

ETHNICITY

The Homeopathy of Kin Selection: An Evaluation of van den Berghe's Sociobiological Approach to Ethnic Nepotism

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Abstract. The present discussion of sociobiological approaches to ethnic nepotism takes Pierre van den Berghe's theory as a starting point. Two points, which have not been addressed in former analyses, are considered to be of particular importance. It is argued that the behavioral mechanism of ethnic nepotism—as understood by van den Berghe—cannot explain ethnic boundaries and attitudes. In addition, I show that van den Berghe's central premise concerning ethnic nepotism is in contradiction to Hamilton's formula, the essential principle of kin selection theory. It is further discussed how other approaches that make reference to ethnic nepotism are related to van den Berghe's account and its problems. I conclude with remarks on the evolutionary explanation of ethnic phenomena.

While some aspects relevant to the study of ethnicity (warfare, aggression) have already been addressed sociobiologically, it was Pierre van den Berghe who offered the first attempt to integrate ethnicity as such in a biosocial framework (see van den Berghe, 1978b). His central idea is that the behavioral disposition of ethnic nepotism, derived from kin selection theory, explains the central features of ethnicity. This theory of ethnic nepotism has been of particular influence for some other authors who want to include evolutionary biology in their account, including Shaw and Wong, 1989; Rushton, 1995; Vanhanen, 1999b; Salter, 2001. For this reason, van den Berghe's theory is taken as a starting point for my discussion.

In addition, two essential steps in van den Berghe's argument that have not yet been clearly addressed are here argued to be unsound, thus posing fundamental problems for his position as it is stated. In particular, the central premise of ethnic nepotism is shown to be based on a gross misunderstanding of Hamilton's rule; this tenet cannot be salvaged because it contradicts kin selection theory. In the second part, other authors' evolutionary approaches to ethnocentrism are discussed with respect to how they relate to van den Berghe's theory and the mentioned problems, where the focus will be on the offered evolutionary explanation of ethnic attitudes. I conclude the analysis with remarks on the methodology and explanation of ethnic phenomena using evolutionary theory.

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Van den Berghe's Account

A review of van den Berghe's theory is necessary in order to highlight the main points of his sociobiological account and to situate my discussion. The perspective taken by van den Berghe is one that regards humans as organisms striving to maximize their inclusive fitness. Three main mechanisms that characterize both animal and human behavior are postulated: *kin selection*, *reciprocity*, and *coercion*.

Kin selection, on this account, is a genetically founded behavioral disposition. In fact, it is the oldest mechanism of sociality to have developed. Kin selection is altruistic behavior directed to relatives. Since it is a propensity to favor kin over non-kin and close kin over distant kin, van den Berghe also calls it *nepotism*. Indeed, the intensity of kin selection is proportional to the coefficient of relatedness (of the donor and the recipient of the altruistic act). Relatives, to the extent that they are related, can be expected to help increase each other's fitness even at some cost to their own fitness. This behavioral disposition could evolve because each individual reproduces its genes not only directly through its own reproduction, but also indirectly through the reproduction of its relatives to the extent that it shares genes with them. Therefore, behaving nepotistically increases one's inclusive fitness. We share kin selection with countless other species (e.g., insects). Consciousness of kin relatedness is not necessary for kin selection to operate, although it is a partially conscious process in our species.

Van den Berghe's definition of kin selection may surprise those who are acquainted with sociobiology. In evolutionary biology, kin selection refers to a special mechanism of natural selection, that is, to an evolutionary process.¹ By considering kin selection a behavioral mechanism, van den Berghe conflates the evolutionary process with its product. In what follows, I try to keep these separate by using the term *kin selection* for an evolutionary process and denoting the behavioral disposition which is so central for van den Berghe's work by the terms *kin nepotism*, *ethnic nepotism*, or simply *nepotism*.

Reciprocity is van den Berghe's name for reciprocal altruism. It is altruism that is furnished with the expectation of return in the future. This sort of cooperation for mutual benefit operates also between non-kin. As it presupposes memory and elementary forms of cognitive capacities, it evolved much later than kin selection and is more developed in humans than in other animals. While reciprocity originated via natural selection, it has been enormously elaborated on by human cultures. It is a means of cooperation and coalition formation within and between human societies. Of course, reciprocity may invite cheating or free-loading and may motivate some humans to deceive others.

Coercion is the use of force for one-sided benefit, that is, for purposes of intraspecific parasitism or predation. The development of collective means of coercion for the purpose of exploitation is mainly a cultural development. It operates between and within societies. Coercion in human societies differs from that in animal populations, because humans not only form individual dominance hierarchies, but also establish group hierarchies. Further, physical strength or other biological properties play a much smaller part in human competition. Finally, ideology may be used to justify hierarchies and roles.

Van den Berghe (1979) tried to show that human family systems and kin groups are organized according to sociobi-

ological predictions. The main mechanism for kinship organization is kin nepotism, and van den Berghe applies it to the question of ethnic relations as follows: Ethnic groups are extended kin groups, since in-group members are more genetically related to each other than they are to out-group members. Though kin and ethnic terms do not denote biological kinship, they are correlated with it. Common ethnic descent is a belief, but to be effective it must coincide with biological descent to a large degree.² Ethnic sentiments are nothing but extended kin sentiments. Intraethnic relations are determined by kin nepotism, insofar as they can be called ethnic and do not belong to other types of social organization. While nepotism is a strong mechanism only with respect to kinsmen, it does have some influence on the relations of other members of the ethnic group, because the members of an ethnic group are to a certain extent related to each other. Nepotism means to favor close relatives over distant relatives. Ethnic attitudes of nepotism and ethnocentrism were selected for because they increased the inclusive fitness of the members of an ethnic group.

The relation between ethnic groups is largely determined by reciprocity or coercion, where both are dependent on cost-benefit considerations. The social organization within an ethnic group is also influenced—as is every type of human behavior—by these two mechanisms. Ethnicity is a special basis of sociality, irreducible to others, though often overlapping with other principles of sociality. Its essence is nepotism, a mechanism of evolutionary origin with a genetic basis, although it is transformed by culture. In contrast, other social groups, such as classes, are formed according to common material interest, that is, by means of reciprocity or coercion. The change in common material interest also explains the dynamics of ethnicity, as in changes of ethnic identification.

Why do ethnic groups use cultural markers of ethnicity instead of physical or phenotypic properties? Because during the last ten thousand years, the members of those ethnic groups that came in contact were not very phenotypically different. That is, cultural criteria are applied since they are much more reliable markers of extended kinship. Humans, for that reason, were selected to favor kin, not to favor those that look alike. When there is, however, migration across a phenotypic gradient, "race" is a good test of kinship. Indeed, racism and such migrations are both very recent phenomena. Racism is a cultural invention, since the employment of certain phenotypic criteria is a cultural choice. But the inborn mechanism of ethnic nepotism makes racism possible and probable in modern societies.

The Homeopathy of Kin Selection

An important contribution by van den Berghe is the focus on the similarities of kinship and ethnicity. Ethnic groups as well as kin groups are defined by common descent. Eth-

nic categories are often derived from kin terms (van den Berghe, 1979). These aspects have been emphasized only by some scholars in the field of ethnic relations (see, e.g., Horowitz, 1985). There is no doubt that kinship terminology is important for ethnic identity. Van den Berghe thinks that kinship and kin nepotism are also important for ethnic phenomena such as ethnocentrism. There are strong, emotional family attachments that provide a stable cohesion of the family. A similar situation applies to ethnicity. Van den Berghe's idea is to regard ethnic groups as extended kin groups—ethnicity is extended kinship (1978b; 1986; 1987; 1995). The basic mechanism of ethnic solidarity is nepotism (see, e.g., 1986:250). The latter—van den Berghe also calls it kin selection—is the propensity to favor kin over non-kin and close kin over distant kin. It has a genetic basis and evolved according to kin selection theory (1978a; 1978b; 1979; 1987; 1995).

“Kin selection” (i.e., nepotistic altruism) may reduce the fitness of the individual acting altruistically, but it increases, conversely, the fitness of the recipient. The intensity of kin selection depends on the coefficient of relatedness, which declines exponentially when considering more distant kin. I call this basic principle of van den Berghe's the *homeopathy of kin selection*. For this reason, nepotism is not simply active among kinsmen, but also to a certain extent among fellow ethnics:

But the principle of nepotism, however diluted, suffuses all levels, and there is no a priori reason why nepotistic discrimination should stop at any particular point, unless it can be displaced by a superior strategy of fitness maximization. (van den Berghe, 1995:362)

Ethnic sentiments are characterized as *extended* kin sentiments or as “kin selection.” The central idea of ethnicity as extended kinship implies in particular that the basis for ethnocentrism is “kin selection,” that is, ethnic nepotism (1979:212; 1987:18).

But what does the metaphor of “extension” actually mean? “Extension” could refer to the historical or phylogenetic situation that large ethnic groups evolved out of small kin groups. Van den Berghe states this fact, but not in connection with his “extension” metaphor. The idea of ethnic sentiments as extended kin sentiments can serve as a useful starting point for psychological studies. This could, in particular, include developmental studies, since family identities are formed before ethnic identities. Maybe ethnic identity originates by means of socialization from kinship identities. This does not seem to be what van den Berghe has in mind, because it is important for him that during the course of human evolution there has been selection for extended kin nepotism: “What I am suggesting is that ethnocentrism evolved during millions, or at least hundreds of thousands of years as an extension of kin

selection” (1978b:404).

Ethnicity is characterized as extended kinship. This apparently means that all basic forms of ethnic social organization are extensions of kinship organization. Nevertheless, with respect to each specific aspect of organization, “extension” might mean something different. Obviously, van den Berghe considers an ethnic group a sort of kin group writ large and ethnic sentiments as weakened kin sentiments toward members of the same ethnic group. But is there a strong phenomenon of kin-centrism, the extension of which is its diluted form ethnocentrism? Is ethnic competition an extension of competition among kin groups? Is warfare among ethnic groups a weakened form of warfare among kin groups? The idea of “ethnicity as extended kinship” is in my view a very powerful perspective. Unfortunately, even in his book-length treatment (1987), van den Berghe gives us no explication of his central starting point.

The sociobiological explanation of ethnocentrism given by Pierre van den Berghe proceeds basically in two steps. The pivotal point is the homeopathy of kin selection, that is, the claim that people behave altruistically towards other persons according to their degree of relatedness. The first step of the argument is a claim about ultimate mechanisms, namely, the tenet that ethnic nepotism evolved by kin selection. The second point concerns proximate causes, namely, the idea that homeopathic nepotism explains ethnic phenomena such as ethnocentrism, due to the fact that the members of an ethnic group are more closely related to each other than to out-group members. I would like to discuss these two essential points, beginning with the second one.

Ethnic discrimination, according to van den Berghe, is the result of kin nepotism, the intensity of which is proportional to the kinship coefficient. The decline of the latter from close to distant kin is exponential ($1/2$ for my full-siblings, $1/4$ for the children of my siblings, $1/8$ for my cousins, etc.). Since kinship and ethnicity are both claimed to be formed by means of differential granting of altruism (though in the case of ethnicity with respect to more distant relatives), the distinction between kin group and ethnic group calls for an explanation. Why is there usually a clear social boundary between the kin group and the ethnic group to which an individual belongs? Van den Berghe says nothing about this. Nepotism, or differential altruism, in this account, does not include an option that predicts the existence of relevant intraethnic boundaries. Some fellow ethnics are simply more closely related to a given individual than others.

As far as the existence of ethnic attitudes is concerned, the homeopathic theory of kin selection requires that ethnic—that is, cultural—boundaries correlate with genetic boundaries. In fact, it is claimed that ethnic discrimination is caused by nepotism operating on differently related individuals:

Ethnic groups, for nearly all of human history, were what geneticists call breeding populations, in-breeding superfamilies, in fact, which not only were much closer related to each other than to even their closest neighbors, but which, almost without exception, explicitly recognized this fact, and maintained clear territorial and social boundaries with other such ethnic groups. (van den Berghe, 1978b:404)

Reynolds (1980) argued that because of gene flow, different ethnic groups (or their precursors) were not significantly genetically separated. Salter (2001) replies that a genetic gradient is inevitable given the structure of groups such as hunter-gatherers. There are surely some differences in relatedness, and empirical studies are needed to assess how large they might be. The question remains whether the genetic gap is significant enough to account for differential behavior towards in-group and out-group members. My point, however, is somewhat different, because it does not depend on the extent of the genetic gradient.

One may grant that members of an in-group are more closely related to each other than they are to members of an out-group. But can this explain ethnic discrimination using a homeopathic framework? The problem is that van den Berghe claims nepotism to be proportional to the coefficient of relatedness, which declines exponentially. The average kinship coefficient of a hypothetical ethnic group might be about $1/_{64}$, while the one of the surrounding population might be $1/_{256}$. These hypothetical values might apply for ethnic groups of a certain size, but my argument is independent of this. The point is that the above difference—however large it might be—is much *smaller* than differences between close relatives. As the intensity of altruism is claimed to be proportional to the coefficient of biological relatedness, relevant differences in the spending of altruism are between an individual and his parents and full-siblings (1 compared to $1/_{2}$) or between an individual and very close kin (1 compared to $1/_{4}$), but surely not between distant and very distant kin. The boundaries of homeopathic nepotism are within families, but not between families or ethnic groups. For this reason, ethnic discrimination is a miracle for a homeopathic theory of nepotism.

Van den Berghe contents himself with declaring that there are differences of relatedness among different populations. He does not give an estimation of kinship or in-breeding coefficients, so that the mentioned problem due to the exponential decline of the coefficient of relatedness does not become apparent. Ethnic phenomena such as ethnocentrism often have not only rather clear, but also distinctive boundaries. Either you are accepted as a fellow ethnic, or you are not. This does not conform to homeopathic altruism. In addition, the theory predicts that a very small proportion of altruism is granted even towards out-group members. Van den Berghe does not explain the “sign change” of ethnicity: rather friendly attitudes towards in-

group members, but often mistrust or hostility towards strangers. Ethnicity involves qualitative differences with respect to in-group and out-group members. Homeopathic nepotism, on the contrary, simply declines in a continuous way. This behavioral disposition—in the manner it is postulated by van den Berghe—is not correlated with ethnic attitudes, so that it cannot be the essential mechanism that accounts for ethnicity.

I now turn to the other step in van den Berghe’s argument, the tenet that ethnic nepotism evolved by kin selection. It is of great importance to discuss this point, because this is the place where evolutionary biology enters the theory, that is, where ultimate mechanisms are included in the account. The central premise of the homeopathic theory is that the intensity of “kin selection”—that is, the propensity to act altruistically—is proportional to the coefficient of relatedness (van den Berghe, 1978a:45; 1978b:402; 1987:7, 19; 1995:360). Van den Berghe justifies this with reference to inclusive fitness theory, namely, as an implication of Hamilton’s formula:

The propensity to be “altruistic,” i.e. to contribute to alter’s fitness at the expense of ego’s fitness, is directly proportional not only to the coefficient of relatedness between ego and alter, but also to the benefit/cost ratio of the altruistic act. (1978b:402)

But wait a minute—is this true at all? Let r be the kinship coefficient of two individuals, let c be the cost of a specific altruistic act and b its benefit to the other individual. Other things being equal, Hamilton’s rule states that behaving altruistically is a better strategy than refraining from doing so whenever $r > c/b$ (the above statement of van den Berghe is apparently due to this equation), or equivalently, if $rb - c > 0$, as van den Berghe correctly states (1978a:45; 1978b:402, 1979:14; 1987:20).³ The sign of $rb - c$ tells us whether the altruistic act under consideration will be selected for or against. The quantity $rb - c$ might be used as a measure of the selection pressure. In this sense, the intensity of kin selection, an evolutionary mechanism, is dependent on r (though not in a proportional manner). But this does not mean at all that “kin selection” in van den Berghe’s sense, as a propensity to act altruistically, is proportional to r . This fundamental misinterpretation of Hamilton’s rule may be due to van den Berghe’s conflation of kin selection as an evolutionary mechanism with nepotism as a behavioral mechanism. Hamilton’s formula is not an *equality* that gives the degree of altruism with respect to the coefficient of relatedness (and the cost-benefit ratio). Instead, it is an *inequality* that states in which situation altruism (rather than selfishness) will evolve.

Why van den Berghe’s tenet is a fallacy, and why it is inconsistent with Hamilton’s formula, can be seen as follows. Whenever Hamilton’s rule is not satisfied, that is, if $rb - c < 0$, acting altruistically reduces inclusive fitness.

Thus, in this case, the best strategy is to refrain from being altruistic. Given constant cost and benefit, this applies for any individual that is distantly enough related (namely, $r < c/b$). Due to the fact that the coefficient of relatedness declines exponentially, and thus very fast, this holds for nearly all individuals. As a simple example, consider sacrificing one's life for four other beings. This is adaptive when you save four brothers ($r = 1/2$) and neutral when you save four nephews ($r = 1/4$). But it is simply maladaptive to show this kind of behavior towards more distantly related individuals. Van den Berghe, on the contrary, claims that an individual should always invest a certain proportion of fitness in altruism (or act altruistically with a certain probability, namely r). The homeopathic theory of nepotism maintains that a certain amount of altruism is in any case adaptive, no matter how distantly related the beneficiary of the altruistic act. This contradicts the theory of kin selection. Given a certain benefit for the recipient of an altruistic act, the loss of individual (classical Darwinian) fitness of the organism acting altruistically can only be compensated when the behavior is directed towards individuals that are closely enough related (or if we deal with reciprocal altruism).

In addition, when an individual has the possibility to act altruistically towards several other individuals of different relationship, the homeopathic theory entails that the best strategy consists in distributing altruistic actions according to the coefficients of relatedness (van den Berghe, 1978b:402; 1995:360). Or, as van den Berghe summarizes: "The biological golden rule is 'give unto others as they are related unto you'" (1987:20). This suggests that if you have a brother (kinship coefficient $1/2$) and a nephew ($r = 1/4$), the ratio of altruism spent towards your brother and nephew should be 2 : 1. However, the best altruistic strategy (given constant cost and benefit independent for different relatives) is to concentrate altruism on the closest relative, which is your brother in this case.⁴ As other things are usually not equal, further relatives may profit by altruism as well. For example, an iterated altruistic act towards a brother might eventually bring no additional benefit for him. In this case, it might be recommended to spend altruism towards other relatives. Nevertheless, this holds only under specified circumstances. Furthermore, kin selection theory can account for altruism only towards close kin, and this empirical fact is included in Maynard Smith's definition (see Maynard Smith, 1964). Van den Berghe, on the contrary, postulates a mechanism of altruism that works also for extremely distant relatives. For these reasons, the homeopathic theory of kin selection cannot be salvaged.⁵

The above-mentioned two main points of van den Berghe's argument face fundamental difficulties. The homeopathic theory of nepotism gave van den Berghe's position some initial plausibility, because it would allow a kind of altruistic behavior that is not only restricted to close kin, but

to fellow ethnics as well. However, the starting point that kin selection accounts for homeopathic nepotism is untenable because it contradicts kin selection theory. Therefore, van den Berghe's theory completely breaks down. Any account that circumvents the mentioned problems can only be called a completely different theory.

Is it possible that the above-stated reconstruction of van den Berghe's argument is wrong, so that my criticism does not concern van den Berghe's theory at all? In my view, the discussion is not based on a misunderstanding, and there can be no doubt that the following points are essential for van den Berghe, as the above-given citations of and references to his repeated statements show. Van den Berghe offers a homeopathic theory of nepotism: kin selection (using Hamilton's formula) is claimed to be the evolutionary origin of this behavioral disposition, and nepotism explains ethnic behavior. This is exactly what I have focused on.

Kin Selection and Genetic Similarity

Some other authors endorse van den Berghe's theory and use it as a starting point for the further development of an evolutionary account of ethnic attitudes. The political scientist Tatu Vanhanen (1999a; 1999b) derives from the sociobiological approach to ethnic nepotism two political hypotheses and tests them using data from several contemporary states. With respect to the evolutionary explanation of ethnic nepotism, Vanhanen simply restates van den Berghe's claims, namely, that ethnic nepotism depends on the genetic relatedness of individuals and could evolve because in-group members are more closely related to each other than they are to those in other groups. This is basically the homeopathy of kin selection:

Evolutionary theories of inclusive fitness and kin selection explain the evolutionary origin and universality of ethnic nepotism. The members of an ethnic group tend to favor their group members over non-members because they are more closely related to their group members than to outsiders. (Vanhanen 1999b:xiii, see also 1999a:57)

Unfortunately, Vanhanen does not offer more justification for this assertion. The problem of how homeopathic nepotism can evolve at all is not addressed. Although it is surely a better strategy to spend altruism towards a fellow ethnic than an outsider, altruism towards a member of one's ethnic group may be maladaptive as well. According to Hamilton's formula, the evolution of altruism (not reciprocal altruism) can usually occur only with respect to close relatives.

Political scientist and ethologist Frank Salter (2001) also defends van den Berghe's theory of ethnic nepotism. He replies successfully to several criticisms leveled against van den Berghe; however, he offers no analysis or discus-

sion of the evolutionary account of van den Berghe. The counterarguments that he assesses concern only the behavioral disposition of ethnic nepotism. For this reason, Salter does not address an essential aspect of van den Berghe's position. At the beginning of his discussion, Salter restates the main points of the defended theory, but the homeopathy of nepotism and its alleged evolutionary origin (namely kin selection), on which I focused, remain rather vague. Salter seems to accept van den Berghe's postulate that altruism and genetic distance are inversely proportional, that is, the homeopathy of kin selection.⁶ Although he explicitly states in his conclusion that van den Berghe offers an evolutionary explanation of the proximate mechanisms involved in this account, he does not offer a discussion of this point, besides mentioning inclusive fitness. It is a pity that some authors content themselves with reference to some intuitions about the maximization of inclusive fitness in order to claim that a sociobiological explanation has been given. In addition, Salter and Vanhanen do not address the point that the boundaries of homeopathic nepotism are within families rather than between ethnic groups.

Up to now, the concept of genetic relatedness to which altruism and nepotism are proportional, according to Pierre van den Berghe, has been used without close attention to its definition. *Genetic relatedness* here means the kinship coefficient, that is, the probability with which two individuals share an allele by common descent. But consider two parents that are both homozygous for the same allele. Any two of their children must have this allele (in fact, be homozygous for it) and thus the same genotype (provided that no mutation occurs). That is, the genes of the two siblings at this locus are *identical in state*. But this does not mean that any two alleles will be *identical by descent*. In fact, the probability that an allele of the first sibling and a given allele of the second sib are a copy of a parental gene is $1/2$. Hamilton's model using the concept of inclusive fitness is about genes identical by descent. This is the reason why the kinship coefficients ($1/2$, $1/4$, etc.) enter van den Berghe's theory of the degree of nepotism.

The *genetic similarity* of individuals in the sense of common genes identical in state is much higher among individuals. Even across species, many genes are shared. One approach that focuses on this property is the genetic similarity theory defended in particular by J. Philippe Rushton (see, for example, Rushton, 1995). This theory holds a core tenet in common with van den Berghe's position. Both authors argue that nepotism and the differential granting of altruistic acts is correlated with genetic relatedness and that this behavior, which has an adaptive evolutionary origin, explains ethnocentrism (due to the fact that in-group members are more closely related). The difference between the approaches is that in van den Berghe's theory genetic relatedness means kinship (the probability that two genes at a locus of two individuals are identical by descent), while Rushton's theory focuses on the genetic similarity of in-

dividuals (the overall amount of genes identical in state).⁷ Despite the difference, some remarks by van den Berghe belong to genetic similarity theory rather than to an account based on kinship coefficients: "It [van den Berghe's framework] identifies nepotism based on proportion of shared genes as the basic mechanism of ethnic solidarity" (van den Berghe, 1986:250).

The core of genetic similarity theory is that an individual is able to detect its degree of genetic similarity to other individuals (using phenotypic clues) and then prefers more similar individuals over less similar ones. Genetic similarity is intended as a generalization of kin selection theory (Rushton, Russell, and Wells, 1984), and in this sense, it tries to circumvent the limitations of kin selection with respect to close kin. For instance, the general behavioral disposition postulated by genetic similarity theory is used to account for ethnocentrism (Rushton, 1995). The general claim of genetic similarity theory about a proximate mechanism (preferential behavior in accordance with similarity) is supposedly justified using empirical data (e.g., on the selection of spouses and friends). Several commentaries in the intensive discussion of Rushton (1989) criticize the intended interpretation of the given data, but I am not concerned with the question of whether individuals behave in correspondence with genetic similarity. Instead, I want to briefly discuss the evolutionary explanation of this alleged behavior, which the proponents of genetic similarity theory advance.

Rushton states the evolutionary explanation of preference according to genetic similarity theory as follows:

Rushton et al. (1984) proposed that, if a gene can better ensure its own survival by acting so as to bring about the reproduction of family members with whom it shares copies, then it can also do so by benefiting an organism in which copies of itself are to be found. This would be an alternative way for genes to propagate themselves. Rather than merely protecting kin at the expense of strangers, if organisms could identify genetically similar organisms, they could exhibit altruism toward these "strangers" as well as toward kin. Kin recognition would be just one form of genetic similarity detection. (Rushton, 1995:74)

There is a theoretically possible way for a gene to ensure that copies of itself (identical in state) spread by causing altruism that is directed not only towards kin. This could happen if this gene caused both a specific phenotypic trait and preferential behavior towards all individuals with that trait. However, while this is a possible evolutionary mechanism, it is usually considered highly unlikely, and no examples of it are known. Richard Dawkins (1976) named it the "green-beard effect" (a gene that causes a green beard and preferential behavior towards carriers of green beards), and has stated that "the green-beard effect is a kind of academic biological joke" (1987:206).

The proponents of genetic similarity theory favor, in particular, another mechanism that should give a gene the possibility to propagate copies of itself without restricting altruism to close kin. The above-cited argument appears to be sound if you only have a superficial understanding of the selfish-gene approach (according to which organisms are vehicles that are programmed to increase the number of copies of genes that are in them). On this reading, behaving preferentially towards a genetically similar individual would yield more copies of one's genes. However, the question is *how* a gene that causes such a behavior can evolve. This is clear from a correct understanding of the selfish-gene perspective, and exactly here lies the problem for genetic similarity theory. Note that it makes reference to *overall* genetic similarity; what Rushton and his colleagues tried to show is that humans treat other individuals preferentially according to their overall genetic similarity (based on measurements on several genetic markers).

Evolution by natural selection concerns change in the frequency of a specific allele at a given locus. In this sense, an allele competes with other alleles at this locus. It does not matter whether the effects of an allele increase the frequency of some alleles at other loci; a gene simply has to augment its own frequency to be evolutionarily successful. For this reason, an allele that influences an organism in a manner that causes this individual to behave altruistically towards other individuals that are genetically similar to it *with respect to other loci* is neither selected for nor against. But genetic similarity theory focuses on overall genetic similarity, which basically includes all these irrelevant genes or loci. Instead, the question should be whether a gene is able to detect (based on phenotypic effects) whether another organism also has this allele at the same locus. Preferential behavior toward an organism that has this allele is a better strategy than preferential treatment toward other organisms. But this scenario is simply the green-beard effect, which, as noted, is usually excluded as a real possibility. This criticism has already been put forward by other authors (e.g., Mealey, 1985). Rushton, however, has not been able to give an answer to this critical question. From remarks he has made in response to his critics, it is not clear to me whether he understands the problem.⁸ Standard kin selection theory, however, is able to give an explanation for the evolution of altruism. When a gene causes altruism toward a relative, this relative has—with a determined probability—the same gene identical by descent, and a fortiori identical in state. This is a clear way in which an allele can benefit the same allele in another organism (at least with a certain probability). It does not invoke a green-beard effect or the irrelevant genetic similarity at other loci.

The second problem for the alleged evolutionary explanation of preferential behavior towards genetically similar individuals stems from the fact that the account does not include cost/benefit considerations. Even if preferring genetically *more* similar individuals (or *closer* relatives in the

case of van den Berghe) is a *better* strategy (other things being equal), it might nevertheless be maladaptive. Since altruistic behavior involves a cost for the individual, the cost must be compensated for the behavior to evolve (in the presence of egoistic rivals). The evolution of altruistic behavior necessarily depends on the cost, the benefit towards the other organism, and the relatedness to this organism. These critical points reveal a general drawback for genetic similarity theory. Its evolutionary scenario is not based on a quantitative model, but only on qualitative remarks about genes. In a quantitative model, the discussed point would become apparent; in particular, it would be clear whether the intended behavior can evolve. This is the strength of Hamilton's model based on the concept of inclusive fitness: the formula includes cost/benefit considerations.

The basic intuition of van den Berghe, Rushton, and their comrades is that an individual is genetically more related to its fellow ethnics than to outsiders, and that it therefore—according to sociobiological considerations—prefers the in-group members over out-group members. Richard Dawkins felt compelled to make a public statement because a group of organized racists used his name and similar sociobiological claims to try to justify their political position: “The equating of ‘kinship,’ in the sense of kin selection, with ‘ties of race’ appears to result from an interesting variant of what I have called the fifth misunderstanding of kin selection” (Dawkins, 1981:528). The fifth misunderstanding consists in failing to notice that kin selection is about the coefficient of relatedness, not about the total number of shared genes (Dawkins, 1979:190-92).

Van den Berghe and Rushton certainly do not want to further a racist view, but what they state as facts (an alleged evolutionary explanation) shares the same intuition that these racists used. This inference is simply—as it is put forward—a fallacy. In this approach, all behavior is basically adaptive, in particular the type of altruistic behavior that constitutes ethnic nepotism. I have tried to explain why altruism based on kin selection can usually be expected only towards close kin. True enough, it is an evolutionarily better strategy to spend beneficial behavior towards fellow ethnics than towards outsiders, because you are more closely related to them. But this fact as such does not indicate that this kind of behavior will evolve (rather than egoism or other behavioral patterns) independent of cost/benefit considerations. There is no reason to accept a version of van den Berghe's or Rushton's evolutionary scenario without a model that shows how such a behavior can evolve. Whether such a model reflects the real course of evolution, how big the average genetic difference between ethnic groups is, and how the postulated gradual differences in behavior towards fellow ethnics and outsiders can explain ethnocentrism are additional points that would need to be answered as well.

Ethnicity beyond Homeopathy

There are approaches that include kin selection as an important mechanism in the evolution of human sociality, but which do not follow van den Berghe in suggesting that ethnic relationships evolved by the same mechanism, namely, that ethnicity is based on a commonality of genetic interests and that ethnocentrism is therefore adaptive. Gary Johnson (1986) develops a theory of patriotism that uses kin recognition mechanisms as links between genetic evolution and the socialization process. On this account, kin selection is an important ultimate mechanism that shaped the behavioral repertoire of hominid ancestors. The operation of kin altruism requires that individuals be able to recognize kin using available information. The mechanisms presented as probably the most important ones in humans are familiarity and phenotypic matching. These proximate mechanisms of kin recognition are still present in more recent societies. Altruistic acts towards non-kin can be elicited by using the cues for these behavioral dispositions. Patriotism originates by the exploitation of the mechanisms during the socialization process. In particular, patriotism need not be an adaptive behavior; there was no selection for it in the recent past. Instead, behavioral dispositions that were adaptive when they originated are now transformed during socialization.

Another account is the one by Irwin Silverman and Danielle Case (1998). They disagree with van den Berghe and Rushton in "maintaining that the influences of genetic relatedness in interpersonal relations are limited for the most part to direct kin," since "ethnic nepotism would have been a maladaptive characteristic" (1998:390). Instead, it is proposed that selection would have favored behavioral dispositions that enable individuals to form the most effective alliances. Ethnic prejudices are seen as rationalizations, "means of preserving self-images of fidelity and fairness in the face of the perennial pursuit of situationally optimal affiliations" (1998:390). The authors agree with the claim that members of ethnic groups are often more closely related to each other than they are to those outside the group. However, they believe that group and alliance formation need not follow lines of genetic relatedness, but can change according to pragmatic considerations. Silverman and Case offer some empirical material that is intended to show that ethnocentrism is not limited to ethnic nepotism but rather reflects the pragmatic considerations of individuals (a discussion of their interpretation is beyond the scope of this article).

Although the two presented approaches advance different explanations, they restrict the evolution of altruism to kin and need not invoke a homeopathic theory of ethnic nepotism proportional to the kinship coefficient. For this reason, their selection scenario has much more plausibility than the ones by van den Berghe or Rushton. The account by Silverman and Case is especially interesting, because it tries to explain ethnic attitudes basically without reference

to altruism. Instead, it points to the importance of group structure and group formation in humans.

As the existence of altruism had been a serious problem for evolutionary theories relying on natural selection, it is no wonder that sociobiology stressed evolutionary mechanisms that can explain altruism, in particular the paradigmatic process of kin selection. Van den Berghe, who is inspired by the rise of sociobiology, regards kin selection as the main mechanism of animal and human sociality (see, e.g., 1987:239). In particular, his theory of ethnic nepotism is based on kin selection. As his second evolutionary mechanism is reciprocal altruism, van den Berghe offers a pan-altruistic image of sociality. This, however, ignores the traditional Darwinian mechanism of individual selection that explains all kinds of adaptive egoistic behavior. As in most social species, an individual is more closely related to its own offspring than to a relative's offspring, and there is usually a disposition towards an individual's own reproduction at the expense of that of its relatives. Being selfish is a good means to maximize one's inclusive fitness. This is the reason why Robin Dunbar (1997) states that mutualism is probably more important as a driving force behind the evolution of social groups in animals, and certainly in primates, than kin selection. Mutualism is a situation in which all individuals benefit from cooperation. Understood as symbiosis, it works even across species boundaries. Another important example of mutualism is group formation. Every animal in a group profits from this social structure because it yields better protection against predators. For this reason, mutualism—that is sheer egoism—is the main force in group formation, and it explains why many organisms live in groups at all. Van den Berghe endorses a mistaken picture of the evolutionary mechanisms of primate sociality.

Mutualism not only explains the mere origin of groups, but it is also probably the cause of several other important adaptations to social life. Not every kind of social behavior must be altruistic (in the sociobiological sense). Possible examples include adaptations that enable hominids of a group to cooperate in collective hunting or tasks that can only be performed if different individuals do not do the same thing at the same time but adapt their actions in accordance with what their fellows do. Predators were a threat to early human groups, but, at a later period, individual groups might have also competed with each other to a relevant extent. This suggests a possibility important for the theory of Silverman and Case. They postulate adaptations to form the most effective alliances according to perceived circumstances. The evolution of such behavior would be due to mutualism benefiting each member of the alliance to a certain degree. In addition, reciprocal altruism makes the evolution of altruistic behavior directed towards non-kin possible. As humans obtained high cognitive capacities, this mechanism was probably a source of the capacity to engage in various social agreements that

involve temporary costs for one individual. In my view, there is some plausibility that mutualism and reciprocal altruism had a greater influence on human sociality than kin selection.

During the period when hominids usually lived in kin groups, the evolution of adaptations for social living was enhanced by kin selection, because altruistic social behavior was directed to kin members, increasing one's inclusive fitness. Nonetheless, the possibility cannot be excluded that several of these behavioral dispositions would have evolved if the groups had not been composed of relatives, implicating kin selection as a factor, but not always the important one. At any rate, when bigger groups emerged that consequently were not composed of close relatives, behavior involving all members of the group could still evolve by mutualism or reciprocal altruism.

Independent of the concrete explanation of ethnicity, several authors acknowledge that it is important to include human group structure into one's account (see, e.g., Shaw and Wong, 1989; Salter, 2001). David Goetze (1998) argues that contemporary ethnic groups—characterized by a high degree of mobility, thereby undermining traditional kin groups—are basically the consequence of kinship as well as functionality considerations. Both factors influence a human being's decision about which ethnic groups to join. Goetze points to the strong human tendency to form groups and compete with other groups, which is often independent of the similarity of the group members. Group formation based on kin recognition is only one factor. In addition, many resources important for humans can only be obtained and defended through cooperation in large groups.

Jan and Birgitta Tullberg (1997) also emphasize the disposition to form in-group alliances, even when splitting into groups is arbitrary. However, ethnocentrism is not considered to be based on kin selection. Instead, it is a special case of group egoism, which is based on individual advantage. The function of group egoism is to form alliances that are able to compete with other groups. A group identity is formed because individuals of larger groups do not know each other well enough. Group egoism, and particularly ethnocentrism, is regarded as collectivistic and dichotomous, whereas kin selection, which is individualistic and differentiated, is a separate phenomenon. The idea that ethnocentrism is simply extended kin interest is criticized on the ground that humans are able to distinguish whether a person is actually a close relative or whether kin terms are utilized to appear related.

Robert Boyd and Peter Richerson (1985) offer their own approach to the question of why cooperation among large groups of unrelated individuals has not been observed except in humans (see also Richerson and Boyd, 1998). These authors, who do not even mention inclusive fitness theory, point to the fact that the explanation of ethnocentrism as rational self-interest is especially difficult

when group size increases. Their solution is a quantitative model that combines evolution and cultural transmission. It is an attempt to model phenomena like ethnocentrism by means of a sort of "cultural group selection."

Discussion

An important lesson clearly emerges from van den Berghe's work: one must keep proximate and ultimate causes distinct. It is one thing to detect a behavioral disposition in a population of individuals, but quite another to determine whether a particular evolutionary mechanism produced this behavior. For a complete evolutionary approach to ethnocentrism, there are two explanatory issues at stake: how to explain this ethnic phenomenon successfully by existing proximate mechanisms (e.g., ethnic nepotism), and how to account for the adaptive origin of these behavioral dispositions. Only facts can be explained. It is not necessary to explain why the coelacanth became extinct; in fact, it cannot be explained, because this alleged fact does not obtain. That is, before being able to correctly explain the evolutionary origin of a behavioral disposition, it must be shown that this proximate mechanism actually exists, which is an empirical task. Van den Berghe, on the contrary, conflates ultimate and proximate mechanisms by using the term *kin selection* for the behavioral disposition of ethnic nepotism. This indeed relieved him of the necessity to give an evolutionary explanation for ethnic nepotism.

As I have shown, what van den Berghe calls "kin selection," homeopathic nepotism, cannot be explained by kin selection. Moreover, he simply postulated (homeopathic) ethnic nepotism based on an alleged prediction from sociobiology. He did not empirically verify that this behavioral disposition actually exists. It remains to be shown that people behave according to homeopathic nepotism. Van den Berghe believes that he has given an evolutionary explanation for something that we do not know conclusively even exists. In addition, he claims that he has explained ethnic attitudes by this behavioral disposition. But a situation can be explained only by invoking causes that really exist. Thus, it is the wrong strategy to fill the important gaps in one's account of proximate mechanisms by referring to behavioral dispositions that are to be expected from evolutionary theory. Instead, one must empirically detect the proximate mechanisms, the probable existence of which is motivated by evolutionary theory.

In addition, there is a fundamental difference between prediction and explanation. Assume, for instance, that in tossing an (unfair) coin one thousand times, heads always obtained. This astonishing correlation yields a justified prediction that the next time heads will also obtain. But when heads is actually obtained on the one-thousand-and-first toss, the explanation for that phenomenon cannot be the fact that heads obtained on the first one thousand tosses. Correlations can be used to make predictions, but one

must find the relevant causal mechanism in order to give an explanation. When a prediction derived from a theory is empirically verified, support is lent to the theory. But this does not mean that there is sufficient evidence that the causal mechanisms of that theory (provided that the theory is about causes instead of correlations) are the right ones. It would be true only to the extent that rival explanatory attempts are excluded by the account.

These considerations are the reason why I do not accept Vanhanen's (1999b) claim that he has explained ethnic conflicts by ethnic nepotism. He simply made predictions about ethnic conflict based on his understanding of ethnic nepotism, and then verified his prediction. But this does not—as he maintains—provide an explanation. He has not yet given an account of how ethnic nepotism and other proximate mechanisms give rise to specific ethnic conflicts.

Similarly, Rushton offers data that might show that preferential behavior is *correlated* with genetic similarity. But he claims, in addition, that there is a *specific causal relationship* between two variables: "people detect genetic similarity in others in order to give preferential treatment to those who are most similar to themselves" (Rushton, 1989:503). However, Rushton does not offer any evidence for this interpretation. Instead, this is taken for granted based on a probably flawed prediction from evolutionary theory. For instance, assortative behavior according to genetic similarity might as well be the consequence of cooperation and competition in social groups. Nevertheless, making predictions is an important task. It may be a heuristic tool for finding plausible hypotheses. In fact, considerations about inclusive fitness motivated a lot of interesting hypotheses that might have been undiscovered without this approach. Although confirming predictions reveals that one is probably on the right track, an explanation must finally be provided, as it was rigorously done in many cases of animal altruism.

One and the same phenomenon may be explained by both proximate mechanisms and ultimate mechanisms. These are actually two different types or levels of explanation. For instance, to explain why individuals of a species show a specific kind of behavior in a certain situation, a researcher might, on the one hand, find mechanisms that trigger this behavior given certain environmental stimuli. This kind of explanation is complete in itself, for the relevant proximate causes have been stated. Another question is why this type of behavior evolved, which calls for ultimate causes and a different account.

These two types of explanations are in principle independent of each other. Providing a proximate explanation does not require that one also provide an ultimate explanation. The fact that an explanation by proximate mechanisms is possible does not mean that an adaptive evolutionary one is possible. Proximate mechanisms (e.g., physiological ones) may be specific for a single individual, but an explanation by selective mechanism requires that a certain proportion

of the whole population exhibit this type of behavior. In addition, it is even possible to separate different types of explanations by proximate mechanisms. First, there are explanations that make reference to triggering causes (for example, physiological or behavioral ones). Second, there are ontogenetic accounts that focus on the developmental origin of behavioral patterns. Finally, there are teleological explanations that reference the function of a structure. Although there is certainly overlap between these levels, they can be distinguished for theoretical purposes. Knowing what stimuli triggered a certain behavior does not predispose one to a specific answer about how this constellation originated in the ontogeny of an organism.

With respect to the explanation of human social behavior, there emerge even more types of explanation. Some of them might be called "psychological," and others "social." Some might explain human conduct with reference to desires and intentions. Such explanations involve neither ultimate nor genetic causes. As well, it is possible to give an adequate cultural explanation of a specific social feature without reference to evolutionary explanations, namely, by taking biological and psychological properties as given (as is done in the case of a physiological biological explanation). Different types of explanation simply address different theoretical levels or different theoretical aspects and focus on one set of causes. For this reason, van den Berghe is wrong in claiming that a cultural explanation without an evolutionary one amounts to creating separate realms of nature and nurture (1986:257). He also states that explaining universal human traits by invoking culture begs the question, because culture is only a proximate cause (1978a:405).

I have already explained why a proximate explanation is a complete explanation, which can be complemented—but need not be completed—by an evolutionary account. A universal feature of human sociality might also admit of a historical explanation that makes no reference to evolutionary causes. This type of explanation would use mechanisms that operated long before the emergence of the situation, similar to an evolutionary explanation. Van den Berghe's insistence on a selection explanation amounts to the tenet that it is the only possible or admissible type of explanation. In biology, proximate and ultimate causes simply refer to different types of explanation, and there is no contention that only evolutionary explanations have ultimate truth, while other explanations do not.

The statement that a trait evolved because of selection may have two meanings. It may refer to the fact that there was *selection for* having this trait, i.e., the property of having this trait was a selective advantage, so that the trait was a cause of selection. But the statement could also mean that there was *selection of* this trait in the sense that it is the product of a selection process. For instance, there was selection for having a thick and thus warm coat in polar bears (and also selection of thick coats). Since a thick coat

is also a heavy one (for developmental reasons), there was selection of heavy coats (but, of course, no selection for being heavy). Only in the first case are we dealing with an adaptation. The second case is about the consequences of adaptive processes.⁹ Of course, not every trait must have evolved because of selection, for there are other evolutionary processes, such as mutation and genetic drift. An evolutionary explanation is not restricted to a selective one. In addition, a behavioral trait may have been adaptive in the past but is no longer so in its present environment. Certain human behaviors may simply be the epiphenomena of psychological dispositions (that may have an adaptive history) according to environmental circumstances.¹⁰

It is often necessary to distinguish between the origin of a trait and its maintenance or further modification. For instance, the purpose of insect wings is the ability to fly. However, for reasons of developmental genetics, the wings had to develop from small appendages that surely did not confer any advantage with respect to flight. But these appendages were adaptive with respect to thermoregulation. Only later on did they have a size that conferred an advantage for flying or gliding to their possessors.

The maintenance of a trait is often easily explained by stabilizing selection. Speech in humans is an example. In a group in which people make use of speech, it is selectively disadvantageous to have reduced language capacities. Many features of life in social groups can be selectively maintained, because the individual gains benefit from them (individual selection). But it is another question how this trait emerged. Why did the first person with the beginnings of some language capacities have a selective advantage?

In van den Berghe's approach, individuals are programmed to maximize their (inclusive) fitness. Several behavioral dispositions discussed by van den Berghe, including ethnocentrism, are seen as the expression of the general tendency to maximize one's fitness. However, organisms are not programmed to behave in a fitness-maximizing way whatever the environment may be. Instead, a certain number of *distinct* behavioral dispositions evolved because they contributed to fitness at that time. If one behavioral disposition has been sociobiologically explained, the fact that another disposition is found that today probably contributes to the fitness of an individual does not entail that this disposition is an adaptation as well. Instead, a new evolutionary explanation for this trait has to be given as in the first case.

Johnson states in his account: "Thus, we have good reason to believe that kin selection has operated on our forebears (both distant and near), and that we therefore retain a genetically-based capacity for altruism" (1986:129). The two mentioned items are, however, two different points. Because of kin selection, we may expect some altruistic behavioral dispositions. But the question is *what* altruistic behavioral patterns. General altruistic behavior surely

did not evolve. The task is to identify and explain these dispositions one-by-one. Moreover, the term *altruism* as used in sociobiology has a specific meaning. It does not refer to what in social contexts is called altruism. Instead, it is the increase in another's fitness *at the expense of one's own fitness*. Evolutionary approaches to ethnicity that rely on altruism have to show that the disposition they want to explain was actually altruistic at the time it evolved. For instance, in times of peace it does not cost anything to be a patriot who declares that he would sacrifice his life for his country. That is, it is not self-evident that the broad behavioral pattern of patriotism is altruistic.

A further general point is that explanatory attempts have to meet scientific criteria before one is justified in accepting them. For instance, the claim that a certain type of behavior increases the fitness of an individual has to be substantiated. To take an example that does not involve social behavior, the above-mentioned explanation of how insect wings evolved was experimentally verified. Using engineering methods, the thermoregulatory as well as aerodynamic properties of artificial wings of different shapes and sizes were studied. It is these data that make the given explanation a scientific one that can be clearly kept apart from mere plausible stories of the evolutionary origin of morphological structures. Philip Kitcher (1985) has elaborated this topic in a masterful way. Based on examples, he distinguishes rigorous sociobiology from what he calls pop sociobiology, which does not meet the scientific standards of the former.

Most behavioral and evolutionary studies in biology are cases of serious sociobiology, which employ evidence from the field or laboratory, usually with respect to animal behavior. Pop sociobiology can often be found among accounts of human nature, where the relevant evidence is not supplied. Elisabeth Lloyd (1999) discusses the approach of the evolutionary psychologists Leda Cosmides and John Tooby, which tries to substantiate evolutionary "social contract theory" by empirical data on how people perform the Wason selection task. Lloyd argues that the experimental data are not able to rule out the rival "pragmatic reasoning schemas theory" about psychological mechanisms. Instead, evolutionary considerations are invoked by Cosmides and Tooby to convince (or rather persuade) the reader that their version of which proximate mechanisms actually obtain is the right one. In addition, no evidence is given for their evolutionary account. This is a pity, because this study is important for several evolutionary psychologists, and because evolutionary psychologists base their claims about proximate mechanisms on experimental data, usually trying to avoid standard pitfalls for evolutionary approaches, knowing what must be shown for a putative adaptive claim.

My own view about the evolutionary origin of ethnocentrism is that highly plausible reasons have not yet been advanced to show that ethnocentrism is an adaptation, as

the strong accounts of van den Berghe or Rushton maintain. Instead, I believe that ethnocentrism was not and is not adaptive. My position is based on the recognition that early groups of hominids probably did not interact with each other to a relevant extent. While this lack of contact between groups is used by the proponents of ethnic nepotism accounts to justify that hominid groups are genetically separated, the limited interaction makes it unlikely that ethnocentric attitudes were of selective advantage. Since groups did not often meet, there was no need for ethnocentrism; this behavioral disposition would not, therefore, confer a higher fitness on ethnocentric individuals. From this reasoning, I cannot accept that ethnocentrism and related phenomena are adaptive behavioral strategies.

In conclusion, evidence on this subject still needs to be elaborated. This is also true for the proximate mechanisms involved in the formation of ethnicity. Several questions need to be answered in more detail. For instance, which psychological properties make up ethnocentrism? How do emotive aspects and cognitive or language-based ones intergrade? How do they link to action, and how do ethnic identity and ethnic mobilization influence each other? What is the relationship of social structures and psychological dispositions? What phenomena are the causes of ethnocentrism, and what are, rather, its effects? Is there basically one type of behavioral mechanism—for example, nepotism—that generates ethnicity, or are ethnic attitudes constituted by the interaction of several psychological mechanisms of ethnicity? Are those mechanisms rather specific ones relating to ethnicity alone, or are they attitudes that influence several social phenomena?

My suggestion is that these questions must be answered before a real evolutionary explanation of the corresponding mechanisms can be given.

Acknowledgments

I am indebted to Alan Love, Peter McLaughlin, Gereon Wolters, Bernhard Kleeberg, and Michael Kempe for helpful discussions on my work.

Notes

1. The term *kin selection* was introduced by John Maynard Smith (1964) for the evolution of altruistic behavior towards close kin (based on the model of Hamilton [1964] introducing the idea of inclusive fitness). Interestingly enough, this is the source to which van den Berghe refers. The meaning of kin selection as an evolutionary mechanism has been maintained since then. See, for example, Ridley, 1997.
2. That there is no contradiction between the fact that an evolutionary account must deal with biological kinship and the fact that kinship as well as ethnic membership is often fictive or constructed was explicitly pointed out by van den Berghe (1995), as well as by Salter (2001). Biological and perceived kinship simply have to overlap to a high degree.

3. In what follows, the notion of a “better strategy” is to be understood in the sense of evolutionary game theory, that is, one strategy is better than another if it will be favored by natural selection, which does not mean that the behavior is better for the individual itself. My discussion of “a better strategy,” and that it is “better to behave” in a certain manner, also has nothing to do with ethical or political evaluation of how an individual ought to behave.
4. This is reminiscent of the following notorious fallacy. Assume that you have a certain amount of money that you can stake on different persons (you may distribute it over several persons) and that you obtain a fixed sum if your bet was right. If you may choose among a lot of people, the person with the highest chances might win with a probability of only 10%, whereas the chances of other candidates might be 5% to 8%. If you choose this person, you will lose your money with a probability of 90%. This might tempt you to distribute your money and stake on other persons as well, because one of them might win. However, the best strategy is simply to stake your money on the candidate with the best chances. The homeopathic theory of altruism exactly parallels this fallacy.
5. Van den Berghe’s article (1978a), in which it is again stated that kin selection is a behavioral mechanism and that its intensity is proportional to the kinship coefficient, was reviewed before publication by Edward O. Wilson. Seemingly, Wilson had no serious problems with van den Berghe’s statement, which is—as just shown—inconsistent with kin selection theory. As I learned during the revision of this paper, van den Berghe is not the first one to commit the discussed fallacy. Mealey (1985), who discusses Rushton’s genetic similarity theory, drew my attention to Dawkins (1979). In this extremely useful article, several misunderstandings of kin selection are discussed. Dawkins included the misunderstanding “An animal is expected to dole out to each relative an amount of altruism proportional to the coefficient of relatedness,” because Altmann (1979) criticized some assumptions by sociobiologists that amount to this fallacy. These biologists did not base an explanation or a theory on this misunderstanding, but they measured frequencies of altruistic behavior, due to the alleged prediction from kin selection theory that these frequencies are correlated with the kinship coefficients. (Like me, Altmann compared this line of thought with the fallacy of distributing stakes according to odds, presented in the foregoing note. So I am not the first one to detect this kind of fallacy in the application of Hamilton’s formula.)
6. See the discussion of the criticism of emphasis on violent emotion and instinct in Salter (2001).
7. Because of this notable difference, I do not agree with Vanhanen (1999b), who states that Rushton’s genetic similarity theory complements van den Berghe’s theory of ethnic nepotism.
8. For instance, Rushton replied to his critics that he does not claim that a single gene brings about a kind of green-beard effect, but that there are groups of genes that cause phenotypic traits as well as preferential behavior towards these traits. But the latter is exactly what his critics called into question. Several alleles at different loci (e.g., new mutations) might be separated during meiosis. For this reason, the question remains: How does a gene, or a group of genetically linked genes that cause a trait (as well as the corresponding preferential behavior), evolve?
9. The distinction between *selection for* and *selection of* was introduced by Sober (1984). Although this terminology is not used among evolutionary biologists, I consider it to be very useful.
10. According to van den Berghe, every universal trait can be presumed to have a genetic basis (1979:6). That this is simply a fallacy is made clear by an example of Daniel Dennett (1995:486). He points to the fact that in every culture hunters throw their spears pointy-end-first, though there is no pointy-end-first gene. Instead, this behavioral pattern results from general human problem-solving capacities, which Dennett takes to be of adaptive origin.

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