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Race and Genetics



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Editorial

Sam Anderson

Shortly after Professor Henry Louis Gates Jr. was arrested at his home in Cambridge, Massachusetts, I stumbled across a conservative talk radio show carrying out a one-sided debate about whether Professor Gates was right to demand an apology of his arresting officer, James Crowley, whom Gates charged with racial profiling.

Normally I would have changed the station, but a caller caught my attention when he suggested that Gates' right to ask for an apology was tenuous because he is "only 44% black." According to the caller, this figure was the calculation of Gates' own ancestry testing company, AfricanDNA. The show's host wondered if Officer Crowley could then "just apologize to that 44%."

That line of reasoning is obviously deeply flawed, even by the loose logic of radio talk shows. The notion that a person's race can be measured with numerical values is farfetched enough; the notion that such genetic figures somehow outweigh social definitions of race is simply ludicrous. Race is either self-defined or in the eye of the beholder.

It is widely understood that categorizations of race are social constructs. We know that all people who check a particular race on the census form are not unified by some genetic blueprint. We know that when Judge Sonia Sotomayor speaks of the judgment of a "wise Latina woman," she is referring not to some superior set of genetics but to the experiences drawn from living within a particular social category (besides, the U.S. Census defines 'Hispanic' as an 'ethnicity,' not a 'race').

Yet, despite what seems common knowledge, there are persisting efforts to locate and emphasize connections between genes and race. A particularly confounding example is BiDil, a drug which the FDA approved specifically for use by African-Americans. As Jonathan Kahn discusses on page 18, the clinical trials which formed the basis for the race-specific BiDil patent were limited to self-defined African-Americans - despite the vast genetic differences that can exist between individuals who consider themselves African-American.

This special double issue of GeneWatch contains extracts from longer papers on race and genetics commissioned by the Council for Responsible Genetics through a grant by the Ford Foundation. The full papers are available at www.councilforresponsiblegenetics.org. Also included are interviews, a book review, and a film review, covering topics ranging from post-conviction DNA tests to factory farming.

As for the Gates incident, the resulting discussion about race in America may not determine much about the importance - or unimportance - of genetics in racial issues; but it is also a topic that won't go away on its own.

The Elusive Variability of Race

An extract from the full paper

BY PATRICIA J. WILLIAMS, J.D.

The question of race is, at its core, a questioning of humanity itself. In various eras and locales, race has been marked by color of skin, texture of hair, dress, musical prowess, digital dexterity, rote memorization, mien, mannerisms, disease, athletic ability, capacity to write poetry, sense of rhythm, sobriety, child-like cheerfulness, animal anger, language, continent of origin, hypodescent, hyperdescent, religious affiliation, thrift, flamboyance, slyness, physical size, or presence of a moral conscience. These presumed markers may appear random in the aggregate, but they have nevertheless been deployed to rationalize the distribution of resources and rights to some groups and not others. Behind the concept of race, in other words, is a deeper interrogation of what distinguishes beasts from brothers; of who is presumed entitled or dispossessed, person or slave, autonomous or alien, compatriot or enemy.

In the contemporary United States, race is based chiefly on broad and variously calibrated metrics of African ancestry. To get a full sense of the ideological incoherence of race and racism, however, one must also include the longer history: the centuries-old Chinese condescension to native Taiwanese Islanders; the English derogation of the Irish for “pug noses”; the plight of the Dalit (i.e., untouchables) in India; or comprehensively eugenic regimes like Hitler’s.

Despite the enormous definitional diversity of what race even means, and despite the fact that the biological studies – from Charles Darwin’s observations to the Human Genome Project – have patiently, repetitively and definitively shown that all humans are a single species, there remain many determined to reinscribe a multitude of old racist superstitions onto the biotechnologies of the future. Despite the biological evidence – and a towering body of social science that is cumulative (observations over time), comprehensive (multiple levels of inquiry) and convergent (from a

variety of sources, places, disciplines) – we are still asking the same centuries-old questions

For purposes of this paper, let us stipulate that race is not a “scientific” or biologically coherent category. I ask for such stipulation because it is beyond my scope to prove or disprove creationist theories of polygenesis, or theological tracts about God’s intention to keep races separate, or essentialist polemics about whether black women are more or less endowed with testosterone than white men. It is true that race-as-biology remains a major hurdle in the cultural imagination: at one extreme, there are those zealots who actively deploy races as the innate mark of beings so different that they constitute another species altogether. And at the other end of the ideological spectrum are those ordinary creatures for whom discussions of race remain heavily inflected by assumptions of biological difference, as a largely unexamined and unconsciously malleable mush of assumptions about genes, social history, law and culture.

Ergo, let us just agree that, as hard as many have tried to find it, there is no allele for race (as distinct from skin color); there are no separate proteins indicating that some of us are chosen by God over others; and there is no distinct cellular pattern that distinguishes the tribal intelligence of any one group on the planet as opposed to another. At the risk of being tedious, I underscore this point precisely because it, like some of the most reproducible of scientific consensus-like evolution, climate change and the value of vaccinations—remains fiercely disputed as “mere” contestable “theory.”

So what is race if not biology?

Race is a hierarchical social construct that assigns human value and group power. Social constructions are human inventions, the products of mind and circumstance. This is not to say that they are imaginary. Racialized taxonomies have real consequences upon

biological functions, including the expression of genes. They affect the material conditions of survival—relative respect and privilege, education, wealth or poverty, diet, medical and dental care, birth control, housing options and degree of stigma.

In antebellum America, race was determined by a number of variables, depending on the state, including color, ancestry, ethnicity, association, behavior, and property records. During the Jim Crow era, appearance became singularly important. Since the civil rights movement, class and speech have sometimes been included among the criteria of line-drawing.

In the industrialized west, racism (as well as related prejudices like class bias, sexism, and religious intolerance) is constructed from a complex intermingling of individual vision, historical happenstance, social milieu, political decision-making and legal structure. If not actually rooted in biology, race is nevertheless the subject of relentless biologizing. From the slavery-apologist Samuel Cartwright to Adolf Hitler, each generation has brought new utensils to the enterprise of racial demarcation. Calipers were used to measure the size of buttocks or length of leg muscles or circumference of skulls or width of noses.¹ There have been mathematical models to measure percentages of “blood” or wavelengths of skin color or degrees of curvilinearity in the arcs of kinky hair. But over and over, race has been proved and proved again to be illusory as a matter of hard science.

Yet still the questions come: If we are one species, what about sub-species? As in: “Blacks, Jews, Asians – you can’t deny they’re different. It’s like a poodle or a dachshund or a St. Bernard is to the species of dog,” according to one of my former students. This sort of perception is a not a matter that will be resolved by yet more scientific testing. Rather, I think this reiterated resistance to data is testament to the persistence of human imagination and the power of belief over documentary evidence.

If history has shown us anything, it’s that race is contradictory and unstable. Yet our linguistically embedded notions of race seem to be on the verge of transposing themselves yet again into a context where genetic percentages act as the ciphers for culture and status, as well as economic and political attributes. In another generation or two, the privileges of whiteness may be extended to those



who are “half” this or that. Indeed, some of the discussions about Barack Obama’s “biracialism” seemed to invite precisely such an interpretation. Let us not mistake it for anything like progress, however: biracialism always has a short shelf life. For example, by the time he was elected President, Barack Obama was no longer our first “half and half president” but had become all African-American all the time. Indeed, Obama himself seemed to acknowledge the more complex reality of his own lineage in an off-the-cuff aside, when, speaking about his daughters’ search for a puppy, he observed that most shelter dogs are “mutts like me.”

In fact, of course, we’re all mutts – and as Americans, we’ve been mixing it up faster and more thoroughly than any place on earth. At the same time, we live in a state of tremendous denial about the rambunctiousness of our recent lineage. The language by which we assign racial category narrows or expands our perception of who is more like whom, tells us who can be considered marriageable or untouchable. The habit of burying the relentlessly polyglot nature of our American identity renders us blind to how intimately we are tied as kin.

In the United States’ vexed history of color-consciousness, anti-miscegenation laws (the last of which were struck down only in 1967) enshrined the notion of hypodescent. Hypodescent is a cultural

phenomenon whereby the child of parents who come from differing social classes will be assigned the status of the parent with the lower standing. Most parts of the Deep South adhered to it with great rigidity, in what is commonly called the “one drop and you’re black” rule. Take for example, *New York Times* editor Anatole Broyard, who denied any relation to his darker-skinned siblings and “passed” as white for most of his adult life. There were many who expressed shock when it was uncovered that he was “really” black. Some states, like Louisiana, practiced a more graduated form of hypodescent, indicating hierarchies of status with vocabulary like “mulatto,” “quadroon,” and “octoroon.” And even today, despite our diasporic, fragmented, postmodern cosmopolitanism, there is a thoughtless or unconscious tendency to preserve these taxonomies, no matter how incoherent. Consider Essie Mae Washington-Williams, the daughter Senator Strom Thurmond had by his family’s black maid. She lived her life as a “Negro,” then as an “African American,” and attended an “all-black” college. But in her 70s, when Thurmond’s paternity became publicized, she was suddenly redesignated “biracial.” Tiger Woods and Kimora Lee Simmons are alternatively thought of as African-American or “biracial,” but rarely as “Asian-American.”

In contrast, many parts of Latin America, like Brazil or Mexico, assign race by the opposite process, hyperdescent. That’s when those with any ancestry of the dominant social group, such as European, identify themselves as European or white, when they may also have African or Indian parents. As more Latinos have become citizens of the United States, we have interesting examples of this cultural cognitive dissonance: Just think about Beyoncé Knowles and Jennifer Lopez. Phenotypically they look very similar. Yet Knowles is generally referred to as black or African-American; Lopez is generally thought of as white (particularly among her Latino fan base) or Latina (among the rest of us), but she is never called black or even biracial.

A PBS program aptly illustrates the problems that ensue when attempts are made to conflate genes and “race.” Harvard Professor Henry Louis Gates hosted a series exploring his roots and those of a handful of other prominent African-American figures, including comedians Chris Tucker and Whoopi Goldberg, scholar Sarah Lawrence Lightfoot and, of course, Oprah Winfrey. It was a fascinating series of TV programs, particularly from the perspective of the discipline of history. It revealed the peculiar difficulties of tracking lines of descent through slavery—the sales of

human beings that acknowledged no family ties, the absence of last names, the absence of first names in some cases, and the necessity of consulting not just census records but also “the master’s” property holdings for listings of possible relatives. The reconstruction of family history was like an archeological dig, part intergenerational storytelling, part study of migratory patterns, part recovery of commercial transactions, and part science.

The science du jour is, of course, DNA testing. On the one hand, DNA testing can be quite useful in establishing certain kinds of family relation. (Since the program aired, Gates has set up his own ancestry-tracking company, AfricanDNA.) Gates’ own test results showed that he had no relation to Samuel Brady, the white patriarch he’d grown up “knowing” as the man who impregnated his great-great-grandmother. Nothing had prepared him for Brady’s *not* being his direct ancestor. Indeed, one of Gates’ cousins remained adamant that the test must be wrong. If the test was right, he insisted, there would have to be “two truths”: One would be the story he grew up with, the other what the DNA says.

Somewhere in between what the DNA says and what shaped the family account is a gap that is something like a lie. A secret passing from black to white? An act of assimilation or aspiration? A myth to hide some shame? A change of identity to escape to freedom? Yet I do hesitate to think of it as precisely on the same moral level as the kind of “lie” that James Frey is said to have told in his memoir *A Million Little Pieces*. There is something very human about the repetition of family stories until they become epic rather than literal, the burying of family secrets, the lying of ancestors, the reinventions of migrants, the accommodations of raw ambition, the insulations from terrible shame. This is, I suppose, distantly related to James Frey’s addled manipulations; it might also be related to, but of a different order than, the magical thinking of mental patients, character-disordered people or victims of great trauma.

There is something commonplace about the kinds of family mysteries that Gates’ inquiries reveal, particularly in the American context. It is part of how many of our ancestors, regardless of where they came from, reinvented themselves in the “New World.” New York University Law School Professor Jessie

Allen describes the “magic” of legal remediation this way: “What ought to have been prevails over the past.” Family stories ritualize the past in a very similar way. It is part of what Professor Robert Pollack, head of Columbia University’s Center for the Study of Science and Religion, calls the “eschatology of repair.”

If there is value to this kind of “emotional truth,” it is important not to confuse it with the sort of “truth” that DNA tells us. While DNA can undoubtedly pinpoint certain aspects of our ancestry through sequencing and matching mitochondrial DNA, it does not make literal sense to say, as Gates did to Oprah Winfrey at one point: “You’ve got education in your genes.” Of course, he was speaking metaphorically at that moment, using the human genome as a metaphor for a pattern of socialization, a family habit, or a thirst for knowledge modeled by parents.

But at other points in the program, as well as in our daily parlance, that metaphoric dimension is applied rather more carelessly – and more dangerously. We have a long history of thinking of identity as genetically based, but again, there is no more an allele for being

“white” or “Latina” than there is for “education.” These are malleable political designations that expand and contract with time and human circumstance.

It behooves us to be less romantic about what all this DNA swabbing reveals. I worry about the craving to “go back to Africa,” to “connect with our Yiddishkeit” or to feel like new doors have been opened if we have an Asian ancestor. The craving, the connection, the newness of those doors is in our heads, not in our mitochondria. It is a process of superimposing the identities with which we were raised upon the culturally embedded, socially constructed imaginings about “the Other” we could be. The fabulous nature of what is imagined can be liberating and invigorating – but it is fable. If we read that story into the eternity of our blood lines, if we biologize our history, we will forever be less than we could be. ■■■

Patricia J. Williams, JD, is a Professor of Law at Columbia University. Her books include The Rooster's Egg (1995), Seeing a Color-Blind Future: The Paradox of Race (1997) (1998) and, most recently, Open House: On Family Food, Friends, Piano Lessons and The Search for a Room of My Own (2004).

A Short History of the Race Concept

An extract from the full paper

BY MICHAEL YUDELL, PhD, MPH

At the dawn of the 21st century, the idea of race – the belief that the peoples of the world can be organized into biologically distinctive groups, each with their own physical, social, and intellectual characteristics – is understood by most natural and social scientists to be an unsound concept. The way scientists think about race today, after all, is different than it was in the wake of the Civil Rights Movement when some promoted black genetic inferiority as an argument against egalitarian social and economic policy and certainly different than one or two centuries ago, when scientific justifications for slavery and later Jim Crow were articulated. In other words, race, its scientific meaning seemingly drawn

from the visual and genetic cues of human diversity, is an idea with a measurable past, identifiable present, and uncertain future. These changes are influenced by a range of variables including geography, politics, culture, science, and economics.

Today, despite the growing consensus among scientists that race is not a useful classificatory tool, an understanding of human difference and diversity remains a hallmark of contemporary scientific practice. This presents a seeming contradiction: how can one study human difference without talking about race? On the one hand, beginning in the 1930s, advances in population genetics and evolutionary biology led many to conclude

that the race concept was not a particularly useful or accurate marker of biological difference. By the 1970s, many prominent biologists, including Richard Lewontin and Stephen Jay Gould, came to see the race concept as a deeply flawed way to organize human genetic diversity that is inseparable from the social prejudices about human difference that spawned the concept in the 18th century and have accompanied its meaning since.¹ Historians and social scientists believe that race is socially constructed, meaning that the biological meaning of race has been constrained by the social context in which racial research has taken place.

On the other hand, because studying genetic differences can improve our understanding of human evolution, disease, and development, the relationship between genetics and human diversity remains an ongoing area of scientific inquiry. The challenge has been to develop a new scientific terminology and methodology that finds meaning in the study of human difference without recapitulating outmoded and racist notions often associated with the concept of race itself. Some scientists have developed novel ways to measure difference between various human populations, including using ancestry, ethnicity, and population as replacements or surrogates for race. Others, however, remain steadfast in their belief that technological and methodological improvements now allow an examination of racial difference with increasing precision that is disconnected from any social prejudices.

Ever since Thomas Jefferson wrote in the Declaration of Independence that “all men are created equal,” America has struggled with the chasm between this Jeffersonian ideal and the realities of the American experience. Jefferson himself was the author of some of America’s earliest ideas about race and science. In 1787, little more than a decade after he had penned the Declaration, Jefferson suggested in his work on the natural history of Virginia, *Notes on the State of Virginia*, that the difference between the races “is fixed in nature” and hypothesized that blacks were “originally a dis-

tinct race.”² The contradiction between the Declaration and *Notes* may be understood, however, by Jefferson’s view of humanity itself. If blacks were of a separate creation, and set apart from the definition of “all men,” then the equality set out in the Declaration did not apply to all.

Historian Frank Snowden, looking at black-white contact before the sixth century A.D. found that although there is an “association of blackness with ill omens, demons, the devil, and sin, there is in the extant record no stereotyped image of Ethiopians as the personification of

ings, which were rooted in an antagonism towards Jewish religious beliefs, began to evolve into anti-Semitism. These blood kinship beliefs rationalized anti-Jewish hatred instead as the hatred of a people. For example, Marranos, Spanish Jews who had been baptized, were considered a threat to Christendom by virtue of their ancestry because they could not prove purity of blood to the Inquisition.

Beginning in the eighteenth century, at the height of the Age of Enlightenment in Europe, these ideas were applied to explaining the diversity of humankind.

This was driven in part by the experiences with new peoples during colonial exploration, the need to rationalize the inferiority of certain peoples as slavery took hold in European colonies, and the development of a new science to assess and explain diversity in all species. The Swedish botanist and naturalist Carolus Linnaeus also made lasting contributions to the race concept at this time. Linnaeus’s “natural system,” which became the basis for the classification of all species, divided humanity into four groups: Americanus, Asiaticus, Africanus, and Europeaeus. But while the term race existed before the 18th century, mostly to describe domesticated animals, it was introduced into the sciences by the French naturalist Georges-Louis Leclerc, Comte de Buffon in 1749. Buffon saw clearly demarcated distinctions between the human races that were caused by varying climates. Buffon’s climatological theory of difference was infused with notions of European superiority. To Buffon, the natural state of humanity was derived from the European, a people he believed “produced the most handsome and beautiful men” and represented the “genuine color of mankind.”

The Swedish botanist and naturalist Carolus Linnaeus also made lasting contributions to the race concept at this time. Linnaeus’s “natural system,” which became the basis for the classification of all species, divided humanity into four groups: Americanus, Asiaticus, Africanus, and Europeaeus.

If racial science is science employed



“Race types,” from Maury’s *New Complete Geography*, 1906.

demons or the devil.”³ In ancient Greece and Rome “the major divisions between people were more clearly understood as being between the civic and the barbarous,” between the political citizen and those outside of the *polis*, and not between bloodlines or skin color.⁴ Most scholars now accept the viewpoint that in the ancient world “no concept truly equivalent to that of ‘race’ can be detected in the thought of the Greeks, Romans, and early Christians.”⁵ Rooting human variation in blood or in kinship was a relatively new way to categorize humans. The idea gained strength towards the end of the Middle Ages as anti-Jewish feel-

for the purpose of degrading a people both intellectually and physically, then beginning in the 19th century, American scientists played an increasingly active role in its development. Scientists like Samuel Morton, Josiah Nott, and George Gliddon offered a variety of explanations for the nature of white racial superiority meant to address the nature of physical and intellectual differences between races, the “natural” positions of racial groups in American society, and the capacity for citizenship of non-whites.

At the core of this work, known as the American School of Anthropology, was the theory of polygeny, the belief that a hierarchy of human races had separate creations. Samuel Morton’s experiments on cranial capacity and intelligence sought to demonstrate this theory. Morton collected hundreds of skulls from around the globe, measured their volume, and concluded that the Caucasian and Mongolian races had the highest cranial capacity and thus the highest levels of intelligence, while Africans had the lowest cranial capacity and thus the lowest levels of intelligence.

More than a century after Morton’s death, the evolutionary biologist Stephen Jay Gould, using Morton’s same experimental material and methods, could not replicate the earlier findings. Gould concluded that Morton’s subjective ideas about race difference influenced his methods and conclusions, leading to the omission of contradictory data and to the conscious or unconscious stuffing or under-filling of certain skulls to match his pre-ordained conclusions.⁶ Indeed, the case of Samuel Morton illustrates how social conceptions of human difference shape the science of race.

At the dawn of the 20th century, explanations for racial difference based on measurable and observable physical traits such as cranial capacity and skin color gave way to a whole new way of thinking about the subject. Race instead came to be understood as a reflection of unseen differences that the scientists of the time attributed to the recently discovered factors of heredity. As ideas about racial differences became rooted in biology, genetics came to provide the formative language of modern racism.

This geneticization of race - the idea that racial differences in appearance and complex social behaviors can be understood as genetic distinctions between so-

called racial groups - was shaped, in large part, by the eugenics movement. According to Francis Galton, the founder of the movement, eugenics promised to give “the more suitable races or strains of blood a better chance of prevailing over the less suitable.”⁷ This could be done either through positive eugenics in which certain groups were encouraged to breed with one another; or through negative eugenics in which certain groups or individuals would be denied the right to reproduce - either through sterilization, as was the case in the United States, or through genocide, as was the case in Nazi Germany. Under the guise of this biological banner, eugenic racial science exerted a diverse and far-reaching influence. It became a powerful ideological force in Nazi Germany, influenced the creation of eugenic sterilization laws in the United States that resulted in at least 30,000 sterilizations, stoked racial hatred in early 20th century America, and became a scientific buttress of 20th century American racial ideology. For the first three decades of the 20th century, many geneticists advocated eugenic ideas and helped to shape the movement.

Beginning in the 1930s, an increasing number of geneticists, anthropologists, and social scientists began moving away from typological and eugenic descriptions of human difference to view races through the lens of population genetics and evolutionary biology. This approach rejected a eugenic notion of fixed genetic differences between so-called racial groups, and instead understood human races as dynamic populations distinguished by variations of the frequency of genes between populations. By rooting the meaning of race in genetic variation it became more difficult (though still possible) to argue that one race or another had particular traits specifically associated with it, or that one individual was typical of a race. Furthermore, the four or five racial groups identified by 18th and 19th century scientists now varied depending upon the genes and traits examined by geneticists. Theodosios Dobzhansky, the evolutionary biologist whose work between the 1930s and 1970s had a tremendous influence on the way that scientists thought about race, concluded that the number of human races was variable depending upon what traits were being examined. In fact, he believed that the

concept of race in the context of population genetics and evolutionary biology was a scientific tool for making genetic diversity intelligible and manageable in scientific study. In other words, while human differences are real, the way we choose to organize those differences is a methodological decision and not one that reflects an underlying evolutionary hierarchy or the conservation of racialized traits through the admixture of populations. This new approach was brought about by new findings in genetics that demonstrated genetic variation was much more common within species than once thought and by the development of what is known as the evolutionary synthesis in biology, a “Darwinian fusion” of population genetics, experimental genetics, and natural history.⁸ Finally, changes in the concept of race were influenced by a growing cadre of scientists who were generally more liberal on matters of race than their predecessors.

At a June 2000 Rose Garden ceremony, President Bill Clinton, flanked by genome sequencers Francis Collins and Craig Venter, announced the completion of a draft sequence of the human genome. Collins, head of the National Human Genome Research Institute, and Venter, then President of Celera Genomics, offered their genomic data to the world - enhancing our understanding of human biology and holding the promise of helping public health and medical professionals prevent, treat, and cure disease. On that day Venter and Collins emphasized that their work confirmed that human genetic diversity cannot be captured by the concept of race and demonstrated that all humans have genome sequences that are 99.9% identical. At the White House celebration Venter said “the concept of race has no genetic or scientific basis.”⁹ A year later, Collins wrote: “those who wish to draw precise racial boundaries around certain groups will not be able to use science as a legitimate justification.”¹⁰ Yet, since the White House announcement, there has been an increase in claims that race is a biologically meaningful classification.

The upsurge of claims that race is a useful taxonomic concept for humans seems to be driven by several factors. First, genomic technology has enhanced our ability to examine the 0.1% of nucleic acids in the human genome that, on average, vary between individuals. Some sci-

entists are relying on the race concept to make sense of the genetic variation in this small sliver of our genomes. Second, the history of the biological race concept suggests that race is deeply embedded in scientific thought and that racialized thinking shaped genetics in the 20th century. This history continues to shape scientific thinking about human difference. Finally, the critical task of understanding and reducing known disparities in health has researchers looking at all possible explanations, including genetic ones, for disparities in health outcomes. Fueled by programs such as the National Institutes of Health's "Healthy People 2010" and CDC's "Racial and Ethnic Approaches to Community Health," the search for the underlying causes of these disparities is a national healthcare priority. The renewed focus on race and genetics suggests that an analysis of the complex relationship between individuals, populations, the environment, and health may be surrendered to a racial worldview.

It would be silly to think that science will somehow extricate us from a racial quagmire. Despite advances in scientific thinking on race, racism and the belief in races persist. Racism is too complicated to be eradicated by science alone. Nonetheless, scientists do have much to offer to the debate over the nature of race and racial classification, and we would all be the better for listening to what they are saying. Geneticists Kelly Owens and Mary-Claire King recognize this, writing that: "Of course, prejudice does not require a rational basis, let alone an evolutionary one, but the myth of major genetic differences across 'races' is nonetheless worth dismissing with genetic evidence."¹¹ ■■■

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Natural Selection, the Human Genome, and the Idea of Race

An extract from the full paper

By ROBERT POLLACK, PhD

Can there be a possible biological basis for categories of "race"? As we use the term in America today, race is a negative category: it defies definition because it lacks content. Race is not what a racist may say it is; it is simply whatever a racist thinks he or she is *not*. What can knowledge of the facts of natural selection and the human genome contribute to our understanding of such an idea?

To start at the beginning, such knowledge can give us a sense of the radical novelty of humanity as a single species in the context of the long history of the universe, and of life on our planet. Unlikely and exotic as it may seem, the best explanation for the facts of astronomy today is that the universe - all space and time itself - began at a point, all at once, some 13.7 billion years ago.

Recently, in terms of the history of the universe - about 4 billion years ago - something as improbable as anything we might imagine occurred here on Earth. In the salty seas, and apparently initially at random, clusters of atoms hooked up into long strings, and a very rare sequence of those strung-out clusters acquired the capacity to make a copy of itself, preserving the sequence of the subunits in the string. A self-copying string preserves the information in the sequence of that string, so long as the copies can make more copies of themselves in turn. One of these self-copying strings of chemical letters - DNA - has been copying itself ever since.

DNA is a chemical of great informational density, a text of great importance. As far as we know today, it is a new thing in the history of the universe, having appeared on our planet and nowhere else that we know of. Of course, self-copying by itself is not sufficient to explain why life emerged on our planet. The second requirement for life is that the different strings of subunits of the self-copying DNA carry meanings, and that one of these meanings be the capacity to assist the DNA in making more copies of itself.

Any version of DNA encoding a novel strategy for survival would be preserved. This second step - Darwin called it natural selection - can explain the history of life on Earth, from the first DNA-encoded organisms to all the species of creatures and plants alive on Earth today.

Our form of life, emergent by the same process of natural selection, has been around only a very short amount of time indeed. Think of each million years since the beginning of the universe as being a page in a book. Today that bookshelf of the universe would hold 30 volumes of 450 pages each (*Figure 1*). The first 21 volumes would have nothing in them about life. Both DNA sequencing and fossil evidence agree that the informational molecule DNA would have been born some time in volume 21, because archeobacteria, the first forms of life, would appear in the seas in volume 22.

Bacteria would continue to be the only shape life took for volumes 23 and 24 as well, though the ones emerging in volume 24 would change the planet's atmosphere to one rich in oxygen, by bacterial photosynthesis. Big-celled forms of life like paramecia and diatoms would appear for the first time in volume 25. Living things made of many big cells would appear in volume 27. Animals would remain in the seas where life had begun until the first tetrapods march on shore at the end of volume 29.

Dinosaurs would appear in the middle of volume 30. They would for the most part be wiped out by page 385. Only the last 65 pages of the last volume would have anything to say of significance about mammals. The last common ancestor of humans and chimpanzees would have lived and died only by page 440 of the most recent volume, 10 million years ago. From that ancestor many other ancestral hominid species would follow, each coming and going in the last ten pages.

On the last tenth of the last page of the last volume, humans emerge in

Africa. And then, somewhere toward the last sentence so far, would be the emergence of language, texts, and thoughts of imagined and imaginary creatures. The period at the end of that sentence would hold the time since science emerged in our mental worlds as a social activity with the capacity to understand all this.

And so at last we come to race and racism. In this last eye blink of universal timekeeping, we find ourselves entranced by two notions that share the same persistence in our minds and the same imaginary quality: that a person is no more than what that person has inherited in her DNA, and that a person's race is merely the clearest example of that generality. The first is a delusion, because the facts of science assure that our mental worlds are not encoded in our genes. Any brain can imagine, learn, teach, remember or forget any idea, regardless of the ancestry of the person whose mind is emergent in that brain, and regardless of whether that idea does or does not reflect the facts of nature. Perhaps the most self-serving and punitive example of such a dreamt idea is the notion that "genes are destiny."

All that makes our genomes human - and all that makes us human in a biological sense - is that these six billion different genomes are capable of coming together with each other through sperm and egg to make another generation of people. The sieve of natural selection assures us that no matter the differences in our DNA sequences, all of us are here because our ancestors' DNA contained the capacity to encode the structures for fertile reproduction in their bodies. Everything else encoded in our genes that makes us different from one another is either in service to the necessity for fertility so that the species and its DNA will survive, or it is a difference that has been passed on because it does not get in the way of that fertility.

The presumption of "race" in the American context runs up against a second fact about our history as a single species. Our species is African in origin; we are all the very recent descendants of Africans. The evidence for this comes from many quarters, but in our terms the DNA evidence is most interesting. Because Africa is the home of us all, today's hundreds of millions of Africans

have the greatest genetic diversity of all human subpopulations. This is because those subpopulations who left Africa to cover the other continents left close relatives behind, and their descendents are the people who live in central Africa today. Of course the DNA sequences of people everywhere are also in flux as new DNA changes or mutations pass the test of natural selection and persist, whether by being of no consequence or, rarely, by being advantageous for the survival of offspring. Still, our species is very young, and the descent of all of today's many "ethnicities" and "races" from people who lived in Africa only tens of thou-

nize as our ancestors, if we met them today, were Africans with dark skin. From these first ancestors, humans migrated throughout Africa and then to the Middle East, Europe, Asia, Oceania, Russia and North America, finally reaching the southern tip of South America 10,000 years ago. Once the planet had been colonized by African emigrants, the itch to move on did not go away - nor has it even today. The difference between those first migrations and later immigrations and invasions is that in the last 10,000 years, no migration would have been likely to settle in territory not already occupied in part by descendents of an earlier migration. The resulting wars and conquests form the narrative of what we are pleased to call modern civilization.

Our common African patrimony makes the insult of American racism more stupid, but not less dangerous, than any other dehumanization. The series of European "discoveries" of the Americas in the past millennium were simply secondary migrations to, and conquests of, the lands first occupied by the original African settlers of North and South America - by descendents of the original African settlers of Europe. That some of these "conquerors" enslaved Africans of their day, that these Africans arrived on the shores of the Americas in that fashion, and that the founders of our country then enshrined the legal non-personhood of their descendents in our Constitution's very first Article, makes this compelled migration only more poignant and ironic. The law stated that:

"... Representatives and direct Taxes shall be apportioned among the several States which may be included within this Union, according to their respective Numbers, which shall be determined by adding to the whole Number of free Persons, including those bound to Service for a Term of Years, and excluding Indians not taxed, **three fifths of all other Persons.**" (My emphasis)

"Indians not taxed" were at that time members of unsubjugated nations. However inconvenient their presence was to notions of the manifest destiny of Europeans on this continent, they were powerful and free enough to be understood to be people in their own right. "Other persons," however, were not peo-



Figure 1

sands of years ago is well-established.

The many different versions of a stretch of chromosomal human DNA still found today in East African populations, have been studied in other populations as markers of first African subpopulations to have left the ancestral homeland for the one or another of the lands reached by a series of migrations that began no later than 60,000 years ago. These DNA fragments confirm archeological evidence that the most recent human migration to arrive at its final destination was the one that settled at the southern tip of the Americas about 10,000 years ago.

The first humans we would recog-

ple. People can either be ignored, or taxed and given the vote; “other persons” could not vote, could not become voters, had no rights, and could be bought and sold. They had political reality and political utility, however. For purposes of counting the number of seats in the US House of Representatives, each “other person” would be counted as three-fifths of a vote, allowing for more white Congressmen from the South.

The recent election of our first President of acknowledged and recent African ancestry has not closed this sorry history, but it has transformed its irony into simple failure. We have no national monument to “other persons” *per se*, while in the past few years we have seen a National Institutes of Health initiative to examine human DNA for evidence of race. This NIH project intends to find the versions of some genes of everybody in one race - or “ancestry,” a euphemism for race in this context - which are never found in the genomes of people not of that race, so that the complexity of a real person, with all her uniqueness of character, history and potential for change, may be reduced to the presence or absence of such a DNA sequence. Enough is known of human genetic diversity to make this an unlikely outcome in any event. DNA differences responsible for skin color differences - the gold standard of American definitions of “race” - turn out to be subject to very strong and rapid natural selection.

Here is how one scholar of the evolution of human skin and skin color put it in a recent review:

“Dark skin evolved *pari passu* with the loss of body hair and was the original state for the genus *Homo*. Melanin pigmentation is adaptive and has been maintained by natural selection. Because of its evolutionary lability, skin color phenotype is useless as a unique marker of genetic identity.”³

Our shared African ancestors were dark-skinned because our species had emerged from hairless variants of an ancestral species, and naked apes like us were most likely to survive under the UV-rich rays of a tropical sun with the pigment melanin robustly produced by cells under their skin. As our African ancestors migrated away from the equator to more northern latitudes, the sun’s rays were no longer so much of a selective agent, and lighter-skinned variants of human DNA conferred the advantage of permitting enough UV light to reach the

blood under the skin, so that a person would be less likely to suffer the consequences of a Vitamin D deficiency. When these light-skinned early Europeans and Asians returned by further migration to the equatorial regions of Asia and the Pacific Islands, their descendents once again emerged as dark-skinned.

DNA samples from an individual cannot be used for any purpose related to the skin-pigmentation notion of “race,” because the DNA differences associated with pigmentation will only reflect the range of skin colors of one’s most recent ancestors. Worse, when the categories of a “race” are attached to the DNA differences responsible for intensity of melanin production, the result will be a biologically useless but politically powerful justification for the presumption that the DNA sequence signaling dark skin is

also a signal for racist suppositions of what a person will necessarily be when this DNA says he or she is “not like one of us.” □□□

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Race, Genes and Intelligence

An extract from the full paper

BY PILAR N. OSSORIO, PHD, JD

Over the past two centuries biomedical science has, at times, provided justification for white privilege. Science has been used to support the proposition that differences in achievement reflect innate differences in ability among racial groups. Broadly speaking, the view that differences in academic achievement, IQ scores, employment status or wealth primarily reflect innate differences is called “biological determinism.”¹ As the late Stephen J. Gould pointed out, at its core, biological determinism is “a theory of limits. It takes the current status of groups as a measure of where they should and must be (even while it allows some rare individuals to rise as a consequence of their fortunate biology).”²

Biological determinism lost most of its scientific credibility by the mid-20th century, and lost much of its social and political power after World War II; however, it never entirely disappeared. Today, some people believe that persistent racial gaps in, for instance, school achieve-

ment, family income, and wealth must reflect innate differences in ability. One human trait that is postulated to play a role in many kinds of achievement is intelligence, and some commentators theorize that racial differences in average levels of intelligence explain achievement gaps.

At the same time, the new molecular genetics has captured the public imagination and has provided tools for conducting large-scale genetic comparisons between individuals and between human groups. Some people will look to modern genetics to provide scientific justifications for racial inequalities. Genetics is particularly appealing in this role because of its apparent precision, authority, and high-tech chic. Many people reason that if groups vary with respect to innate cognitive abilities, then the differences between groups must be attributable to differing racial patterns of genetic variation. To disentangle claims about race, genetics and intelligence, we must examine beliefs about race and intelli-

gence, and understand what role genes reasonably could or could not play with regard to the intersection of these two concepts.

In the contemporary world, beliefs about racial difference, and racial superiority or inferiority, may be articulated in the language of molecular genetics and genomics. Modern genetics has great authority, and beliefs about race that once relied on vague notions of innate difference can be made to sound more precise and credible by framing them as genetic explanations. Genes can be viewed as the substrate by which God or natural selection rendered some groups superior and others inferior. Educational achievement, wealth, and other measures of status often run in families, a fact that may increase the intuitive credibility of genetic explanations. However, societal institutions operate to entrench groups who wield power into self-perpetuating dynasties. From the Tudor monarchical dynasty in 16th century England to the Bush and Kennedy family dynasties in the 20th and 21st centuries in the United States, families with access to power pass their positions of privilege on to succeeding generations through processes that have little to do with hereditary transmission of genetic traits.

Just as there is no unitary definition of race, there is no agreed upon or single definition of intelligence; one aphorism holds that intelligence is what intelligence tests measure. Psychometricians argue that intelligence tests measure reasoning skills, although the tests also measure knowledge. Some innovative scholars have developed theories of emotional intelligence and multiple intelligences—multiple types of cognitive function that are valuable and measurable, and that may manifest differently in different contexts.³ The typical IQ test does not measure multiple intelligences; instead, the test produces a single intelligence quotient (IQ).

Some scholars argue that one's IQ indicates one's general cognitive ability, often referred to by the letter "g".^{1,2} Many other scholars argue that the notion of a single, general quality that underlies performance on all cognitive tests is incoherent.³ Stephen Jay Gould has provided a thorough explanation and critique of the concept of *g* in *The Mismeasure of Man*.² The measure "g" has been a useful concept for commentators who seek to create social hierarchies based on intelligence, because "...ranking requires a criterion for assigning all indi-

viduals to their proper status in a single series."²

Alfred Binet, the developer of the first intelligence test in the early 20th century, rejected the notion that his test measured a person's inborn or fixed cognitive ability. He also declined to use his test to rank individuals according to cognitive ability. The purpose for which he devised the test, and the only purpose for which he thought it appropriate, was to measure the intellectual capacity of children who were performing poorly in school, to determine which children had cognitive deficits for which remedial instruction might be helpful. Later psychologists, particularly those in the United States, took up and modified Binet's test, and were willing to embrace the view that intelligence was an inborn and fixed attribute of a person. We can call this view the hereditarian theory of IQ.

Over the past decade, some contemporary proponents of the hereditarian theory have argued that 1) IQ is the most important determinant of academic success; 2) academic success is the most important determinant of high status

***“Cognitive abilities
are complex and will
likely be influenced by
a myriad of environ-
mental factors and
genes.”***

and wealth-generating employment; and therefore 3) the economic elite have their positions and wealth as a matter of merit (intellectual contribution to society), and conversely, members of the economic underclass also deserve their position at the bottom of the social hierarchy.⁴ These commentators argue that programs aimed at raising the academic achievement of disadvantaged students are misguided because those students are, on average, biologically incapable of significant academic success. Racial gaps in test scores, from IQ to the SAT, are interpreted by hereditarians as evidence of inherent and immutable racial or ethnic differences in underlying cognitive capacity.

Many claims of contemporary hereditarians have been critiqued and

debunked in books such as *Measured Lies*, *Inequality by Design*, *Whitewashing Race*, and *Intelligence and How to Get It*. These books describe mistakes of fact, method and logic made by the hereditarians.

A significant problem in debates about hereditarian theories of IQ is that correlations are often treated as proof of causation. If one observes that people in lower socioeconomic brackets, on average, score lower on IQ tests than people in higher socioeconomic brackets, this does not mean that low IQ causes poverty. It could be that poverty causes low IQ, or that something else causes both outcomes. If IQ test scores correlate with race (however race is defined), this does not mean that some inborn racial essence causes particular IQ test scores. One reasonable alternative explanation is that race is correlated with other factors, such as quality of schools, exposure to lead, or malnutrition, and these other factors are causing the observed differences in test scores.

Many scholars question the entire enterprise of treating heritability statistics as though genes and environment are actually separable influences on IQ or any other trait. Genes always function within particular environments to shape the developing human organism. The developmental interaction among many genes, and numerous environmental factors, is complex, varies over time, and is susceptible to chance events.

Researchers have, in fact, found evidence that some environmental factors are strongly associated with IQ and other measures of cognition. Malnutrition and exposure to environmental toxins, such as lead from paint, are strongly correlated with IQ. The quality of a person's school significantly impacts her IQ score - children who begin their education in poor quality schools and then move to better ones show increases in their IQ scores.⁵

A study published in 2009 found that long-term stress is negatively associated with young adults' performance on cognitive tests.⁶ This study measured levels of several physiological properties associated with stress, including blood pressure, cortisol, and epinephrine levels. The researchers collected data throughout their participants' childhood years, then administered tests of cognitive performance when the children turned 17 years old. Young adults whose bodies exhibited the highest levels of chronic stress had the least effective working memories and

poorer cognitive performance. These data only show correlations between stress and IQ scores; they do not prove causation, but they suggest an alternative theory that is at least as plausible as the theory that genetic differences are the primary cause of group differences in IQ scores.

Research also undermines the hereditarian claim that IQ is the primary determinant of achievement. Many environmental variables predict achievement as well or better than IQ, except for people whose IQ scores are at the abnormally low end of the scale. For instance, a person's social environment may be an important determinant of her achievement, yet variables that capture a person's social environment are often, literally, left out of the equation in work done by hereditarians. The social environment includes the expectations of one's peers, encouragement by one's parents and teachers, enrichment opportunities available in the neighborhood, etc. A decades long study that included social environment variables found that a 15 point difference in IQ scores among high school boys only explained 6 percent of the variability in their earnings at age 35. The greater the number of social factors taken into account, the less important IQ became.⁷ Social context variables were still significantly correlated with earnings by age 55.

In a related analysis, Fisher *et al.* demonstrated that if all adults in the country had the same score on an IQ test, the variation in household income would only decrease by about 10%. Contrary to hereditarian claims, these data suggest that differences in IQ do not explain much about professional achievement and wage inequality, including wage inequality between racial groups.⁵ On the other hand, factors external to an individual can greatly influence her or his lifelong course of achievement.

Because race comprehensively structures people's lives in the United States, it is correlated with many environmental factors that can influence IQ and achievement. People of different races tend to live in different neighborhoods, so they may be exposed to different levels of lead, different quality schools, different diets and different levels or types of stress. They may be exposed to different attitudes about achievement. People of minority groups may routinely experience racism, a kind of stress that can have long-term physiological consequences. On average, people of different

racess receive health care at different institutions, and the care they receive is not of the same quality. In sum, racial groups differ with respect to so many environmental factors that it is very likely that environmental differences explain current racial gaps in mean IQ scores.

The environment can be modified in ways that genes cannot. When the environment is changed, the trait of interest (in this case intelligence) may also change *even though genes also play a role in shaping that trait*. In one study, African-American children in Milwaukee who were thought to be at risk for cognitive disability, were randomized so that half received intensive day care and early, enriched education, while the other half received ordinary day care and schooling.⁸ By age five, children who received the intensive intervention averaged 110



on a standard IQ test (above average), while children in the control group averaged 83 (well below average). The effects of early, intensive education were still apparent by adolescence, when the children from the intervention group scored, on average, 10 points higher on IQ tests than the children from the control group.

There is some evidence that differing environments have influenced the entire human population's IQ scores over time. People's average IQ scores have risen by about 3 IQ points per decade over the last century.⁸ The average IQ score from 1917 would amount to about 73 on today's tests. This effect almost certainly is not due to changes in human genetics, because there has not been enough time for new intelligence-related mutations to arise and spread throughout human populations. The most likely explanation for the rise in IQ is that some relevant environmental factors have changed, causing people to develop in ways that are reflected in higher average IQ scores.

Another piece of evidence concerning widespread environmental influences on IQ is that the mean difference

between black Americans' and white Americans' test scores has narrowed since the 1970s. Using data from several different IQ tests that were administered in a standard manner to black and non-Hispanic white people, Dickens and Flynn showed that blacks have narrowed the IQ gap by one third to one half of what it was in the 1970s.⁹ If IQ were a fixed, intrinsic quality of races, then the IQ gap should be stable over time, but it is not.

The binary formulation of "genes vs. environment" is misleading. Cognitive abilities are complex and will likely be influenced by a myriad of environmental factors *and* genes. Given the complexity of brains and cognition, one ought not expect that a few genes will play a dominant role in shaping the normal range of human cognitive abilities; numerous genes will be involved. It is statistically implausible that variants of numerous genes relating to intelligence would be distributed among racial groups in a manner that systematically conferred cognitive advantage on one group or disadvantage on another. Furthermore, there is no evidence to support the claim that current racial differences in mean IQ scores are caused by racially distinctive patterns of genetic variation.

There is evidence that IQ scores are influenced by environmental factors that are pervasively and systematically patterned along racial lines in the U.S. Nonetheless, mean IQ differences among racial groups have been decreasing over the past few decades, perhaps in response to improved educational opportunities for some minority individuals. Taken together, the evidence suggests that differences in IQ scores are the *result* of social inequality rather than its cause. ■■■

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Book Review: *Intelligence and How to Get It*

BY ANDREW THIBEDEAU

A century of IQ testing defies our egalitarian hopes that all men are created equal. To many, this is common sense: some are born with the stuff of genius, while the rest of us must accept our intellectual mediocrity. This hereditary view of human intelligence has been used to explain the fact that people score differently on IQ tests. IQ scores do not vary uniformly, but stratify along two interrelated dimensions: class and race. Hereditarians argue that racial minorities and the poor have lower IQs because they lost at genetic roulette. In *Intelligence and How to Get It: Why Schools and Cultures Count*, University of Michigan professor Richard E. Nisbett is unpersuaded by this kind of genetic fatalism, and in its place offers a theory that holds social, economic, and cultural factors to be the principal determinants of the human intellect.

To follow Nisbett's argument, it is necessary to think of intelligence in terms of IQ—a notion rather out of vogue in today's age of multiple intelligences and "emotional IQ." To begin, he offers a vague definition of intelligence (can there be any other kind?) that encompasses the ability to reason, solve problems, and think abstractly. A slippery concept difficult to examine quantitatively, intelligence is made the tangible object of analysis by means of the IQ test.¹ As it turns out, exactly how well different IQ tests measure "intelligence" is mostly unimportant on account of one statistical observation: the results of all IQ tests positively correlate with each other. In other words, people who score well on one IQ test usually score well on every IQ test. What matters here is not the elegant correlation itself, but its necessary implication: that intelligence is a real cognitive faculty that can be measured, if only indirectly.

What's more, Nisbett explains, strong evidence tells us that intelligence

as measured by IQ is the *single best predictor* of future performance in school and in the workplace, as well as an individual's chances of dropping out of school, divorcing, being unemployed, or having illegitimate children.² However uncomfortable one finds reducing the human intellect to a single metric, IQ has clear utility. The central question of Nisbett's book—whether or not IQ is susceptible to environmental influence and intervention—is therefore one of highest scientific and social import. To answer this question, he teases apart the complex lattice of class, race, biology, and culture, so that he might reveal how they impact IQ.

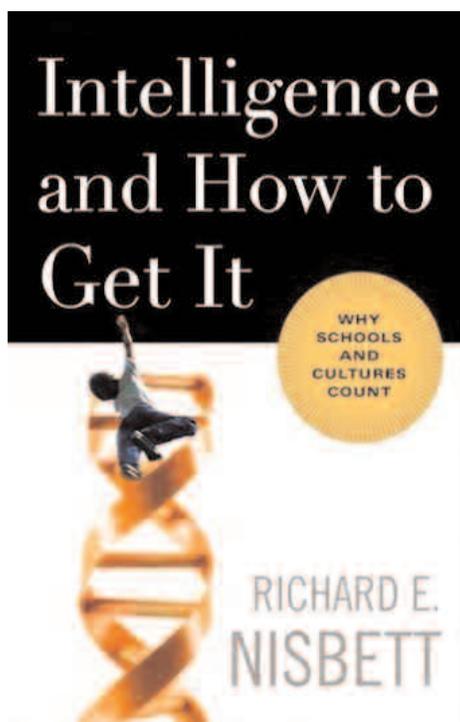
Nisbett first takes a close look at what he calls the "cognitive cultures" that demarcate racial and socioeconomic groups. He finds that working-class parents are more likely to raise their children in punitive and stressful ways. On average, children in working-class homes will hear two encouraging comments for each reprimand they incur. For the children of welfare-dependant, African American mothers, every encouraging comment is accompanied by two reprimands. Middle-class parents, on the other hand, give six encouragements for every reprimand. The evidence shows that middle-class parents speak an average of 2,000 words per hour to their children. By age three, they have heard about 30 million words. Working-class children hear about 1,300 words per hour—20 million words by age three and a vocabulary a third smaller than middle-class children. Children of poor, African American mothers hear a mere 600 words per hour.

Add to this parade of horrors the corrosive impact of racial prejudice. Among manifold injustices, endemic racism restricts African Americans' career trajectories. More often than not, studies show, employers choose less-

qualified white applicants over better-qualified African American applicants. This discounts the value of African Americans' qualifications, reducing the incentive to obtain those qualifications. Taken together, these factors form the solid basis upon which Nisbett concludes that the divergence of IQ scores along racial and socioeconomic lines is environmental in origin.

Throughout the book, Nisbett draws on a body of empirical work to refute claims that population differences in IQ scores—particularly the gap between white and African American IQ scores—are inborn. If it were true that European genes made for higher IQs, he reasons, individuals with a higher percentage of European ancestry would score higher on IQ tests. Looking at several studies comparing the IQs of individuals with differing fractions of European heritage, Nisbett finds no link between European genes and higher IQ. As further evidence that IQ differences are not genetic, he points to the so-called Flynn effect, the widespread upward trend in IQ scores documented by intelligence researcher James R. Flynn. Flynn has observed an average 18 point rise in IQ over the past half century. It is impossible that genes account for this increase. Fifty years is simply too short a time for natural selection to produce such a seismic shift in the human genome.

Having established the environmental basis for population-wide differences in IQ, the remainder of Nisbett's book addresses the question of how to fix them. His answer: education. Examining the best research available, Nisbett draws some tentative conclusions. Overall, blind investment, voucher programs, charter schools, and teacher certification requirements do not improve student achievement. On the other hand, teacher experience and quality count for a lot. Limited research



Intelligence and How to Get It: Why Schools and Cultures Count

By Richard E. Nisbett
W.W. Norton, 2009

the other, sustained achievement gains that were observed. For example, participants in these programs were less likely to repeat grades, more likely to do well on standardized tests, more likely to finish high school, less likely to have problems with delinquency, and less likely to become dependant on welfare.

The only significant shortcoming of Nisbett's book is its uncritical use of race. Because he undertakes to explain the IQ gap between "black" and "white" populations, race is necessarily one of the principal objects of his analysis. In light of decades of genetic research, however, the consensus is that "the idea of discrete races in the typological mindset of past centuries clearly does not apply to humans."³ That racial distinctions have no genetic basis does not negate the existence of race. To the contrary, race is a potent sociocultural phenomenon that exercises great force in people's lives. It is this theory of race—race as cultural construct—that provides the conceptual foundation for Nisbett's focus on racially-defined populations. He uses race as a proxy meant to capture the complex dimensions of a sociocultural reality.

While Nisbett's use of race is therefore conceptually defensible, no such defense appears in his book. He simply presents his subject as "IQ in Black and White." Next to his nuanced discussion of intelligence and genetics, his ubiquitous use of an outmoded racial typology seems almost clumsy. Perhaps worse, it implicitly "favors the default assumption that racial differences are genetic in origin."⁴ This marks Nisbett's book with a tacit racial essentialism and detracts from his central conclusion that biology alone is not the principal determinant of human intelligence.

Overall, Nisbett's book is a timely and illuminating contribution to the discussion of race, class, and intelligence. He presents a strong counterpoint to the hereditarian view of intelligence and supports his claims with ample research and solid reasoning. His discussion of how to improve education is limited by the paucity of reliable research in that area. While more research must be done,

Nisbett's ultimate conclusion is a sound and important one: brains are not the prize of a genetic lottery, but products of environments over which we have control. To make the best of that control, the evidence suggests we put our resources toward creating richer "cognitive cultures" for all children: by educating parents, intervening to fix broken systems, and placing renewed emphasis on early-childhood education. This, then, is why schools and cultures count. ■■■

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suggests that incentive programs that reward successful teachers correlate with higher student achievement.

It should come as no surprise that the most successful educational initiatives are those that aim, in effect, to recreate a "middle-class" environment for underprivileged children. Focusing on early childhood, these programs engage the children using the best-available developmental aids and educational toys and provide intensive lessons and activities designed to cultivate the children's cognitive, linguistic, and social faculties. The children are given good nutrition and quality medical care. Teachers meet routinely with parents, encourage them to become involved in their child's education, and program staff actively work to promote stability and reduce conflict and stress in the home.

The results of even the best of these programs have been mixed. While high gains in IQ are observed at the end of the programs, these fade with time. Nevertheless, Nisbett argues that the value in these programs can be found in

¹ The first such tests, designed at the turn of the last century, gauged intelligence by dividing a person's "mental" age by their chronological age, hence *intelligence quotient*.

² As Judge Leon R. Yankwich observed: "[T]here are no illegitimate children, only illegitimate parents." *Contest Over Children Ends*, L.A. Times, Aug. 9, 1928, at A8.

³ John H. Relethford, *Race and Global Patterns of Phenotypic Variation*, 139 AM. J. OF PHYSICAL ANTHROPOLOGY 16, 20 (2009).

⁴ Clarence C. Gravlee, *How Race Becomes Biology: Embodiment of Social Inequality*, 139 AM. J. OF PHYSICAL ANTHROPOLOGY 47, 49 (2009).

Ancestry Testing and DNA: Uses, Limits - and *Caveat Emptor*

An extract from the full paper

BY TROY DUSTER PHD

Direct consumer use of DNA tests for ancestry tracing has taken off in the last five years, and we are not just talking about probes for first-generation genetic lineage as in the “*Who’s your daddy?*” tests popularized on daytime television. Since 2002, nearly a half-million people have purchased tests from at least two dozen companies marketing direct-to-consumer kits.¹ The motives for testing range from the desire for ancestral links to those who lived on other continents five-hundred plus years ago to a more modest interest in reconstructing family histories. For many African-Americans, the quest to find a link to regions and peoples of sub-Saharan Africa can take on a spiritual or even messianic quest, at least partially explained by the fact that the Middle Passage across the Atlantic during the slave trade explicitly and purposefully obliterated linguistic, cultural, religious, political and kinship ties. The 2006 PBS television series, *African American Lives*, brought this quest into sharp relief. First celebrity and later ordinary Blacks were mesmerized by stories of DNA matches that claimed to reveal or refute specific ancestral links to Africa, to Native American heritage, and surprising to some, East Asian or European populations.

In sharp contrast, CBS’ *60 minutes* aired a dramatic segment in the fall of 2007 (October 7) that portrayed a direct and sharp challenge to the claims-making about such ancestry testing. The segment began with Vy Higgensen, an African-American woman from New York’s Harlem triumphantly affirming her connection to “new kin” (one of whom was a white male cattle rancher from Missouri). But as the program unfolds, we see a disturbing cloud of doubt drift over the last part of the segment that ends with a less than subtle hint at spe-

cial claims. A first test from the company African Ancestry, claims that Higgensen is linked to ancestors in the Sierra Leone, the Mende people. She rejoices. “I am thrilled! It puts a name, a place, a location, a people!” But then she is shown the results of a second test, from another company, Relative Genetics, which claims that she instead has a genetic match to the Wobe tribe of the Ivory Coast. She seems unruffled. Yet a third test, from Trace Genetics, claims that her ancestors are from Senegal, the Mendenka. Now she seems agitated, visibly concerned, confused - and most certainly disappointed that what began as a definitive match to a particular group or region of Africa has now turned into a “you pick which one you want to believe” game.

Here we have the first sally into a combined definitional and epistemological conundrum beginning with the meaning of “ancestry.” While this term is typically used to refer to geographic areas where one’s biological ancestors lived, with just a few minutes of reflection we can see an enormous problem to which even common sense will alert us: *Which ancestors?* Easy enough if we are only dealing with mom and dad, or four grandparents. We can even handle three generations back with eight great-grandparents. But if we go back six generations, that means we all have 64 direct biological ancestors. Since each of these 64 could be said to have made an equal biological contribution to our makeup, why would we choose to represent any one or two as our “real” biological lineage? (Eight generations gives us 256 such ancestors, and twenty generations places the figure at 1,048,576.)

What can DNA tell us about our genetic lineage, and where does it fall short? What explains Vy Higgensen’s multiple results from different testing

sites? Flawed methodology? Partial truths hyped as definitive findings? Did the testing companies use different methods or deploy different reference populations - or both?

Let’s begin with what DNA testing can tell us about biological ancestry. There are two different tests, one for males and another for females, and each can provide relatively definitive results along one particular line of our genetic ancestry.

Males inherit the Y-Chromosome from their biological father. The markers are sufficiently distinctive so that the test can not only identify the father, but also the father’s father, and if the data were available, the father’s father’s father. This path to ancestry identification can go on for as many generations as data are available - which is how Thomas Jefferson (or one of his brothers) was linked to Sally Hemmings’ offspring.

The test for female ancestry has an interesting parallel. We can definitively answer “Who’s your mommy?” All of a mother’s children inherit her mitochondrial DNA (mtDNA). Located within the cell but outside the nucleus, mtDNA serve as the cell’s energy producers but only the daughters pass it on. Thus, for a female, it is possible to trace and identify her mother, her mother’s mother, etc., (along the same line as just noted for males using Y-chromosome analysis). This was the way that granddaughters were linked to their grandmothers in the aftermath of Argentina’s “Dirty War” (1976-83). Thousands of young fathers and mothers “disappeared” by acts of the ruling junta, and their orphaned children were given to couples who wished to adopt.² It was through mitochondrial DNA testing that the grandmothers were reunited with the children of their murdered or missing daughters.

These two tales reveal not only the power of DNA ancestry testing, but their significant and consequential social and political uses as well. However, it is also vital to re-state the limitations. These two tests can identify, for example, only two of the 64 great great great great grandparents. Indeed, only two of the next generation further back of 128 can be so identified, only two of 256, and so on. Yet each of the other 62 or 126 or 254 ancestors contributed equally to our genetic makeup as the two we can trace by the sex-linked paternal or maternal lines.

To supplement the limitation of Y-Chromosome and Mitochondrial DNA

testing, a group of researchers has come up with a procedure to discern the frequency of certain markers that are hypothesized as belonging, selectively, to our ancestors. However, there are several blind assumptions that have to be accepted in order to have confidence in the links to ancestral populations so defined.

Unlike Y DNA or mtDNA tests, this technology examines a group's relative share of genetic markers found on the autosomes, the non-gender chromosomes inherited from both parents.

Since Ancestry-Informative Markers (AIMs) are overwhelmingly shared across all human groups, it is not their absolute presence or absence but their rate of incidence that is usually being analyzed. This is especially true when it comes to claims about continental populations. How did these markers come to represent ancestral populations of Africa, Europe, and Native America? The vast majority of these markers are *not* 'population specific,' as the inventor of Ancestry Informative Markers originally claimed.³ Because the companies marketing ancestry tests hold proprietary interests in their techniques, most do not make them available for possible scientific replication, and their modeling constructs are therefore undisclosed. Thus, we are left to speculate about the threshold level of frequency that is used to determine the grounds for inclusion or exclusion, as well as what counts as a "pure" reference population.

There is a yet more ominous and troubling element of the reliance upon DNA analysis to determine who we are in terms of lineage, identity, and identification. The very technology that tells us what proportion of our ancestry can be linked, proportionately, to sub-Saharan Africa (ancestry-informative markers) is the same being offered to police stations around the country to "predict" or "estimate" whether the DNA left at a crime scene belongs to a white or black person. This "ethnic estimation" using DNA relies on a social definition of the phenotype (the observable physical or biochemical characteristics of an organism, determined by both genetic makeup and environmental influences). That is, in order to say that someone is 85 percent African, we must know who is 100 percent African. Any molecular, population, or behavioral geneticist who uses the term "percent European" or "percent

Native American" is obliged to disclose that the measuring point of this "purity" (100 percent) is a statistical artifact that begins not with the DNA, but with a researcher adopting the folk categories of race and ethnicity.

The work of Evett et al (1993, 1996), Lowe et al (2001) and others suggest that there are only about ten percent of sites in the DNA that are "useful" for making



Racial classifications in 18th century Mexico. Source: García Saiz, María Concepción. *Las castas mexicanas : un genero pictorico americano*. Olivetti (1989).

distinctions. This means that at the other ninety percent of the sites, the allele (one member of a pair or series of genes that occupy a specific position on a specific chromosome) frequencies do not vary between groups such as "Afro-Caribbean people in England" and "Scottish people in England." But it does not follow that because we cannot find a single site where allele frequency matches some phenotype that we are trying to identify (for forensic purposes, we should be reminded), that there are not several that will *not* be effective, for the purposes of aiding the FBI, Scotland Yard, or the criminal justice systems around the globe in highly probabilistic statements about suspects.

When representative spokespersons from the biological sciences say that "there is no such thing as race," they mean that racial categories have no discrete boundaries, that there is nothing mutually exclusive about our current (or past) categories of "race," and that there is more genetic variation within categories of "race" than between. All this is true. However, when Scotland Yard or the New York City police force wants to narrow the list of suspects in a crime, they are not primarily concerned with tight taxonomic systems of classification with no overlapping categories. Some African-Americans have Cystic Fibrosis even though the likelihood is far greater among Americans of North European descent, and in a parallel if not symmetrical way, some American whites have Sickle Cell Anemia even though the likelihood is far greater among Americans of West African descent; but in the world of cost-effective decision-making, genetic screening for these disorders is routinely done based on common-sense versions of the phenotype. The same is true for the quite practical matter of naming suspects.

Much like the industry of assisted reproduction in the United States, there is a complete absence of regulation or quality control of genetic ancestry testing. There is no requirement for transparency in the construction and use of reference populations. Any company can claim to provide accurate information about your ancestry. If three different companies offer three different answers (as in the *60 Minutes* report noted at the outset), which one is more likely to be correct? There is no way of knowing, since we have no "gold standard" for excellence or professional self-policing. This was pointed out in *Science* two years ago¹, and in November 2008, the American Society of Human Genetics (ASHG) issued a statement on ancestry testing that included five recommendations emphasizing the need for greater responsibility, research, explanatory clarity, collaboration and accountability by these direct-to-consumer companies. The statement also pointedly warned of several important limitations to the scientific approaches used to infer genetic ancestry, including the false assumption that contemporary groups are reliable substitutes for ancestral

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BiDil and Racialized Medicine

An extract from the full paper

BY JONATHAN KAHN, PhD, JD



On June 23, 2005, the Food and Drug Administration approved a drug designed to treat heart failure in African-Americans exclusively. This race-specific drug, called BiDil, is not a new drug, but merely the combination into a single pill of two existing generic drugs that have been used to treat heart failure, regardless of race, for over a decade.

BiDil was brought to the FDA by NitroMed, a hitherto small Massachusetts biotech company with no other products on the market. NitroMed explicitly requested race-specific FDA approval for its drug based on clinical data produced by its “African-American Heart Failure Trial” (A-HeFT) on the grounds that the trial population happened to be all African-American.

BiDil does indeed appear to significantly help many people suffering from a heart condition. There is no scientific evidence, however, that race has anything to do with how BiDil works. This is for the simple reason that A-HeFT enrolled *only* “self identified” African-Americans. With no comparison population, no legitimate claims can be sustained that BiDil works differently or better in African-Americans than in anyone else.

The FDA, however, accepted NitroMed’s argument that because the trial population was African-American, the drug should be labeled as specifically for African-Americans. This sends the troubling and unsubstantiated message that the subject population’s race was somehow a relevant biological variable in assessing the safety and efficacy of BiDil. Ominously, it also gives the federal government’s stamp of approval to the use of race as, in effect, a genetic or biological category. By seeking and granting approval of BiDil as a drug solely to treat African-Americans, NitroMed and the FDA thus opened a Pandora’s box of

racial politics without fully appreciating the implications of what they were doing.

First, most drugs on the market today were tested almost exclusively in overwhelmingly white male populations. We do not call these “white” drugs, nor should we. Rather, the operating assumption for approving these drugs was that the unmarked racial category of “white” was coextensive with the category “human being.” A drug tested on white people was good enough for everybody. In approving BiDil as a drug only for African-Americans, the FDA has implicitly adopted an assumption that drugs tested in black people are only good for black people. This sends the unintended but nonetheless powerful message that black people are somehow less fully representative of humanity than are white people.

Second, given that the BiDil researchers admit their drug will work in non-African-Americans, the most plausible reason for conducting a race-specific clinical trial is that NitroMed holds the rights to a race-specific patent that will give them control over profits from BiDil until 2020. Of course, this hardly constitutes a sound scientific basis for designing a clinical trial, but it’s a good economic one: if BiDil had been approved for treatment regardless of race, NitroMed’s patent protection would have expired in a mere two years.¹

Third, there is the problem of who “counts” as African-American. In an increasingly intermixed and complex society, one might ask just “how much” of an African-American one has to be to get the drug - 1/2, 1/4, 1/8? This starts sounding suspiciously like the blood quantum thinking of the Jim Crow era. Moreover, the label itself also refers to “black” people. Does this include dark skinned people from South Asia, or Australian Aborigines? The trials and label of BiDil

are based on the concept of “self-identification.” Self-identification, however, is a subjective social judgment. It has nothing to do with the biological phenomena of drug metabolism and response.

Fourth, race-specific labeling will make it more likely that non-African-Americans who might benefit from the drug will not get it. Health care providers simply may not think of prescribing it to non-African-Americans, and insurance carriers may not cover such “off-label” use. Alternatively, what happens if someone who would typically be socially identified as white decides to self-identify as African-American in order to get insurance coverage for the drug? Are insurance companies then going to become arbiters of racial identity?

Fifth, marketing a race-specific drug can lead to a misallocation of health care resources. To the extent that we reduce the very real racial disparities that exist in health care to a function of genetic difference, we risk diverting political will and economic support away from addressing the pressing social, economic and political causes of racial inequality in our society. Racialized medicine presents us with the superficially appealing and misguided message that instead of fixing injustice, we can simply fix molecules.

Finally, by approving BiDil only for African-Americans, the FDA gives the federal government’s stamp of approval to the use of race as, in effect, a genetic category. Even the BiDil researchers admit that race is not a genetic category; moreover, there is no accepted biological definition of race. Given our nation’s troubled history of racial oppression, this is not something that should be taken lightly.

At the outset, it is important to dis-

tinguish between the use of race in medical practice as opposed to racialized medicine. It may be entirely appropriate, even necessary, to use race when tracking and addressing broad issues such as health disparities in American society. Understanding race as a social construct is entirely consistent with recognizing and addressing race-based inequalities in access to or quality of medical care in our society. Such inequalities reflect the biological implications of the social and historical phenomenon of racial discrimination.

Social understandings of race vary over time and across space. In the past, the U.S. Census has included racial categories ranging from Mulatto to Hindu. In the Jim Crow south, children of Armenian or Greek immigrants were sometimes mandated to go to schools designated for black children. Today, someone of light brown complexion who is socially identified as “black” in the U.S. (say, for example, someone with a white mother from Kansas and a black father from Kenya) might be identified as “white” in Jamaica or Brazil. In the U.S., the concept of “self-identification” has become the norm in assigning racial identities to individuals. As a social practice for collecting census data this makes sense; but as a medical or scientific practice it is far more problematic.

In medical practice what matters is our shifting understanding of the correlations between such evolving social identities and the evolving economic, political and environmental conditions to which they may be related. For example, what are we to make of the fact that African-Americans suffer from disproportionately high rates of hypertension, but Africans in Nigeria have among the world’s lowest rates of hypertension, far lower than the overwhelmingly white population of Germany? Genetics certainly plays a role in hypertension, but any role it plays in explaining these differences must surely be vanishingly small.

There may be occasions where race can be productively used even in genetic research, but in such cases it is very important to differentiate between using a racial group to characterize a gene versus using a gene to characterize a racial group. Thus, for example, a researcher trying to understand the genetics of dia-

betes may choose to study the Pima Indians in the Southwest United States because that group has a very high incidence of diabetes. This is an example of using a socially identified racial or ethnic group in order to try to characterize a gene (here for diabetes). It is quite another thing, however, for a researcher who finds such a gene to use it to characterize the identity of Pima Indians as a group with “the gene for diabetes.” The former use does not necessarily stigmatize or define a group in terms of genetics, the latter use does.

In situations such as those just mentioned, medical practitioners need not, indeed often should not, ignore race. The issue is not primarily one of *whether* to use racial categories in medical practice but *how*. Carefully taking account of race to help understand broader social or environmental factors that may be influencing health disparities can be warranted in certain situations, but it is always important to understand that race itself is not an inherent causal factor in such conditions.

In contrast, *racialized* medicine is premised on an implicit - and sometimes explicit - understanding of race as a genetic construct. Such an understanding is both scientifically flawed and politically dangerous. Since the inception of the Human Genome Project, much time and attention has been devoted to insuring that biological knowledge emerging from advances in genetic research is not used inappropriately to make socially constructed racial categories appear biologically given or “natural.” Since Richard Lewontin’s ground-breaking work on blood group polymorphisms in different groups and races in the 1970s, scientists have understood that race will statistically explain only a small portion of genetic variations. As a 2001 editorial in the journal *Nature Genetics* put it, “scientists have long been saying that at the genetic level there is more variation between two individuals in the same population than between populations and that there is no biological basis for ‘race.’”² More recently, an editorial in *Nature Biotechnology* asserted that, “Race is simply a poor proxy for the environmental and genetic causes of disease or drug response. . . . Pooling people in race silos is akin to zoologists grouping raccoons, tigers and okapis on the basis

that they are all stripey.”³

Politically, history teaches us that constructing races as genetically bounded and discrete categories is only one short step from constructing races as inferior and superior. Racism feeds on biologically reductive constructions of racial difference. It is imperative to recognize the significance of race to understand and address the real and persistent health disparities that plague our country. But these disparities are the result of social, economic and political histories of injustice. They demand social, economic and political responses. If we falsely reduce health disparities among socially defined racial groups to a function of genetic difference to be addressed through race-specific medicine, we risk diverting valuable resources and will away from developing policies and practices to confront the true causes of health disparities.

Unlike *racialized* medicine, which treats race as genetic, the *use* of race in medical practice has many legitimate and important places. Collecting broad-based epidemiological data is perhaps foremost among these. Only by using social categories of race is it possible to identify and track racial disparities in health, healthcare access and outcomes. Such information is needed to address on-going issues of racial justice in society. It may also be appropriate for individual health practitioners to take race into account under certain circumstances in trying to assess the needs of their patients. To the extent that health practitioners understand that race, as a social phenomenon, has biological consequences - such as where higher incidence of hypertension might in part be due to an array of environmental, social, or economic factors disproportionately associated with being a racial minority in the United States - it may be legitimate and important to take race into account in formulating appropriate medical interventions.

The case of BiDiI clearly raises concerns over the dangers of reifying race in a manner that could lead to new forms of discrimination. BiDiI, however, is part of a much larger dynamic of reification in which the purported “reality of race” as genetic may be used to obscure the social

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Health Care and Insurance Reform

Improving Access, Recognizing Limits

An interview with George Annas

George Annas, JD, MPH, is a member of the Board of Directors of the Council for Responsible Genetics. He is the Edward R. Utey Professor and Chair of the Department of Health Law, Bioethics & Human Rights of Boston University School of Public Health, and Professor in the Boston University School of Medicine and School of Law. He is the cofounder of Global Lawyers and Physicians, a transnational professional association of lawyers and physicians working together to promote human rights and health.

There has been a lot of political talk about health care and health insurance reform recently. Do you see anything coming of it?

I think for insurance reform (and we now call it “insurance reform” rather than health care reform) the cornerstone needs to be insurance coverage for everybody. But the real problem with health care in America is the health care system itself. People may have insurance, but we still need to change the primary care system so they can actually get access.

It’s not going to happen overnight. That’s the problem with politics: your time horizon is the next election. And we will have to wait a few years to make judgments about how well this is working - whatever “this” is.

Probably one of the biggest questions is whether health care should be dealt with as its own issue - it’s big enough to be its own issue - or as part of economic recovery. The question is there for health insurance, too, unless you’re doing away with health insurance for a single-payer system, which we’re not doing anytime soon. I think we should. It makes perfect sense - the inefficiency of these multiple insurance policies is overwhelming.

How might new policy address the racial

and class-based disparities in health care access and health insurance coverage - either ideally or in actuality?

For one, we can get people insured. It’s just unconscionable in a developed country that we have 50 million uninsured.

Then there’s getting everyone access to health care. People say “everyone has access to health care.” Yes - when it’s an emergency! That’s not health care, that’s just emergency care. And the most interesting thing about that is that we do see medical emergency care as a right. You do have the legal right to care if you have an emergency, and I’ve always thought we should try to generalize that: we have a right to health care in this country. Not just to preserve your *life*, but your *health*. And I think that’s the direction we’re going, but it’s going to take a while.

Now, about the race and class disparities. If you’re really poor, you can qualify for Medicaid - but no one is proposing ‘Medicaid for all!’ Now, a lot of people like ‘Medicare for all.’ That’s a great plan. You don’t hear any citizen groups saying “We need to reform Medicare!” The doctors’ groups say it should pay them a little more, but it’s a very popular plan.

‘Medicare for all’ would cover everybody. It would significantly reduce class and racial disparities, but by itself could not solve the problems of health care delivery and geographic disparities. .

After BiDiI, is there any more serious talk about racialized medicine?

Not really, though it depends on who’s talking. The problem with linking race and medicine is that it’s really not based on race, it’s based on genes, and genes don’t track for race. It’s very strange.

Private companies are pushing DNA ancestry tests, and some of them seem to suggest that, in the future at least, those test results could have some sort of

health implications. What do you think?

That seems unlikely. We love simple solutions to complicated problems, but that doesn’t mean there is one. You hear that Japanese people don’t have obesity problems like we do here - but when Japanese people move to America it’s different. So even if a condition has a genetic component, you can’t say it’s everything. With something like obesity, there’s definitely an environmental component, which includes access to healthy food.

Even though in many ways we in America live unhealthy lives, we’re very health conscious. And there are ways in which we are healthy, too - we rank poorly compared to a lot of the world, but we live longer than we used to.

Do you think that’s in spite of or because of our health care?

It certainly has little to do with medical care. The AMA put out a statement after Obama’s speech to their organization that life expectancy in the U.S. has gone up by 10 years over the last few decades because of our medicine. Well, that’s not true - medicine is not irrelevant, especially in drugs to reduce heart disease, but it’s not the overall driver, rather public health and education are.

Can health care delivery be effectively addressed as a national issue? It seems that it would be difficult in the way that education is difficult to address at a national level - just standardized testing and providing or withholding funds.

Education is a good analogy - everybody has the right to education, but we’ve seen that a lot of public schools are bad, so there are private alternatives. That’s the way it will be with health care, too: the way the system is set up, the rich will always be able to buy themselves better health care. And I think that’s fine - that’s not the problem. The problem is poor people and middle class people not being

able to afford or to get decent access to health care.

Where this can be a national issue is through a national standard of care. Right now there are wide variations in the U.S.

You mean in standard of care?

Standard of care and cost of care. Boston is a classic example: we have the most expensive health care in the country, by far. And so we say, "We have the best care in the world!" Well, no - we have the *most* care in the world as well as the most expensive care in the world.

This is probably the most controversial area in the whole discussion: do we set up some kind of national system? One of my favorite things the Clintons did was their response to the Harry and Louise ads back in the 90's. In the ads, there was a couple called Harry and Louise sitting in the kitchen, going over their health care options. The line at the end is, referring to the government: "They choose, we lose."

So the Clintons, Bill and Hillary, made a spoof on Harry and Louise. It was very funny - they were sitting there like Harry and Louise, talking about the Clinton health plan. And at one point, Hillary turns to Bill and says, "It says here, on page thirty-five thousand, five hundred and ten, that ultimately we all die!" And Bill and Hillary face the camera and say, "There's got to be a better way!"

As in, "Why should we settle for eventually dying?"

Right! It was all very tongue-in-cheek, of course. And the next day, on the news, Sam Donaldson said, "That's a mistake. You can't talk about dying to Americans." And then, in fact, the White House pulled the ad. Sam Donaldson was right: you can't make it seem that 'we're all going to die' is the centerpiece of your health plan!

At the same time, the key to a sustainable health care plan is a recognition of limits. We don't recognize that in this country. Now we have this whole movement of personalized medicine based on your genome - how insane is that? Even if it works, we can't afford the health care system we already have - now we're going to have a special designer drug, just for you? That's never going to happen, except for the very rich.

But some DNA tests can have predictive value. Couldn't that reduce health care costs, if people take preventative action?

Possibly. If you learn you have a sus-

"The amount of medicine that anybody can consume is infinite."

ceptibility to diabetes, for example, you can start taking action and reduce medical costs later. Of course, at some point you're still going to get sick and die - but if you find out about the conditions you really have to take care of and you know what to do about it, sure, it could be a big saver. On the other hand, not everyone with a genetic susceptibility to disease will actually develop the disease, so in their case preventive interventions will just increase cost without health benefits.

Of course, you could also find out you have something incurable - and then what?

That's the other thing. As soon as they found the Huntington's gene, the thought was that everyone would want to go get screened. Well, as it turns out, very few people at risk wanted to get screened at all, because there's no cure.

With most of the consumer genetic tests, can't you choose not to find out something you don't want to know?

Right, that's what James Watson did when he had his genome analyzed, he didn't want to know whether he had early onset Alzheimer's. Well, for him it wouldn't be early onset any longer!

A colleague of mine, Bob Green, did a study to see how people would react to learning that they had the gene for early onset Alzheimer's. Overall people react pretty well. They don't become overly depressed, they don't kill themselves or do all the things that many imagined they would do. One thing he found is that most

people, since this is a genetic condition, have family members who have it - so finding out they are at high risk is not such a shock.

And after all, we're all going to die - and we've managed to deny that, and to internalize that denial, very well. We're not going around every day saying, "Oh my God, I'm going to die so what's the point?"

It seems like being told about your likelihood of getting a certain condition, the concreteness of it, might make it harder to ignore. Though you could just start denying that, too ...

Right - we can deny it if it's something we can't do anything about. Now, if we can do something about it, that makes it harder - it becomes more than just a genetic lottery. Smoking is a good example. We know that smoking is bad for you, and that you've got to stop. And lots of people do - but there's the pleasure aspect, and a tradeoff.

There's a great British study, actually, that shows how smokers actually reduce the money spent on healthcare and social security. So if you're just interested in how much the government spends on the elderly you'd encourage smoking - because they die earlier. Of course it's not all that surprising that we save money if people die younger.

But we also spend almost half of our medical care dollars in the last year of life, and we always will. And there's nothing wrong with that, because you can't predict when your last year of life is going to be - and the sicker you are, the more medical interventions are available. If you actually knew, however, when someone would die, we could save a lot of money (assuming, which I do, that most people would reject extremely invasive end-of-life care that had little, if any, benefit).

The amount of medicine that anybody can consume is infinite. It really is. Ivan Illich said that death is the "ultimate form of consumer resistance." The only way you can say 'no' is to die! And that's one thing you'll never hear discussed during the health care debate: death. Because in many ways, we built our notion of medicine around the idea that nobody dies. ■■■



Racial Disparities in Databanking of DNA Profiles

An extract from the full paper

By MICHAEL T. RISHER, JD

Of the hundreds of thousands of arrests every year in California on suspicion of a felony, nearly 320,000 in 2006, approximately 30% never lead to any conviction.¹ A disproportionate number of these innocent arrestees are people of color. In the U.S. justice system, people who are arrested but never convicted are presumed innocent; yet, as of January 1, 2009, all arrestees have been forced to let the State of California take a DNA sample, analyze it and include the resulting profile in a criminal database, to be compared evermore with crime-scene evidence. There are procedures for some of these people to try to get the samples and profiles expunged; however, these procedures often require arrestees to wait three or more years before even requesting expungement and necessitate the help of a lawyer. As a result, the overwhelming majority of people arrested but not convicted of any crime are unlikely even to

try to get their samples destroyed. Tens of thousands of profiles taken from innocent people will thus remain in these criminal databases. The consequence will be a magnification of the current racial disparities in our criminal justice system as more and more people of color's DNA profiles are included in databases that make them potential suspects whenever DNA is recovered from a crime scene.

The effects of this disproportionate inclusion of people of color in the databanks are made clear by the other papers in this series on genetics and race. What is perhaps less clear is how our criminal justice system, which promises equal justice under the law, can tolerate this injustice. This paper, after outlining the legal growth and transformation of DNA databanks, examines how various steps in our criminal justice system create and magnify racial disparities, and how the law makes it nearly impossible to

effectively address the problem. It also looks at how taking DNA samples at various stages in this process may affect these disparities and the factors that cause them. I use as my primary example California's system because it is one of the world's largest criminal justice systems in one of the nation's most diverse states. It is also the system in which I have practiced law for the last decade, and is representative of where DNA databanks throughout the country will likely be in the next few years as more and more states and the federal government collect DNA from arrestees.²

DNA databanks comprise two distinct components: the actual biological samples and the computerized database of the profiles generated by analyzing these samples. In criminal-justice databanks, the biological samples are collected from crime scenes (forensic samples) and from known individuals (known samples). Until recently, known samples were usually obtained by drawing blood, although now most states and the federal government primarily obtain samples by swabbing the inside of the person's cheek to collect skin cells.³

The government analyzes both forensic samples and known samples to create DNA profiles, which are essentially a digitized description of 26 parts of the DNA molecule. The profiles are then uploaded to the Combined DNA Index System ("CODIS"), a centralized, searchable law enforcement database accessible to state, federal, and international law enforcement agencies. CODIS was created by the FBI in 1994 after Congress authorized it to establish a national DNA database to link existing state and local databanks. The biological samples themselves are retained by the local police or crime lab for later testing.

Once an arrestee's profile is uploaded into CODIS, it is immediately compared to the thousands of crime-scene samples in the CODIS forensic database. As long as the arrestee's profile remains in CODIS, any new crime-scene samples will be searched against it. When an arrestee profile exactly matches a crime-scene profile, CODIS automatically notifies agencies that provided the sample. Then that agency will usually provide the identity of the arrestee to the agency with jurisdiction over the crime so that it can follow up.

DNA databanks have grown exponentially in the last decade as new laws

have expanded the range of people subject to having their DNA forcibly seized, analyzed, and the resulting profile databanked. California's databank is a good example of this. It was originally conceived as a way to connect people convicted of serious violent crimes with other such crimes in which DNA evidence is most useful. The original 1989 DNA-collection law established a databank and required people convicted of murder or a felony sex offense to provide DNA samples before they were released from custody.⁴ The state department of justice had the authority to analyze these samples and include the resulting analysis in the new statewide databank.⁵ From today's perspective, this program seems quite limited: the only people subject to having their DNA databanked had been convicted of very serious crimes, either by pleading guilty or after the charges had been proved beyond all reasonable doubt to a jury.

But the law soon began to expand to include more people. The first steps were modest: in the late 1990s, new crimes were added to the list of qualifying offenses, and the law was amended to require that samples be taken immediately after conviction, rather than just before release. The latter change was enacted as the focus shifted from preventing new crimes to solving old crimes. In 2004, California voters enacted Proposition 69, drastically expanding the database. The two biggest changes were that, as of November 2004, every person convicted of *any* felony - which can include simple drug possession, shoplifting, or even intentionally writing a check without sufficient funds to cover it - has had to provide DNA samples. And, as of January 1, 2009, every person *arrested* for a felony in California must give a DNA sample. Prop. 69 thus radically changed the database from one comprising profiles of individuals *convicted* of violent felonies to one that includes profiles from *suspected* shoplifters.

This huge increase is not distributed equitably among all people. African-Americans comprise 6.7% of California's population, but 21.5% of those arrested for felonies in the state.⁶ Although, as discussed below, the possibility of race-based decision-making at all levels of the criminal justice system makes it impossible to know whether changing from a database of people convicted of felonies to one including everybody arrested for

felonies will result in an increase in the *proportion* of people of color in the database it will clearly result in a significant increase in the absolute number of minorities included.

Racial disparities fluctuate depending on the stage of the criminal proceeding from the high-level initial decision to make certain acts criminal, to a police officer's decision to contact or arrest an individual, to the decisions made by prosecutors, judges, jurors, and defense lawyers. Thus, the stage at which DNA samples are taken will affect the racial disparities in the databank, albeit in unpredictable ways.

The first and broadest stage at which racial disparities are introduced into the criminal justice system is at the legislative level, where crimes are defined and classified. The basic question is, of course what conduct is considered criminal: why is a person who possesses drugs subject to criminal sanctions while a business that puts its workers or consumers at risk with dangerous or unsanitary facilities subject only to civil sanctions? Even beyond that basic issue, our criminal justice system treats very similar conduct differently in ways that create racial disparities. The most notorious example of this is the crack versus powder forms of cocaine disparity in the federal system, which for years punished people convicted of crack cocaine offenses (well over 80% of whom are African-American) much more severely than powder cocaine offenders (72% of whom are white or Hispanic).⁷

The legislative establishment of "drug-free zones," often around schools, parks, or public-housing projects, can also have racially disparate effects.⁸ These laws mean that people who live and commit drug crimes in dense urban areas, where few locations are *not* close to a school or park, will be punished more harshly for the same conduct than are their suburban or rural counterparts. Because urban areas usually have higher proportions of people of color, these harsher punishments will reinforce racial disparities.

Laws like these interact with seemingly race-neutral DNA collection laws to produce great disparities in the databank. A databank that includes all persons convicted of felonies will include every person - primarily people of color - convicted of possessing cocaine or heroin, no matter how small the amount; but

it will not contain samples from people - primarily white - convicted of minor methamphetamine offenses that were prosecuted as misdemeanors. Conversely, a databank that includes only violent crimes or sex crimes - as many originally did - should result in fewer disparities than an all-felony database for the reasons just described. Excluding non-violent crimes is reasonable since DNA evidence is almost never involved in non-violent offenses.

DNA databanks themselves create a feedback loop that further magnifies these disparities. Well over half of all serious crimes go completely unsolved, with the police never even identifying a suspect. If DNA databanks work as they are intended, they will identify suspects for at least some - perhaps many - of these crimes. But a racially skewed databank will produce racially skewed results; because racial disparities in the criminal-justice system have led to the inclusion of a disproportionate number of profiles of African-Americans in CODIS, the databank will return a disproportionate number of matches to African-American suspects. In contrast, crimes committed by members of groups that are underrepresented in CODIS will escape detection, particularly as the police spend an increasing amount of their limited time and resources focusing on cases where they have found a DNA match.

The U.S. Constitution, as interpreted by the courts, does not prohibit this shift, regardless of the racial disparities it introduces. The courts have held that the Fourteenth Amendment's promise of equal protection of the law prohibits only intentional discrimination, which means that challenges to criminal laws that result in racially disparate impacts are extremely difficult. In the words of the U.S. Supreme Court, discriminatory intent means "more than intent as volition or intent as awareness of consequences. It implies that the decision-maker, in this case a state legislature, selected or reaffirmed a particular course of action at least in part because of, not merely in spite of, its adverse effects upon an identifiable group." If the governmental body would have acted the same way even without the discriminatory intent, the law stands.

The United States Court of Appeals has applied these same principles to reject an argument that the racial disparities in the federal DNA database made it

unconstitutional.⁹ No matter how disparate the impact of the database, without indications that Congress enacted it in order to adversely affect African-Americans, the challenge failed.

A second policy-level set of decisions also creates racial disparities: the allocation of law-enforcement resources. The clearest big-picture example of this is the so-called "war on drugs," which is largely responsible for filling our prisons with men and women of color over the last 30 years.¹⁰ A war on securities fraud or tax evasion would result in the arrest and prosecution of a very different demographic. Yet resources for combating white-collar crimes have been cut, despite evidence that violations are common and devastating to our society, as evidenced by the current global impacts of finance fraud. On a smaller scale, police decisions to conduct buy-bust operations in specific neighborhoods - where undercover officers attempt to buy drugs from people on the street and then arrest anybody who sells them the drugs - mean that the police choose who will be targeted based on what neighborhood is chosen for the operation. These operations usually occur in poor, urban neighborhoods with large minority populations.

Racial disparities also enter through racial profiling by individual officers. Studies have shown that some mixture of unconscious racism, conscious racism, and the middle-ground use of criminal profiles often leads law enforcement to focus its attention and authority on people of color. This can include everything from discriminatory enforcement of traffic laws to detainment and arrests of people of color without sufficient individualized suspicion.

As with challenges to legislative actions, challenges to racial profiling under the Constitution are extremely difficult because of the need to show discriminatory intent. The difficulty is magnified because the law gives police officers substantial discretion as to who they approach, stop, question, or search. The Supreme Court has held that the police may lawfully make pretextual stops - for example, singling out one speeding driver among many because the officer has a hunch that they may be carrying drugs. This means that, although the police may not stop a person based solely on race, there are many explanations an officer can give if called upon to explain a stop: the driver or passenger's nervous glance,

reduced speed upon seeing the officer, a pedestrian wearing a heavy coat on a warm day, and so on. None of this behavior alone would justify the stop of a car, but such seemingly innocent actions are enough to justify the officer's decision to stop this particular car for driving a few miles per hour over the speed limit while ignoring all the others that did the same, or to stop a particular individual for jaywalking while ignoring similar violations. Even if a court determines that an officer did make a stop based on nothing more than the driver's race, the only remedy is the possibility of a civil suit against the officer. Unless serious harm was done, this is highly unlikely to occur, so it is not a significant deterrent to such police abuse of power.

Arrestee sampling adds another incentive for police officers to make questionable or outright illegal arrests. Whether or not the arrest leads directly to charges being filed, the arrestee's DNA profile will automatically be included in the database and run against all crime-scene evidence, now and in the future. Because of the barriers to having DNA samples removed, few arrestees will be able to have their samples and profiles expunged, thus allowing a single law enforcement officer the power to place people under lifetime genetic surveillance.

The low level of proof required to make an arrest, combined with the difficulties of preventing arrests that are illegal for lack of proof or for discriminatory enforcement of laws, means that allowing DNA collection immediately after arrest will lead to large databases full of innocent people. Furthermore, given the ubiquity of racial profiling, people of color will largely populate the databases. The bottom line is that police end up with enormous discretion to determine who is in a database, with absolutely no review of many of their arrests. The consequence of the arrest of a plainly and indisputably innocent person will be not only a short stint in jail, but a lifetime of genetic surveillance. ■■■

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The Color of Our Genes

Balancing the Promise and Risks of Racial Categories in Human Biotechnology

BY OSAGIE OBASOGIE, PHD, JD

A group of faculty members from Stanford University recently published a set of guidelines for using race in human genetics research. These guidelines, called the “Ten Commandments of Race and Genetics” by the *New Scientist*, provide both a descriptive account of the relevance of race to biomedical research and normative suggestions that call for using racial categories in a responsible manner.

These recommendations come at a time when the race and genetics conversation is at a fever pitch. Many hope that advances in human biotechnology will yield profound medical, scientific, and social advances. But what often goes unacknowledged is that if we are not extremely careful, commercial and forensic applications utilizing human biotechnology may resuscitate harmful ideas about the significance of genetics in understanding racial difference and the cause of racial disparities. To help mitigate such misunderstandings, policy tools such as race impact assessments should be adopted widely across several regulatory agencies. By facilitating greater engagement between public policy and human biotechnology, race impact assessments can provide a forum for multiple stakeholders to work with government to assess the effect race-specific biotechnologies might have on minority communities.

To understand why public policy must grapple with the impact biotechnology might have on racial minorities, we must first take a close look at how race has informed these technologies’ development and deployment.

Race and genetics: from research to Main Street

One of the Human Genome Project’s most heralded findings was that all

humans are over 99.9 percent similar at the molecular level, a discovery that supports the social rather than genetic character of racial categories. (Subsequent research has slightly raised the initial estimate of difference, to around 0.5 percent.¹) At the time that the Human Genome Project’s results became public in 2000, numerous scientists and other observers predicted that its finding of human genetic similarity would finally move society beyond the biological theories of racial difference that have fueled centuries of racial strife.² The truths of science, some hoped, could promote racial healing. Yet almost as soon as researchers announced this result, several research projects began to focus on mapping the less than 1 percent of human genetic variation onto social categories of race.³

Since then, biomedical researchers and companies have become increasingly interested in developing treatments that use race and ancestry (both perceived and self-identified) as proxies for groups’ genetic predispositions. Put differently, these efforts presume that social categories of race reflect medically relevant genetic differences, even when such differences have not been identified. This is better known as race-based medicine: drugs that are developed, approved, and marketed for specified racial groups. Only one of these drugs (BiDil, marketed to treat heart failure in African Americans) has received FDA approval, but others are in development.

Meanwhile, dozens of biotechnology companies are marketing genetic testing services directly to consumers, bypassing physicians and other health care professionals. Combined with the power and reach of the Internet, direct-to-consumer genetic testing offers people the ability to swab their cheeks at home, mail the sample (along with a fee ranging from



\$100 to \$1,000), and receive information a few weeks later.

While much skepticism has accompanied the growth of direct-to-consumer genetic testing, there has been less public discussion about the significant concerns stemming from genetic tests claiming to reveal information about consumers’ ancestral origins, which are often interpreted as tests of racial purity and mixture. Genetic ancestry tests are gaining popularity, especially among African Americans, who often have these tests pitched to them as a way to make an end run around the genealogical dead end produced by the slave trade. But in examining less than 1 percent of a person’s genetic background, these companies often overstate their tests’ ability to say anything significant about a person’s heritage, giving the impression that social categories of race and ethnicity are somehow genetically verifiable.

Biotechnology is also making an impact in forensics, a field that uses techniques such as ballistics, fingerprinting, and toxicology to investigate crimes. Two decades ago, the United Kingdom’s Sir Alec Jeffrey revolutionized forensics by developing genetic profiling. This capacity to extract unique identifying information from hair or body fluids left at crime scenes has given police a powerful tool for generating suspects and solving crimes.

A substantial part of DNA forensics’ power now comes from massive databases storing large numbers of genetic profiles. Once a DNA sample is gathered from a crime scene, it can be checked

against stored profiles for matches.

But whose DNA winds up in police databases? Typically, it is people who have had previous run-ins with law enforcement. And herein lies the risk for minority communities: given that Blacks and Latinos are disproportionately policed, arrested, and prosecuted, their profiles are likely to be over-represented. This means that the significant civil liberties concerns raised by DNA forensics will disproportionately burden these communities.

Will biotechnology revive biological theories of race?

Like many scholars, the authors of the Stanford guidelines recognize that there is no scientific basis for the idea that human genetic variation reflects any sort of racial hierarchy and acknowledge that racial categories exist within social and political contexts that shift over time. They discourage researchers from using race as a proxy for biological similarity, and caution against what they term the “naïve leap” to genetic explanations of complex social phenomena such as IQ or propensity for violence. Their guidelines are an important contribution, and should be adopted widely so that research on race and human genetics can proceed responsibly.

However, as I argue in my report, “Playing the Gene Card? A Report on Race and Human Biotechnology,” concerns about race and human biotechnologies cannot be limited to individual research agendas or best practices in clinical settings. Rather, it is crucial to consider how these technologies, particularly when taken together, are likely to have a public impact. However laudatory, no set of voluntary guidelines or recommendations can obviate the need for greater public oversight of how racial categories are deployed in research, in the marketing of the resulting products, and in the public understanding of the research findings.

This point is particularly relevant since the approval of regulatory bodies such as the Food and Drug Administration and the United States Patent and Trademark Office can allow the state to sanction potentially misguided claims about the relationship between race, genetics, and social and health outcomes. Regulatory bodies can play a powerful role in giving misplaced legitimacy

to claims that correlate social categories of race with genetic variations when the evidence indicates the opposite.

There is some evidence that social categories of race may be genetically relevant to the extent that they may correlate with geographical origin, broadly defined. This, in turn, may reflect the histories of isolation and evolution experienced by some groups. Yet there is also evidence that today’s applications in biomedicine, genealogy, and forensics have treated race in a somewhat circular fashion; unexamined ideas and assumptions about the genetic relevance of race, often reflecting lay perspectives, can shape research questions and methodologies. This is what Troy Duster and others have called the reification of race: transforming race as a social concept into a specific, definite, concrete, and now presum-

“Even with the best of intentions, commercial and forensic applications of this research can unwittingly create the very difference they seek to find.”

ably genetic category that can feed back into preexisting assumptions about racial difference.

The potential of race-specific medicine, genetic ancestry tests, and DNA forensics to revive biological thinking about race is not necessarily due to any ill intent on the part of researchers working in the area of race and genetics. To the contrary, many scientists have devoted their careers to egalitarian and praiseworthy pursuits such as resolving health disparities and assisting law enforcement. For example, the use of racial categories in biomedical research has been proposed as a way to make biomedicine more inclusive. But even with the best of intentions, commercial and forensic applications of this research can unwittingly create the very difference they seek to find. As in other areas, racial injustice is best understood as a matter of systematic outcomes rather than a

question of intentions.

The social, political, and economic dynamics that surround research concerning race and genetics might allow less-than-robust scientific studies or weak correlations between genetic variations and social categories of race to be marketed as commercially viable genetic tests or biomedicines. Our society’s continued stake in the idea that social categories of race reflect inherent biological differences—even when faced with substantial evidence to the contrary—contributes to the acceptance of these products. This process might work to reconstitute an inaccurate and unsubstantiated view of racial difference and disparities.

Why we need race impact assessments

Given the remarkably high stakes involved and the rapid development of biotech products and services that implicate racial categories, it is time for policymakers to take these matters under serious consideration. Responsible regulation and oversight can go a long way towards ensuring that these products and services are based on sound scientific research, and that they do not promote unfounded biological theories of racial difference. Regulators can help protect racial minorities from inappropriate commercial pressures, less than forthright marketing, and the often-unintentional re-articulation of folk notions of biological race. The goal is to create an environment in which research and scientific innovation can move forward while guarding against potentially harmful social outcomes.

How might this work? In order to encourage more forethought in regulatory decision-making and implementation, other fields have adopted the use of impact assessments. One relevant example is the health impact assessment,⁴ a set of procedures, methods, and tools that, according to the World Health Organization:

“...provide a structured framework to map the full range of health consequences of any proposal, whether these are negative or positive. It helps clarify the expected health implications of a given action, and of any alternatives being considered, for the population groups affected by the proposal. It allows health to be consid-

ered early in the process of policy development and so helps ensure that health impacts are not overlooked.”

Public health researcher John Kemm notes that despite different definitions, two essential characteristics of health impact assessments are that they “seek to predict the future consequences for health of possible decisions; and that [they] seek to inform decision-making.” For example, a health impact assessment of a proposal for a new factory would look at a number of ways it may affect the local population’s health, such as whether emissions from the building are linked to adverse health outcomes and how best to contain them.

Similar regulatory assessments of the possible public impact of an innovation or initiative may be instructive for identifying and mitigating their possible adverse effects for racial minorities. Race impact assessments⁵ could encourage shared responsibility among multiple actors – including regulators, researchers, internal review boards, and affected communities and their representatives – in making sure that biotechnologies are not used to promote unfounded biological understandings of race and that claims made about the relationship between race and genetics are based on sound evidence. Just as health impact assessments aim “to enhance recognition of societal determinants of health and of intersectoral responsibility for health,”⁶ race impact assessments could promote recognition of the social construction of race and the social determinants of racial disparities.

What might such race impact assessments look like in the context of biotechnology? As an example, modifications to the traditional role of the Food and Drug Administration might allow it to convene advisory committees as part of its review process that look beyond safety and efficacy to evaluate whether medicines with race specific indications such as BiDil might reinforce biological understandings of race when no biological or genetic mechanisms have been identified.

The composition of such a committee would have to accurately reflect the demographic makeup of the stakeholders and constituent groups affected by the research. Its assessment would not be limited to reviewing biostatistical evidence from clinical trials. It would also consider the effects race-specific medi-

cines might have on broader commitments to racial justice, specifically in the context of past discrimination based on biological notions of race. This might encourage narrowly tailored mechanisms to ensure that a drug’s beneficiaries have access without prematurely giving legitimacy to biological understandings of racial difference.

A race impact assessment of ancestry tests might lead federal and/or state governments to closely scrutinize marketing claims to ensure that they do not overstate the current state of the science. Such assessments might lead regulators to require genetic testing companies to limit their advertising to scientifically verifiable statements, and to give consumers adequate information about the tests’ limitations.

In the context of DNA forensics, a race impact assessment could shed light on policy shifts that might disproportionately affect certain communities, such as familial searching, the use of molecular photofitting, or including arrestees that have not been convicted in DNA databases. This assessment might encourage refinements and recalibrations that could lessen the burden on those communities while ensuring that law enforcement has the tools it needs.

The overall goal of race impact assessments in biotechnology would be the same as its counterparts in public health and other realms: to increase dialogue between stakeholders and policymakers so as to balance competing interests through strategic planning that promotes the public good. ■■■

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populations and the lack of transparency regarding the statistical methods that companies use to determine test results.⁴

While the ASHG statement calls for greater transparency, we have seen that private sector providers of ancestry testing have proprietary reasons for keeping secret their own particular combinations of key technology, software and population sampling procedures. Most are unwilling to disclose the size and composition of their reference populations. Without mechanisms to enforce transparency, there is no way of assessing the scientific basis for specific assertions of “percent ancestry.” For example, until and unless there is a publicly available version of what constitutes a 10 percent European or a 100 percent African genome, claims about 80 percent ancestry cannot be fully understood or tested, much less replicated.

Building on the ASHG recommendations for transparency, there is a need for specific policies enforced by federal agencies. For example, the Federal Trade Commission and the Centers for Disease Prevention and Control can and should play pivotal roles in setting industry standards for what constitutes responsible and accountable practices. These agencies can promote the research necessary to identify minimal guidelines for presenting the fair uses and clear limitations of current genomic technologies. Guidelines for transparency would also include clear statements spelling out the risks associated with over-extrapolating or misinterpreting genetic ancestry results. The active involvement of regulatory agencies would provide infrastructure for the interdisciplinary dialogue necessary to create effective policies and for maintaining industry standards (Lee et al 2009). While supporting such measures, we should not be naïve about their effectiveness, since the demands on these companies to generate profits are strong and insistent. ■■■

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Post-conviction DNA Testing and the William Osborne Case

An interview with Nina Morrison, attorney for Innocence Project



William G. Osborne was convicted of a 1993 rape in Alaska. With new forensic technology, a DNA test could exonerate him, but the state of Alaska has refused to grant the test. Nina Morrison is lead attorney in the Innocence Project's attempt to gain access to a post-conviction DNA test for Osborne, and the case was recently heard by the U.S. Supreme Court. The court decided 5 to 4 against granting the tests, but left the door open for states to improve access to post-conviction DNA testing.

The Innocence Project has said that the Osborne decision will have limited impact. What does that mean?

Ever since the introduction of post-conviction DNA testing into criminal cases, the action has always been, and will continue to be, in state court. Most of the cases that we handle, actually, get resolved on consent - that is, although it can take time to do negotiations, in a little over half the cases we handle we are able to get prosecutors or other custodians of evidence to allow us to get a post-conviction DNA test. Most of those cases never go to court at all until after you get the results. With Osborne, we were dealing with getting a DNA test in the first place.

Where we do litigate for access to DNA testing, we have always and will continue to proceed in state court and under state law, because the states have by and large responded very quickly to DNA evidence's remarkable

abilities to get to the truth in these criminal cases - and the overwhelming majority of states, in fact all but three as of this writing, have passed laws agreeing to provide post-conviction DNA testing as state law.

What the Osborne court essentially said is that they were not going to find Osborne's due process rights were violated until he had tried another procedure that appeared to still be available to him in state court. There have been some news reports saying "court rejects constitutional right to DNA testing," and that's really an overstatement of what they held. Even in the federal context, the decision leaves room for the federal court to examine whether a state court procedure has been adequate to vindicate a person's fundamental right to DNA testing.

And one thing the court did say for the first time, very explicitly, is that there's what lawyers call a 'liberty interest,' or a fundamental constitutional right to prove your innocence where the state has a procedure that lets you go to court to challenge your conviction. So that means that the constitutional rights are still very much in play.

So the Supreme Court is saying 'go back to Alaska and try another avenue'?

Right, Osborne himself has to go back to Alaska. So who knows, when we go to court in Alaska under this new procedure, they may well agree to provide the testing. The state said during the Supreme Court proceedings

that they don't have a problem with post-conviction DNA testing generally; they just don't want us pursuing it in federal court.

Whether Osborne gets the tests is still very much an open question. It's still very frustrating, though - we all know the test could be 100% conclusive on his guilt or innocence, and it seems foolish to make Osborne go to state court and potentially make him fight a few more years to get the test when the court could just order it now. But the majority didn't see it that way.

And I should also probably say that the federal courts have always been a last resort for people seeking DNA testing in any event. There have only been a handful of people prior to Osborne who had gotten a testing order in federal court, and I think fewer than two dozen cases seeking testing in federal court. So it was always a small but important part of the litigation. Clearly the Osborne decision will make it harder for people to go to federal court claiming that their rights were violated by a state's refusal to give them access to DNA testing, but it by no means rules that out as an option.

If the new legal avenue in Alaska doesn't work out - if the state still refuses to allow the testing - might the case go back to the Supreme Court?

It's certainly possible. A couple of very experienced Supreme Court lawyers have contacted me since the decision to say that the court usually keeps a close eye on the cases it sends

back, and if it turns out that the procedure in Alaska is not adequate to protect Osborne's rights, they may well want to review the case again. We're hoping it won't come to that and the state will just give him a DNA testing order once we get back to state court.

I happen to be calling you from Massachusetts, one of the states that doesn't have legislation allowing for post-conviction DNA tests. What do you think needs to happen in these?

The Osborne decision is a call to action on the part of state legislatures. The case reaffirms how important DNA testing can be to an accurate determination of guilt or innocence, it talks about DNA's unparalleled ability to get to the truth, to identify the guilty and exonerate the innocent, but it said the state should continue to be the primary place where people bring their claims for DNA testing. It puts the responsibility back on the states to ensure that their procedures for getting testing are constitutional.

That means not only that states like Massachusetts have been given a push by the Supreme Court to enact their own laws, if they don't already have one, but states that don't provide meaningful access to testing for some or all of the prisoners who should be able to utilize them also need to take a hard look at their laws and improve them.

For example, two states, Alabama and Kentucky, have post-conviction DNA testing laws, but they only apply to people who are on death row. So if someone is "only" serving a life sentence in prison, no matter how probative DNA testing would be of their innocence claim, they can't apply for DNA testing. And that, we think, is a very arbitrary restriction that the Supreme Court could look at quite skeptically if a case from those states ever made its way to them.

There are other states that exclude those who plead guilty to the crime, but we've seen a number of people exonerated through DNA testing even though they plead guilty to the crime

at the trial. Clearly a guilty plea doesn't mean that you're actually guilty in all cases.

How is Innocence Project addressing those restrictions - through policy, through bringing cases, or both?

We're working on them on multiple fronts. We have a staff of attorneys who handle individual requests for DNA testing on a case-by-case basis, as well as an intake department that spends years carefully screening the cases before they even get to the attorneys. We also have a policy department that has been active in many states in getting these laws passed and improving the laws that are already on the books, and we've been working with colleagues in those states to try to get restrictions lifted for some time. Hopefully the Osborne decision will give us some momentum.

It may also be that individual prisoners who are trying to get DNA testing from those states will bring constitutional challenges to the adequacy of those laws, and the courts may look at those favorably. Time will tell what this means for the constitutional challenge if the state law isn't sufficiently protective of the rights that the courts recognize.

Obviously race is a critical issue in the Innocence Project's work - 70% of those exonerated are people of color, and 2/3 of cases have been cross-race sexual assaults. How do you see Innocence Project's role in dealing with the racial disparities in the criminal justice system?

Well, like any question involving race in American society, it doesn't lend itself to simple solutions. One of the things that we hope to do at the Innocence Project is, through our work representing individual clients, provide data that can help illuminate the scope of the problem. The cases you mentioned have helped to do that, and we're seeing a disproportionate impact, it appears, among defendants who were charged with sexually

assaulting someone of a different race.

We're just beginning to examine in detail the possible factors, but among the plausible reasons is that cross-racial assaults are often (though by no means always) perpetrated by strangers. Stranger rapes tend to be taken more seriously by the criminal justice system than those between people who know one another. Some have suggested that when the victim is white and the perpetrator is of another color, these cases receive greater scrutiny and greater attention; and what we certainly have seen is that high-profile cases that arouse the passion and anger of the community tend to be the ones that create pressure on law enforcement to solve the case via a conviction. When law enforcement is under pressure to get a conviction, mistakes can and do happen in many cases.

Another thing that's in play is that so many of our exoneration cases involve mistaken eyewitness identification. There is a wealth of scientific data that shows people are more likely to misidentify someone of a different race as opposed to their own race, so whether or not there is any pressure on the law enforcement end, human error in these cross-racial cases may certainly play a part.

What role do you think DNA testing plays in addressing - or exacerbating - the disparate treatment of people based on race and class?

To some extent, our ability to know that is limited by the role of our specific cases - our cases are only a piece of the overall racial issues in the criminal justice system, and we are limited by the data we have. At the very least, the data we're seeing raises cause for concern about whether people of color, particularly African-Americans and Latinos, are disproportionately suffering the burden of wrongful conviction in this country. And if the problem of wrongful conviction itself weren't enough to raise a call for change, this disparity would certainly seem to add an additional layer of urgency, given

that the justice system is committed to equal justice regardless of race and class.

How has race played a role in the Osborne case?

Well, it was a cross racial crime - the victim was white and the two perpetrators were African-American, and we have pointed out since the beginning that the possibility of a misidentification in this case is enhanced by a number of factors, one of which is the cross-racial nature of the crime. So in that sense it certainly has played a role.

Alaska is the one state in the country we have found that has never granted anyone a post-conviction DNA test by court order or by consent - so they seem to be withholding equally.

Why do you think the state of Alaska has pushed back so vigorously on this issue?

You know, it's really still a mystery, after a decade of fighting over this. None of us have a good answer as to why they're opposing testing. For years they said they were just opposed to us getting it in federal court, but they also opposed it in state court, and it remains to be seen whether they'll continue to oppose it there. What we do know is that there's absolutely no dispute that a simple DNA test could prove beyond any doubt whether William Osborne committed this crime. It's mystifying that the state wouldn't want to do this at the first opportunity, especially since we're offering to pay for it and it would cost them absolutely nothing.

What makes it even more egregious is that in Alaska there is no statute of limitations on rape barring the state from prosecuting the real perpetrator of this case if Mr. Osborne is innocent. That is to say, if we did a DNA test and we not only exonerated Osborne but also, through the CODIS database, identified the true perpetrator, they could still prosecute that individual. Why they wouldn't want to

know that person's identity, and to get him off the streets by prosecuting him if he's still at large, is also just baffling.

And didn't the prosecutors openly admit that the testing could prove Mr. Osborne's innocence or guilt?

Well, it's a good thing you point that out - they didn't say it all along, they actually only said it when they were at the Supreme Court and their feet were held to the fire. For years they said the testing might not mean anything because the condom [at the crime scene, from which the DNA evidence was acquired] could have been from some incident other than the rape - even though that position is ludicrous, on the record, given the nature of the crime, where the evidence was found, and how quickly it was recovered.

They didn't want to accept that it was theoretically possible that the DNA could exonerate him, but by the time it got to the Supreme Court they admitted that the DNA could be conclusive. But it took over a decade to get to this point.

You mean to the point that there is an agreement that the DNA evidence would be conclusive?

Right. And one of the things that's very troubling is that the state courts had all along relied on the prosecution's representation that the DNA could not prove innocence. Since that's no longer true, it calls into question all of the state court proceedings to date. It's very interesting how they've changed their position, and it's really quite troubling as well, but we'll certainly go on from here with the understanding that that's no longer a disputed issue.

With that issue aside, it seems that the case should go differently in Alaska this time.

From your lips to the judge's ears ... I don't know. I've been working on

this long enough not to make any confident predictions about what will happen when we go back to court.

In the past, have other people in Alaska requested DNA tests and been specifically denied?

Yes, several people had been denied. One person actually got the order for testing, but it turned out the evidence was gone when they got around to testing it. No one has ever received the DNA test in Alaska post-conviction, and we know of only one case in which the court agreed to order the testing. And the Supreme Court said "aha!" - there was this one case, so Osborne could try that route.

At what point did you realize the Osborne case would become a larger issue than just the innocence or guilt of Williams Osborne himself?

This case started out as one where he was represented by a public defender - who did a really amazing and thorough job trying to get DNA testing any way he could. As with so many cases of great national importance, it started with one man's struggle to get justice. That's the way all of our cases start. So it really wasn't until things started moving up the ladder of national courts that we started to realize that it could have national implications, though we were by no means sure that the Supreme Court would take the case. And when they did, obviously, we realized it was going to become quite important.

In terms of individual cases, it seems the Innocence Project will always have work to do; but in terms of policy, is there a finish line?

That's where the old adage about 'the perfect is enemy of the good' applies. We aren't under the illusion that we are going to eradicate wrongful convictions entirely in our lifetime, but what we do know is that there are a number of very basic and very important measures that the justice system

can take that would dramatically reduce the rate of wrongful convictions in this country that have not been taken by most jurisdictions. And we have an enormous amount of work to do to make that a reality.

Eyewitness misidentification and forensic reform are the two areas we're working on the most, because the solutions are especially clear. We also think the system is likely to be receptive to these solutions. It really presents a win-win for law enforcement because they can so dramatically increase the accuracy of criminal prosecutions.

In the short term, we're focusing a lot on reforming eyewitness ID procedures at the state and local level, and we're also focusing on implementation of the incredibly important goals set forth in the National Academy of Sciences' recent report.

The other thing, obviously, is that post-Osborne, we have a lot of work to do to ensure that DNA access at the state level is meaningful and comprehensive. Our policy department has their work cut out for them to bring this legislation into compliance, and we're hoping that we'll have a lot of partners at the state level who share our interest in making sure that post-conviction DNA testing is readily available.

What do you think has already been accomplished by the Osborne case - both for him individually and in terms of setting precedence?

I think the case has done a few things. Even though Osborne didn't prevail in his federal claim, the court did very clearly say that a convicted person has a *liberty interest*, or a protected constitutional right, to meaningful access to DNA testing where it could prove one's innocence. That is something that wasn't clear in the matter of federal law and precedent before the Osborne decision, and certainly will increase the scrutiny as to whether or not the state procedures are enough to get the job done.

On a sort of broader, non legalistic

level, the outpouring of support we've had in the wake of Osborne has been really tremendous. We've gotten emails from people all over the country who are outraged by the decision. It's something that I think is much harder for laypeople to understand than lawyers, who are more familiar with this notion of federalism, the division of power between state and federal courts. To laypeople, it's just mystifying to say "well, of course the DNA test could prove his innocence, but he has to go back to state court to get it." They don't understand why the Supreme Court couldn't just order it. And, on a basic level, neither do I!

But I think this has helped raise

awareness about just how much work is involved in getting access to DNA, even in such straightforward cases. I think some members of the public are still under the impression that DNA testing is very easy to get in 2009, that you just press a button and say "I'd like my DNA test" and they hand it over to you, and it's really not that simple. We have to spend years in court fighting for very simple DNA testing, even in cases where it would clearly be probative, and that's unfortunately not going to change much after Osborne. Hopefully, though, this case will create some momentum on our side and get criminal justice players at the state level to be more cooperative. ■■■

Continued from page 19

reality of "racism." To the extent that this dynamic succeeds in reductively reconfiguring health and other types of disparity in terms of genetic difference, it casts personal responsibility and the market as the appropriate arenas for addressing differential outcomes. It also undermines the rationale for deliberate state or institutional interventions to address discrimination.

This is not to advocate "color blind" medicine. To the contrary, there are very real health disparities in the country that correlate with race. African-Americans suffer a disproportionate burden of a number of diseases, including hypertension and diabetes. Like heart failure, these are complex conditions caused by an array of environmental, social, and economic as well as genetic factors. Central among these is the fact that African-Americans experience discrimination, both in society at large and in the health care system specifically. The question is: once society identifies these disparities in health outcomes, how does it address the underlying causes? Of course, outcomes can have multiple causes, both social

and genetic. But health disparities are not caused by an absence of "black" drugs. As studies by the Institute of Medicine, among others, make clear, they are caused by social discrimination and economic inequality. The problem with marketing race-specific drugs is that it becomes easier to ignore the social realities and focus on the molecules.

For all the legitimate concerns that the genomics revolution might lead to new forms of discrimination, we must also be alert to the potential appropriation of genetics to obscure or justify existing inequalities. ■■■

Jonathan Kahn holds a PhD in History from Cornell University and a JD from Boalt Hall School of Law. He writes on issues in history, politics, and law and specializes in biotechnology's implications for our ideas of identity, rights, and citizenship.

Fateful Harvest

A review of the documentaries *Food, Inc.* and *Fresh*

By ANDREW KIMBRELL

As with other Americans of the boomer generation, I was brought up inundated with such corporate bromides as “better living through chemistry,” “progress is our middle name,” and even “DDT is good for me.” As for food, the future was clear. It was epitomized by the culinary habits of TV’s futuristic Jetson family, who met their daily nutritional requirements by eating various tablets rather than food. And emulating the astronauts, our future beverage of choice would be the orangey-tinged Tang. Behind all the jingles, ads, and media mantras of that time was the unquestioned message that the more artificial and industrialized our food the more “modern” and desirable it was. Any and all technologies used for food production were said to represent inevitable progress.

Within a few years after World War II, the majority of U.S. food production was increasingly dependent on massive chemical inputs, including pesticides and fertilizers, huge monocultures, and factory-like farms. This resulted in unprecedented profits for the agriculture companies. In the process, the “culture” in agriculture was removed and “business” was substituted. Predictably, “agribusiness” became a massive and institutionalized lobbying and media force foisting this industrial food model on us by strong-arming our elected officials and government agencies, buying out our educational institutions, suing recalcitrant farmers, and, of course, flooding the media.

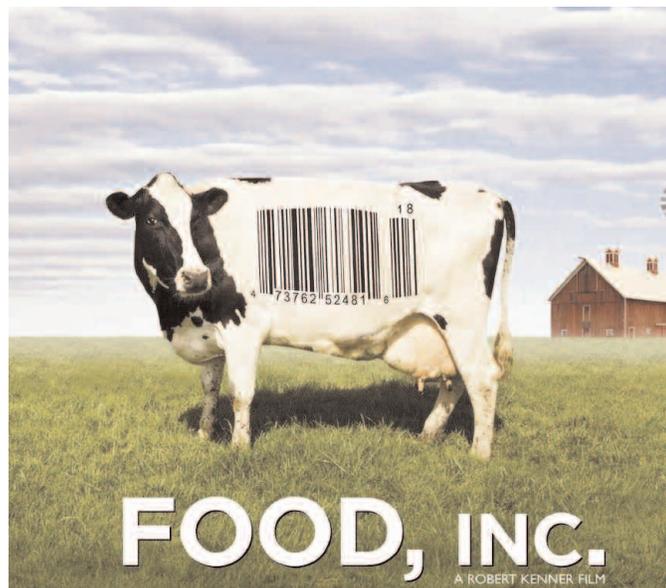
For several decades, our indoctrination into this industrial food

mind-set went without widespread challenge. Our highly urbanized society became increasingly removed from the sources of its daily bread. Over the last century we have been transformed from a nation of farmers, with our hands and minds linked to the soil, to consumers lined up in supermarkets to buy an array of food products about which we know very

ers who are blowing agribusinesses’ “cover” these days. We have exposé reports on food issues by major NGO’s, books by the likes of Michael Pollan, Marion Nestle, Barbara Kingsolver, Claire Cummings and Eric Schlosser. We have some ground breaking documentaries such as “*The Future of Food*” and “*The World According to Monsanto*.” Two recent movies, *Food, Inc.* and *Fresh*, continue to expose the horrific reality of industrial food production. Full disclosure requires this reviewer to mention that he and his organization the Center for Food Safety provided significant input to *Food, Inc.* and that he makes a couple of brief appearances in *Fresh*.

For those schooled in the ways of agribusiness, many of the revelations in these movies will be only too familiar. To summarize: industrial agriculture is dramatically increasing the incidence of cancers and myriad other human diseases; creating new bacteria, viruses, and other disease agents that poison our food; contaminating

our rivers, lakes, and oceans with pesticides, chemicals, and the wastes from our factory farms; exhausting and eroding our topsoil; decimating our forests through clear cutting for industrial-scale agriculture; costing us most of our genetic diversity through mono-culturing and now genetic engineering; has already led to the loss of around ten million farmer jobs and five million farms; threatens our food security as the patented-crop monocultures become ever more susceptible to disease and insect infestation; has



Food, Inc. (Documentary)

Directed by Robert Kenner

little. This great physical and psychological distance between consumer and food production creates a tragic disconnect between the general public and the social and environmental consequences of the food being grown and eaten. This disconnect between us and our agricultural system was, and remains, the essential “cover” that allows the corporations to hide the real and terrible impacts of the industrialization of our food supply.

Fortunately there are an increasing number of writers and filmmak-

already been responsible for the threat to the majority of species on our endangered species list; and imperils the entire biosphere as a significant contributor to global warming gases.

Food, Inc. presents this material in compelling fashion with top notch production values. The movie has the advantage of informed and engaging commentary by Michal Pollan and Eric Schlosser as we are led through the industrial food litany of horrors. Especially welcome and perhaps of greatest interest to readers of GeneWatch is the portrayal of farmers and seed cleaners who are being persecuted and prosecuted by Monsanto for purported patent violations. Starting in 1985, and buoyed by a 2002 Supreme Court opinion written by former Monsanto lawyer Clarence Thomas, the US Patent and Trademark Office has allowed the utility patenting of seeds and plant genes and cells. This patenting policy includes not only genetically engineered seeds but conventional hybrid seeds as well. Unlike the plant breeding rights granted by Congress, these patents forbid farmers to save, exchange, or do small scale sale of their seeds.

Under this misguided patenting regime, Monsanto and other companies have sued farmers that save or exchange their seeds. The compelling stories of the thousands of US farmers who have been threatened by Monsanto and the hundreds of farmers and farm businesses that have been sued has not been available to the larger public. It is certainly to be hoped that this movie with its wide commercial dissemination wakes up policy makers to the plight of farmers, and to the larger monopolistic threat of Monsanto and four other companies owning almost 50% of all world's commercial seeds. Unfortunately neither *Food Inc.* nor *Fresh* delves deeper into the issue of genetically engineered foods. Few people know that around 85 percent of all genetically engineered crops in the US and globally

are designed not to increase yield or nutrition (which they don't) but rather to withstand massive spraying of weed killing chemicals. That is why the leading genetic engineers of plants are all chemical companies. Plenty of material here for a future documentary.

Fresh has few of the production values of *Food, Inc.* and sometimes its audio and video editing failures



Fresh (Documentary)
Directed by Sofia joanes

are downright disturbing. What it has is heart. Somehow its portrayal of the plight of the ten billion animals abused in our factory farms is far more poignant than that in *Food, Inc.* And it's hard not to start cheering for the parade of food heroes presented in this movie. Farmers who have transformed their hog farms from industrial to humane, entrepreneurs who have started whole new sustainable and local food distribution systems, urban farmers educating their neighbors in impoverished "food deserts" how to eat and think about sustainable food. The movie forcefully reminds us that something happened on the way to the corporate-planned industrialized food future—something that the agribusiness proponents did not see coming.

Millions of Americans have decided to vote day after day with the food dollars for a different vision of agriculture. Through their food choices they have begun to demonstrate new attitudes about maintaining their health, healing the earth, and protecting farm communities and animal welfare. As a result, more of us are eating organic than ever before, and organic food production, though still small, is the fastest growing segment in U.S. agriculture today. And as this movie shows, myriad, ambitious projects are underway for "beyond organic" farming that is local, in appropriate scale, humane, biodiverse, socially just, and that comports with wilderness protection.

Ultimately what the current wave of movies and books demonstrate is that we find ourselves in the midst of a historical battle over two very different visions of our food future in the 21st century. An exponentially expanding movement for organic, local, ecological, humane and just food is challenging the decades-long hegemony of the corporate industrial model. *Food, Inc.* and *Fresh* urge us to be "creators" rather than consumers. They help us understand that every action we make in deciding what foods to buy, grow, or eat creates a very different future for ourselves and the earth. □□□

Andrew Kimbrell is Executive Director of the Center for Food Safety, editor of Fatal Harvest: the Tragedy of Industrial Agriculture, and author of Your Right to Know: Genetic Engineering and the Secret Changes in Your Food.

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2. In the last 7 years, the number of states that require every person convicted of a felony to provide a DNA sample has gone from 22 to 50. Compare State Laws on DNA Data Banks Qualifying Offenses, Others Who Must Provide Sample (2009) with Fighting Crime with DNA (2002), both available from the National Conference of State Legislatures at <http://www.ncsl.org/programs/cj/dna.htm>.
3. See Cal. Penal Code § 295(e), 28 C.F.R. § 28.12(f)(1); 73 Federal Register 74935 (December 10, 2008) ("the states that collect DNA samples from arrestees typically do so by swabbing the inside of the person's mouth ("buccal swab"), and many states use the same method to collect DNA samples from convicts").
4. Former Cal. Penal Code § 290.2, enacted by Stats.1989, ch. 1304, § 1.5, pp. 5176-5178. For a discussion of the enactment, amendment, and eventual replacement of this provision see *People v. King*, 82 Cal.App.4th 1363, 1369-70 (2000).
5. Former Cal. Penal Code § 290.2; see *People v. King*, supra, 82 Cal.App.4th at 1369-70.
6. See Crime in California, supra, Table 42. Because these data do not distinguish between felony and misdemeanor convictions, they overstate the number of people who are convicted of felonies. Some of this overcount can be corrected by subtracting the number of people sentenced only to jail, which indicates that the person was convicted of a misdemeanor. See Cal. Penal Code § 17.
7. See Crime in California Table 37. This ratio comports with national statistics, nationally, less than 20% are violent crimes or residential burglaries. United States Department of Justice, Bureau of Justice Statistics, State Court Sentencing of Convicted Felons, 2004 - Statistical Tables, Felony Sentences in State Court, available at <http://www.ojp.usdoj.gov/bjs/pub/html/scscfo4/tables/scso4101tab.htm>.
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Osagie

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