AMERICAN JOURNAL OF HUMAN BIOLOGY 13:569–575 (2001)

Letter to the Editor

Editor's Note

The following letter addresses the use of the term "race" in human biology research. It is based on a paper published in the Journal (El-Moalem et al., 1997, p. 415) and an exchange of letters about the paper (Bogin, 1998, p. 279; Bouchard et al., 1998, p. 280). Bogin and Bouchard and colleagues were invited to respond to the commentary, but have declined. Hence, the commentary is published below.

The letter raises several issues dealing with the term "race" and related constructs, and the limitations of our terminology. On one hand, the authors call our attention to the need for care in the choice of socially and politically sensitive terms. On the other hand, they draw our attention to difficulties involved in the study of human variability when individuals are classified by racial/ethnic status in health surveys and the census, and in meeting requirements of funding agencies. Hopefully, this commentary will encourage our readers to think about these issues in the context of a better understanding of human biological variability. The Journal does not intend, however, to carry on a series of exchanges on the concept of "race."

ROBERT M. MALINA
Editor-in-Chief

"Race": Confusion About Zoological and Social Taxonomies, and Their Places in Science

Bogin (1998) and Bouchard et al. (1998) make arguments respectively for and against the use of the term "race", and perhaps the concept as well. The animation in the exchange is reminiscent of that to be found in Systematic Zoology from 1953 to 1959 (see especially Volumes 3 and 4) where the validity of the subspecies concept was debated. Discussions about the existence of races in extant Homo sapiens occurred later in Current Anthropology from 1962 to 1964. A careful examination of the discourse on race suggests that there is mis-communication: different usage of the term exist (see also Gordon 1965, Keita 1993), which reflects a melange of old science, social practice, and their entwined histories. Hence there is much confusion. This is well illustrated in the letters of Bogin and Bouchard et al., and deserves comment.

Bogin objects *a priori* to El-Moalem et al.'s (1997) use of the term race to describe various American (U.S.) demographic groups. He notes that the writers, who are from the HERITAGE Study Group, did not define "race." Bogin indicates that this term is to be properly understood as being synonymous with the subspecies rank or category and concept of formal zoological systematics (see Mayr 1969), which is covered by the Law of Priority and designated by the trinomen. After denying the existence of races in extant humans, he suggests that the origins of racial designations such as Caucasian are scientifically dubious, incorrectly attributing this particular term to the mid-nineteenth century (it is earlier).

Bouchard et al. note that Bogin did not offer an alternative to "race". They defend the term in part by stating that its use has been common practice and that the subjects self-defined themselves into "races." Further, various U.S. governmental agencies have sanctioned the term, if not the concept of race. Bouchard et al. take the position that Bogin's arguments have their ontology in the ideology of "political correctness" and can be dismissed as being without scientific merit.

The exchange is important for what it teaches us about the value of the development of standard usage for terms in human biology. It may also indicate that biological anthropology (or human biology) needs to be examined from the discipline of the philosophy of science to find out the degree to which subjectivity, bias, ideology, "old history," or ideas is embedded in the subject's lexicon, assumptions, and models of interpretation. In practice, are terms always used in their scientific senses? Does mainstream published work provide an example of correct scientific usage, or help to perpetuate problematic constructs?

Bogin's criticism would seem to have weight if race is being used in its formal and correct biological sense as a category of organization below the species level. Zoologists, however, have debated subspecies criteria, and more fundamentally the category's usefulness and meaning (see Sys-

tematic Zoology Volumes 3 and 4, Mayr 1969). Issues covered by taxonomists, who were primarily morphologists, in those discussions included: 1) the various degrees of overlap (or lack of it) required to establish different groups, 2) the meaningful or required levels of divergence which would legitimize distinguishing subspecies, 3) the related issue of whether subspecific systematics should reflect microevolutionary relationships, 4) the corollary requirement that the taxonomic schema have predictive value, and 5) the problem of ideal typological thinking (Wilson and Brown 1953, Brown and Wilson 1953). At the heart of the matter is the issue of what should be the goals of neo-Darwinian (micro) taxonomy: simple grouping by morphological or any traits, or the depiction of micro-evolutionary relationships, assuming some fundamental legitimacy for either of these. Classification, identification and systematics are not the same. Furthermore, the advances of molecular biology and a better understanding of evolutionary processes have made it clear that the concept of "affinity" has many dimensions, especially for humans. A given individual or population may have multiple "relationships." Gene, genealogical, and population histories and affinities are not the same. This complexity represents an opportunity for deepening our understanding, advancing science, and as quaint as it sounds, promoting the health and well being of our species in its total environment.

The commonly known *morphologically* based "taxa" of humans ("races") fail to capture, describe or explain the variation found in extant humans from several vantage points (Keita and Kittles, 1997). This point can be made no matter one's view on the origins of modern humans (see also Templeton 1999). The classical race paradigm, in operation and concept, is informed by typological thought—Plato's idea that reality was composed of underlying eidos (essences or types). For Plato variation was imperfection. The strict racial approach constructs human diversity as being reducible to a fixed number of foundational, natural, and indivisible units (types), which consist of near uniform individuals. Variation from these units in this model is primarily explained by admixture. Thus, there were primary and secondary races. Another aspect of the racio-typological approach is that the units and their defining traits have "homelands." The ongoing legacy of this is the persistence of ideas about what traits are found to be in a "real" Asian, European, or African, which reflects the old polygenism. While few working biologists seem to hold a classical racio-typological view as a theoretical position, the influence of this mode of thought has not disappeared. Recent examples include the debates about the "origins" of Kennewick Man, and the interpretation of recent finds by Chinese researchers as being specifically "Europeans" based on aspects of their anatomy. There are competing explanations for the recovered phenotypes.

The classical race construct has numerous problems. The zoologists critical of the subspecies and trinomen noted several specific difficulties in practice: 1) a lack of concordance of traits across a species' range, 2) polytopicity (not polytypicity), 3) an arbitrariness in deciding recognition of subspecies, and 4) the existence of demes within subspecies which had been formally recognized (Mayr 1969, Mayr and Ashlock 1991). Trait non-concordance (lack of positive covariance) makes possible numerous different classification schemes, and numbers of "races." Polytopicity refers to groups, geographically widely separate, which have very similar morphological traits, and the problem of whether they should be classified under one name (which would suggest a "recent" common origin). Demes are well differentiated local breeding populations with high trait concordance whose coherence is greater than the official subspecies in which they are found. Demes are problematic because they may have a level of distinction worthy of recognition, which cannot be acknowledged formally due to the Law of Priority. This situation clearly illustrates the issue of arbitrariness in designating subspecies. (Conservationists sometimes use a division called the evolutionary significant unit (ESU) which captures isolated groups with unique traits, conceived as unique lineages at some level, but this is also arbitrary, and driven by the concern to conserve particular kinds of diversity, which is different from the goal of classical systematics (see Templeton 1999). It cannot be said that ESUs are the equivalent of subspecies, although they may be an appropriate unit of analysis in some circumstances.)

From the perspectives of simple classification and boundary formation—versus systematics—the received racial schema are

not exhaustive or productive of mutually exclusive categories when the full range of available data are considered. Serogenetic studies indicate that the within-taxa variation is greater than that between the received named "major" racial units ("Mongoloid," "Negroid," "Caucasoid"); these results mean that numerous individuals are more similar to those outside their morpho-grouping than to its centroid value for the traits studied (Latter 1980). The received racial taxa do not reach the level of differentiation used by population geneticists to designate functional subspecies (races) and coherent genealogical lineages (Templeton 1999). Near worldwide research on lineage markers (mtDNA and Y-chromosome variants) shows that the (individual) bearers of specific haplotypes do not form into clusters of individuals with uniform morphologies and geographical origin (i.e. classical "races" as commonly accepted) (Penny et al. 1995)—a stereotypical Swede may pair with an Mbuti. Nuclear DNA studies suggest to some that Blumenbach's "Caucasian" entity (or some of it) is at foundation an "intermixed" group composed of earlier differentiated non-European (specifically Asian and central African) elements (e.g. Bowcock et al. 1991)—this may be a problem given that the contributing groups seem to conform to received raciotypological schema—but should be acceptable to those who believe in the existence of races. The coalescence times of various genetic systems sampled broadly from across the world, when considered with fossil data (and their geography) suggest that the initial molecular microdifferentiation of *Homo sapiens sapiens* (by nomenclature a proper race) took place in Africa (see Keita and Kittles 1997); this problematizes the conceptual ontological universe of race and its terms which imply a fixed persisting diachronic relationship between geography, external anatomic phenotype ("racial type"), and a molecular "profile." Other work is interpreted as suggesting that various non-African populations possess a subset of haplotypes found in eastern and northern Africa, whose peoples in turn have a subset of a larger African pool in a deep biohistorical sense (Tishkoff et al. 1996). For Africa these data obviate the need to postulate African diversity as the product of numerous "racial" interactions; an evolutionary model is far more parsimonious (Kittles and Keita 1999).

None of these observations are meant to imply a belief that genetics or genetic events explain all levels of biological organization. Rather the intention is to illuminate the clash between the received concept of zoological race, i.e. subspecies, which is a morpho-typological construct, of Platonic cast, and the reality and complexity of evolution, of *Homo sapiens* and other species. Races are types, defined by complexes of anatomical traits; clear boundaries exist by definition, and definitions are tautologies. (Breeding populations are mating systems.) The boundaries implied by the specificity of type definitions are shattered when other data are considered. For the biological construct of race to be valid, with the connotation of a foundational and maintained biological uniformity and coherence of its members, there should be the finding of concordant groupings of individuals by lineage markers, other DNA, and morphology. Epigenetic effects also have a role in phenotypic variation, and cannot be ignored, but these do not figure prominently in the conceptual universe conjured by the term "race."

Current data, when viewed holistically, seem to suggest that human variation is the product of a variegated differentiation that structures via various processes, pathways and mechanisms through time and space. This dynamic situation is not described well by a racial terminology and world view, which suggest a static non-evolutionary reality, and are biologically misleading. The problem, to reiterate, is the belief or implication in data interpretation, that the racial (morphotypological) units emerged nearly simultaneously with the currently associated average molecular/genetic profiles in their defining cradles, and have remained largely unchanged ever since. This is an interesting belief given that the variations of some systems (e.g. HLA) have not been fully characterized for numerous regions. Also there were/are different views on the number of races. Significantly none of the traditional well-known "racial divisions" (in their "homelands") are Mendelian breeding populations. Rather they seem to be collections of various biological phenomena of varying time depths, as is best illustrated by the lineage data viewed in the contexts of geography, time and the range of variation in other traits. Collectively the individuals who comprise the classical "races" are generally polylineal, in spite of their morphological

similarity (by definition), and do not conform to the model implied and required by the concept of race.

In terms of systematics, it is well known that different types of human data will produce different patterns of clusters. Different measures and concepts of affinity do not necessarily correlate. Studies of individuals reveal a complexity not seen in studies of groups, as noted for DNA and from mitochondria and the Y-chromosome. Ancestors and descendants may not "look alike." Known historical relationships and different kinds of biological data may not "track" in expected ways. What can be called the grandparent paradox is illustrative of some of the conundrums of thinking in terms of "race." A fairly extreme hypothetical case is given to make the point—but there are many real world examples. Consider the "full-blooded" Dane who marries into an isolated, heretofore endogamous, Dogon blacksmith community, and whose descendants married only within that group. Is the Dane more related to the general Danish population (or "Caucasian race") or to his/her grand- or great-grandchild? Biological distance studies or classification efforts using traditional data (e.g. craniometrics, skin color) can be easily envisioned as placing the Dane into a different "race" (as commonly understood) than the descendant with whom 25% or 12.5% of genes are shared—far more than are held in common by individuals at the general population level (in the sense of recent descent). Multiple extreme phena may be present in families and among individuals sharing the same ancestors. This example may seem to compare apples and oranges. However, the point is to contrast the realities of known genealogical descent, relationship and resemblance. (Real examples at the population level are easily envisioned: the descendants of the Afro-American polar explorer Matthew Henson are Inuit, but have a genealogical affinity to Henson (who had no AfroAmerican descendants), and his extended family. A subset of Afro-Americans and Inuit, who both belong to wider breeding communities, are more related to each other than either is to their wider designated groups. Incidentally Henson's more distant descendants resemble "stereotyped" Inuit. The example can be extended. Suppose there had been a group of men and women like Henson involved in similar historical circumstances, but who never go home, and whose descendants exist only in a population deemed "racially" different. What happens over time, to a small group which is bioculturally assimilated? The genealogical connection is not lost with the local contributing population of the "foreign" parental group, but the external phenotypic resemblance may "disappear"; mtDNA and Y variants are another matter. The point is that there are different kinds of affinity (historically known, cladistic, phenetic, and patristic) and therefore relationship. These can exist at different levels between groups and individuals.)

Approaches based on racial thinking have led to interesting results, as when Carl Seltzer unknowingly classified full siblings into different races in research to solve (or resolve) the Lumbee "problem" (see Greenbaum 1991). This will not be surprising to all. Some sociocultural groups are used to wide intra-family phenotypic variability (in the anatomical traits on which "race" is based); researchers from such groups may bring different assumptions to population research about the meaning of variability on multiple levels, and what is possible.

The information and examples cited illustrate that racial conceptualizations can hide *bona fide* family relationships, which is interesting given the hierarchical place of the racial construct in the thinking of most of us. Of interest in the aforementioned example is that depending on sex and lineal relationship the Dane and descendant could be identical in a lineage marker (assuming no mutations), although very different in various anatomical traits. There exists the intriguing reality that one's descendants may belong to a different "race," which plays philosophical havoc with the metaphysics of discreteness as biologically and socially constructed, and underscores that phena are not taxa. This observation also further problematizes the relationship between similarity and relatedness. The emergent property of human DNA is variation, not race. The racial mode of thinking may lead to misinterpretations of human biohistory on many levels. In the United States numerous "indigenous" southern "Whites" and "Blacks" are probably more genealogically related to each other than they are to anyone in their assumed "ancestral homelands." This possibility may have implications for research design in some situations. There is no ex-

cuse to misuse the term race because the specific origins of those called "White" and "Black" are unknown. These entities are not races when the concept and the data are critically evaluated, anymore than those called such in the traditional literature. Using "race" as a synonym for "group" is not scientific. Unfortunately this colloquialism is widespread in society.

While Bogin is zoologically correct he has apparently not considered that formal taxonomic practice is not regarded as important in much human biology work. Some researchers may be unaware of the earlier discussions about subspecies and race. Human biologists frequently study units that are constructed from individuals who are sociopolitically defined. Their terminology and its definitions predictably come from the social universe, with all of its history and problems. Bogin perhaps has over-reacted to what may only be nomenclatorial sloppiness in the use of the word "race." This, however, is not certain.

The comments of Bouchard et al. are just as interesting and perhaps more problematic. Lay people who self-define themselves into "races" are probably not working from concerns about formal taxonomy. Their concept of race comes most directly from "society," although the racial terms have their origins in earlier science. The scientific validity of self-defined "race" is questionable. It is not a stretch to say that race to most non-scientists means social group. The racial vocabulary and its referents have been historically processed through social and political worlds. The racial taxa of earlier science were transformed into operationalized social categories by the socio-political system. Biological phena were made the basis for social identities. Official recognition was largely denied to the ethnicities born of indigenous New and Old World sociocultural history, which were the original units of self identification. Individual ethnic groups were amalgamated by political and ideological forces and made into generic "Whites," "Blacks," "Reds," and "Yellows," thus destroying the possibility of the ethnogenesis of formal New World Ibo-French, Chinese-Scotch, Ashanti-Apache, or Irish-Wolof communities (analogous to the Scotch-Irish); instead we get "racially hybrid" groups whose members were usually legally assigned to the parental group with the least power or prestige. This transformation process was especially true for the various Africans reduced to the status of slaves; their (North) Americanization legally rendered them conceptually as ethnically and biologically homogeneous (in spite of social rules of hypodescent). Identities became "racialized" in a literal sense, although it is well to note that the racial schema devised for Europe consisting of Nordic, Alpine, and Mediterranean units were never imposed and reified into official social groups.

The new concepts of identity became legislated and reproduced by people themselves over time as a part of public (or popular) culture in the context of a generally socially segregated system. However, in spite of constraints, there was gene flow between these groups who are clearly not homogeneous in their distant or proximate origins. This information, when considered with current data on genetic variation, indicates that the "races" of the sociopolitical world do not conform to subspecies, nor to the field context in which subspecies are said to exist (see Mayr and Ashlock 1991). Bouchard et al. do not acknowledge Bogin's concern about the scientific meaning of race. Their use of government sanction as justification is not constructive in resolving this scientific issue, and is itself political. At another level of politics, even the classic morphological concept has been misapplied to current individual reality because of older conceptions about the "racial" nature of the populations of various countries (see the old Statistical Directive 15 of the Office of Management and Budget which defines in a blanketing fashion all persons of some countries into one or the other of taxa of the traditional racial schema, and irrespective of individual phenotype, although stating that its classifications are not to be taken as "scientific"). The validity or invalidity of applying the (biological) race concept has nothing to do with "political correctness" in any of its permutations.

There is irony here. Bogin holds the HERITAGE Study Group members to a scientific standard of usage of the term race which they do not acknowledge, and this group defends the colloquial social use of race in the name of good biological science! Race in the past, even by scholars, has been used to describe a pot pourri of entities such as "cultural, religious, national, linguistic, ethnic, and geographical groups of human

beings" (Stepan 1980:xvii). This is clearly not good practice in zoological terms.

These authors have different notions of race. Hence, dialogue is minimal. The entities studied by El-Moalem et al. are best described as North American social or sociopolitical groups, not races, and generalizations in principal should not be made from them, the possible exception being situations where common socioeconomic factors have so insulted the biology of development and daily existence such as to cause convergence. Specific findings in U. S. "Blacks" and "Whites" should not be assumed to be true for groups labeled similarly elsewhere in the world, and not even within the same national borders. For example, hypertension is said/observed to be more frequent in Blacks than Whites. As is well known, disaggregating hypertension statistics by geography for "Blacks" reveals substantive differences. Hence, increased hypertension is not a "Black" phenomenon in the ontological essentialist sense characteristic of racial thinking. This bears remembering, as is the fact that the sociopolitically defined American Blacks are highly biologically variable anyway, physiognomically and otherwise. None of this is to deny that various demographic groups in the U.S. do not constitute entities with different biological and sociopolitical histories at some level. However, caution is urged in how we view and study these groups, and make generalizations. The labeling of these entities as *races* implies a primordial naturalness, thus denying the roles which human society have had in creating them. It also makes it possible to think that most of the social and health problems are 'natural.'

The socio-political groups of the U.S. possess internal variation. The African component of various regional Afro-North American "Black" populations is not necessarily from the same region in Africa; nor are their European or Native American ancestries the same. These historically grounded observations have implications for research. The local physical, populational, cultural, and political environments which may all contribute to the biological "profile" have not been identical. Upon close examination other groups in America (as defined by OMB Directive 15) probably also have regionality. Although there are sometimes reasons to compile national data by socio-political group, such data will not help in understanding and solving the problems of specific local populations. Stereotyping concepts proceed easily from racial thinking, and may derange the best scholastic intentions; policy could be misdirected. In the same issue of the journal containing the exchange on race there is an article on the contribution (in part) of "ethnicity" to differences in fat distribution in Puerto Ricans, "Whites," and "Blacks." What does "ethnicity" mean in this instance, and what is its relationship to "race", genealogy, and phenotype especially when the origins and variation of Puerto Ricans are considered. When can "Puerto Ricans" be treated as a group, a single breeding population? Are the right questions being explored? Have we all become so used to examining various questions from a generic racialized worldview, that it hurts research? We should be careful of confounding cultural-environment variables with genetic ones. There is a biology of ethnicity that may have many parameters. If continental ancestry is believed to play a role, for example, in findings for "Puerto Ricans," it would be of interest to explore the compositions of the studied samples if this is possible; historical data will help inform which Spaniards, Native Americans, and Africans should be considered in any explanation which incorporates "origins." Perhaps in some cases it will not make a difference, but this is the question to be explored. We need more sophisticated approaches that integrate a range of data.

The dialogue about "race" is far from over. What is clear is that living humans have numerous levels of biological inter-relationships with each other, and this somehow must be incorporated into our work. We should study local real populations; the issue is not merely to eliminate the term race, which has a place in scientific taxonomy, but to understand that the units once labelled as such in humans do not meet the criteria of zoological subspecies, and hence are not "races." The traditional racial lexicon should also be dropped because of its associated implications. There would seem to be no scientific justification for using the term "race" to describe the units of our enquiry. Unfortunately racial terms, concepts, and models have persisted in spite of ad-

vances in our knowledge, and of their great theoretical problems.

S.O.Y. Keita
A.J. Boyce
Field Museum of Chicago
Institute of Biological Anthropology
Oxford University

LITERATURE CITED

Bogin B. 1998. Letter to the Editor. Am J Hum Biol 10:279.

Bouchard C, Leon AS, Rao DC, Skinner JS, Whitmore JH. 1998. Response to Bogin. Am J Hum Biol 10:280–281.

Bowcock A, Kidd JR, Mountain JL, Hebert JM, Carotenuto L, Kidd KK, Cavalli-Sforza LL. 1994. Drift, admixture, and selection in human evolution: a study with DNA polymorphisms. Proc Nat Acad Sci (USA) 88:839–843.

Brown WH, Wilson EO. 1953. The case against the trinomen. Syst Zool 3:174–176.

El-Moalem HE, Gagnon J, Province M, Bouchard C, Leon AS, Skinner JS, Wilmore JH, Rao DC. 1997. Race differences in reproducibilities: The HERITAGE Family Study. Am J Hum Biol 9:415–424.

Gordon H. 1965. Genetics and Race, Part I. S Afr Med J 39:533–536.

Greenbaum S. 1991. What's in a label? Identity problems of southern Indian tribes. J Ethn Stud 19:107–126.

Keita SOY. 1993. The subspecies concept in zoology and anthropology. J Black Stud 23:426–445.

Keita SOY, Kittles R. 1997. The persistence of racial thinking and the myth of racial divergence. Am Anthropol 99:534–544.

Kittles R, Keita SOY. 1999. Interpreting African genetic diversity. African Archaeol Rev 16:87–91.

Latter B. 1980. Genetic differences within and between populations of the major human subgroups. Am Natural 116:220–237.

Mayr E. 1969. Principles of Systematic Zoology. New York: McGraw-Hill.

Mary E, Ashlock PD. 1991. Principles of Systematic Zoology, second Edition. New York: McGraw-Hill.

Penny D, Steel M, Waddell P, Hendy M. 1995. Improved analysis of human mitochondrial DNA sequences supports a recent African origin for Homo sapiens. Mol Biol Evol 122:863–882.

Stepan N. 1980. The Idea of Race in Science. London: MacMillan Press Ltd.

Templeton A. 1999. Human races: A genetic and evolutionary perspective. Am Anthropol 100:632–651.

Tishkoff S, Dietzsch W, Speed W, Pakstis AJ, Kidd JR, Cheung K, Bonne-Tamir B, Santachiara-Benerecetti AS, Moral P, Krings M, Paabo S, Watson E, Risch N, Jenkins T, Kidd KK. 1996. Global patterns of linkage disequilibrium at the CD4 locus and modern human origins. Science 271:1380–1387.

Wilson EO, Brown WL. 1953. The subspecies concept and its taxonomic application. Syst Zool 2:97–111.