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Another Look at Ethnicity as a Biological Concept

Moving Anthropology Beyond the Race Concept

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Abstract ■ Montagu referred to race as ‘man’s most dangerous myth’, while Lévi-Strauss called it ‘the original sin of anthropology’. Although persuasive arguments against the concept of race were made throughout the 20th century, race remains a particular problem for anthropologists who deal in the classification of human populations. Racial terminology has been perpetuated within anthropology largely owing to the fact that, historically, race formed the very core of anthropological study. Despite the conceptual inadequacy of race, the anthropological enterprise has yet to move beyond it as an explanatory tool for understanding human biological variation because of the lack of a conceptual and/or methodological replacement. This article re-analyses historical anthropological literature on ethnicity and biocultural interaction as a replacement for the race concept, and recasts it in the context of modern philosophical and psychological perspectives on population variation.

Keywords ■ biocultural ■ ethnicity ■ human variation ■ physical anthropology ■ race

The persistence of racial categories has dramatically limited our understanding of the patterns and processes of human variation. Theoretically, racial classifications suffer as a means of explaining population variation because they are based on the *a priori* assumption that humans fit into discrete groups, either phenotypically or genotypically. Certainly, various genetic or morphological traits exist in differing frequencies among ‘populations’, but the amount of genetic exchange between such populations is significant both locally and globally. Human history has demonstrated our vast mobility, and, regardless of one’s own perspective on how populations spread throughout the world, all mainstream models see East Africa as the cradle of humanity. From there either early hominids or modern humans (depending upon the chosen evolutionary model)¹ spread throughout the globe, both by land and by sea. With such mobility, it is highly unlikely that so-called racial groups could have developed as isolated populations within well-defined geographic areas. The question to be asked in this article, therefore, is specific and of paramount importance for moving beyond the racial paradigm: are there any workable models available that would allow us to move conceptually beyond the flawed race concept by

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accommodating the uniqueness of the individual and universality of humankind? This article examines the generally overlooked historical arguments regarding ethnicity as a non-racial model for conceptualizing human variation and analyses their potential for building an explanatory framework. The necessary shift away from the race concept will not be successful until an appropriate theory and method are in place, and that will only be possible when not just the patterns of evolutionary change are accounted for, but also the processes causing such change.

The biocultural approach to human variation

It is frequently claimed that negative reactions to the race concept are based primarily on political correctness; therefore, the classification of human groups is only problematic because of the sociological implications of such categorization. What is largely ignored or misunderstood is that the concepts of both species and subspecies are controversial within evolutionary biology in general (Billinger, 2006). The problem with the race concept, at least as it applies to modern humans, is not sociological, but one of the interaction between the biological and social realms. That is, one might argue as Deniker (1904), Huxley and Haddon (1935), Hulse (1969) and Montagu (1941, 1942a, 1942b) did in the first half of the 20th century, that humans represent a unique problem in terms of the 'gene pool' or 'breeding population'. These authors all suggest that human biology is structured by ethnicity rather than by geography, as previously thought, and that races or subspecies are merely theoretical abstractions of such groups. This might be best called the 'biocultural' approach to human variation.

Ernest Hooton (1940, 1946) is important in this context because he made perhaps the greatest contribution to the advancement of human osteological methodology in North America during the 20th century, and this biocultural approach contradicted his insistence that the phenotype was the basic unit for anthropological study of human variation.² It turns out that such phenotypic evidence does have value for the study of small regionalized historical skeletal samples, but presents a number of problems when used in broader taxonomic or phylogenetic applications. In contrast, the biocultural approach is based on modern genetic principles. Ashley Montagu was the champion of this approach: Aldous Huxley wrote in the introduction to Montagu's *Man's Most Dangerous Myth* (1942a) that anthropological writers suffer from over-simplification, whereas Montagu insisted on the principle of multiple and interlocking causation. This over-simplification is still a persistent theme in contemporary anthropological studies. Although anthropologists deal with both socio-cultural and biological problems in the human context, an integrated biocultural approach has been largely overlooked.

While Franz Boas was the first to mount a concerted attack on the idea of race from within anthropology, he did so not only on philosophical grounds, but also with extensive empirical data. Boas published a number of papers between 1910 and 1913 (see Boas, 1911, 1912, 1940) under the heading 'Changes in the Bodily Form of Descendants of Immigrants'. This collection has become classic in anthropology for its demonstration of the plasticity of the human form. The premise of this project was, according to Boas (1911: 1), that 'the principle data to be collected in an investigation of this kind must relate to the differences in composition of the immigrants that arrive in this country at different periods, and to the changes that may take place among their descendants born in this country'. Boas analysed anthropometric data from over 13,000 European immigrants to the United States and their descendants, focusing primarily on the head form of living individuals using the cephalic index (calculated by dividing the head breadth by length and multiplying by 100) in order to study change in constitution over time. It had been previously assumed that the cephalic index demonstrated heritability and was resistant to environmental influences (Gravlee et al., 2003; Halloway, 2002), and therefore average values for the index should remain constant between types. The immigrant groups selected for study were chosen because they represented both 'the most distinct European types' and the largest groups of immigrants to the United States at that time.³

It seems that even Boas himself was surprised by the results that he obtained, which he subjected to thorough statistical analysis:

From a practical point of view, it seemed all-important to know whether the American environment had a favourable or unfavourable effect upon the descendants of immigrants. The investigation has shown much more than was anticipated. There are not only decided changes in the rate of development of immigrants, but there is also a far-reaching change in type – a change which can not be ascribed to selection or mixture, but which can only be explained as due directly to the influence of environment. (1911: 2)

Boas (1912: 530) drew many conclusions from the analyses of the extensive data he collected, but his conclusions based on morphology by cephalic index calculations are most relevant to the present discussion:

1. American-born descendants of immigrants differ in type from their foreign-born parents. The changes that occur among various European types are not all in the same direction. They develop in early childhood and persist throughout life (Table 1).
2. The influence of the American environment makes itself felt with increasing intensity, according to the time elapsed between the arrival of the mother and the birth of the child (Figure 1).

Boas's results were complicated and his methodology was often unclear and, as a result, he was subjected to numerous criticisms of his original conclusions (Boas, 1912: 533), prompting him to publish his entire data set in 1928.

Table 1 Increase (+) or decrease (–) in measurements of children of immigrants born in the United States compared with those of immigrants from Europe, weighted according to number of cases (from Boas, 1911: 56; 1940: 60). Measurements are given in millimetres (mm)

<i>Race/nationality and sex</i>		<i>Length of head</i>	<i>Width of head</i>	<i>Cephalic index</i>	<i>Width of face</i>	<i>Stature</i>	<i>Weight</i>
Bohemians	<i>male</i>	–0.7	–2.3	–1.0	–2.1	+29.0	170
	<i>female</i>	–0.6	–1.5	–0.6	–1.7	+22.0	180
Hungarians and Slovaks	<i>male</i>	–0.5	–1.1	–0.7	–1.0	+59.0	54
	<i>female</i>	–0.3	–0.9	–1.0	–2.2	+10.0	38
Poles	<i>male</i>	–0.3	+0.2	+0.2	+0.7	+42.0	22
	<i>female</i>	+0.9	–1.6	–1.4	–1.3	+17.0	27
Hebrews	<i>male</i>	+2.2	–1.8	–2.0	–1.1	+17.0	654
	<i>female</i>	+1.9	–2.0	–2.0	–1.3	+15.0	259
Sicilians	<i>male</i>	–2.4	+0.7	+1.3	–1.2	–1.0	188
	<i>female</i>	–3.0	+0.8	+1.8	–2.0	–5.0	144
Neapolitans	<i>male</i>	–0.9	+0.9	+0.9	–1.2	+6.0	248
	<i>female</i>	–1.7	+1.0	+1.4	–0.6	–18.0	126
Scotch	<i>male</i>	+1.4	–0.5	–0.8	–1.5	+18.0	39
	<i>female</i>	–0.3	+0.3	+0.2	+1.9	+39.0	33

The results of Boas's study remain controversial even today. Two recent re-assessments of his 1928 data have reawakened the debate over the role of environmental factors in determining the size and shape of the skull. Sparks and Jantz (2002) applied modern statistical techniques to Boas's data, concluding that the results demonstrate that heritability is stronger than Boas's results suggest, while Gravlee et al. (2003) also statistically analysed the results, concluding that Boas was essentially correct in his conclusions. The prolonged debate over the relationship between heritable and environmental factors in shaping physical constitution gives testament to the complexity of this relationship, which anthropologists have attempted to reconcile for well over a century. I argue that the best model for explaining this relationship as a non-racial phenomenon is the biocultural concept of the *ethnic group*, although this concept is most certainly in need of critical appraisal.

In 1900, the chief librarian of the Muséum National d'Histoire Naturelle in Paris, Joseph Deniker, published *The Races of Man* (1904), looking at the study of anthropology and ethnography and the problems of racial classification. This book represents what is likely the first published argument that the traditional anthropological race concept should be replaced by the notion of ethnicity. What is most remarkable about this book is how Deniker seemingly anticipated many of the debates that would arise in the biological sciences and anthropology during the mid 20th century and into the 21st century, drawing on many problems with systematic taxonomy in general, and its application to humans in particular.

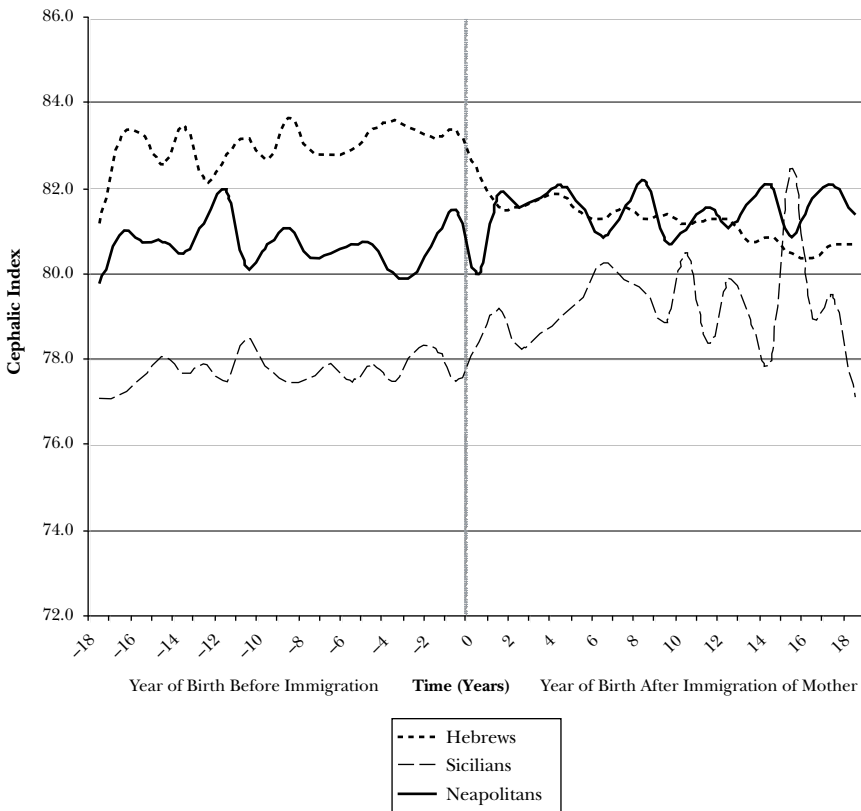


Figure 1 Cephalic index of foreign-born and American-born adult males, arranged according to time elapsed between birth and immigration: Hebrews, Sicilians, and Neapolitans (data plotted from Boas, 1911: 61; 1940: 61)

Deniker appreciated the great cultural and biological variability of human groups, and was sceptical of attempts to give a systematic view of all the peoples of the earth, either socially or physically. He was primarily interested in fundamental questions about the nature of human groups and their relations to zoological phenomena, leading him to ask:

Do these real and palpable groupings represent unions of individuals which, in spite of some slight dissimilarities, are capable of forming what zoologists call 'species', 'subspecies', 'varieties', in the case of wild animals, or 'races' in the case of domestic animals? One need not be a professional anthropologist to reply negatively to this question. They are *ethnic groups* formed by virtue of community of language, religion, social institutions, etc. . . . and are by no means zoological species. (Deniker, 1904: 2-3)

Deniker views races as theoretical groupings, but sees ethnic groups and individuals of ethnic identity as directly observable. Further to the argument against human groups as zoological species, Deniker (1904: 3–4) believes that there could be no typical specimen discovered for each or any theoretical racial group:

Here are, then, entities, theoretic conceptions exactly like ‘species’ in zoology; only instead of having within our reach the ‘types’ of these species as in zoological collections, we are obliged to rest content with approximations thereto, for it is a very rare occurrence to meet with an individual representing the type of the somatological unit to which he belongs. Most frequently we have to do with subjects whose forms are altered by blendings and crossings, and in whom, setting aside two or three typical traits, we find only a confused mixture of characters presenting nothing striking. . . . In reality, those peoples are almost undiscoverable who represent ‘somatological units’ comparable to the ‘species’ of zoology.

In fact, Deniker (1904: 4) not only believes that external physical traits are of little heuristic value in terms of real biological relationships, but argues that none of the zoological terms – ‘species’, ‘variety’ or ‘race’ – can be accurately applied to the genus *Homo*.

This objection to the application of zoological terminology such as ‘species’ or ‘variety’, not only to *Homo sapiens* but to the entire genus *Homo*, was based on Deniker’s notion of zoological species living under the influence of nature; such natural groupings could only occur in wild animals. In contrast, race could only be the result of the artificial conditions of animal domestication, which created well-defined breeds (Deniker, 1904: 4). In essence, Deniker’s argument is that man is not subject to nature in the same ways that animals are – although humans live in artificial environments, these environments are created by ourselves, not by outside forces. However, because these conditions are self-imposed and not created by domestication, man cannot be directly comparable to animals in terms of bodily constitution. Specifically, Deniker (1904: 4) argues, ‘The data relating to the formation of varieties, species, and races can therefore be applied to the morphological study of man only with certain reservations.’

The fact that race is not simply an anthropological problem, but one of general biological application (Billinger, 2006) certainly was not lost on Deniker, who recognized this point a full century ago:

[L]et us bear in mind that even the distinction between the species, the variety (geographical or otherwise), and the race is anything but clearly marked. Besides, this is a question of general biology, and it is no more settled in botany or in zoology than in anthropology. (1904: 5)

Deniker explains that the main barrier to building an accurate classification of human groups is that the recognition of natural biological groups relies on proven interfertility, and while it may be inferred that all human groups have the potential to interbreed, as Darwin suggested in *The Descent of Man*

(1871: ch. 7), Deniker believes that such interbreeding cannot be proven experimentally among humans of different geographic populations. Deniker also disagreed with Darwin's (1888: 280) suggestion that 'it is almost a matter of indifference whether the so-called races of man are thus designated, or are ranked as species or sub-species; but the latter term appears the more appropriate'. Rather, Deniker rejected the term subspecies:

The word 'race' having been almost universally adopted nowadays to designate the different physical types of mankind, I shall retain it in preference to that of 'sub-species', while reiterating that there is no essential difference between these two words and the word 'species'. (1904: 7)

Even though Deniker disagreed with Darwin in terms of terminology, he agreed that any such division was arbitrary and, because of this, he felt that the debates between those who believed that humans are part of a single unified species and those who believe that human races are separate species were moot:

The whole of this ancient controversy between monogenists and polygenists seems to be somewhat scholastic, and completely sterile and futile; the same few and badly established facts are always reappearing, interpreted in such and such a fashion by each disputant according to the necessities of his thesis, sometimes led by considerations which are extra-scientific. (1904: 7)

Over a hundred years later, the problem remains essentially the same – poorly established facts about human evolution are always reappearing, and are often uncritically applied. In his attempt to push the study of human variation further, Deniker (1904: 8–9) believes that humans cannot accurately be studied either zoologically or sociologically. He claims that ethnic groups are the result of a tension between two factors: variability, or dissimilarity, and heredity, or the perpetuation of the similar. Man must therefore be studied as both an individual of a zoological group, and groupings of individuals in societies.

At this point, particularly in Europe, anthropology was seen as the study of the somatological characteristics of the genus *Homo* as a whole or in relation to other animals, whereas ethnography or ethnology was concerned with the study of ethnical characteristics. Deniker was interested in bringing together both these areas of study to build a more comprehensive view of human variation: 'However, there is a convergence of characters in mankind, and we find even to-day the trace of savagery in most civilized peoples. Ethnical facts must not then be considered separately' (1904: 9). A complete social and biological description of each of the known human populations was Deniker's goal, but, in providing such a classification, he reverted to the term 'race' for describing what he had already called ethnic groups, and based his classification solely on external physical features. Perhaps the fundamental flaw of this scheme was the lack of a definition of ethnic group, which seems to have limited Deniker's own use of the term for describing the variation of man that he saw.

Although Huxley and Haddon make no mention of Deniker's earlier work, they view the relationship between zoological notions of race and its inapplicability to human populations in much the same way, though with a seemingly greater sense of urgency:

The word 'race' soon acquired a vagueness that it has never since lost. It is probably that this vagueness, together with the occasional employment of the word by certain scientific men of a previous generation and the supposed parallel between zoological and human 'races' have combined to give it a special popularity with a group of writers who deal with scientific themes without adequate scientific equipment. From them it has descended to the literature of a more violent nationalism. (1935: 19)

Their strongest indictment against anthropological approaches to taxonomy is that the application of modern (post-evolutionary synthesis)⁴ genetical theory to the problems of biology was not being adequately felt in the domain of anthropology (Huxley and Haddon, 1935: 60). In an attempt to bring anthropological study into the fold of Mendelian genetics, Huxley and Haddon made it their goal to elaborate 'the fundamental distinction between the *phenotype* or visible appearance of an organism and its *genotype* or transmissible constitution' (1935: 74).

Huxley and Haddon contended that practically all human groups had a mixed origin, and, as a result, all possessed a great degree of genetic variation. For them, the true value of studying variation is the range:

The expectation of the Mendelian geneticist, knowing the facts of inheritance and the migratory habits of man, is of groups possessing a large range of variation, often concerned with striking characters of a qualitative nature as well as with quantitative ones; such groups can only be distinguished from each other by statistical methods. In such groups the *mean values* for characters, though still useful, no longer have the same theoretical importance. The *range of variation* of characters is of far greater practical importance, as is also the range of qualitatively different recombination-types. The two resultant 'racial' or ethnic concepts are fundamentally dissimilar. (1935: 104)

The emphasis on range over averages in mixed populations leads Huxley and Haddon to argue that race was a non-entity, prompting their famous claim: 'In the circumstances, it is very desirable that the term *race* as applied to human groups should be dropped from the vocabulary of science' (1935: 107).

The significance of their argument lay partly in the social aspects of race that they outlined, but they also provided concrete genetic arguments, citing the vast migration of humans as the principal underlying factor:

In other animals, the term *sub-species* has been substituted for 'race'. In man, migration and crossing have produced such a fluid state of affairs that no such clear-cut term, as applied to existing conditions, is permissible. What we observe is the relative isolation of groups, their migration and their crossing. In what follows the word *race* will be deliberately avoided, and the term (*ethnic*) *group* or *people* employed for all general purposes. (Huxley and Haddon, 1935: 107-8)

The relationship between phenotype and genotype continues to present a great problem for anthropologists and biologists alike, and, when dealing with such mixed ethnic communities, classifications based on phenotypic evidence, particularly soft tissues, do not correspond well with direct genetic evidence, which is much more difficult to ascertain:

The method of characters and the method of genes differ in their scientific value and in the practicability. It is much easier to attempt a classification in terms of characters, and indeed this is the only method that is immediately practicable (as well as a necessary first step towards the classification in terms of genes). But it is less satisfactory from the scientific point of view. This is partly because apparently similar characters may be determined by different genes, and conversely because the same gene in combination with different constellations of other genes may produce very different characters. It is also less satisfactory because a character is always the result of an interaction between constitution and environment. To disentangle the genetically unimportant effects of environment from the genetically essential action of genes is difficult in all organisms and especially so in man, where the social and cultural environment – unique characters of the human species – play predominant parts. (Huxley and Haddon, 1935: 108–9)

This focus on both cultural and physical environment playing predominant roles in shaping the genetics and physical structures of human populations is reminiscent of the perspective taken by Boas in his immigrant studies.

Huxley and Haddon argued that classifications were arbitrary and that any classification of human aggregates by any set of criteria would produce a classification that would poorly fit any other set of criteria. As a result, they were very clear that: ‘If *race* is a scientific term, it must have genetic meaning’ (1935: 129). However, whereas Deniker rejected the use of the term ‘subspecies’ to describe human populations, Huxley and Haddon gave subspecies the same hypothetical role that Deniker gave race. But, in dealing with real human populations, they reiterated their preference for the term ‘ethnic group’:

[T]o avoid the unfortunate connotations of the word *race*, the term *sub-species* is preferable. It should be emphasized, however, that the existence of such human sub-species is purely hypothetical. Nowhere does a human group now exist which corresponds closely to a systematic sub-species in animals, since various original sub-species have crossed repeatedly and constantly. For the existing populations, the non-committal term *ethnic group* should be used. (1935: 136)

Their idea of ethnic classification was one that would be quantitative rather than qualitative, and three-dimensional rather than based on single characters:

To sum up, the first aim of ethnic classification should be to give an accurate descriptive picture of the physical characteristics of different regional groups, in terms of certain agreed physical characteristics. For this we require not only averages and statistical estimates of variability for single characters, but curves

showing their distribution in adequate samples of the population. We further require numerical estimates (correlation coefficients) of the degree of association between different characters. This procedure will enable us to give a descriptive classification of human populations in different geographical regions of the world, in terms of ethnic groups with certain physical peculiarities. (Huxley and Haddon, 1935: 143)

This way of thinking about human variation allowed for a degree of flexibility that was not common in previous taxonomic thought. Where taxonomies were rigid and ignored microevolutionary processes, Huxley and Haddon believed that the notion of typology could be accurately employed when researchers recognized that types were not static or pure, but theoretical models:⁵

This descriptive classification may then be interpreted in terms of ideal types which are presumed to have combined to form the existing mixed populations, and of hypothetical major and minor sub-species into which the human species must be presumed to have differentiated in the course of its evolution. But the types must not be regarded as fixed, and the sub-species will never have been genetically pure. (1935: 143)

This tension between the notion of type and the appreciation of microevolutionary forces is perhaps the main barrier to moving beyond traditional classificatory attempts, but Huxley and Haddon were clear that the key to understanding biological groups and their relatively rapid evolution was genetic and not morphological, but the problem in their methodology was that they had no way to directly access genetic material in the pre-DNA age, and were forced to rely primarily on soft tissue variation (hair form and colour, skin colour, eye form and colour), and physiological and psychological factors (body temperature, pulse rate, respiration, onset of puberty, metabolic changes, colour vision, sense perception), along with minimal anthropometric variables (stature, head form, nasal form) and blood group data to form their ethnic classification.

The most comprehensive view of ethnic classification and its value over racial classification is that developed by Montagu (1942a, 1942b, 1962, 1997). Montagu outlines and closely follows the arguments of his predecessors, focusing on both the taxonomic issues that Deniker had discussed and the genetic problems elaborated by Huxley and Haddon (see particularly Montagu, 1962: 921–2). Montagu was clear and concise in his criticism of the race concept, and brought this clarity to his arguments for ethnicity as a replacement for race. Earlier attempts to incorporate the social world into the structure of biological systems suffered from a lack of definition for the term ‘ethnic group’, a problem that Montagu recognized and attempted to rectify, stating: ‘An ethnic group represents part of a species population in process of undergoing genetic differentiation; it is a group of individuals capable of hybridizing and intergrading with other such ethnic groups, to produce further genetic recombination and differentiation’ (1942b: 374). More specifically, Montagu defines the ethnic group as:

[O]ne of a number of populations comprising the single species *Homo sapiens*, which individually maintain their differences, physical and cultural, by means of isolating mechanisms such as geographic and social barriers. These differences will vary as the power of the geographic and social barriers, acting upon the original genetic differences, vary. Where these barriers are of low power neighboring groups will intergrade, or hybridize, with one another. Where these barriers are of high power such ethnic groups will tend to remain distinct or replace each other geographically or ecologically. (1942b: 375)

Montagu's (1941: 247) indictments against the race concept are direct and well informed, and his belief that the concept is fundamentally flawed is based upon three basic premises: (1) it is artificial; (2) it does not agree with the facts of human variation; (3) it leads to confusion and the perpetuation of error. These arguments are based firmly in the primacy of genetic evidence, which remained lacking in anthropological classifications at the time:

The immediate task of the physical anthropologist interested in the origins of human variety, is to investigate the problem presented by that variety not as a taxonomist but as a geneticist, since the variety which is loosely called 'race' is a process which can only be accurately described in terms of the frequencies with which individual genes occur in groups which represent adequate ecologic isolates. If 'race' and 'racial' variability can best be described in terms of gene frequencies, then among the most important of our tasks must be that of discovering what roles the primary and secondary factors play in producing that variability. (Montagu, 1942b: 373)

This perspective entails a complete rejection of Hooton's claim that taxonomy must begin at the level of the phenotype.

Montagu refined his argument over a period of about 20 years. Regarding the taxonomic issues first raised by Deniker, Montagu similarly suggested that we are subject to the same forces of evolution as all other species, but in a form that has been modified by culture:

At the outset it should, perhaps, be made clear that I believe, with most biologists, that evolutionary factors, similar to those that have been operative in producing riation in other animal species, have also been operative in the human species – but with a significant added difference, namely, the consequences which have resulted from man's entry into that unique zone of adaptation in which he excels beyond all other creatures, namely *culture*, that is to say, the man-made part of the environment. (1962: 919)

This distinction between environment in a natural state, to which all non-domesticated animals are subject, and the artificial environment created by human language and technology is the key to understanding human variation as opposed to species variation in general. For Montagu, human variation follows unique patterns due primarily to mobility and social selection:

On the evidence it would seem clear that man's cultural activities have introduced elements into the processes of human riation which have so

substantially modified the end-products that one can no longer equate the processes of raiation in lower animals with those which have occurred in the evolution of man. The factors of mutation, natural selection, drift, isolation, have all been operative in the evolution of man. But so have such factors as ever-increasing degrees of mobility, hybridization, and social selection, and it is the effects of these and similar factors which, at least so it has always seemed to me, makes the employment of the term 'race' inapplicable to most human populations as we find them today. (1962: 919)

It is because of these factors that Montagu argues that traditional biological terminology, such as 'race' or 'subspecies', is wholly inadequate in the realm of human biology.

Montagu makes clear that his perspective on human variation and the unity of species does not to deny the variation that exists in human groups, but rather is intended to allow adequate exploration of the processes that have created the great diversity that is seen. It is therefore Montagu's primary goal to urge the usage of terminology that encapsulates these processes while circumventing the deficiencies seen in the use of the terms 'race' and 'subspecies' in the human realm:

Of course there exist differences, but we want a term by which to describe the existence of these differences. We do not want a prejudiced term which injects meanings which are not there into the differences. We want a term which as nearly mirrors the conditions as a term can, not one which falsifies and obfuscates the issue. (1962: 919)

The limiting factor in the exploration of patterns of human variation is not solely terminological; rather, it must be conceptual. Montagu's criticism of race as *Man's Most Dangerous Myth* (1942a, 1997) was based not simply in the misapplication of racial theory, but in the fallacy of the concept itself. Montagu's main accomplishment in this regard was not only in elaborating the 'long and tortured history' (Montagu, 1962: 920) of the race concept; his terminological deconstruction was an attempt to provide a new conceptual landscape for human variation studies.

The term 'race' takes for granted what should be a matter for inquiry. And this is precisely the point that is raised when one uses the noncommittal 'ethnic group'. It encourages the passage from ignorant or confused certainty to thoughtful uncertainty. For the layman, as for others, the term 'race' closes the door on understanding. The phrase 'ethnic group' opens it, or at the very least, leaves it ajar. (1962: 926)

The term 'ethnic group' is concerned with questions; the term 'race' is concerned with answers, unsound answers, where for the most part there are only problems that require to be solved before any sound answers can be given. (1962: 927)

In fact, Montagu (1945) had much earlier made a measured attack on the misuse of systematic terminology in the study of human evolution, particularly the terms 'primitive', 'advanced', 'specialized' and 'atavism'.

While Montagu's constant criticisms were focused and well informed, many of his colleagues were highly critical of his approach. General debate over the race concept was particularly bitter between Montagu and Carleton Coon, as well as Hooton (Marks, 2000; see also Dobzhansky et al., 1963), and many who agreed with the inadequacy of the race concept were also critical of the notion of ethnicity that Montagu proposed, particularly Brace (1964b). Where Montagu argued that physical anthropologists must understand the implications of culture for biology, Martin (1963) argued that the domain of physical anthropologists is biology, dealing with 'physical or genetic' differences separate from cultural considerations. To this criticism Montagu (1963: 1352) replied, 'The very grounds which he finds constituting objections to the usage of that term are those which make it so appealing to me.'

In reaction to Montagu's usage of 'ethnicity', Martin believes that Montagu takes the race concept in the wrong direction, and that the term 'population' is perhaps a better alternative to 'race':

It is disappointing that Montagu did not directly discuss the term 'population'. It is a term commonly used in current literature and one which Montagu himself employs frequently. 'Population' implies interbreeding individuals, or groups, with varying degrees of genetic exchange. It is admittedly a general and vague term but one which, because of its unspecific nature, involves no assumptions, and erects no barriers, save that of genetic exchange. It is adaptable, and yet meaningful, to virtually every physical study. (1963: 403)

Montagu's biocultural approach, in essence, is not particularly different linguistically from the vague and unspecific terminology suggested by Martin; however, Montagu insists that any new concept or term reflect the desire to explain the mechanisms involved in physical differentiation:

Physical (genetic) and cultural evolution are not mutually exclusive processes. And, indeed, since man has become man principally because his chief means of adapting himself to the physical environment has been through culture, I hope that no student of physical anthropology will ever again be misled enough to believe that we shall ever intelligently be able to investigate the 'physical or genetic' differences without any implications to culture. The cultural implications are virtually always there. (1963: 1352-3)

This notion of human biology as intrinsically cultural remains controversial and the culture concept itself is somewhat problematic to arguments against racial or subspecific classification. Because of this controversy, Montagu suffered much harsh criticism, even from his own anti-race allies, who view physical anthropological evidence as primarily genetic.

Both Polgar (1964) and Brace (1964b) believe that Montagu's concept of ethnicity, and the intentional vagueness of the concept, is virtually indistinguishable from the race concept, and should be recognized as an unwarranted substitution. As a result, Brace (1964b: 313) argues that such approaches as those of Deniker, Huxley and Haddon, and Montagu have

not led to any significant progress in understanding human variation and diversity because they do not represent an alternative approach. Polgar (1964: 424) believes that use of the race concept should involve an explanation of its context, and outlines three operational definitions: populations (geographic groupings), cultural groups or communities, and perceptual sets (based on lay classification of phenotypic attributes). He concludes that the study of phylogenetic relationships between geographic, genetic or morphological groups would be better served by the use of 'population clusters' or 'phylopopulations'. However, Brace (1964b) takes a strong position against the use of the term 'population', which he believes obscures correlated clines of trait and selective force. To this, Huxley critically replied:

There is no doubt in my mind that the human species in its early evolution started to form geographical subspecies, and that these became quite sharply differentiated from each other, and gave rise to the so-called primary races. The distinctions between them have, of course, been blurred by migration and crossing ever since that time, but the basic differentials remain the same. ('Comments', in Brace, 1964b: 316)

Huxley's main interest was how local groups formed within these 'populations', and it is in relation to these smaller local subspecies or races that he suggests: 'The neutral term "ethnic group" seems to be the scientifically most respectable designation' ('Comments', in Brace, 1964b: 316). Clearly, the difference in perception is in the level of analysis.

While Brace's arguments are not only focused upon the recognition of the fundamental flaws of racial taxonomy but also the flaws of 'ethnicity' or 'population' as replacement terms or concepts, he fails to provide any solutions to the outlined problems. What should be evident from this debate is that the argument is entirely semantic, and the underlying genetic principles are being completely disregarded or overlooked. In response to Brace's comments, Coon tells us: 'Brace writes as if the concept of race were unique in man and the question of the existence of races could be decided on human materials alone' ('Comments', in Brace, 1964b: 314). Similarly, Count, also commenting on Brace, clearly states:

[M]an participates in exactly the same evolutionary processes as any other animal – *and in no other*. When cultural elaboration is called evolution in the same breath with organic evolution, it is logical confusion. It is an easy step thereupon to argue that culture has mediated to abrogate the operations of 'natural selection'. I have never encountered any valid evidence in support of such an assertion, and only miracles can abrogate the operation of natural law. ('Comments', in Brace, 1964b: 315)

These arguments demonstrate an inherent bias in favour of biology as a reflection of an underlying 'natural' system or structure, at least at that particular historical moment. Neither Coon nor Count provides convincing explanations of why culture cannot or should not be considered an external factor with biological outcomes.

Montagu ('Comment', in Brace, 1964b: 317) sought to clarify the fact that ethnicity was in fact a viable alternative approach not simply because it would replace the word 'race' in the anthropological vocabulary, but because in his view biological and environmental forces cannot be studied as isolated factors, but should be viewed as integrated causal explanations. Thus, Montagu argues that ethnicity represents a new way of conceptualizing *human* variation, since he believes that social environment has demonstrable effects on biological evolutionary patterns. Montagu clearly insisted:

I have repeatedly emphasized the pathetic fallacy, the reductionist malaise, of regarding populations of human beings as biological races from the purely zoological point of view, for the simple reason that populations of men have never behaved as 'purely zoological' taxa.

Human populations have behaved in uniquely cultural ways, and these cultural ways have produced an amalgam of variability in genetic, morphological, and cultural traits which require far more profound and extended forms of investigation than the simple-minded rubber-stamping approaches of the classifiers of 'races'. ('Comment', in Brace, 1964b: 317)

Even though Montagu was quite explicit in his reasoning for rejecting the traditional biological approach and adapting a biocultural framework, many of his critics (see, for example, Brace, 1964b; Count, 1951; Garn, 1961) maintain that his reasons are sociological and not based in biology. To these claims, Montagu quite definitively responds:

I was, of course, concerned, among other things, on humanitarian grounds about the social and biological consequences of the misuse of the idea of race. But what especially concerned me was the fuzziness with which the concept was used by physical anthropologists. The artificial groupings called races by most physical anthropologists seemed to me not to correspond to the realities which were claimed for them. It was on scientific grounds that I criticised the orthodox anthropological conception of race – not on humanitarian or sociological grounds. On similar grounds a growing number of physical anthropologists and biologists find the concept of race unsatisfactory. (Montagu, 1965: 326)

While the biocultural concept of ethnicity was elaborated and encouraged by some of the most esteemed anthropologists of their particular times, Deniker, Huxley and Haddon, and Montagu, little progress has been made in understanding the benefits of such an approach. Montagu, being one of the most prolific anthropological writers of the 20th century in both biological and cultural anthropology, pushed the biocultural approach further than any other. Brace ('Foreword' to Montagu, 1997: 16) suggests that while Montagu understood the deep issues on a theoretical level, the full range of basic biological data necessary to sustain his theories was never produced. In the absence of such data, as is often the case, simple explanations persist in the absence of causal explanations of such complex factors. On the topic of race and subspecies, this remains exactly the case;

biocultural approaches remain generally ignored or misrepresented with only a few rare exceptions.

Perhaps the best example of such an exception is the symposium of the Eugenics Society, held in London in 1968, entitled 'Biosocial Aspects of Race' (Harrison and Peel, 1969).⁶ Of particular interest to the present discussion are the papers presented there by Hulse (1969) and the keynote address (The Galton Lecture) by Harrison (1969).

Hulse (1969: 31), a student of Hooton's, quotes his teacher and mentor as frequently stating: 'When people meet they sometimes fight, but they always mate.' While Hooton remained faithful to the racial approach to human biology, this particular outlook is fundamental to the biocultural approach in that discrete or genetically closed 'populations' are rare, if they even exist, since miscegenation seems to be the general rule throughout human history. If such isolates do exist, they exist in specific local environments and are not suitable for insertion into generalized racial categories. It is on this perspective that Hulse breaks from Hooton's insistence on phenotype as the basis for classification. Arguing from what appears to be a much more Boasian perspective, Hulse calls into question the sets of traits that have been used by his colleagues and predecessors for declaring racial groups:

Traits which are glaringly cultural in origin and modes of transmission have been recklessly attributed to race. Traits which are demonstrably plastic, and subject to environmental modification, have been listed by reputable scholars as racial characteristics. To complicate matters still more, we often find that a feature – stature is a good example – may have a strong genetic component, yet be subject to considerable variation for environmental reasons. (1969: 32)

Though Hulse does not mention the previous work of Montagu in his discussion, he nonetheless adopts a remarkably similar definition of ethnic group as a non-rigid or stable socio-cultural unit unified by sentiment and tradition.

The term 'population' suggested as a replacement for 'race' by Martin is also problematic for Hulse. Hulse believes that human groups are of a different type from general biological populations:

A genetically distinct breeding population is an entity of a thoroughly different sort, since it may be characterized in biological terms. Castes and ethnic groups are found only in the human species, but breeding populations exist in most if not all bisexual animal species. The barriers between castes and ethnic groups are the result of human culture and human imagination. The barriers between breeding populations may be oceans, mountains, deserts, climatic zones as well. . . . In many cases, at least within the human species, social regulations may be effective in causing genetic distinctions to be retained, but it is far more doubtful that social regulations caused them to originate. (1969: 33)

These comments seem reminiscent of those of Huxley and Haddon in that what might be considered a hypothetical primary race evolved particular

physical characteristics in response to specific environmental stimuli, but the distribution and maintenance of such traits within and between groups across geography depends not only on geographical barriers in a larger sense, but on social barriers at a local level. Specifically in relation to physical environment, Hulse suggests:

The genetic characteristics of a population have, as a rule, evolved in response to environmental stress. They presumably reflect adaptive requirements; and adaptation is to the ecology as a whole, not simply to the social aspects of ecology. Consequently we find that human breeding populations whose ancestors lived for thousands of years in different parts of the globe have evolved varied peculiarities. (1969: 34)

Hulse therefore relies on an implicitly interconnected view of social and geographic environments.

Harrison (1969), on the other hand, chooses to focus more specifically on how physical anthropologists have approached the study of such trait variation in light of the biocultural approach, suggesting that the main focus of human morphological studies has been narrowly focused on form rather than function, neglecting the related biological processes and their explanatory value:

Most of the characters studied by early physical anthropologists, the visually obvious one of morphology, are far removed from the immediate site of gene action, and typically, variation in these characters is, at least, partly due to the direct effect of the environmental variation on growth and development. (Harrison, 1969: 129–30)

Morphological variation and its taxonomic implication has been the primary domain of physical anthropologists trained by Hooton or his disciples, even though Hooton himself was interested in genetic inheritance and eugenics. Such a morphological perspective, however, is based entirely on analogous relationships, and may give no indication of actual evolutionary relationship (Billinger, 2006; Lewontin, 1991). The lack of concern for such problems results in the assumption that morphology is directly indicative of underlying genetic patterns. According to Harrison: 'Some physical anthropologists, like some geneticists, have tended to regard environmental effects, generally, as little more than a nuisance which conceal the nature of hereditary variation' (1969: 131).

For Harrison (1969: 132), the main problem in focusing on specifically genetic evidence to explore hereditary variation is that the genetic characters anthropologists have shown interest in, such as blood group systems, haemoglobin structure, serum proteins, blood enzymes, etc., are considered to be simply inherited, but in most cases they are genetically complex. Such polymorphic character systems differ in the frequency of genes rather than in absolute presences or absences, therefore distinguishing between monomorphic and polymorphic traits in population-level research is essential, since some populations may be

monomorphic for a particular character that is polymorphic in other populations. It is, however, extremely rare that any single population would be monomorphic for one variation while other populations are monomorphic for an alternative variant in the same character system. Therefore, classifications based on such traits are particularly difficult, since the level of variation within each population is generally quite high.

Harrison deals with the geographical variation of traits by referring to clinal variation, a concept first introduced by Huxley (1938, 1939) explaining the gradual variation of the measured value of a character (phenotypic, genetic, behavioural, etc.) along a geographic axis.⁷ According to Harrison (1969: 132), changes in both gene frequency and quantitative traits (in terms of mean values) tend to occur gradually and evenly, though there may be some instances of relatively abrupt changes. Gene frequencies (genoclines) and quantitative traits (phenoclines) do not necessarily follow the same patterns; therefore, assumptions about changing gene frequencies based on geographical gradients in physical characters may be inaccurate at best. This leads Harrison to conclude:

The clinal nature of the variation and the discordance of character distributions makes any classificatory system of geographical variety not only arbitrary but also artificial. Livingstone (1962), indeed, has gone so far as to say that there are no races, only clines. This seems to be to me too extreme a position. As already stated, races are acceptably defined biologically as populations which differ in gene frequency and, since such populations undoubtedly exist, races must exist. (1969: 140–1)

This position is confusing since Harrison claims that races exist but their classification is arbitrary and artificial.

Although he does not give credence to the idea of ethnic classification as Hulse did, Harrison does see racial classification in humans as being fundamentally different from other species:

It may be concluded that the race concept is of little value in the scientific study of man; it has no exactitude and it, in itself, explains nothing. Even the use of racial names, like mongoloid, negroid, caucasoid, has no precision, though they serve as rough and ready summaries of a number of physical features which certain populations tend to possess. Nevertheless, in my personal view, it is both scientifically and ethically wrong for human biologists to deny the existence of race. The amount of geographical variation in genetic systems is great, despite the clinal nature of the variation fairly abrupt changes do occur, races palpably exist, and to my mind it helps nothing to call them ethnic groups. The important point is that the biological variety which I have discussed and which is the basis of the race concept, tells us nothing about the nature and variety of other human attributes. (1969: 141)

Though Harrison dismisses ethnicity outright and problematizes the use of 'race' while seemingly contradictorily upholding its value, it appears that his view of human variation is not all that dissimilar from those held by

Deniker, Huxley and Haddon, Montagu and Hulse, only his retention of traditional terminology differs. What is at odds with these writers is Harrison's perspective that human variation must fit into traditional biological (or natural historical) schema.

Are ethnic groups biologically discrete?

The biological implications of ethnicity have been treated more recently by anthropologists such as Crews and Bindon (1991), Corcos (1997) and Molnar (2002), but only in a cursory fashion. Kitcher (2003), however, provides a more thorough treatment of the issues of race and ethnicity from a philosophical perspective, in which he claims that anthropologists who take an eliminativist approach to race base their reasoning on two main points: (1) phenotypic traits have no intrinsic value nor do they correlate with other characters with intrinsic value; (2) 'intra-racial' diversity is far more pronounced than 'inter-racial' diversity in genotypic terms. Kitcher does not disagree with either of these points, but he does not believe that they provide adequate support for racial eliminativism. Rather, he suggests that eliminativists have failed to recognize more subtle ways in which racial divisions might have biological significance (Kitcher, 2003: 232). Focusing on interconnections between race, ethnicity, biology, and culture, Kitcher (2003: 234) explores ways in which a concept of race might be developed which is compatible with current understandings of human variation. He also asks what the consequences of replacing the biological concept of race with the social concept of ethnicity might be.

Kitcher (2003: 234) outlines what he believes are three necessary conditions of any concept of race:

- (R1) A racial division consists of a set of subsets of the species *Homo sapiens*. These subsets are the pure races. Individuals who do not belong to any pure race are of mixed race.
- (R2) With respect to any racial division, the pure races are closed under reproduction. That is, the offspring of parents both of whom are of race *R* are also of race *R*.
- (R3) With respect to any racial division, all ancestors of any member of a pure race belong to that race. The parents of an individual of race *R* are of race *R*.

The essential point that Kitcher (2003: 236) wants to make is that '*The concept of race is a historical concept*' relying on an idea of a historical lineage that is more or less discrete due to a general pattern of inbreeding or endogamous mating. Kitcher further explains that the notion of reproductive isolation is commonly misunderstood, since isolation need not be absolute, and hybrid zones in other species provide various examples of

this, but that interbreeding can occur between two or more discrete populations at low levels. On this point, Kitcher asserts:

If there is a workable biological conception of race, then it must, I believe, honour (R1)–(R3), employ the historical construction in terms of founder populations and inbred lineages, and finally, demand that, when the races are brought together, the differences in intraracial and interracial mating probabilities be sufficiently large to sustain the distinctive traits that mark the races (which must, presumably, lie, at least in part, in terms of phenotypes, since the organisms have no direct access to one's genes). (2003: 238)

Thus, Kitcher's concept of race relies on the notion of at least approximately isolated breeding populations with sustained similarities in distinguishable physical traits. Drawing on American census data from 1970 and a variety of research on mixed or interracial marriage, Kitcher attempts to demonstrate empirically that patterns of ancestry and descent similar to his notion of isolated breeding populations exist in humans, which sustain phenotypic differences developed in geographically separated founder populations.

Obvious problems with Kitcher's conclusions come directly from the data he uses to support his assumption that the low frequency of intermarriage between some American populations, particularly African Americans and Caucasians, suggests that these populations are behaving as separate units from an evolutionary (and perhaps ecological) perspective. With ever-increasing globalization, relying on data that is over 30 years old is of limited relevance at best. In order to be convincing, a sustained historical trend toward 'intraracial' mating must be demonstrated.

Canadian Census data from 2001 shows several interesting trends in terms of 'mixed unions' (Milan and Hamm, 2004), which contradict Kitcher's intraracial mating hypothesis, at least in the Canadian context. Mixed unions represented 3.2 percent of all persons in couples (marriages and common-law unions) in Canada in 2001, compared to 2.0 percent in the United States in 2000. These mixed unions are comprised of one visible minority and one non-visible minority or two different visible minority group members.⁸ While this may seem a low percentage of overall unions, it is a 35 percent increase from the 1991 Census. The most common type of mixed unions were between a visible minority and a non-visible minority (i.e. Caucasian), accounting for 2.8 percent of all couples in 2001, increasing from 2.4 percent in 1991. While no specific data for Black–Caucasian mixed unions are given, 57 percent of Blacks (Africans or African Americans) partnered with other Blacks, with the remaining 43 percent in mixed unions. In contrast to Kitcher's findings, Blacks had the largest number of mixed unions of all couples in Canada in 2001 in terms of absolute numbers. The 2001 Census data also demonstrates that mixed union rates differ not by racial group, but by individual ethnic groups (Table 2), and are affected by age, location, education and place of birth (Table 3).⁹

Table 2 Proportion of mixed couples from 2001 Canadian Census (adapted from Milan and Hamm, 2004: 3)

<i>Selected visible minority groups</i>	<i>Total couples (no.)</i>	<i>Partners within the same visible minority group (%)</i>	<i>Mixed unions (%)</i>
Japanese	25,100	30	70
Latin American	57,800	55	45
Black	117,800	57	43
Filipino	78,700	67	33
Southeast Asian	45,200	74	26
Arab/West Asian	73,800	76	24
Korean	24,800	82	18
Chinese	26,500	84	16
South Asian	232,000	87	13

Table 3 Factors affecting mixed unions from 2001 Canadian Census (adapted from Milan and Hamm, 2004: 5)

	<i>Total</i>	<i>Mixed unions</i>	
		<i>Two different visible minorities (%)</i>	<i>One visible minority and one non-visible minority (%)</i>
Age			
15 and over	3.2	0.4	2.8
15 to 19	5.4	0.7	4.6
20 to 29	5.3	0.6	4.6
30 to 44	4.3	0.6	3.8
45 to 64	2.5	0.3	2.2
65 and over	1.0	0.1	0.9
Education			
Less than high school	1.5	0.2	1.3
High school	2.3	0.3	2.0
Some postsecondary	3.6	0.5	3.1
University degree	5.6	0.7	5.0
Place of birth			
Canadian-born	2.1	0.1	2.0
Foreign-born	6.7	1.5	5.2

Wilson (2004) is also critical of Kitcher's use of this data and his assumptions regarding reproductive isolation, since patterns of racial self-identification and classification in Census data collection are constantly shifting and tend to blend together historical, biological, cultural and ethnic categories. Therefore, the approximate patterns of isolation that

Kitcher claims are also shifting, providing no 'real' example of that which he wants to prove. Still, Kitcher concludes that this data demonstrates that:

[W]e might say that races are *both* socially constructed and biologically real. Biological reality intrudes in the objective facts of patterns of reproduction, specifically in the greater propensity for mating with other 'blacks' (or other 'whites' respectively); the social construction lies in the fact that these propensities themselves have complex social causes. (2003: 247)

The recognition that a concept can be both socially constructed and biologically real should come as no surprise, since this idea was quite eloquently explained a few years earlier by Hacking (1999). Kitcher claims that this social and biological interaction results in a significant difference in the probabilities of interracial and intraracial mating, maintaining distinguishable phenotypic and genetic characteristics present in the founding populations. Therefore, he believes that such groups are, in a micro-evolutionary sense, separate evolutionary units, and classifiable as races, though perhaps not in the traditional sense of human racial categories.

The mechanisms of Kitcher's anti-eliminativist argument apparently work on two levels:

While the concept of human races may have biological significance, in the sense that there are differences in gene frequencies which can be preserved because of low probabilities of interracial mating, the explanation of the mating preferences may have no biological significance. Race may *quite literally* be socially constructed, in that our patterns of acculturation maintain the genetic distinctiveness of difference racial groups. (2003: 247)

This social construction aspect of what have been considered 'racial' groups is exactly what was at the root of the notion of ethnicity promoted by Deniker, Huxley and Haddon, and especially Montagu. Kitcher (2003: 248), however, views such variation on the ethnic level as paralleling that of the biological:

- (E1) An ethnic division consists in a division of *Homo sapiens* into non-overlapping subsets. These subsets are the pure ethnicities. Individuals who do not belong to any of the subsets are of mixed ethnicity.
- (E2) Pure ethnicities are closed under cultural transmission. That is, the cultural 'offspring' of 'parents' all of whom are of ethnicity *E* are of ethnicity *E*.
- (E3) All cultural 'ancestors' of any member of any pure ethnicity are of that ethnicity. If someone is of ethnicity *E*, then all their cultural 'parents' are of ethnicity *E*.

This parallel is somewhat dubious, since Kitcher's emphasis on purity in both the biological and social levels of his theory seems unrealistic, even in light of his relative approach to genetic and cultural exchange as approximately isolated.

Kitcher's belief in an implicit relationship between biology and culture leads him to suggest that there is a process of harmonization and reinforcement constantly at work:

On the biological level, interracial mating is limited through the differences in the cultural items acquired by members of different races. On the cultural level, patterns of culture are preserved because culture is usually primarily transmitted by parents and other family members (who may also influence the receptivity to other potential cultural parents), who belong to the same race and share the same ethnicity. One particular consequence . . . is that past racism shapes the attitudes of people today, in particular their attitudes to sexual union, and that this can maintain patterns of mating that are skewed toward one's own group. (2003: 249)

It seems that Kitcher should be pointing to something more fundamental than social structure and the possible outcomes of racist thought, though he does open the door to the perspective that humans may have a 'hard-wired' predisposition toward exclusionary breeding. What is perhaps the greatest problem in his approach is that he draws an implicit connection between biology and culture, and sees a direct relationship between race and ethnicity, but fails to recognize that possibility that race and ethnicity may actually be one and the same.

The racial groupings Kitcher refers to could also be sub-racial groups, kin-groups, varieties, or any other sub-specific grouping in terms of the formal Linnaean taxonomic hierarchy or any system of social or biological folk taxonomy (Wilson, 2004: 9). If ethnicity is a fluid social term it cannot adequately parallel or harmonize with a static biological conception of race. Rather, if this relationship exists, ethnicity would necessarily be the causal factor (in the absence of geographic-environmental barriers) and the 'racial' group would be the result, but since it is highly unlikely that such a group would be discrete, the notion of racial categorization fails to explain any aspect of human variation. If racial divisions have social causes, then they are not races in a biological sense. Whether this is a condition that exists only in human populations is enough to dismiss the notion of race at least in reference to modern *Homo sapiens*.

Kitcher's comments, suggestive of a 'hardwiring' of a preference for inbreeding, lead to more interesting questions about social and biological structures, though it also leads us into a more dangerous essentialist territory. It would, however, be fruitless to pursue a non-racial method for explaining human variation if it could be demonstrated that – regardless of whether biological races can be shown to exist or not – the human mind will inevitably categorize the world based on the assumption that groups are discrete social or biological entities. Races would then be real, at least in a cognitive sense. Gil-White (2001) has made claims about the cognitive role of human ethnic categories that go far beyond the cultural understandings of general 'natural kind' categories that have been espoused by Atran (1990) and Hirschfeld (1996, 1998).

Neither Atran nor Hirschfeld sees race as an innate concept, but rather a result of an interaction between culture and cognition. Atran (1990: 49) believes that some cognitive processes, such as colour classification or 'living-kind' categories, are only marginally affected by social change, while other forms of cultural knowledge, totemism or molecular biology, for example, depend on specific cultural institutions for their existence and transmission. Humans, therefore, commonly classify living kinds according to type, and apparent morphological distinctions between human groups *may* be conceived as natural biological divisions, from which social hierarchies develop (Atran, 1990: 78). Hirschfeld (1996: 13) believes that humans generally conceptualize the human world as composed of distinct types – what he calls 'human kinds', which are predicated on the attribution of common inherent or intrinsic features. Hirschfeld (1998) demonstrates that, although human biological variation is poorly captured by existing systems of racial classification, systems of 'natural' human taxonomy exist in virtually every culture, and even very young children preferentially sort people by race and gender. However, he also explains that children do not see race as being constant, and that the development of deep-seated natural human kind preference is based on a manipulation of natural categorization by the political economy.

Gil-White (2001) pushes the cognitive argument further into essentialism, arguing that humans intellectually process ethnic groups as species, resulting from an evolutionary adaptation that discriminates in favour of in-group relations and endogamy. If such a perspective can be shown to have any significant degree of explanatory value from within the psychological and philosophical disciplines, this may present an important tract from which we can discuss the biology of ethnicity. If, as Gil-White explains, 'it is true that we naively and intuitively process ethnies [ethnic groups] as species, this is likely to improve our understanding of the behaviour of ethnic actors in different contexts' (2001: 519). Indeed, if we can understand the ways in which the human mind views others in terms of relationships and phenotypes, which will in turn explain the structure of local communities, then we can positively assert that the concept of ethnicity is biologically meaningful and represents a viable vehicle for shifting the study of human variation away from the dominant racial epistemology.

Utilizing Hirschfeld's notion of 'human kinds', Gil-White (2001: 518) proposes that the favouring of like ethnies is an essential cognitive process with adaptive evolutionary significance: 'Keeping track of these "kinds" is important, for attempted interactions with aliens with different standards of performance will more likely lead to failed than to mutually profitable interactions.' Gil-White (2001: 514) also suggests that the identification and order of natural human kinds results in an attachment of putative essences. With these putative essences comes the mistaking of race and ethnic group:

... we essentialize races because we mistakenly 'think' they are ethnic groups. We thus process 'races' as ethnies even though not by the longest stretch of the imagination can they be characterized as representing norm or behavioural boundaries of any kind, which is the original reason for exapting the living-kinds module. (Gil-White, 2001: 534)

As interesting as these arguments might be, they suffer on numerous levels, and do not make any more significant contribution to the understanding of human biology or psychology than do the works of Atran and Hirschfeld, upon which Gil-White's argument is based. His approach is more properly sociobiological than biocultural.

First, the entire premise of the argument is based upon ethnobiological studies indicating a significant overlap between traditional and Western scientific models of bio-classification. There is also an underlying assumption that species is an essential unit in biology, since many cultural folk taxonomies closely mirror those of systematic taxonomies, and the biological species concept is based on the notion that species are naturally discrete breeding populations. That species do in fact represent discrete breeding populations is assumed, but has not been conclusively demonstrated. Second, if 'races' and 'ethnies' are confused by the mind, and ethnies are understood essentially as species, then logically should races also not be processed as species? Gil-White's conception of the difference between race and ethnic group is unclear. But we need not talk about ethnic groups in this case, because races would be real biological entities created by the mind and produced by self-domesticative breeding. Third, the assumption that such a hypothetical cognitive process has adaptive evolutionary significance is presumably false, since exogamy is genetically preferable to endogamy, introducing new and favourable biological elements through the founder effect.

If Gil-White's propositions were correct, there would be self-evident biological races, not ethnic groups, since they would be discrete and discriminating breeding populations. As we know, human mobility and curiosity has resulted in vast degrees of gene flow, which have destroyed any sense of racial 'purity' that *may* have existed during early human evolution. This perspective is also held by multiregional evolutionists who believe that *Homo erectus* populations evolved independently into *Homo sapiens* throughout Africa, Asia and Europe, with a degree of gene flow between all populations (see Wolpoff and Caspari, 1997, 2000). It is perhaps more appropriate then to utilize Hirschfeld's work on the cognition of categorization, which sees classification as an essential process of the mind, yet flexible and subject to political economic forces. These categories seem to represent something very close to what Deniker, Huxley and Haddon, and Montagu called ethnic groups, which are flexible and historically contingent, but not without real biological meaning.

Conclusion

This article has provided a mainly historiographical look at the arguments for the concept of ethnicity not simply as a social category, but one with real biological meaning. In doing so, it has been necessary to take a significant look at the under-appreciated literature signalling a call for a biocultural approach to studying human variation and away from simple taxonomies. Shifting to contemporary scholarship on ethnicity, philosophical and psychological literature dealing with the essential nature of specific and subspecific taxonomy has also been critically evaluated. This article represents a call for a functional rather than a structural approach to studying human biology, which must fundamentally be biocultural. Patterns are of limited relevance without discussion of the processes that created them. Humans create a unique problem in biology, since culture is an adaptive evolutionary strategy (as opposed to Gil-White's claim that ethnic classification is an adaptive strategy; see Richerson and Boyd, 2005). Harrison (1969) argues that invalidating the race concept in humans for social/cultural reasons does not necessarily invalidate the biological race concept. This is indeed true, but it does not mean that the concept cannot or should not be invalidated in its application specifically to humans, and, quite obviously, if it can be invalidated in relation to other species, it will naturally be considered invalid in the human context. It should already be evident that the race and subspecies concepts are not only problematic in general biological usage, but especially ineffective for exploring human variation.

We have also seen in this article that the term 'population' has become a popular alternative to racial terminology. A population in a Mendelian sense is defined by both the rate of isolation (endogamy) and gene flow (exogamy). Various gene frequencies exist in each gene pool (population), depending on the degree of isolation. Similar to Kitcher's definition, Molnar (2002: 55, 253) explains the gene pool as a group of interbreeding individual organisms forming what might specifically be called *breeding populations* or *demes*, which constitutes a series of mating circles relatively isolated from other such groups. Of course, this isolation can be created by various types of barriers (i.e. physical, cultural, social, linguistic, etc.) and can generally be understood as an interaction between multiple biological and behavioural forces. It should again be emphasized that this sort of definition has a distinct similarity to the concept of ethnicity that has been detailed throughout this article. Ethnic groups are defined by a historically specific limitation on gene flow, or a *general* preference for endogamy. This preference is likely socially conditioned or ecological, rather than cognitively essential. However, where the breeding population assumes a high degree of isolation, ethnic groups can be open systems.

While humans do not exist outside of the biological world and forces of evolution, technological control of fertility, health and mortality make it arguable that modern genetic structures throughout much of the world are affected more by patterns of mating and mobility than by natural selection (Macbeth, 1993: 49, 81). Human variation, then, must be biocultural. Some believe that 'population' and 'ethnicity' take on similar meanings when applied biologically (see Crews and Bindon, 1991: 45), but 'population' simply acts as a placeholder for 'race' (see Caspari, 2003: 73). It does not represent a conceptual shift but a terminological one. Attached to the 'population' is the hierarchical aspect of race and subspecies, and the problem for ethnic biology is that it represents various levels of organization, and is not especially conducive to taxonomic treatment. Montagu's attempts to advance the biocultural approach were certainly limited by his inability to provide data sets demonstrating how various types of biological analyses could be of taxonomic implication. It should be recognized, however, that the appropriate collection of data must be conducted on solid theoretical foundation before it can be of any analytical value.

Notes

- 1 While genetic evidence conclusively points to Africa as the origin of modern humans, theories regarding the processes by which humans came to occupy various regions of the globe remain controversial (Collard and Wood, 2000; Hawks and Wolpoff, 2003). There are three main competing theories of human phylogeny. The Out-of-Africa hypothesis is by far the most popular. Based on the mtDNA evidence of Cann et al. (1987), it claims that modern humans evolved in Africa approximately 200,000 years ago and spread throughout Europe and Asia in two or three waves beginning around 100,000 years ago and reaching Asia around 60,000 years ago. The Multiregional Continuity hypothesis is an anthropological model based primarily on morphological rather than genetic evidence, and claims that the origin of races began with the migration of *Homo erectus* out of Africa two million years ago. *Homo erectus* then split into a number of different groups spreading throughout north-western Africa, Asia and Europe. Through natural selection, these *H. erectus* groups adapted to their local environments, thus developing a number of morphological variations distinct from the original *erectus* form somewhere between 250,000 and 200,000 years ago. According to this model, these distinct populations eventually evolved into regionalized variants of *Homo sapiens*, the early ancestors of modern races (Wolpoff and Caspari, 1997; Wolpoff et al., 1984). More recently, the Weak Garden of Eden (GOE) hypothesis (which is marginally compatible with the multiregional view) suggests that modern *Homo sapiens* evolved from a subpopulation of *Homo erectus* and spread slowly over several tens of thousands of years, then later expanded from separated daughter populations (Harpending et al., 1993: 484).

2 According to Hooton:

Racial classifications, in so far as they are to be employed by scientists or anybody for the betterment and the alleviation of human struggles, must conform to the ancient, natural, and, on the whole, correct procedure of taxonomy. They must be based upon observable characters of human phenotypes. Yet these classifications, if they are to be valid and meaningful, must be brought into line with the discoveries of modern genetics. If the physical groupings of mankind are assumed to be based upon combinations of inherited rather than acquired characters, it is necessary to demonstrate that the phenotypes involved do, in all probability, represent the visible manifestations of genetic factors – that behind these phenotypes are inferential genotypes which are responsible for them, in conjunction with the inevitable modifying effects of environment. (1946: 441)

- 3 Boas (1911: 55–6) classified the immigrant groups as: Central European – Bohemians, Slovaks and Hungarians, Poles; Hebrews (from Russia, Poland, Germany, Austria, Switzerland and Romania); Mediterraneans (Sicilians, Neapolitans); Scotch. It is not clear, however, how the Scotch actually fit into this typology.
- 4 Modern understandings of biological variation from within the biological sciences stem from the substantive redefining of the field that occurred in the 1940s with the ‘evolutionary synthesis’, flourishing out of the combination of natural selection and genetics in the study of species and speciation, led by Theodosius Dobzhansky, Julian Huxley, Ernst Mayr, George Gaylord Simpson and Bernhard Rensch (see Mayr, 1997, 2004). This reworking of evolutionary understandings brought together Darwinism and Mendelian genetics, thus providing a mechanism for understanding the processes of natural selection.
- 5 Although Huxley and Haddon make no reference to Max Weber in their discussion of the ideal type, they use this notion in much the same way as Weber. Weber believes that concepts must be clear, distinct and precisely defined in order for the scientific mind to comprehend reality, and that the perfection and purity of the ideal type make concepts clear, distinct and intelligible (Schwartz et al., 1995: 425). According to Weber:

... an ideal type is formed by the one-sided accentuation of one or more points of view and by the synthesis of a great many diffuse, discrete, more or less present and occasionally absent concrete individual phenomena, which are arranged according to those one-sidedly emphasized viewpoints into a unified analytical construct (*Gedankenbild*). In its purity, this mental construct (*Gedankenbild*) cannot be found empirically anywhere in reality. It is a utopia. Historical [or anthropological] research faces the task of determining in each individual case, the extent to which this ideal-construct approximates to or diverges from reality. (1949 [1903–1917]: 90)

- 6 In the context of ethnicity, there seems to be little appreciable difference between the terms ‘biosocial’ and ‘biocultural’, since the processes involved are social, cultural and biological. Therefore, they can be used interchangeably.
- 7 Brace (1964a, 1964b) also refers to the cline concept and Livingstone’s (1962) insistence that human variation is clinal rather than racial.
- 8 Visible minorities are defined by the Canadian Employment Equity Act as ‘persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in colour’ (Milan and Hamm, 2004: 2).

- 9 The 2001 Census data also shows: (a) Japanese have the highest proportion of mixed couples but are the smallest minority group, whereas Chinese/South Asians are the largest minority groups and have the lowest proportion of mixed couples; (b) young urban dwellers are most commonly in mixed unions; (c) persons in mixed unions are likely to have higher education and be foreign-born; (d) mixed unions are more frequent for common-law unions than marriages (Milan and Hamm, 2004).

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