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RACE AND BIOLOGY: CHANGING CURRENTS IN MUDDY WATERS

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In May of this year, Southwest Airlines moved into the Philadelphia aviation market. This move had a major impact on the city's economic base as well as the attitudes of it residents towards air travel. Previously caught in the grip of US Airways and its control of 65% of the flights into and out of Philadelphia International Airport, travelers no longer had to drive 2+ hours to Baltimore to avoid paying fares that were more than twice as high as those of its neighbor to the south.

The arrival on the scene of Southwest Air also spurred an advertising campaign as it competed with US Airways for business. One particular television commercial promoted Southwest's low fares between Philadelphia and the Boston area. The commercial depicts various individuals who had purchased tickets practicing so as to be able to pronounce vowels with a proper Boston accent. They repeat aloud words such as "tonic," "park," "yard," "dollar." As I watched the commercial, I was struck by the question "What is a Bostonian?" Is a Bostonian someone who pronounces their vowels in a particularly characteristic way? If so, then what about people who live there but don't have this accent? Do residents of Boston who have this accent come from a particular neighborhood or social group in the city? Or what about someone who moved in from, say, Mississippi with its southern drawl? Is he or she a Bostonian? Or what if that someone was a mother with two small children who grew up speaking like a Bostonian? Or another person who grew up in Boston and moved to Minnesota? One might logically ask: "What's going on here?"

I don't know what will happen in the war between US Air, Southwest, and other airlines in Philadelphia but, as I was preparing this paper in the past several days, I was struck at the analogy to the matter of the biological basis of race. Is a person assigned to a particular race because he or she possesses a few biological characteristics – a trait-based concept of race – or because that person lives in, or was born in, a particular geographical region – a place-based concept. Or perhaps racial identification comes about from being part of a particular community whose members marry within its boundaries – a population-based concept.

The federal government – at least some of its agencies – is well aware of the problem (US Census Bureau, 2000). Given the confusion surrounding the concept, the Bureau of the Census has opted to characterize race as reflecting: "…self-identification by people according to the race or races with which they most closely identify." The Bureau goes on to say "These categories are sociopolitical constructs and should not be interpreted as being scientific or anthropological in nature." And finally, just to cloud the issue even more – or perhaps to demonstrate its innate fuzziness, "…the race categories [that are used] include both racial and national-origin groups." It seems clear that the biological basis of race must rest ultimately upon one's conceptualization of race as a category, the scientific interpretation of the characteristics that define each category, and the uses to which the resulting data are to be put.

Trait-Based Concepts of Race

Though not the first, the use of traits to describe and delineate races has almost as long a history as the use of place, the oldest by a few decades. Johann Friedrich Blumenbach is generally credited with producing the first taxonomy of race in his volume, *On the Natural Variety of Mankind*, published in 1775. In the third edition of this volume (1795), Blumenbach changed his original four-race geographically-ordered taxonomy to a five-race one that emphasized physical morphology as the organizing principle. This shift, from geography to morphology, marked a series of important changes in views about race that has lasted to the present day.

First, even though Blumenbach retained geographical names for the categories, his departure from a standard continental organization began the shift in emphasis from geography to physical appearance. Asian became Mongoloid, American became Indian, European became Caucasoid, and African became Negroid.

Second, the difficulties of dealing with morphological variation were dealt with by the development and application of typology to race. Typology reduces a pool of variability to a set of averages or, using more sophisticated statistical procedures, some other aggregate measure. Regardless of the technique used, a typological analysis of a set of traits and/or measurements results in the description of an idealized individual who simply doesn't exist. As the distinguished evolutionary biologist Ernst Mayr noted, to a typologist, the type is the reality and variation an abstraction.

Third, individuals were grouped into races primarily on the basis of their features and not their ancestry. This lead to errors, misapplications, and much more seriously, to the abuse of biology as a means of achieving power over others. Whether in Nazi Germany, where physical appearance was used to validate a non-Aryan ancestry, in the United States with its "one drop of blood" laws, or in apartheid-era South Africa, where Japanese businessmen were classified White so their families could live in the best neighborhood and attend whites-only schools, trait-based concepts of race have been, and still are, subject to criminal misuse.

Place-Based Concepts of Race

As a formal taxonomic category, race was first used to classify groups living in different regions of the world. Linnaeus developed a place-based taxonomy of four races – or subspecies: African, American, Asian, and European. Skin and hair color were the most important, but facial features were also used as descriptors, along with selected personality characteristics and cultural practices. Lacking an understanding of the mechanics of heredity, Linnaeus and other scholars of the time – e.g., Blumenbach and Samuel Stanhope Smith – interpreted variability in a Lamarckian fashion as being caused directly by the different environment. These traits were transmitted through heredity to succeeding generations.

Key to a place-based view of race is the idea of being "from" somewhere, a place to where ancestry could ultimately be traced, and where one's biological heritage rested. Persons whose ancestors migrated to Australia from Europeans are still racially European, as are African-Americans still African, despite the awkwardness associated with mixed ancestry.

A placed-based concept of race moved to the fore in the 1950's, with the development of population biology, ecology, and a Darwinian interpretation of biological variability that emphasized natural selection. Races were conceptualized as geographical units – geographical races – whose defining characteristics were seen as the products of adaptation through natural selection to environmental forces. For example, the linear physiques of African groups living in hot, dry conditions were seen as an adaptation permitting more effective loss of heat. Short, chunky body forms among populations from cold climates permitted the retention of heat. This reasoning, supported by more than a little research, was applied to hair and nose form, skin color, and other features. Even the massive faces of European Neanderthals of the last glacial period were seen by some as adaptations to cold.

This view was stated most forcefully in a number of papers by Carleton Coon who, along with his colleagues Stanley Garn and Joseph Birdsell, produced *Races: A Study of the Problem of Race Formation in Man* (1950). Rather than being the product of migration and admixture of ancestral types, Coon, Garn, and Birdsell argued that human biological variations were not simply taxonomic indicators, but rather reflected the adaptive responses of groups to their environments. In short, races became adaptive groups.

Population-Based Concepts of Race

The years following the Second World War witnessed a number of advances in the sciences. As noted above, among the most important were the development of population biology and the synthetic theory of evolution. Mendelian – or breeding – populations were defined as reproductive units whose members received their genes through their parents from a bank – or pool – of genetic material held in common by the population. The gene pool was modified through time by natural selection, but also by other forces whose actions were stochastic rather than deterministic.

The impact on our view of race was significant. First of all, a race was seen as a demographic unit, defined not by trait or geography, but by isolating mechanisms that

constrained mating. In the case of the individual, being part of a breeding population became more important than traits or genes. Geography remained important, but less so since populations could overlap in their spatial distribution or they could break apart or fuse with others as isolating mechanisms disappeared or new ones spring up. And finally, isolating mechanisms could also be the result of the action of cultural factors, e.g., religious sanctions on marriage, social stratification, ghettoization, racism (see, e.g., Garn, 1961).

Second, as the conceptualization of race changed from a taxonomic unit to an adaptive unit to a population unit so did the answer to the question: how many races are there? Where Linnaeus had named four, at least one scholar named 40. And where early investigators saw races as geographical, even continental, categories – as subspecies – population-oriented students of race advocated multiple levels. In his book on race, Garn identified major geographical races, regional races, local races, microraces, and a category of hybrid groups (e.g. neo-Hawaiians, of Asian, European, and Polynesian accessory) that defied a straightforward classification (Garn, 1961).

What then is the Biological Basis of Race?

What can we conclude about the biology of race from this brief survey of concepts of race among taxonomists, anthropologists, evolutionary biologists? First of all, over the two-and-a-half centuries of research into and writing about race, there have been major changes in how we understand and analyze human variation. Second, despite this, there has been virtually no real change in racial taxonomies. To be sure, the complexities of classification have been uncovered, many more racial groups have been suggested, and many have rejected race as a valid biological category. But the major groups – the "geographical units" – have remained essentially unchanged since the 18th century,whether one's approach is based on traits, geography, or population. In 1968, Garn and Coon published a paper titled "On the Number of Races of Mankind." They concluded that, insofar as race is concerned, taxonomy is in the eye of the taxonomist. A "lumper" will identify somewhere between 4 and 7 races, while a "splitter" will insist on as many as 3 or 4 dozen. As a biological concept, race is clearly a divisive term with no agreement as to its operationalization among those who use it. Its validity rest ultimately on the uses to which it is put.

At the same time, in the final analysis each of these three conceptualizations of race has some measure of biological truth. Shared history implies shared ancestry and shared ancestry implies shared biology. And exposure to the same environments will, over time, result in some degree of similarity in biological features. As a result there will be some general concordance in the distribution of physical traits – to a point. But only to a point. The fact is that each of these concepts is seriously flawed as an approach to dealing with biological variation among humans, as individuals and in groups.

Basing race on biological traits – either genotypic or phenotypic – ignores the advances of modern population biology and studies of population structure and dynamics. Except for the rare mutant – and even that is arguable – there is no genetic or phenotypic character that is unique to anything approaching a racial group. It is by now axiomatic that there is far more variation within groups than there is between them.

Using trait-based approaches also ignores the impact of the environment on human biology. In a series of important studies, Boas demonstrated over half-a-century ago that many morphological features – the very ones frequently used in racial taxonomy – undergo significant change in the first generation of migrants, when compared to their non-migrant relatives. This is especially true among children, whose sensitivity to the environment has been demonstrated countless times. And the dramatic changes in stature over a few generations, as well as the tripling of the rate of obesity over three decades, throughout both the lesser developed and developed countries, demonstrate clearly the plasticity of the human phenotype.

A place-based approach to race fares no better. The study of the relationships between biological variation and the physical environment was a major step in our understanding the significance of human adaptability. The demonstration that many traits previously labeled as inferior in fact were advantageous in particular environments helped to usher in a new era among biological anthropologists.

But unfortunately, too many of today's biomedical researchers frequently perpetuate errors associated with the concept of race as place-based. How often do we read the results of a study of risk factors for some disease or condition in which race is replaced by a nominal label and analyzed as a 0 or a 1? Or when some health risk is associated with race and attributed to biology? This is a clear example of poorly-designed research that obfuscates rather than clarifies our knowledge of biology, behavior and disease.

Population-based concepts utilize the most recent developments in studying biological variation and have revolutionized our understanding of the mechanics of evolution. But they are limited in dealing with racial categories. Races are simply not populations, either in the Mendelian or the geographical sense, any more than they are collections of trait or gene frequencies.

The Challenge

Our challenge, especially for those concerned with race, is not to discard the term as irrelevant. There is a basis to race, especially in the broad, Linnaean sense and to ignore it is to do a disservice to the scholarship which has preceded us, as well as to stand as fools before our students and the general public. Insofar as biology is concerned, the problem we all face is that, since at least the 18th century, biological traits have served as markers of social value, further reinforcing stereotypes and reifying existing social and cultural discriminatory practices.

We are further challenged by the fact that these very traits, used to make value judgments about individual and group worth, are the ones that are least valid for describing population variability. Humans make their own judgments often independent of science. No one would characterize the union of a male who has the gene that codes for the Diego red cell antigen and a female who lacks that gene as an interracial marriage. Yet hair texture, skin color, and nose form are three of the most egregious

morphological and value-laden features used as sanctions to maintain culturally-approved behaviors and reinforce culturally-constructed stereotypes.

That far too many scientists have manipulated their data so as to support official racist policies should not surprise us. The oxymoron “scientific racism” has consistently provided the catalysts that acted upon a passive, even willing, human substrate to support public policy on patently false ides regarding the biology of race.

To develop a valid concept about race and biology, and to apply that concept to the race-based problems of disparity, privilege, and power should become a priority for each of us, in our teaching our scholarship, and our day-to-day interactions as citizens. This requires a number of actions on our part.

- Develop more effective ways to express human biological variation, to our students, our peers, and the public in general
- Place the biological basis of race into perspective without denying its existence or dismissing it as unimportant
- Do not carry out research that uses race as a biological label of uncertain meaning
  - State models and analyses clearly so that grouping variables represent the intended constructs and not convenient and meaningless labels
  - Remember that poorly designed research may have unintended social and political consequences
- Open up and maintain dialogues across the disciplines to keep our focus on problem-solving
- Become an engaged scholar
- Utilize scholarship as part of the process of democracy as problem-solving

Conclusion

The 1992 meeting of the American Academy of Higher Education, held in Phoenix, had as its theme “The Engaged Scholar.” Implicit within that theme and explicit in the lectures, presentations, and workshops was the message that our scholarship does not exist in an ivory tower, or any other type of vacuum. Our work is part of a larger whole that extends across disciplines and throughout history, as well as prehistory. Race is a complex term. On balance it is a socially and culturally-constructed one applied to social issues of great human significance. But race has a biological basis as well, perhaps scientifically important only in taxonomy, but of enormous importance in its cultural construction. We must keep the relationships between the two constructs clear, visible, and based on sound knowledge.

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