying to dissolve our epistemological investment in dividing the world up into subjects and objects. Articulations—in contrast to statements, which Latour argues badly misconstrue the relationship between human and nonhuman actors—refer to the way propositions elaborate upon and engage with a host of supporting forms and actors. Through the process of articulating propositions, entities gain credibility and tangibility as they are made to appear and perform in expanding networks, within and outside of laboratories. 'Instead of being mute, unknown, undefined, it becomes something that is made up of many more items, many more articles, many more reactions to many more situations. There are, quite simply, more and more things to say about it, and what is said by more and more people gains in credibility' (1999, pp. 143–144).

¹¹As Venter explained, Celera's approach was specifically designed to discount the significance of race. 'The method used by Celera has determined the genetic code of five individuals. We have sequenced the genome of three females and two males who have identified themselves as Hispanic, Asian, Caucasian or African-American. We did the sampling not in an exclusionary way, but out of respect for the diversity that is America and to help illustrate that the concept of race has no genetic or scientific basis. In the five Celera genomes, there's no way to tell one ethnicity from another. Society and medicine treat us all as members of populations, whereas as individuals we are all unique and population statistics do not apply' (Venter, 2000, p. 8).

¹²Cooper makes this point succinctly: 'Since we do not know about the genetic variants that predispose persons to common chronic diseases, one might assume that arguments for the existence of genetic

predispositions would be made for all population groups equally. The reality is very different. Minority groups, particularly blacks in the United States, are assumed to be genetically predisposed to virtually all common chronic diseases' (Cooper *et al.*, 2003, pp. 1167–1168).

¹³The use of DNA haplotypes trees to model human races is subject to keen criticism. As Alan Templeton argues, 'The widespread representation of human "races" as branches on an intraspecific population tree is genetically indefensible and biologically misleading, even when the ancestral node is presented as being 100,000 years ago' (1998, p. 646).

¹⁴Wade also makes this argument in his book, *Before the Dawn: Recovering the Lost History of Our Ancestors* (2006), where he allows 'the work of Risch, Feldman, and others has probably not yet become the consensus view'. But he conveys their research as representing a widely accepted, rather than hotly contested, stance.

¹⁵In particular, see the discussion engendered by what A. W. F. Edwards has labelled 'Lewontin's Fallacy' (Edwards, 2003; Bamshad *et al.*, 2004; Lewontin, 2005).

¹⁶The 6.3% figure represents only a portion of the 'less than 15% of human genetic diversity [that] is accounted for by differences between human groups!' (Lewontin, 1972, p. 396).

¹⁷Cooper and colleagues acknowledge that studies of multiallelic loci demonstrate the possibility of clustering persons into population groups with high degrees of statistical accuracy; they also recognize that the analysis of single-nucleotide polymorphisms (SNPs) has generated a more limited basis for some degree of classification according to continent. What they question is the public health relevance of these studies. They strongly disagree that 'the ability to categorize persons according to continental "race" validates the clinical and epidemiologic use of self-reported racial ancestry in terms of the categories of white, black, Asian, Pacific Islander, and Native American used by the US Census'. Regarding the occurrence of population-specific alleles, they point out that most of these are not functional and it is not apparent that such differences have any impact on traits related to health. 'Accumulated small differences in common alleles will yield differences in population risk only if a disease is caused primarily by interactions among multiple loci, and this is both mathematically and biologically implausible' (Cooper *et al.*, 2003, p. 1167). Cooper *et al.* further assert, 'categorizing people on the basis of differences in allele frequencies is therefore not the same as apportioning the whole of human diversity into medically relevant categories. The more relevant outcome—that the sets of common functional polymorphisms are distributed in discrete racial categories—has not been demonstrated. Furthermore, most population geneticists concur that the bulk of genetic variation (90–95%) occurs within, not among, continental populations' (2003, p. 1167).

¹⁸This was illustrated in the documentary, *African American Lives* which recorded the reactions of famous African-Americans as they received the results of their DNA ancestry tests.

¹⁹See <http://www.genomecenter.howard.edu/units/genethics/default1.htm>.

²⁰In fairness to Latour, though, this problem with his model is hardly evident in regards to his common subjects of study, for which the 'human' 'nonhuman' binary works quite well. His goal is to describe the 'massive socialization of novel objects—atoms, fossils, bombs, radar, statistics, theorems—into the collective', and towards this end his model works quite well. But the key point in analysing the 'fifth loop' is to grasp that which 'holds a collective tightly together', and in the case of the debate considered here, the answer is quite simply an intense interest in race.

²¹Kaplan and Bennett suggest such a strategy for keeping these modifiers and conditionals in view in their review of editorial guidelines regarding racial topics in medical journals. They recommend 'that the reasons for using race/ethnicity should be specified, that categories should be described and justified, and that all relevant variables should be considered in analyses' (2003, p. 2714).

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