

THE RISE AND FALL OF THE BIOLOGICAL CONCEPT OF RACE

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This essay briefly analyzes how the concept of race changed in physical anthropology during the later half of the 20th century. Since Johann Blumenbach divided modern humans into five varieties in 1806, racial classification was an essential part of physical anthropology until about the 1950's. Race was considered to be strictly a biological concept, which must be distinguished from the "ethnic group" as a cultural concept. However, the difficulties of defining race as a biological concept and of obtaining consistent racial classification, together with the consideration of issues on racism, led most physical anthropologists to retreat from "racial" studies during the 1960's. Thus, the chapter on race disappeared quickly in textbooks of physical anthropology in the 1960's. At the same time, rapid development in human population genetics opened a new way for studying human geographical diversity, indicating that phylogenetic relationships and "origins" of ethnic groups can be studied much more objectively than the previous "racial" classifications. In this paper, I try to show that the biological concept of human race has now completely collapsed, and propose that race be dealt with as a "social" concept like gender, as contrasted to sex. However, this does not mean that the geographical diversity of humans is not worth studying in biological anthropology. On the contrary, I emphasize that for the integrated understanding of humans as a biological system, the studies of individual as well as geographical diversities are of crucial importance. Some perspectives for future studies are discussed.

Key words: RACE, PHYSICAL ANTHROPOLOGY, HISTORY, HUMANKIND, JAPANESE.

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Introduction

Like other primates, human individuals are endowed with a highly sensitive visual ability. At the same time, however, this ability forms the basis for human problems of discriminating individuals with visibly different forms and colors both within and between the groups. The typological thinking with "labelling" everything is another human characteristic which may also form the basis for racial classification. One can recognize these two features in what is regarded as the oldest illustration of "racial" classification found in the pyramid of the Aegyptian king of about 1,700 BC (Fig.1). Here, four types of humans are distinguished based on visual characteristics such as skin color, facial appearance and hair form as well as clothes and

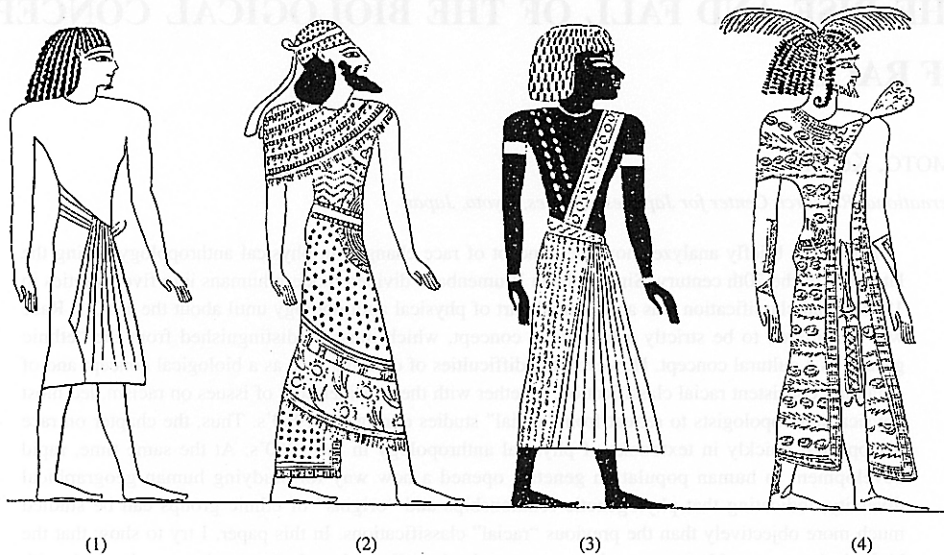


Fig. 1. The oldest record of "racial" classification, as appeared on the relief in a tomb of the Egyptian Old Dynasty. From left (1) Egyptian, (2) Assyrian, (3) Negro, and (4) Lybian (after Eickstedt, 1934).

ornaments (Chantre, 1904, cited in Eickstedt, 1934).

Carolus Linnaeus (1758) founded the systems for the classification of animals and plants and named the human species *Homo sapiens*, as it is well known. However, he did not seem to be clear about the rule of infraspecific classification. Thus, while on the one hand, he classified *Homo monstrosus* ("monstrous human") as a distinct species from *Homo sapiens* ("sapiential human"), on the other hand he described several "varieties" corresponding subspecies of *H. sapiens* based both on biological and ethnic differences.

It was Johann Blumenbach who divided modern humans into five principal races purely on the basis of physical characteristics such as skin color, hair form and the form of nose and other facial parts (Blumenbach, 1806). His classification of (1) Caucasian, (2) Ethiopian, (3) Mongolian, (4) Malay and (5) American races are the basis for the popular version of Caucasoids, Negroids (Capoids and Congoids, according to the strictly geographical naming), Mongoloids and Australoids, found in anthropological textbooks up to recent times (e. g. Hooton, 1946; Vallois, 1948; Martin and Saller, 1959; Coon, 1965).

The golden age of racial classification was the later half of the 19th century and the early half of the 20th century. Countless classifications were proposed, in which the number of races varied greatly from a mere two (lumper: e.g. Keith, 1949) to 29, 52 or even more (splitter: e. g. Deniker, 1926; Biasutti, 1959). The most rigid classification following the zoological nomenclature system was made by the German anthropologist Egon Freiherr von Eickstedt, who classified under a single species *Homo sapiens* three subspecies, 38 varieties and 37 subvarieties (Eickstedt, 1934).

Racism, or the ideology of inequality of the human groups defined as races, also has a long history (for references see Snyder, 1962; Montagu, 1965). Even after the fall of the Third Reich,

and also after the statement of UNESCO (1951) on the nonexistence of "pure" races, a British anthropologist Ruggles Gates (1960) addressed the belief in the genetic and racial determination of intelligence in the journal *Mankind Quarterly*, followed by a series of fierce debates between him and the Mexican anthropologist Juan Comas in the journal *Current Anthropology* starting in 1961 (Comas, 1961).

Since the 1960's, application of population genetic theories and methods opened new dimensions for studying human geographical diversity. These aim at understanding interrelationships rather than the classification of human geographical groups. On the other hand, studies at the organismal level such as morphological and behavioral characters are important for understanding human life, adaptation, health, and basis for culture. It is problematical, however, to use these characters in phylogenetic inferences.

The purpose of this essay is not to present a full account of the history of racial studies. Rather, I intend to focus on the inadequacy of the racial concept based on recent developments in physical anthropology. In addition to the difficulty of obtaining consistent classification as mentioned above, I point out the problems as follows and argue why I think race as a biological concept has completely collapsed.

Problems of Racial Classification

1. Inconsistent definition of race

Race, as usually regarded, is a "biological grouping within the human species, distinguished or classified according to genetically transmitted differences" (*Encyclopaedia Britannica*, 15th Edition, 1989). Attempts have been made to define race more precisely, but no definition ever became a standard.

Some considered the human race to be a collection of populations having a number of physical features in common and extending over a geographically definable area, while others, accepting the definition given by geneticists such as Dobzhansky (1953), considered it to be a breeding unit or a Mendelian population of man which can be subjected to actual study (Garn and Coon, 1955). Boyd, for example, took the former view and classified mankind into six "races" on the basis of the various blood group gene frequencies (Boyd, 1950)¹, whereas Coon and others took the latter view and enumerated 30 "races", which they later referred to as "local" races (Coon, Garn and Birdsell, 1950).

Both definitions of races, however, have limitations. In the former view, human races were considered to be broad divisions of mankind taxonomically next to species, which Garn and Coon (1955) called geographical races or racial stocks. Here, however, there is danger of oversimplification, neglecting the fact that variations within each race are very great. Another problem is that the biological significance of such large divisions of mankind is obscure. Thus, it was stated that "geographical races are to a large extent collections of convenience, useful more for pedagogic purposes than as units for empirical investigation" (Garn and Coon, 1955).

1 (1) Early European group (hypothetical)
 (2) European (Caucasoid) group
 (3) African (Negroid) group
 (4) Asiatic (Mongoloid) group
 (5) American Indian group
 (6) Australoid group

On the other hand, it seems to me to be also difficult to apply the concept of breeding unit as denoted local races or microgeographical races of Garn and Coon (1955) to describe human races. First, we do not know exactly the actual range of gene exchange in human populations, especially where no historical records are available. Second, any local population within a larger racial division that is more or less isolated may be considered to be a breeding population. For example, the majority of today's Japanese, Hondo-Japanese or Wajin, may well be considered a breeding population, relatively well separated geographically from the neighboring Asian populations, although in most physical characteristics as well as gene frequencies of polymorphic genes it can hardly be distinguished from the continental populations of northeast Asia, particularly the Korean (Omoto, 1992, 1995; Omoto and Saitou, 1997). Then, what is the ultimate difference between races and ethnic groups? Since a human breeding unit is usually characterized by the possession of a common culture, particularly language, it is often indistinguishable from ethnic group. Because the unit of actual study is usually such an ethnic group rather than a hypothetical Mendelian populations, it seems unnecessary and even confusing to refer to a local population "race" as a biological concept. I will argue this point later more in detail.

2. Inadequate use of the characteristics defining race

Until the 1950's, classification was mainly based on "racial characteristics" such as skin color, stature, forms of head, nose and hair, and so on. These characteristics show marked geographical variation and because of them, humans are called "polytypic species". Polytypism is a misleading concept, since what shows marked geographical variation are the individual characteristics, and not the species itself. Moreover, these characteristics have two basic problems when applied in the phylogenetic inferences.

First, the genetic basis for these characteristics are mostly obscure. Stature, for example, is subject to environmental change, as evidenced by the fact that the average height for the Japanese living in Tokyo increased by 10 centimeters during the last 100 years (Kouchi, 1996). Second, the geographical variation of such characteristics as skin color (pigmentation) must have resulted from adaptive evolution in particular environmental conditions and not directly related to phylogeny (Coon, Garn and Birdsell, 1950). Therefore, the classification based on these characteristics may not reflect a phylogenetic history of human populations, knowing about which must be the aim of scientific inquiries.

During the 1960's, when our knowledge of genetic markers such as blood groups increased, it was considered more proper that races can be classified by genetic markers rather than by morphological traits. However, it was soon apparent that classification based on one or a few genetic systems may indicate peculiar groupings which are not readily understood by most physical anthropologists. For example, the distribution of ABO blood group genes in native Americans is so different from that of Asians as to raise doubts for the commonly believed, relatively recent origins of native Americans in Asia (Mourant, 1954).

As a result of developments of genetic distance analysis by theoretical population geneticists in the late 1960's and the early 1970's (Cavalli-Sforza and Edwards, 1968; Nei, 1972), together with the popularization of computers, phylogenetic studies rather than classification became the main purpose of human population comparisons. Since the discovery of the high degree of sequence diversity of human mitochondrial DNAs (Brown, 1980; Cann, Stoneking and Wilson,

1987), phylogenetic inferences in anthropology became increasingly detailed.

3. Problems of classifying infraspecific groups

In any event, however, for most anthropologists race was still considered a zoological concept meaning a division of a human species. It is "a major segment of a species, originally occupying, since the first dispersal of mankind, a large, geographically unified, and distinct region" (Coon, 1965). However, if race is defined as subspecies or varieties within human species, as viewed in its most complete form in the German "Rassenkunde" (Eickstedt, 1934), serious questions arise. It is obvious that subspecific classification has no rules. Today, even the classic species concept seems not to be acceptable, since there are many examples conflicting with the notion of a genetically closed system of a species. Thus, for example, interspecific crosses among the macaque monkeys commonly produce fertile hybrids (Lindburg, 1980). However, classifying subspecies is far less objective, without any reliable biological principles.

Also, there is a reason why classification of human races is fundamentally difficult. According to the zoological nomenclature code, when a taxon is described the description should include designation of the type specimen (a holotype and an allotype representing both sexes) which must be kept in museums or other official institutions. It is clear that such a code cannot be applied for humans.

4. Problems of typological thinking

As Ernst Mayr as well as others have pointed out, one of the outstanding developments in recent evolutionary biology including systematics is the change from "typological" to "population" thinking (Mayr, 1963). In earlier studies a race was represented by a certain "type", neglecting the importance of variation of characters within such a group. Thus, individuals deviating from the "typical" ones were assumed to be hybrids or abnormal individuals. To take one of the well known examples of the earlier half of the 20th century, Ruggles Gates stated that "the modern European populations are so intermingled....that the geographic boundaries between Nordic, Alpine, and Mediterranean have largely ceased to exist" (Gates, 1948).

It was clearly established during the 1960's, however, that the magnitude of individual variation in genetic characters is such that no two individual humans as in other wild animals are genetically identical except monozygotic twins. Any human individual is likely to be heterozygous at considerable number of different gene loci (Harris, 1970). It was also shown by human population geneticists that gene diversity between major "races" is not larger than that of within any such group (Nei and Roychoudhury, 1974).

The problem is that the "typological" explanation is simple to understand and hence attractive to the general public. For example, the "Jomon" and the "Yayoi" types contrasted by a set of morphological characters such as flatness in the face, height of the nose, stature, form of the ear lobe, etc., are often used to explain the "dual structure hypothesis" for the formation of the present Japanese populations. This hypothesis posits two main waves of migrants of modern humans to the Japanese Archipelago: the first one is represented by peoples of the Jomon period (ca. 13,000 - 2,300 years BP), while the second one by later migrants of the Yayoi period (ca. 2,300 - 1,700 years BP) and afterwards (Hanihara, 1991). This is certainly an important hypothesis of the origins and formations of the Japanese population to be tested by future studies. However, the dichotomy of the modern Japanese into two types mentioned above has no

scientific basis. It is the modern version of the typological division of "Satsuma" and "Choshu" groups made by Erwin von Baelz in the late 19th century (Baelz, 1901).

5. Uselessness of human classification

The fundamental question is why should we classify human groups. Is there any usefulness in anthropological sciences for human infraspecific classification? As mentioned above, there have been two categories in defining the human race: the "classified" group and the breeding unit, both of which have limitations. While I find no biological rule for racial classification, I also find it unnecessary to call ethnic groups "races". However, the basic difference of these two categories for human grouping is clear. While race as the "classified" group is to me an imaginary product, ethnic group is more or less a reality, close to the breeding population of other animals. Thus, the concept of race is useless.

It has been argued that race is not a scientifically rigid concept, but it is useful for pedagogic purposes (Garn and Coon, 1955). However, as I mentioned above, a simple explanation like race is dangerous in making the general public believe in typological thinking. On the other hand, it is ethnic groups and not races from which scientific materials and information are obtained. It is my hope that biological anthropology will completely abandon race as a scientific concept. It is obvious, however, that the word race continues to be used in society. Words like whites, blacks, orientals, and so on will never disappear, so far as humans remain an animal with sensitive visual perception and tendency to typological thinking. It is time to regard race as a social concept like gender, as opposed to sex as a biological concept.

6. Issues of prejudices

Finally, I must mention that racial classification could hardly be accepted by most native populations in the world who suffer from discrimination mainly by politically dominant groups. Here, I use as an example the Ainu of Hokkaido, northern Japan, about whom I have carried out genetic studies (Omoto, 1972, 1975, 1995, 1996). The "racial" origin of the Ainu was one of the great mysteries in classic anthropology until the 1960's. Many "theories" were proposed postulating that the Ainu belong to either (1) Caucasoids, (2) Mongoloids, or (3) Australoids, besides the theory of (4) "Racial Island" with no particular relation to other "races" (Koganei, 1927; Kodama, 1970).

Recently, I have had an opportunity to talk to the Ainu people living in Sapporo City, Hokkaido. They complained that anthropologists have treated them just as scientific material without explaining to them directly in simple words the purposes, meanings and results of their studies. They seem to feel that anthropologists are people who discriminate cultural minority groups with the discipline of racial classification as a kind of political tool. I had no words to justify our studies in the past, but explained to them that our purpose is to understand scientifically the nature, diversity and evolutionary history of humans as a whole, not just of a particular ethnic group, such as the Ainu. I also emphasized that our research objects are populations, although we must obtain samples from individuals. Because the Ainu may represent the descendants of the native inhabitants of the Japanese Islands prior to the Yayoi migration, it is important to study the genetic structure of the Ainu population. Without such studies, the question as to the origins of the Japanese peoples as a whole, which in turn is a part of the natural history of humans as a whole, will never be answered.

Since anthropology only provides scientific knowledge and does not offer actual benefits to the subjects of the study, it is a difficult task for anthropologists to explain to them why their studies are important. However, without efforts for mutual understanding between researchers and subjects, anthropology will never become truly a human science.

Conclusions and Perspectives for Future Studies

In this essay I have tried to show that the biological concept of race is no longer tenable. In particular, the concept of race as a classified group should be avoided in anthropological sciences, since this concept is not only useless in modern biological science, but also misleading in advertising typological thinking. On the other hand, the recognition of human "natural" groups corresponding to the breeding population in other animals is important. They are represented by ethnic groups, and it is not necessary to call them under the category of race, such as local, geographical, or micro-races. Race will remain as a social concept like gender, but it will never become an important concept again in biological anthropology.

However, I do not mean to imply that studies on the geographical diversity of humans are unimportant. On the contrary, studies of the uniqueness or universal features of the human species and also geographical diversity are of crucial importance for the integrated understanding of humans. The human species is unique for its extraordinarily wide distribution all over the world. Its habitat ranges from tropical rain forest, savannah, ocean to desert, with varying climatic conditions from polar coldness to tropical heat. Consequently, human populations show substantial geographical diversity, both in genotypes and in phenotypes, resulting from adaptation to different environments. In the classic anthropology until about the 1960's, too much attention was drawn to the geographical difference compared with the individual difference within a population. A balanced view on human uniqueness and diversity, both intra- and interpopulational, will be necessary to understand humans as a biological as well as socio-cultural system.

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——— 人種という生物学的概念の興隆と破綻 ———

——— 尾本 恵市 ———

要旨：本論文は、自然人類学において人種という概念がどのように用いられてきたか、また20世紀後半にそれがいかにして破綻したかを概観する。1806年にヨハン・ブルーメンバッハによって5人種が区分されてより、自然人類学では長い間、人種は生物学的概念であって、文化的概念である「民族」とは異なるとされた。しかし、集団生物学の発展とともに、人種の定義の不確実性、あいまいな人種形質、類型学的な人種観、「分類群」か「繁殖集団」か、ならびに人種主義の危険性などの様々な問題点が明らかになった今日では、生物学的な人種概念は完全に破綻しているといつてよい。人種という概念は、性におけるジェンダーと同様に社会的な概念と考えたほうがよい。一方、人類の総合的な理解のためには、生物としてのヒトの普遍的な特徴のみならず地理的多様性の進化に関する研究が重要である。