KIN SELECTION, SOCIALIZATION, AND PATRIOTISM: AN INTEGRATING THEORY[1]

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***Abstract.* Patriotism may be interpreted as one brand of human altruism. Contemporary evolutionary theory suggests that the roots of human altruism lie in kin selection. However, patriots in contemporary large-scale societies make their patriotic sacrifices on behalf of groups that are composed predominantly of non-kin. This fact appears to call into question the view that human altruism is founded on kin selection. This article attempts to resolve the problem by linking kin recognition cues to the socialization process. The result is a theory which integrates kin selection and socialization as foundations of human altruism. Since patriotism is a noteworthy example of human altruism, and one especially relevant for political science, the theory is applied to patriotism in order to generate hypotheses about the process of patriotic socialization.**

Most Americans were taught as children of Nathan Hale's archetypal example of patriotism: "I regret that I have but one life to lose for my country." Whatever one's patriotic inclinations, and regardless of whether the account is fact or fiction, Nathan Hale behavior is a social scientific problem. The social sciences deal with the behavior of a particular species of animal. As an animal species, humans have a nature which is necessarily the product of biological evolution; the foundation for the study of human behavior must therefore be human biological nature. The problem with Nathan Hale behavior is that it appears to be at odds with contemporary evolutionary theory. This article proposes a general social scientific theory capable of resolving the problem by using kin recognition mechanisms as links between genetic evolution and the socialization process. The theory will be applied particularly to the socialization of patriotism. Hypotheses suggested by the theory will be proposed in the course of applying it to patriotism.

Kin Selection And Altruism

The problem of the self-sacrificial behavior of soldiers, spies, and martyrs reflects an issue no doubt as old as systematic thought about human nature: "Are human beings by nature cooperative and altruistic, or is human nature intrinsically egoistic and competitive?" (Masters, 1978:59). Western political thought has produced a variety of perspectives related to this question (Masters has reviewed these perspectives from a contemporary point of view in several articles, e.g., 1977, 1978, 1983, 1984). The emergence of Darwinian biology seemed to lend support to a Hobbesian perspective. Disregarding parental care, classical Darwinian theory suggested that natural selection should produce egoists rather than altruists. Since evolution occurs because of differential contributions by individuals to subsequent generations, individuals whose behavior contributed to the reproductive success of

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conspecifics at the expense of their own reproduction should be selected against. Thus, it seemed that natural selection should produce selfishness.

Despite its scientific elegance, classical Darwinian theory was obviously not entirely adequate on this point: nature exhibits many clear cases of altruism, even aside from human cases. Among these are sterile castes, help against predators (active defense, distraction displays, or warning calls), cooperative breeding, and food sharing (Wilson, 1975). For many years these anomalies were explained away by appeals to the "good of the species." The problem with this explanation was that characteristics which promote the fitness of *individuals* will be established in a species even if these characteristics reduce the probability of species survival (Maynard Smith, 1978).

One way of dealing with this problem is to appeal to group selection rather than individual selection. If group-beneficial traits appear that would be selected against *within* the group by natural selection, the traits could nevertheless be preserved by differential survival *among* groups. Thus, selection at the level of the group rather than the individual is used to explain altruistic traits. However, there are a number of problems with using the concept of group selection as an important explanatory device within evolutionary biology. One of these is the question of how altruistic traits could be established and maintained within a group in the face of adverse individual selection. Group selection would require high rates of group extinction (Maynard Smith, 1976). While group selection for individually disadvantageous traits remains a possibility under restricted conditions, many evolutionary biologists agree that it is probably not a particularly important mechanism in evolution, and that it probably is not responsible for most cases of altruism that interest us (see Williams, 1966; Maynard Smith, 1964, 1976; Alexander, 1979). Thus, group selection is probably not an adequate explanation for altruistic capacity among humans.

A more recent theory in evolutionary biology is more promising for the explanation of some forms of cooperation among humans. This theory attempts to account for the evolutionary origin of reciprocally cooperative behavior among animals, including humans (Trivers, 1971; Axelrod and Hamilton, 1981). If cooperation between two or more animals could be mutually beneficial, evolution should select for a capacity to make, in effect, cost-benefit analyses as a basis for engaging in such cooperative behavior. While reciprocation theory holds promise for explaining the biological substrate for "economic man," the capacity to engage in behavior of reciprocation is an inadequate explanation for true altruism. The limiting case for altruistic behavior is life-sacrifice for unrelated individuals, and as Williams has said, "The natural selection of alternative alleles can foster the production of individuals willing to sacrifice their lives for their offspring, but never for mere friends" (1966:95).

This quote from Williams leads us to the most promising new development in evolutionary biology for the explanation of altruistic behavior—kin selection theory. It has always been recognized that natural selection could produce altruistic behavior on behalf of offspring. In a classic 1964 article (in two parts), William D. Hamilton extended this recognition by demonstrating that natural selection could work to produce altruistic behavior among relatives other than lineal kin (e.g. siblings, cousins, and even more distant kin). The result was a revised concept of fitness that Hamilton called "inclusive fitness." In the classical concept, fitness was measured in terms of the number of lineal descendants in future generations. Inclusive fitness, by contrast, refers to one's genetic contribution to future generations through *both* lineal and collateral relatives. Hamilton recognized that since genes are shared by collateral and not just lineal relatives, natural selection could produce altruism among siblings or other relatives under the right conditions. As Hamilton put it: "The social behavior of a species evolves in such a way that in each behavior-evoking situation the individual will seem to value his neighbors' fitness against his own according to the coefficients of relationship appropriate to that situation" (1964:19; emphasis deleted).

Hamilton's theory, like all elegant theories, helped explain a wide variety of otherwise problematic phenomena (e.g. sterile castes in social insects). It therefore helped trigger a great deal of research and theory in biology on the evolution of social behavior. Wilson (1975) dubbed this area of work "sociobiology," and made rather ambitious estimates of the potential capacity of sociobiology for explaining the social behavior of humans (1975: Chapter 27; 1978; Barash, 1982, has provided a useful text).

That aspect of natural selection identified by Hamilton in his 1964 paper was quickly given the name "kin selection" by J. Maynard Smith (1964). Different uses of this term by some authors has resulted in confusion. For example, Wilson (1975) blurred the distinction beween group and kin selection, prompting a response from Maynard Smith (1976) reaffirming the distinction. Other authors, perhaps self-servingly, have defined kin selection so as to exclude lineal descendants as part of the process (e.g., B. J. Williams, 1980). In this article kin selection will be defined as a subtype of natural selection through which gene frequencies change as a result of the effects of the behavior of an individual on the reproduction of relatives, both lineal and collateral. This definition seems consistent with Maynard Smith's original import (1964, 1976) and Hamilton's concept of inclusive fitness (see also Alexander, 1979; Essock-Vitale and McGuire, 1980; and Michod, 1982).

Research on kin selection may eventually provide us with keys for understanding human social nature. This is not to say, as some overly enthusiastic sociobiologists would have it, that sociobiology will eventually cannibalize the social sciences. It is to say that an understanding of the biologically-evolved social predispositions of humans will provide a foundation for the social sciences, in the same way that chemistry provides a foundation for the understanding of physiology.

Even this fairly modest estimate of the potential of kin selection theory is not shared by all biologists and social scientists, even those with no apparent political axes to grind. Some believe that both human altruism and human selfishness are entirely learned (e.g., Gould, 1978, 1980). Others believe that humans are genetically encoded only for selfishness, and that altruism results from social indoctrination that inhibits and counters the biologically natural selfishness (e.g., Campbell, 1975, 1978).[2]

There are a number of problems with these positions, but the most important is that our hominid forebears almost certainly were subject to the operation of kin selection (as Masters has pointed out in discussing this issue, 1978:69-71). In the first place, kin selection as defined here would operate to produce dispositions for parental care in any species in which the young are born helpless. Secondly, the conditions of hominid evolution as we currently understand them fit the other conditions identified by evolutionary biologists for the operation of kin selection: "long lifetime, low dispersal rate, and mutual dependence" (Trivers, 1971:39). All of these conditions fit the three or four million years of hominid evolution in which individuals lived in relatively small bands composed predominantly of kin. On this basis it seems quite reasonable to assume that kin selection must have operated on our hominid ancestors. It also seems highly doubtful that biological evolution would have eliminated such genetically based dispositions in the relatively short time that humans have lived in large-scale societies. In fact, we may reasonably assume that kin selection continues to operate at some level even *within* contemporary urbanized societies. Those who do not assist their offspring, siblings, and other close relatives probably reduce their inclusive fitness relative to those who do. 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.

If this position is correct, we are still left with the problem set forth at the beginning of this article: humans, in contrast to other species, frequently engage in altruistic behavior, not uncommonly of a life-endangering or life-sacrificing variety, on behalf of non-kin. We might attempt to explain this anomaly by appealing to cultural conditioning which taps into a genetically-based capacity for altruism (Campbell, 1965; Masters, 1978). However, until we can specify the mechanisms of linkage between cultural conditioning and genetic heritage, this position is barely more tenable than others. The remainder of this article will be devoted to outlining a theory specifying these mechanisms. We must begin by taking a closer look at the process of kin selection.

Kin Recognition

Social scientists discussing kin selection, and partisans in the sociobiology debate, frequently overlook an essential aspect of the kin selection process —kin recognition (or kin identification). If animals are going to bestow altruistic behavior on kin, they must have the capacity to distinguish kin from non-kin. If they do not make this discrimination, they will reduce their inclusive fitness by contributing their energy or their lives to non-kin. Kin recognition does not mean that an animal identifies kin cognitively; it means only that there is behavioral discrimination among kin and non-kin based upon some cue (or cues) which elicit behavior.

The importance of kin recognition mechanisms as intermediaries of kin selection was recognized by Hamilton in his 1964 paper. Hamilton proposed four possible mechanisms of kin recognition, and these same four have typically been discussed by biologists in any extended discussion of kin selection (e.g., see Barash, 1982:102-105; Alexander 1979:108-121). The centrality of kin recognition for kin selection has led to something of a growth industry in biological research since about 1978. It is not my purpose to review all of these studies. Instead, drawing heavily on an excellent review article by Holmes and Sherman (1983), and a summary listing by Blaustein (1983), I will briefly review the four possible mechanisms of kin recognition (Lewin, 1984, and Cherfas, 1985, have also provided useful reviews).

1. *Recognition Alleles.* Perhaps the most obvious possible mechanism of kin recognition for the nonbiologist would be a direct genetic mechanism in which a genetically-coded phenotypic trait is tied to a genetically-coded basis for recognition of that trait. This would amount to genes recognizing themselves in other individuals through the intermediation of their carriers. Recognition of relatives would thus take place entirely independently of the organism's prior experience. For several reasons, Hamil-

ton and many other biologists believe that such recognition alleles are improbable. However, their existence cannot be entirely discounted, since several studies have obtained results that are at least consistent with such an ability (e.g., Blaustein, 1983; Getz and Smith, 1983; Hepper, 1983).

2. *Location (or Spatial Distribution).* A second possible mechanism depends upon a high correlation between location and kinship. If the habits of a particular species mean that individuals in a particular location (e.g., a nest) are probably kin, selection can take advantage of this correlation. Conspecifics in a particular location will become beneficiaries of altruistic behavior because there is a high probability that they are kin. Since this mechanism is indirect, it allows for "mistakes" by benefactors and exploitation by other animals. Thus, many birds "recognize" their nest sites rather than their own offspring, at least until fledging occurs, and will thus bestow parental behavior on unrelated young placed in their nests. The genetically coded rule says, in effect, "If it's in your nest, it's yours."

3. *Association (or Familiarity).* A third type of mechanism depends upon association:

> When relatives predictably interact in unambiguous social contexts where kinship is not likely to be confounded by the mixing of unequally related individuals, recognition may be based on the timing, rate, frequency, or duration of such interactions. Thus the term *association* refers to opportunities that developing individuals have to interact rather than to a particular type of learning process. . .(Holmes and Sherman, 1983:47)

This mechanism, which Holmes and Sherman suggest may be the most common means of kin recognition in nature, thus depends upon familiarity. Due to living and rearing arrangements, individuals with whom one is familiar are more likely to be kin than others. By coming to know the appearance, odor, or vocalizations of particular individual associates, the animal is able to discriminate in subsequent interactions with conspecifics between those who are probably kin and those who are not. As in the case of location, this mechanism is subject to mistakes and exploitation, for if unrelated individuals are introduced into the family in an appropriate way, they will be accepted as kin and subsequently treated as such.

4. *Phenotypic Matching.* The final possible mechanism is dependent upon an assumed correlation between genotype and phenotype. If the genotypes of related individuals express themselves phenotypically in characteristic appearances, odors, etc., an individual may be able to recognize kin through learning its own phenotype and comparing it with those of conspecifics. As with recognition alleles, this mechanism would allow the identification of likely kin even in the absence of familiarity or locational cues. However, this mechanism would work through a combination of genetic factors and learning. The genetic factors are the genetically influenced phenotypic traits that are used for discrimination. In the absence of a recognition allele, however, the individual must match these traits to something learned. Holmes and Sherman explain:

> Under this mechanism, an individual learns its own phenotype or those of its familiar kin by association. When first encountering an unfamiliar conspecific, it matches the unfamiliar phenotype against the template it has learned. Such matching may parallel a process psychologists term 'stimulus generalization'. . . in which the response to an unfamiliar stimulus depends on its similarity to a familiar stimulus. (1983:48)

As with location and association, phenotypic matching will be subject to mistakes and exploitation. A mimicking of a phenotypic trait by which an animal identifies kin will be capable of eliciting altruistic behavior on behalf of non-kin. Porter, Matochik, and Makin (1983) took advantage of this fact to demonstrate experimentally that siblings in spiny mice use phenotypic matching to identify kin: "Animals that had a particular artificial odorant applied either to themselves alone, or to themselves and their littermates, subsequently displayed preferential responsiveness to unfamiliar animals that had been treated in the same manner with the identical odor" (p. 978). Such cues can even be powerful enough to lead to acceptance of individuals of a different species and rejection of siblings, as Carlin and Hölldobler found with a species of ant:

> The principal mechanism of nestmate recognition in carpenter ants *(Camponotus)* appears to be odor labels or 'discriminators' that originate from the queen and are distributed among, and learned by, all adult colony members. The acquired odor labels are sufficiently powerful to produce *indiscriminate acceptance among workers of different species* raised together in artificially mixed colonies and *rejection of genetic sisters* reared by different heterospecific queens. (1983:1027; my emphasis)

It should be noted that there is no reason why animals must employ only one of these kin recognition mechanisms. More than one might be utilized, either at the same time or in different developmental stages. Thus, as observed earlier, location is a kinship cue used by some species of birds for offspring recognition prior to fledging. After fledging, when this cue may no longer be effective, a capacity for recognition on the basis of prior association with the individual offspring has developed (Holmes and Sherman, 1983:47).

Several general observations should be made about these mechanisms of kin recognition. First, in the absence of any conclusive evidence for the existence of recognition alleles, it appears that kin recognition is indirect. The three empirically confirmed mechanisms operate on the basis of environmental cues that are correlated with kinship. Second, given that kin recognition cues are indirect, kin recognition is neither automatic nor foolproof. Consequently, to understand any altruistic behavior presumably produced by kin selection, whether in humans or other animals, we must also understand the evolutionarily-produced cues that elicit the behavior. In the absence of such understanding, and based on *our* knowledge of an animal's kin, some aspects of social behavior otherwise explainable will be inexplicable. Finally, to bring us full circle, the evolutionary function of kin recognition mechanisms should be succinctly stated. Under kin selection theory, the probability that an individual will engage in altruistic behavior toward a conspecific is a function of the coefficient of relatedness of the parties and the cost-benefit ratio for the benefactor and recipient. Kin recognition amounts to genetically based rules for "calculating" the coefficient of relatedness. In other words, degree of relatedness is operationalized through kin recognition mechanisms. These mechanisms thus provide rules for determining, in particular circumstances, whether a conspecific should be treated as an evolutionary competitor or an evolutionary collaborator. *Those identified as non-kin are evolutionary competitors. Individuals in this class will be, like other parts of an actor's environment, either threats to inclusive fitness or resources to exploit when possible to enhance inclusive fitness.* Any cooperation with individuals in this class of conspecifics should be based strictly on reciprocity. On the other hand, individuals identified as kin are *potential* evolutionary collaborators ("potential" because kin, even parents and offspring, are partial competitors [Trivers, 1974]). Under favorable cost-benefit circumstances, then, individuals in this class are appropriate recipients of altruistic behavior. In sum, mechanisms of kin recognition are an essential factor in determining the behavioral orientation of an animal toward any conspecifics with whom it comes into contact. They are thus a foundation for all social behavior.

Kin Recognition And Human Social Behavior

It should be clear from this discussion that if kin selection operated on our hominid forebears, it did so through the medium of one or more of the four mechanisms of kin recognition. It should also be clear that an understanding of this mechanism or mechanisms would be crucial to understanding any aspects of human social behavior that result from kin selection. This section will propose the likely mechanisms of kin recognition in humans and the likely consequences of these mechanisms for human social behavior.

It is unlikely, for two reasons, that humans possess recognition alleles. First, there is the apparent improbability that recognition alleles exist for any species. Second, there appears to be evidence that humans do not possess an innate capacity to recognize kin. We may see this most clearly in the apparent inability of human mothers to recognize their own offspring. In species in which parental care is necessary for offspring survival, offspring recognition should be the variety of kin recognition that is most strongly selected. This should be especially true for the mother in cases in which the mother is also a caregiver. These conditions, of course, apply to humans. We would therefore expect that if recognition alleles exist in humans we would see evidence for innate recognition of offspring by mothers. Based on accounts of hospital mistakes in which mothers have unwittingly accepted children that are not their own offspring, we have good prima facie evidence that humans do not possess recognition alleles. In addition, humans commonly bestow loving parental care on adopted infants that are unrelated. If an innate recognition capacity existed in humans, we would expect to find such behavior uncommon. As David Barash has summed up in discussing this point, "Since human beings give birth to helpless young that cannot walk about and become readily confused with another's offspring, we lack a precise, biologically mediated recognition capacity" (1982:327).

It also seems unlikely that location is an important kinship cue among humans. Current evidence suggests that our hominid ancesters were nomadic. Without a fixed location that was regularly correlated with kinship, specific location would not evolve as a kinship cue. It is possible, on the other hand, that ego relative location could be used by humans. Since a band typically travels as a unit, the genetically-coded rule would predict that those in an individual's immediate vicinity, wherever that is, are kin. However, with interband interactions and regular contact with those of varying degrees of relationship, this rule would be a poor predictor of kinship. Thus, location, in any form, is probably not a mechanism of kinship recognition among humans.

With the third mechanism, association, we come to a very likely candidate for kin recognition among humans (Alexander, 1979; Barash, 1982; Essock-Vitale and McGuire, 1980; van den Berghe, 1981). Given typical human patterns of child care, those with whom one associates most intimately and most frequently are also typically one's closest kin (parents, siblings, and offspring). In addition, given that hominids lived for three or four million years in relatively small bands composed predominantly of kin, most of the other individuals with whom one associated on a regular basis would also be kin. Under these conditions, it seems highly probable that kin recognition by association would evolve to direct the effects of kin selection. As van den Berghe has said: "In the small-scale societies typical of our species until a few thousand years ago, the simple test of acquaintance based on previous association sufficed in most circumstances" (1981:28).

Recognition by association would depend, in any species, upon perceptual discrimination among individuals and memory. Human capacity to remember individuals probably needs no discussion. And we certainly know that we have the capacity to identify individually the persons with whom we have associated regularly. Most of us are pretty good at identifying the voices of those with whom we have associated closely. In addition, experimental evidence exists for a capacity to identify intimate associates by odor (Porter and Moore, 1981). However, it is likely that the most important means of identifying individuals in humans is visual identification of faces. Axelrod and Hamilton have noted that capacity to discriminate perceptually among individuals would be an important element in the development of reciprocal cooperation.

> Reciprocal cooperation can be stable with a larger range of individuals if discrimination can cover a wide variety of others with less reliance on supplementary cues such as location. In humans this ability is well developed, and is largely based on the recognition of faces. The extent to which this function has become specialized is revealed by a brain disorder called prosopagnosia. A normal person can name someone from facial features alone, even if the features have changed substantially over the years. People with prosopagnosia are not able to make this association, but have few other neurological symptoms other than a loss of some part of the visual field. The lesions responsible for prosopagnosia occur in an identifiable part of the brain. . . This localization of cause, and specificity of effect, indicates that the recognition of individual faces has been an important enough task for a significant portion of the brain's resources to be devoted to it. (Axelrod and Hamilton, 1981:1395, who draw on Norman Geschwind's fascinating "Specializations of the Human Brain," 1979:189)

This capacity for recognizing individual faces would serve equally well as a foundation for kin recognition on the basis of association.

If it is true that kin selection has operated among hominids on the basis of association, it would be difficult to overestimate the importance of this feature for understanding human social behavior. Sociobiologists and social scientists influenced by sociobiology have frequently formulated their predictions about human social behavior using concepts of biological kinship. This is understandable, given that the issue for biology is kin selection among biological kin. It has even been taken into account that biologically defined kin are not always socially defined kin (kin terms are frequently applied to individuals who are not biological kin). This is not a particularly important problem for sociobiology as long as there is a sufficiently high correlation between biological kinship and social kinship (Essock-Vitale and McGuire, 1980). However, it seems to me that the most important point relating to human kin selection and kin recognition *for the social sciences* has been missed by most authors (Alexander, 1979 and van den Berghe, 1981 are two exceptions of whom I am aware). Kin selection probably operated on our hominid and protohominid ancestors prior to the appearance of both cognitive understanding of human reproduction and language. Behavioral programming produced by kin selection therefore no doubt preceded both the cognitive identification of biological kin and the symbolic identification of socially defined kin. While these latter two factors no doubt play roles today in mediating such behavior in humans, it seems reasonable to assume that this original programming remains an important and perhaps critical component of our genetically programmed social nature. *Thus, for the social scientist, as opposed to the biologist, generalizations concerning behavior that may be founded upon kin selection should be formulated not in terms of kinship, but in terms of the conditions which evolution has used for eliciting this behavior in hominids.* If association has been one of those conditions, then social scientists should investigate association (or related, but more refined concepts) as the source of altruistic behavior among humans.

The reader will see that we are hereby returned to the problem with which this article is concerned. If altruistic behavior among humans is called forth by an indirect means such as association, it is not the least bit surprising that we would find human altruism frequently directed to non-kin. When relationships among non-kin mimic, in some appropriate way, the close association typically found among members of a family, we may expect that altruistic behavior will be elicited. Even though examples and related hypotheses practically tumble forward, I will limit myself to just one example. In an article with a provocative title ("Death by Hand Grenade: Altruistic Suicide in Combat"), Joseph Blake (1978) explored Durkheim's theory of altruistic suicide as it might apply to heroic suicide in combat. Blake hypothesized that heroic suicide in combat should be more probable in highly cohesive combat units. Using data on incidents in which soldiers threw themselves on hand grenades or other explosive devices, Blake found that his hypothesis was supported. The theory advanced here would explain why this relationship between social cohesion and altruistic behavior should exist.[3]

I am not proposing that the relationship between association and altruism is simple, nor that the predisposition to altruistic behavior is unconditioned by experience. On the contrary, I assume that the relationship is complex, and that there are probably complex interactions among genetically-based "rules" and experience. My intent here is only to direct attention to what may prove to be a fruitful line of inquiry.[4]

Association may be the most important kin recognition mechanism in humans, but it seems probable that phenotypic matching is another and supplementary mechanism (Alexander, 1979; Essock-Vitale and McGuire, 1980; van den Berghe, 1981). Even if association were operating as a mechanism, phenotypic matching would serve to refine and supplement kin recognition. On the assumption that phenotypic similarity will, more often than not, reflect genetic relatedness, those who discriminate behaviorally on this basis should enhance their inclusive fitness relative to those who do not. Now, it must be remembered that phenotype includes behavior as well as physical characteristics. Some instances of behavioral similarity (e.g., gait and facial expressions) may be attributable in significant measure to genetic relatedness. Many others, or most, are probably attributable primarily to experience. Even these similarities, however, would probably be highly correlated with kinship, because kin are most likely to share common experience. Thus, even behavioral similarities attributable to experience were probably, in the course of hominid evolution, a reasonably reliable indicator of kinship.

If humans have inherited behavioral dispositions based upon phenotypic matching, we should expect to find a persistent tendency for humans to discriminate behaviorally on the basis of the physical appearance and behavior of their conspecifics. Thus, when other things are equal, those whose physical appearance and/or behavior are most like an actor's would be the most likely beneficiaries of altruistic acts, and probably also reciprocal cooperation (in ordinary language, we would be most likely to "trust" a potential partner of a reciprocal exchange if he or she looks or acts like us). Conversely, and again when other things are equal, those whose physical appearance and/or behavior are least like an actor's would be the least likely beneficiaries of altruistic acts and reciprocal cooperation. Further, since phenotypic matching would identify those who are dissimilar as potential threats and acceptable sources of exploitation, we would expect to find antagonistic and exploitative behavior directed toward such individuals.

On these grounds, one would predict, in regard to *physical* phenotype, that when other things are equal humans will discriminate behaviorally on the basis of race. Within races one should find discrimination on the basis of racial subtype. And within racial subtypes one should find discrimination based upon even finer differences in physical appearance. The prevalence of these forms of discrimination in the contemporary world requires no comment.[5]

Numerous consequences would also follow from a human predisposition to discriminate on the basis of *behavioral* phenotypes. On this basis, of course, we would expect to find ethnic discrimination, other things being equal (see van den Berghe's superb extended discussion, 1981). Campbell's original view (1965) of ethnocentrism as founded on a genetic base would thereby be supported. Likewise, Fred Willhoite's excellent discussion (1977) of collective intolerance as genetically founded receives support on the theory that humans are genetically programmed to be intolerant to different behavioral phenotypes. Such intolerance would both contribute to, and be reinforced by, collective conflict over scarce resources.

On this basis we would also expect to find class discrimination in stratified societies. Even assuming homogeneity of race and ethnic background, there should be more behavioral differences between social classes than within social classes. Individuals would therefore be predicted to discriminate among members of different social classes on the basis of these differences.[6] When class differences overlap with ethnic and racial differences, discrimination should be especially pronounced. As with ethnic discrimination, this predisposition should both contribute to, and be reinforced by, class conflict over scarce resources (van den Berghe, 1981 provides a detailed discussion of these interactions).

Although examples could be multiplied at length, I will limit myself to one more. The behavioral phenotype of human individuals includes their verbal and other symbolic behavior. An ideology (whether social, political, economic, or religious) consists, in effect, of a related set of verbal and other symbolic behaviors. On this basis, we would expect to find a rather pronounced tendency for ideological discrimination. To the extent that such differences in verbal and nonverbal symbolic behavior are correlated with other differences (e.g., social class), ideological discrimination would be reinforced. When different ideologies are also associated with conflict over scarce resources, the propensity for discrimination would be further magnified.

Having outlined two likely mechanisms of human kin recognition, and therefore of behavioral discrimination, a few general observations are called for. If behavioral discrimination among humans occurs on the basis of both association and phenotypic matching, these two factors should typically reinforce one another. Thus, on the basis of similar experience, close associates will tend to be similar behaviorally. Being similar behaviorally will, in turn, promote close association.

We need not conclude from the foregoing that any particular form of discrimination is automatic or inevitable. The experience of individuals and collectivities no doubt influences the type, level, and objects of discrimination (in part because experience would influence the perception of similarities and differences). On the other hand, it seems important to recognize that behavioral discrimination of some type is inevitable. This is a reasonable presumption for two reasons. First, in a Darwinian world, competition of some kind is inevitable for all species. With selection at the level of the individual, competitors necessarily include conspecifics. Competition among conspecifics proceeds in part on the basis of behavioral discrimination. Second, human social order itself depends upon behavioral discrimination of some kind. Even if racial, ethnic, and class discrimination could be eliminated, social order would still presumably require behavioral discrimination between the honest and the dishonest, the competent and the incompetent, etc.[7]

It should not be thought that this theory of the evolutionary origins of behavioral discrimination is opposed to realistic-group-conflict theory (see Campbell's useful summary, 1965:268-292). On the contrary, if they exist, *these genetically based predispositions are evolution's mechanisms for identifying competitors and facilitating competition with them over scarce resources.* In the case of humans it is obvious that these predispositions do not have fixed objects. Human behavioral discrimination can be channeled on the basis of experience. If this were not the case, humans would not be capable of the shifting alliances they so obviously use in intergroup conflict. Cognition probably plays a role in this capacity, especially as it assists in the formation of temporary bonds based upon reciprocity. However, my own prejudice is that cognition probably subserves these predispositions as much as, or more than, it directs them. In any case, research directed to testing hypotheses derived from this theory would have to take into account that these predispositions are obviously not unalterably fixed as to their specific objects.

If this theory of kin selected behavior in humans has merit, implications for the social sciences are enormous. Aside from the implications for understanding a wide range of specific human behaviors, this theory would provide foundations for a new perspective on the very nature of large-scale human societies. In the next section I will propose a rudimentary theory of the nature of post-band human society (this theory draws upon, or is consistent with, Alexander, 1979; Durham, 1979; Masters, 1983; and van den Berghe, 1978, 1981). It is in light of this theory that we must interpret contemporary patriotism, and most particularly, Nathan Hale behavior.

The Nature of Post-Band Human Society

Hominids apparently lived in relatively small bands of mostly kin for three or four million years. Humans themselves have spent the greater part of their existence in such small bands, and indeed they populated the earth with such bands before the emergence of large-scale societies. We may infer, on this basis, that humans were genetically programmed for life in such small groups. Since increases in population apparently resulted in fissioning of groups (and the populating of the earth with such groups) rather than larger societies (until about 12,000 years ago), we may even say that such bands are the biologically natural form of human society. Although I can present neither argument nor evidence here, I assume that human societies expanded beyond bands of mostly kin only when forced to by population pressure, ecological change, or intersocietal conflict. Such expansion resulted eventually in societies whose membership consisted predominantly of non-kin. *Evolutionarily-defined competitors became social colleagues.* They nevertheless still remained competitors; competition was merely channeled and modified in the interest of protecting inclusive fitness under new conditions. Humans were probably preadapted for this development by behavioral capacities for altruism, reciprocity, and coercion (van den Berghe, 1978).

We may reasonably assume that the capabilities produced in humans by evolution contributed to the inclusive fitness of those who have descendants living today. Among those capabilities would be a brain capable of establishing the individual in networks of reciprocity that contribute to inclusive fitness. These same capabilities, or perhaps others produced by evolution, will also allow individuals to manipulate kin, and especially non-kin, in the interest of fitness maximizing. We should expect on this basis, then, that humans are programmed to use (or exploit, in a value-free sense) non-kin, whenever possible, in the interest of furthering their own inclusive fitness. These capabilities will include the capacity to learn through social experience (not necessarily cognitively) how to take advantage of human behavioral dispositions. Those who learned best how to exploit others without themselves suffering counterbalancing adverse consequences should be at an inclusive fitness advantage. Of course, such efforts at exploitation could be cooperative on the part of groups of kin or groups of non-kin bound together temporarily by reciprocity. All individuals and all groups will be part of this evolutionary game. When the groups are whole societies, we would expect shifting conflict and cooperation among societies. Within societies, we would likewise expect shifting conflict and cooperation among groups. As part of the intrasocietal game, what we call customs and rules will evolve in the form of reasonably standardized sets of behaviors among many societal members. The prevailing customs will reflect overlapping interests and the prevailing balance of power among the groups.

One subset of these customary (but evolving) behaviors constitute what social scientists frequently call the "socialization process." From the perspective proposed here, the socialization process consists of the behaviors of societal members which have as their object the altering of the probability of future behaviors of other societal members. The behaviors of the socializers thus constitute a learning environment for those who are socialized. The outcome of the socialization process will, of course, have implications for the inclusive fitness of the socializer as well as those socialized. The socialization of offspring by parents can thus be interpreted as an effort on behalf of parents to enhance their own inclusive fitness by influencing offspring behavior. Given the .5 coefficient of relatedness between parents and offspring, parental socialization should normally also, to some degree, enhance the inclusive fitness of the offspring themselves.[8] Efforts at socializing non-kin should also be directed at enhancing the socializer's inclusive fitness, but in this case normally at the expense of those socialized. Of course, every member in the system will be doing the same thing. The interactive and cumulative product over time is what the social scientist calls the "socialization process." That process, like other customs and rules, should reflect the prevailing balance of power within the system. The process may serve the interests of most or all system members to some degree; it should serve the interests of the dominant members to the greatest degree.

Among the behaviors of concern to all members will be the behaviors of social interaction. Thus, every society will evolve a socialization process which deals, on one hand, with reciprocity-based interactions. Included will be what we often call "norms" relating to honesty, fair-dealing, etc. The socialization process of every society should also evolve behavioral methods of producing altruistic acts and altruistic cooperation (cooperation that is asymmetrical in outcome). It is in the inclusive fitness interest of every member to elicit, if possible, altruistic acts by non-kin on behalf of themselves or their kin. Some such altruistic acts may be to the benefit of many, most, or even all societal members. One example here would be defense or aggression on behalf of the group. Of course, the benefits of such defense or aggression will not necessarily be evenly distributed—dominant members should benefit the most.

How can such altruistic acts on behalf of non-kin be elicited? The answer by now is probably obvious. *Altruistic acts on behalf of non-kin can be elicited by exploiting the cues produced by evolution for kin recognition.* In studying those parts of the socialization process that particularly relate to altruistic behavior, then, we should find that the process is, in significant measure, constructed so as to take advantage of these cues. We might find these elements especially pronounced in those parts of the socialization process that relate to life-endangering or life-sacrificing behavior. It is reasonable to expect that socialization to patriotism would be one area that would be especially relevant. Patriotism no doubt fulfills a number of functions, but among those is probably the preparation of the individual for life-endangering behavior on behalf of the group in defense or aggression. Thus, the process by which individuals are socialized to be patriotic should be constructed along the lines I have suggested.[9]

Socialization To Patriotism

Patriotism is frequently defined as love of and loyal support for one's country. I use the term here to refer to those behaviors (including speech) which reflect love of or loyalty toward one's political community. While related to nationalism, then, patriotism is a broader and much older phenomenon than nationalism. The altruistic character of patriotism is reflected in the Oxford English Dictionary's definition of patriot: "One who disinterestedly or self-sacrificingly exerts himself to promote the well-being of his country."

If the account of post-band society explained in the preceding section is accurate, patriotism in large-scale societies is a brand of manipulated altruism. The roots of such altruism are biological. A genetically based capacity for altruism has been produced by the operation of kin selection on our forebears. The elicitation of altruism depends upon the presence of kin recognition cues. The cues capable of eliciting altruism in humans are probably association and phenotypic matching. Large-scale human societies, products of adaptation to conditions which made their first appearance about 12,000 years ago, have evolved processes of socialization which exploit these cues by which altruism originally came to be elicited in the course of three to four million years of hominid evolution. Among the altruistic dispositions these socialization processes produce is patriotism. This theory thus provides links between kin selection, socialization, and patriotism. To that extent, the goal of this article has been accomplished. It is not my intent to propose a theory of the patriotic socialization process itself. However, in order to demonstrate the application of this theory to patriotic socialization, it may be useful to engage in some unsystematic and exploratory speculation on a few potentially fruitful avenues of research on this process.

Based upon my personal experience with the American variety of patriotic socialization, it seems likely that classical conditioning plays an important role in this process. For example, it appears customary in the United States for patriotic rituals to be performed and patriotic symbols to be exhibited at performances of ritualized combat (e.g., sports events) and exhibitions of pageantry (e.g., parades and fireworks displays). Such performances and exhibitions seem typically to involve a number of stimuli that may serve as primary reinforcers. For example, food and drink are frequently present, and the particular foods and drinks are often culturally (and probably physiologically) distinctive—hot dogs, ice cream, and beer come to mind. In addition, such events probably also involve a number of other reinforcers, either primary or secondary. For example, sports events and parades probably involve pleasing combinations of action, color, and sound. One may reasonably assume that the spectators are, at the least, physiologically aroused by their experience. To pair patriotic rituals and symbols with such stimuli represents the contiguous pairing of stimuli characteristic of classical conditioning. One would hypothesize, then, that patriotically conditioned individuals will undergo the same physiological changes in response to the conditioned rituals and symbols that they undergo as spectators of such events. We may find that the physiological changes are precisely those that (1) prepare individuals for vigorous action, and (2) make them especially susceptible to leadership. Viewed in this light, it is certainly no accident that men (and sometimes women) are led into battle or to the barricade with the paraphernalia of patriotism—songs, flags, insignia, etc.[10]

There is another element in all of this, however. The reinforcers of these events of patriotic conditioning are experienced *collectively*. In the first place, we frequently attend such events in the company of family or close friends. That we often experience these events with our closest associates may be highly significant. In addition, our family and friends are joined by hundreds or thousands of others. Thus, the conjunction of the reinforcers, the patriotic rituals and symbols, and the collective nature of the event, may prepare the conditioned individual not only for action, but for collective action. By creating or coopting social events that participants find highly enjoyable, and pairing these events with patriotic rituals and symbols, participants may be collectively conditioned to respond collectively at a later time upon an appropriate presentation of the patriotic stimuli.[11]

Numerous authors have called attention, at least in passing, to the frequent use of kin terms in patriotic speech (e.g., Alexander, 1979; van den Berghe, 1981; Barash, 1982; Masters, 1983). We find in patriotic literature and speech recurrent references to the "motherland," the "fatherland," the "homeland," joining together with our "brothers and sisters," etc. In the United States we owe allegiance to our "Uncle Sam." The prevalence of such terms would be predicted by the theory proposed here. Kin terms are among the first words learned by children. These terms apply to the child's caregivers and closest associates during a particularly vulnerable period of their lives. The pairing of these symbols with the child's closest associates (usually biological kin) and the typically nurturative experience with those associates, amounts to classical conditioning. Under appropriate circumstances, then, the kin terms should be capable of evoking behavioral dispositions associated with the individual's kin.

On this foundation, one would hypothesize that the hortatory literature and speech of *all* human groups or movements that seek to cohesively unite those not already closely associated and evoke highly cooperative or self-sacrificial behavior, will recurrently employ kinship symbols. This should be revealed in the use of direct kinship terms like "mother," "father," "sister," and "brother," as well as in terms like "family," "home," and "homeland" that are intimately associated with kinship. In addition to patriotic pronouncements, one would also expect to find this feature in the pronouncements of religious and revolutionary movements.[12] The expectation that *all* such groups or movements will be found to employ kinship symbols is based upon two observations. First, all known human societies employ terms of kinship (Fox, 1979:132). Second, the humans to whom those terms apply are typically close associates and probably kin. These symbols are therefore more evocative of self-sacrificial behavior than any others. The orator or pamphleteer who does not possess an intuitive understanding of this fact will no doubt be ineffective.

Many terms not obviously associated with kinship also play central roles in the speech and literature of patriotism. Especially prominent examples are terms like "nation," "country," and the names of particular nation-states. We should expect to find that the process by which such terms acquire their evocative significance is that of higher-order conditioning. If neutral stimuli like kinship terms have acquired evocative significance because of their association with reinforcers like the family experience, the significance of these terms can be transferred to other terms through recurrent pairing. Analysis of the process by which young children acquire "attachment" to nation or country may well implicate as one component higher-order conditioning based upon kin terms. That is not to say that such higher-order conditioning for "nation" and "country" will be based exclusively on kin terms. Terms like "nation" and "country" are probably also paired with other terms having positive connotations, such as "beauty," "honor," and "sacred" (Rushton, 1980:88). A mental recitation of the American national anthem or "America The Beautiful" will suggest other examples.

Instrumental conditioning and observational learning, thus far not mentioned, are probably also important in patriotic socialization. Patriotism appears to develop early in children, and perhaps largely as a result of socialization within the family. Instrumental conditioning, among other means, is probably employed by parents as they reward patriotic expressions and punish those deemed unpatriotic. From the perspective of the present theory, such instrumental patriotic conditioning is probably especially effective *because* the agents of the process are the child's closest associates.

Presentation of medals for valor or awards for patriotism constitute instrumental conditioning for the recipients. However, this is probably not their primary function. Such presentations usually take place at public ceremonies, and these ceremonies are typically reported widely by the media. Such ceremonies are probably best interpreted as primarily events of observational learning. Ronald Reagan is a master at staging events of observational learning. In his first and third State of the Union messages, before Congress and nationwide television audiences, Reagan introduced altruistic heroes. In 1984 he honored a hero of the Grenadian invasion. In 1982 he similarly honored Lenny Skutnik, the man who pulled from the Potomac River a survivor of the Washington, D.C. Air Florida plane crash.

I have thus far discussed patriotic socialization in relation to the kin recognition mechanism of association. We should also find that phenotypic matching is involved. Phenotypic matching, of course, is based upon *perceived* similarities and differences. Since perception can vary, perception is subject to manipulation. We should therefore find that the socialization process stresses similarities or differences among people according to the interests of the socializers. It hardly needs pointing out that racists stress differences between themselves and the groups they hate, while nonracists stress similarities between themselves and the same groups. The dehumanization of despised groups by their despisers has been noted by many.

We should find many manifestations of this phenomenon in the process of patriotic socialization, both in the day-to-day language of parents and teachers, and in the oratory of political leaders. Thus, in times of internal tension in a society, political leaders whose interest is the reduction of the tension should be found using, aside from kin terms, many references to the similarities between and fundamental identity of the antagonistic groups. By contrast, those leaders whose interest lies in the exacerbation of the conflict should be found employing emphasis upon differences and lack of identity between groups. With such usage, both kinds of leaders may be able to draw upon deep-seated dispositions.

The same phenomenon should be found in the public pronouncements of political leaders regarding other countries. For an ally, similarities will be stressed in order to predispose citizens toward a country whose cooperation in international affairs is important. By contrast, differences should be stressed for an enemy. And if a marriage of convenience converts an enemy into an ally, this change should be reflected in a change in political leaders' descriptions of the similarities and differences between the two peoples and their social, political, and economic systems. Thus, content analysis of public statements by both American and Soviet leaders from the pre-World War II period into the 1950's should reveal a decline during World War II for both sets of leaders in references to the differences between the American and Soviet peoples and systems, and a corresponding increase in references to similarities. Likewise, after World War II and with the emergence of the Cold War, we should find this trend reversed for both sets of leaders.

The examples in this section illustrate a few lines of research on the patriotic socialization process that would follow from the theory proposed in this article. Research on these questions would constitute only a beginning, for the several learning mechanisms of patriotic conditioning may operate differently in different settings and at different cognitive developmental stages. Furthermore, there are undoubtedly complex interactions among these different elements. The suggestions outlined in this section are therefore proposed simply as points of departure for future research on the process of patriotic socialization.

Summary

Patriotism, especially in patriots who endanger or sacrifice their lives on behalf of large-scale societies, is a brand of altruism. Such altruism, benefiting nonkin as patriotism does, appears inconsistent with contemporary evolutionary theory. Discounting extreme genetic variation and mutation, it seems humans should be incapable of such behavior. Nevertheless, such behavior is quite common. The theory proposed here seeks to resolve this paradox by showing that the cues produced by evolution for eliciting altruism can be manipulated to evoke altruism on behalf of non-kin. These cues are probably association and phenotypic matching. The process through which these cues are systematically manipulated is the socialization process. Based on this theory, suggestions for research on the process of patriotic socialization were advanced. Research along these lines may lead to a better understanding of the patriotic socialization process, as well as provide indirect tests of the theory linking kin selection and socialization.

Notes

1. This is a revised version of a paper presented under the same title at a panel of the Association for Politics and the Life Sciences, held at the annual meeting of the American Political Science Association, August 30-September 2, 1984, Washington, D.C. I am indebted to Steven A. Peterson, discussant for that paper, for his useful critical comments. I would also like to thank Roger D. Masters, Fred Kort, Heiner Flohr, James N. Schubert, Timothy Sawyer, and two anonymous reviewers for their helpful comments and/or encouragement, as well as Linda Miller and Kim Harms for preparation of various drafts of the manuscript.

2. Campbell's position is a change from an earlier position (1965) in which he argued that humans inherit genetically based dispositions for *both* selfishness and altruism.

3. In attributing the military tenacity of the German army in World War II to the strength of primary group ties within combat units, Shils and Janowitz note: "German combat soldiers almost always stressed the high level of camaraderie in their units. They frequently referred to their units as 'one big family'" (1975:218).

4. Although he does not provide a full theoretical discussion of kin recognition, nor discuss relevant animal research, van den Berghe (1981) has proposed a theory of human kin recognition that is fundamentally the same as that proposed here (both in regard to association and phenotypic matching, the discussion of which follows). I am indebted to an anonymous reviewer of an earlier manuscript for bringing van den Berghe's masterful work to my attention.

Alexander has proposed a social learning model based upon association as a kin recognition mechanism in humans (1979:108-112). If I understand his argument correctly, he hypothesizes that the family would normally be a source of positive reinforcement, and that therefore a correlation would exist between positive reinforcement and kinship. Thus, positive reinforcement by associates would become the cue for altruistic behavior. While I agree with Alexander that the nature of the experience with close associates (in many cases biological kin) is important, it seems to me that rather than the nature of the experience constituting the mechanism, it probably conditions the mechanism. Thus, if we had refined concepts of association and altruistic behavior, I would wish to formulate an ideal case law in terms of *these* concepts. Research would then be directed to how the particular experience of the individual with close associates alters the relationship. This conceptualization would help explain the seemingly paradoxical protective behavior that brutally abused children frequently demonstrate toward their abusing guardians. Because of genetic programming, close association with the guardian elicits some protective and caring behavior on the part of the child despite the abuse.

5. Van den Berghe rightly points out that the gross differences in physical phenotype between races would not have been useful kinship discriminators for most of hominid evolution, because until the time of mass migrations, humans would not have come into contact with those of other races (1981:29-33). This fact should not obscure, however, the possible broader importance of phenotypic matching on physical characteristics. We can reasonably expect that physical phenotypic matching would occur even in racially homogeneous populations on the basis of physical characteristics that determine what we often call "family resemblance." These relatively subtle similarities and differences between individuals may have been, and may continue to be, relevant cues in guiding day-to-day social interactions within populations.

6. Van den Berghe (1981:241-247, 257-261) maintains that class and ethnicity are basically "antithetical principles." He stresses that classes are founded on overlapping economic interests, and that class-relevant behavior is economically utilitarian. I find myself in basic agreement with his analysis, but it seems he implicitly underestimates the extent to which phenotypic matching plays a role in class-relevant behavior. Classes may be *created* by convergent economic interests, but the day-to-day behavior of class members vis-a-vis members of their own and other classes is probably influenced by dispositions based upon phenotypic matching. The solidarity of groups created by converging economic interests is probably reinforced by dispositions activated by similarities of dress, etiquette, language, etc. Likewise, discriminatory behavior toward members of other classes is probably based, in part, upon differences in dress, etiquette, language, etc.

7. I do not propose association and phenotypic matching as the only biological sources of human behavioral discrimination. Heiner Flohr (1984) has

discussed several possible biologically based sources of prejudice. Association and phenotypic matching would help explain several of these—group orientation, xenophobia, and discrimination against nonconformists. However, reduction of cognitive uncertainty and pre-judgment as a probabilistic survival device could be at least partially independent sources of behavioral discrimination.

8. Trivers (1974) has shown that parental socialization should not be viewed as a process in which children are mere passive recipients of indoctrination. Since there is not a one-to-one correspondence between the inclusive fitness interests of the parent and child, some conflict is to be expected. Thus, as Elliott White has convincingly argued, children are no doubt active participants in the socialization process (1981a, 1981b). However, the nature of their participation in the process is probably constrained by cognitive developmental processes (Piaget, 1951; Peterson and Somit, 1982; Peterson, 1983). Even nutrition would probably play a role. (Davies, 1977)

9. When soldiers of large-scale societies sacrifice themselves on behalf of their societies, what are the implications for biological evolution? It might be argued that since kin are included in the large group that benefits from such sacrifice that the soldier is still enhancing his inclusive fitness. In the case of a small-scale society, in which the ratio of non-kin to kin is low, such enhancement might be possible. However, for large scale societies, in which the ratio of non-kin to kin is high, the soldier will be related to relatively few of those on behalf of whom he fights. Thus, it seems doubtful that such soldiers (e.g., American soldiers in Vietnam) are enhancing their inclusive fitness. Indeed, relative to those who stay at home, it seems they would be decreasing their inclusive fitness.

If this is true, it would seem that sacrificial behavior on the part of soldiers of large-scale societies would result in selection against altruistic genes or a gene complex. One would hypothesize, on that basis, that the population of contemporary large-scale societies would be, on average, less altruistic than populations of small hunting and gathering societies that have been relatively isolated. However, there are several reasons for thinking that such selection would have been mild, and perhaps even counteracted entirely. First, it must be remembered that it is typically only one sex that engages in life-sacrificing altruism on the battlefield. Thus, if mothers and sisters of the sacrificers carry the same genes, selection against genetically based altruism may have been relatively mild in the roughly 12,000 years of large-scale societies. Second, since wars are intermittent, it is likely that some male siblings and/or offspring will not be called upon to take up arms. Third, social institutions at home may compensate for negative selection by providing financial or other rewards that enhance the fitness of the surviving soldier or the dead soldier's relatives. The society may also provide social sanctions against the male stay-at-home that reduce his inclusive fitness (e.g., social ostracism, imprisonment, lack of benefits). Fourth, and finally, higher rates of altruism toward kin than non-kin *within* a society on a day-to-day basis would also tend to offset selection against genetically-based altruism produced by occasional life-sacrifice on behalf of the large-scale society. Given these four considerations, it seems reasonable to assume that any negative selection would be at least mild, and that it might be offset altogether.

10. Future research should investigate whether men are, on average, more susceptible to the appeals of patriotism than women. Given that males are usually the active defenders of primate groups, it would be reasonable to hypothesize that differences are likely between men and women in this area. For a useful introductory discussion of sexual dimorphism and defense, especially among primates, see Barash, 1982:195.

11. Dawson, Prewitt, and Dawson (1977:148-149) have drawn attention to the fact that patriotic rituals in the school are performed as group activities.

12. I am reminded that Eric Hoffer noted in *The True Believer* (1951) that mass movements must produce united action and self-sacrifice on the part of their followers. For that reason, Hoffer notes, such movements need to break down prior allegiance. One such allegiance would be to the family: "Almost all our contemporary movements showed in their early stages a hostile attitude toward the family, and did all they could to discredit and disrupt it" (p. 40). Hoffer offers early Christianity as an example. It is worth quoting him, and thereby Matthew, at length.

> . . . not one of our contemporary movements was so outspoken in its antagonism toward the family as was early Christianity. Jesus minced no words: "For I am come to set a man at variance against his father, and the daughter against her mother, and the daughter in law against her mother in law. And a man's foes shall be they of his own household. He that loveth father or mother more than me is not worthy of me: and he that loveth son or daughter more than me is not worthy of me." When He was told that His mother and brothers were outside desiring to speak to Him He said: "Who is my mother? and who are my brethern? And he stretched forth his hand toward his disciples, and said, *Behold my mother, and my brethren!*" (1951:40; emphasis added)

From the perspective of this article, it is not surprising that the symbols used to help break the bonds of individuals with their natal families were the symbols of kinship. It hardly needs pointing out, in addition, that these are not the only kinship terms used by Christianity.

Although the emphasis in this article is on patriotism, the observation at this point regarding revolutionary and religious movements illustrates the broader applicability of the theory. Bonds created by association may elicit altruistic behavior on behalf of friends, institutions like schools (note the kin term usage in "alma mater," which means, literally, "fostering mother"), and others. Thus, while patriotism may be facilitated by association cues, the same cues may help motivate an individual to "betray" his country on behalf of friend or family, or to participate in a revolutionary movement.

COMMENTARIES

GLOBAL EVOLUTION AND BONDING

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The Gaia Hypothesis—perhaps named after the supreme mother creator goddess Gaea of the primitive Greeks—proposes that the earth's biosphere is a living organism. If this were true, or if we were to entertain it as a suggestive metaphor, then we should think of the biosphere as a self-contained organic system, with its own dynamic processes and boundaries. Like other forms of life, it would occupy a special niche, in this case between heaven and earth.

Should we accept this idea, we might ask ourselves how specific parts of the biosphere have evolved. In his article, Johnson offers some fascinating insights. He is particularly concerned with the dynamics of human group evolution, and the way in which group beneficial traits may be selected for. His main purpose is to discuss and evaluate different ways in which such altruistic attributes may serve the long run interests of both groups and individuals.

One approach to this problem of group-individual relations is to descend to the level of genes and the concept of "inclusive fitness." The individual's genes exist not only in his or her own body, but also in the bodies of others, related in closer or more distant ways. The individual can thus make "a contribution to future generations" by helping to ensure the genetic transmission of "both lineal and collateral relatives."

This, of course, leads immediately to the problem of kin recognition and criteria for mutual assistance. Johnson discusses a number of mechanisms, concluding that familiarity and phenotypic matching are most likely to assist genetic discrimination. Individuals are most likely to provide assistance to others that are like them, and whom they recognize.

These same mechanisms can also be used to increase the survival chances of broader groups with more diffuse affinities, like nation states. In addition, Johnson points out that rituals can incorporate kinship symbols and include important conditioning stimuli—food, drink, action, color, sound. Such rites, reinforced by other socialization experiences, synthetically produce the critical elements of similarity and recognition.

Kin selection and socialization tell us how we got from there to here. These mechanisms may contribute to loyalties to multiple levels of the world system, arranged in a complex structure of world consciousness (Beer, 1985, 1974). They can account for the socio-economic bonding of family, band, tribe, religion, race, ethnicity, and class. They may also illuminate the political development of cities, regions, and nation-states.

The bonding processes that we have discussed thus help generate modern nationalism. Nationalism, in turn, drives the development of modern nuclear weapons. These weapons represent what appears to be a severely nonadaptive mutation: while they might conceivably have functional uses elsewhere, they threaten literally to blow our whole world apart.

The lessons of biological and social evolution suggest that a more extensive global consciousness would probably increase the biosphere's adaptive potential. Nevertheless, the diversity of human characteristics and the weakness of global socialization mechanisms have so far prevented wider bonding and further evolution.

This next level of bonding may, however, be necessary if most of the earth's genetic pool included is to survive. Such broader consciousness would call for some immediate sacrifices from lower level systems, but these sacrifices are no different from past altruistic behavior that has led in the present evolutionary direction.

The goddess Gaea was not only the goddess of creation, but also of prophecy, particularly honored at the early shrine of Delphi. We should hope that the Gaia hypothesis also has as much to tell us about the future as the past.

KIN, ETHNICITY, CLASS, AND THE STATE: OF CONSCIOUSNESS OF KIND, TRUE AND FALSE

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First, let me register the elation of pseudo-kin recognition elicited by the phenotypic match between Johnson's ideas and mine. Until I got to footnote 4 (which I read after the body of the text), I assumed that the intellectual convergence was a case of culturgen diffusion. Then, I was even more pleased to discover that Johnson's formulation was first arrived at independently of my book, *The Ethnic Phenomenon*. A theoretical paradigm capable of independently generating such close identity of formulation is obviously a powerful one.

Since I agree with so much of what Johnson has to say, my comments will be principally addenda, and a friendly response to his footnote 6. Johnson applies his concepts principally to large-scale, complex, state-organized societies. This is understandable since it is in those societies that seemingly genuine altruism calls into sharpest question the sociobiological model of self-serving behavior. I would like to suggest that Johnson's model is a more general one, but that it lacks an explicit formulation of a theory of the state to clarify his application of the model to complex, large-scale societies. The general problem is one of kin recognition, or what early social science called "consciousness of kind." As Marx noted, consciousness could be "true" or "false," that is, it could promote or hinder self-interest.

Small-scale, stateless, classless societies are relatively well-protected against the deceitful manipulation of consciousness of kind. The recent French film, *The Return of Martin Guerre,* illustrates how even complex agrarian societies were still fairly immune to parasitism of beneficent behavior by outsiders. People in mobile, industrial, mass societies obviously stand at the end of a continuum of vulnerability to parasitism.

What is not explicitly evident in Johnson's model is that the prime parasite in complex societies is the state or, more accurately, the group of individuals who control the state's coercive apparatus. Small-scale ethnic states made up of a few thousand people linked by multiple ties of kinship and marriage are only minimally parasitic. In those states, the main advantage of the ruler is greater access to the reproductive power of women through polygyny, and the main activity of the state is predation against other societies rather than internal parasitism.

Large industrial states, especially multi-national empires, are most blatantly parasitic and ideologically manipulative. Those are the ones in which "patriotism" is most elaborately developed as a state religion and ritual, calculated to develop false consciousness. State ideologies of patriotism, paternalism, or fraternalism are all designed to disguise the nature of coercion and the process of surplus appropriation by the ruling class. Still, the effectiveness of these ideologies is limited by pre-existing consciousness of kind in the subject populations. Emperor Hirohito is a more credible father of Japan than Queen Victoria was a mother of India. Patriotism is an ideological smokescreen for coercion, mimicking kin selection or reciprocity.

No state, however, can fool all of the people all of the time. I doubt that any state comes even close to creating total false consciousness. Thus, the burden put on ideology as an explanation of seemingly sacrificial altruism (e.g., in combat) must not be exaggerated. There are many good and selfish reasons for taking risks in combat: access to plunder and to women, rewards to relatives, and others. Besides, most soldiers in combat are risk minimizers. Sure, German soldiers fought like hell, but in part because they feared their officers more than the enemy; their officers feared the Nazi Party officials who infiltrated every *Wehrmacht* unit. *Esprit de corps* perhaps, but also *esprit de* court martial. Just compare the number of American G.I.s shot for cowardice during the Second World War with the number of executions in the *Wehrmacht,* and much of the variance in behavior will be better explained, I think, than by any recourse to ideological explanations. In short, I am suggesting that the *explanandum* (genuine altruism) is not all that large, although what there is of it is indeed partially explainable by a state ideology creating false consciousness.

This brings me to class, ethnicity, and footnote 6. In *The Ethnic Phenomenon,* I contrasted class and ethnicity as bases of social organization, although to term them antithetical was perhaps an overstatement. I suggested that ethnicity was an extension of kinship, ultimately based on a commonality of *genetic* interests. Ethnic groups can range in size from a few hundred closely related and intermarried people, where ethnicity seamlessly merges into kinship, all the way to modern nations of hundreds of millions where it becomes so diluted as to make common descent largely fictional. In fact, ethnicity is often a *nested* concept in which different levels of inclusiveness surround ego with multiple rings of nepotism, merging with kinship at the core. Ethnicity consists of the outer rings of an onion of nepotism; the inner rings are the various degrees of kinship expressed through rising coefficients of relationship; ego is at the core of the onion.

Class, by contrast, is simply a collectivity, actual or potential, made up of individuals who share *material* interests. It too, covers a wide range of social formations, all the way from small ephemeral groups formed around a limited, segmental interest, to enormous and often amorphous occupational categories of millions of people in industrial societies. The small end of the spectrum corresponds to the broad legal definition of class or to Ralf Dahrendorf's, while the large end comes closer to the Marxian notion, with Weber somewhere in the middle.

The relationship between class and ethnicity, especially in industrial societies, is an extremely complex and important topic, and there is much *empirical* overlap between the two sets of categories. Indeed, as Johnson suggests, and as Weber discussed long ago when he spoke of estates (*Staende*), a class may, and often does, acquire many of the attributes of an ethnic group, especially in occupational categories with fairly stable membership (of which castes represent an extreme special case). Thus, I do not disagree with Johnson at all. The adjective "antithetical" overstates the distinction between class and ethnicity. I was reacting against a scholarly tradition (especially the Marxist one) that befuddles the analytical distinction between the two, but I am quite ready to recognize the empirical overlap between the two types of social formation. The *extent* of the overlap varies widely from society to society, has crucial consequences for the structure of societies, and is to be determined empirically in each case, being the outcome of multiple historical circumstances rather than of any rigid kind of determinism.

Both class and ethnicity are open to ideological manipulation and to false consciousness. Indeed, even kinship is open to deceit and parasitism, its main point of vulnerability being the uncertainty of paternity, the principal male hazard in parental investment. To generalize, *any* basis of sociality contains an intrinsic and irreducible antimony between cooperation and conflict. Cooperation *within* the group arises from the overlap of individual interests, and often operates within a broader social context of conflict *between* groups. *Intra*-group conflict emerges from the inevitable divergences of individual interests, and is therefore ubiquitous, even in nuclear families. Monozygotic twins come close to having identical genetic interests, and exhibit an exceptionally high degree of solidarity, but even they often differ in a few mutations.

The central insight of Johnson is to place mechanisms of recognition of overlapping interests at the core of social analysis. In terms of kin selection, he is, I believe, quite right to suggest that stable patterns of long-standing interaction in small human groups, and phenotype-matching (in the broad sense of phenotype, which includes cultural traits as well as physical ones) are the oldest such mechanisms by which we consciously or unconsciously assess or infer biological relatedness. In humans, there is a large measure of self-consciousness in the operation of these criteria of relationship and, thus, also of deliberate manipulation, deceit, and parasitism.

Johnson's analysis of mechanisms of kin recognition for the operation of nepotism or kin selection can be easily extended to what Trivers called "reciprocal altruism" in the realm of class relations (in the broad legal sense, as in "class action"). In kin selection, the problem is one of assessing overlap of genetic interests. The evolution of the recognition mechanisms is ancient and, in good part, unconscious. In reciprocity or class relations, the problem is to judge overlap of material interests, independently of biological relatedness. The evolution of those mechanisms is more recent. It is linked to the development of a big brain, and the mechanisms involve a large measure of conscious calculation and manipulation.

Johnson's focus on patriotism elaborates a special case of manipulation of such a mechanism. Patriotism in large, heterogeneous states is an ideology propagated by the ruling class to instill false consciousness, and induce the ruled to behave against their best interest. It frequently mimicks kin selection because the old evolutionary roots thereof make the idiom of kinship especially potent, and because the unconscious and nonrational component of kin selection makes it an effective smokescreen for deceitful manipulation. Indeed, the ruling class frequently deceives itself, for the most effective ideology (and religion) is the one propagated by self-deceived proponents. The most effective deceit is self-deceit, as Trivers insightfully suggested in his discussion of reciprocity.

GENE-CULTURE COEVOLUTION AND GENETIC SIMILARITY THEORY: IMPLICATIONS FOR IDEOLOGY, ETHNIC NEPOTISM, AND GEOPOLITICS

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Johnson has formulated an insightful theory of patriotism in which socialization and conditioning expand biologically evolved kin-recognition systems to obligate people to behave toward in-group members as though they were genetically more similar than in fact they are. In this commentary I will broaden his thesis by proposing a model in which patriotism is more than just "manipulated" altruism working to the individual's genetic detriment, being instead, a genetically influenced strategy by which genes more effectively replicate themselves. While the conditioning processes Johnson outlines undoubtedly occur (Rushton, 1980), as does manipulated altruism (Dawkins, 1982), if these were sufficient to explain the human propensity for deontological action, patriotism would remain an anomaly for evolutionary biology. One questions whether evolutionarily stable ethical systems would long survive if they led to reductions in the inclusive fitness of those believing in them.

What I am therefore suggesting is that genes incline people to construct and learn those ideologies which increase genetic fitness. The idea that genes have such extended (and reciprocating) effects beyond the body in which they reside, constitutes a central focus for current thinking in sociobiology (Dawkins, 1982; Lumsden and Wilson, 1981, 1985). From the standpoint of Lumsden and Wilson's theory of gene-culture coevolution, for example, patriotic nationalism, religious zealotry, class conflict, and other forms of ideological commitment (even 'international socialism') can be seen as genetically influenced cultural choices that individuals make which in turn influence the replication of their genes. Thus the makeup of a gene pool causally affects the probability of any particular ideology being adopted, and the subsequent ideology, in turn, causally affects relative gene frequency. Religious, political, and other ideological battles may become as heated as they do because they have implications for genetic fitness; genotypes will thrive more in some ideological cultures than others. From this perspective, Karl Marx did not take the argument far enough: ideology serves more than economic interest; it also serves genetic purpose.

For this account to be true, (a) individual and group differences in ideological preferences must be partly heritable, and (b) ideological practices must confer differential genetic fitness. Evidence exists to support both these propositions. With respect to (a), while it has generally been assumed that political attitudes are for the most part environmentally determined, both twin and adoption studies demonstrate moderate to substantial heritabilities (e.g., 0.50) for both specific conservative social and political attitudes, as well as stylistic tendencies such as authoritarianism and degree of ideological committment (Eaves and Eysenck, 1974; Eaves, Martin, Heath, Jardine, Feingold, and Eysenck, 1985; Scarr and Weinberg, 1981).

With respect to (b), that is, whether the learning of ideologies can increase genetic fitness, obvious examples are to be found in those religious beliefs regulating sexual practices, marital custom, infant care, and child rearing (Reynolds and Tanner, 1983). Other evidence derives from cultural proscriptions on dietary habits. Amerindian tribes adopting the use of alkali cooking for maize, for example, had larger population densities and more complex social organizations than Amerindian tribes who did not, primarily because alkali cooking releases the most nutritious parts of the cereal, enabling more tribal members to grow to reproductive maturity (Katz, Hodiger, and Valleroy, 1974; see also Lumsden and Wilson, 1981). The native tribes were unable to explicate the biochemical reasons for the benefits of alkali cooking, but their cultural beliefs had evolved for good reason.

The above analysis provides a new perspective on the role of religion in economic and political organization, a topic that has generated research interest at least since the proposition that the Protestant Reformation was a major influence on the rise of capitalism. One result of this research has been the view that the emergent "work ethic" led Protestants to reach higher levels of economic attainment than Catholics, both within and between nations. From the perspective of gene-culture coevolution, however, it is important to emphasize the reciprocal cycle between culture and genes; thus it is just as likely that the "first cause" was a change in gene frequencies predisposing individuals toward greater individualism, industriousness, frugality, and intelligence which subsequently inclined them to adopt a belief system supportive of their genotypes as well as attain a high level of economic success (for a partial review of the heritability of individual differences in personality, see Rushton, Russell, and Wells, 1985). The "Protestant Ethic" has never explained why Jews and Orientals economically outperform Protestants; group differences in partially inherited traits, however, may do so.

One objection to the account given so far concerns the mode of gene-culture transmission. It could be argued that while religious ideologies directly benefit the extended family, those such as patriotism would often result in a decrease in fitness (hence Johnson's thesis ultimately resting on patriotism being a form of manipulated altruism). A recent formulation going beyond classical kin-selection theory, however, provides a firmer basis for an evolutionary understanding of ideological commitment, *for benefited genes do not have to be only those residing in kin.*

Genetic Similarity Theory

Kin-selection essentially means that genes may ensure their own survival, not only by causing the organism of which they form a part to reproduce, but also by causing it to act in such a way that its relatives produce more than they would have done without its action (Hamilton, 1964). Kin-selection theory, however, can be incorporated into *genetic similarity theory* (Rushton, Russell, and Wells, 1984, 1985). Essentially the argument is as follows. If a gene can ensure its own survival by acting so as to bring about the reproduction of a family member in which a copy of itself is to be found, then it can also survive by bringing about the reproduction of non-family members in which copies of itself are to be found. In other words, the tendency to favor relatives is a special case of a tendency to favor those of similar genotype.

In order to pursue this general strategy, an organism must be able to detect copies of its genes in others. Johnson has outlined the main ways in which degrees of kinship, or genetic similarity, can be differentiated (recognition alleles, spatial distribution, familiarity through association, and phenotypic matching). He accepts that all might be used, but downgrades the first as implausible, while emphasizing the latter two. A strong version of genetic similarity theory, however, implies the existence of a genetic similarity detector ("recognition alleles"), for such a mechanism would be maximally efficient. All one need postulate is that some phenotypes are inherently more attractive to the organism than are others. The evolutionary origins of such a mechanism could be simple: if like appearance is positively correlated with like genes, any mutation toward preference for like phenotype would tend to proliferate.

The evidence in favor of an innate genetic similarity detector is best considered by contrasting its discriminatory power with that of a phenotype matching procedure. As Johnson allows, the human preference for similarity in others is well documented. Since similarity can be based on either like genes or like experiences, which of the two causes of similarity is the more important? From a phenotype matching perspective it shouldn't matter whether similarity is created by the genes or by the environment. From the perspective of recognition alleles, however, it is genetic similarity that is of prime importance. Evidence that humans can and do differentiate genetic from environmentally caused similarity has been found in the context of human marriage, where spouses have long been known to resemble each other. My co-workers and I have found that such resemblance is higher for the more genetically influenced of a variety of anthropometric, cognitive, and personological characteristics (e.g., wrist size and nasal breadth rather than bicep or waist size). Put another way, there is a positive correlation between assortative mating coefficients and heritability estimates (Rushton and Russell, 1985; Russell, Wells, and Rushton, 1985). Similar processes are predicted to occur in other relationships, including friendships and even broader social groupings.

Ethnic Nepotism

One implication of the genetic similarity theory extension to kin-selection theory is that a biological basis is provided for what van den Berghe (1981) has referred to as "ethnic nepotism." Two individuals within an ethnic group will, on average, be genetically more similar than two from different ethnic groups. It is in an individual's genetic interest, therefore, to benefit his own group over others, and there is good evidence that altruism does follow such lines. Group members often prefer to congregate in the same area and associate with each other in clubs and social groupings. Charitable donations are typically made in greater quantities within ethnic groups than between them and empirical studies have documented that people are more likely to offer help to members of their own race or country than members of other races or foreigners. Anyone working in a university in the United States over the last 50 years will be personally aware of the changing norms concerning "racial" and "religious" quotas, and attendant ethnic rivalries, and perhaps, too, of ethnic differences in abilities, attitudes, and lifestyles (Rushton, 1985) which, as Johnson notes, can aggravate relations between groups. The American university situation is not unique. *The Times Higher Educational Supplement* (August 30, 1985:8) reports that the Kenyan government has warned lecturers and administrators at the University of Nairobi to stop awarding higher marks to students of their own tribe. The same page also carried a story of a 'tribal' problem in a university in Sri Lanka where members of the Tamil minority have had to be given police protection.

The tribal nature of university populations was first observed by this author in 1981 while spending six months at the ethnically heterogeneous University of California at Berkeley. The contrast with my more homogeneously White Anglo-Saxon Protestant (WASP) home base caused me to attend to the ethnic differences with interest. Not only did fellow ethnics tend to congregate and sit together, but they often banded together for direct political action. Black newspapers on campus were militantly concerned with the plight of black rioters in London, England, 7,000 miles away, as well as the Atlanta black child murders. Jewish student newspapers, on the other hand, were more concerned with what they saw as the beleaguered State of Israel and the plight of dissident Jews in Russia, and of black Jews in Ethiopia even more thousands of miles away. They were appealing for money to help airlift the Ethiopians to Israel, many of whom are now there, paradoxically providing an internal 'tribal' problem of their own. The Chicanos, to take a final example, seemed primarily interested in getting bilingualism adopted at the University Faculty of Education and in strengthening the laws aiding migrants from Mexico and Central America. Similar examples will come readily to many people's minds, and it would seem that one of the influences determining which issues become salient and what positions will be taken on them is the person's group membership.

Some may object that these examples include "religious," "class," and "linguistic" divides, not necessarily causally associated with genetics. This, however, could be put to the test by calculating genetic distances between people (a variety of genetic markers are possible, the most recent and sophisticated being based on studies of DNA sequences). If genetic similarity theory is correct, it would be predicted that many of the classic divides are genetic in origin. The recent analyses of Professor Bonne-Tamir of Tel Aviv University, for example, (Karlin, Carmelli, and Bonne-Tamir, 1982; Meyers, 1985) show that Jews, even after being scattered around the world for two millenia, remain—to a significant degree—genetically distinctive. Jews from Iraq have more in common from a genetic viewpoint with Jews in Poland than either group has with the non-Jews among whom they have lived for centuries. This is also true of immigrants to Israel from such diverse areas as Germany and the Soviet Union on the one hand and Libya on the other (the Ethiopian Jews mentioned above, incidentally, do *not* appear to be genetically Jewish). Jews as a group can be expected to adopt ideologies that work in their genetic self-interest world wide as, of course, can Anglo-Saxons, Japanese, East Indians, Africans, and all other "gene pools."

Genetic similarity theory also has implications for within-group altruism. The more homogeneous the group, the more likely it is that feelings of in-group solidarity and patriotism may arise. Many have considered the Japanese population to be exemplary in terms of the degree of internal cohesion that has prevailed since Japan was forced to open its doors to the West. Freedman (1979) has argued that the Japanese are one of the most inbred of modern industrial nations, there having been little or no major gene mixing for some 1700 years, and uses this fact to explain also the high rate of adoptions of nonrelatives in Japan, a custom going back centuries (adoptions are known to be more successful when the parents perceive the child as similar to them). Degree of genetic homogeneity may partially explain the military tenacity of the German army in World War II discussed by Johnson, and perhaps, too, the lack of morale in the American Army in Vietnam.

Genetic Similarity and Geopolitics

The theoretical stance taken so far predicts that the ease of producing patriotic sentiment and internal harmony varies with the genetic homogeneity of the national group. As van den Berghe (1981) puts it: "Ethnicity can be *manipulated* but *not manufactured*" (p. 27; van den Berghe's emphasis). It also predicts that genetic similarity has important implications for group relations both within and between nations. Since ethnic aspirations are rarely justified in terms of naked genetic self-interest, any analysis will necessarily have to be conducted at a deeper level than surface ideology. Political interests are typically couched in the highest of ethical terms, no matter how utilitarian, transparent, or heinous these appear to opponents. Just consider the incompatible claims from such competing gene pools as the Arabs and the Israelis, the Afrikaners and Zulus.

If ideologies are filtered through the calculus of genetic self-interest, one might examine the genetic consequences of political action to see who appears to benefit—or lose. Political issues are most likely to generate concern when sexual mores and reproduction are at stake. It is interesting to examine the growth of right-wing Christian fundamentalism from this perspective. According to a recent article in *Time* (September 2, 1985), the movement represents, in part, a reaction to the perceived moral breakdown of society. Largely as a result of portrayals in the mass media, and changes in the educational system, many religious people have apparently come to "feel they live in a hostile culture" (p. 51). Among the issues on which this group is most vociferous is abortion. One might speculate that, if estimates of genetic similarity could be obtained, the fundamentalists would be somewhat homogeneous and close to the central tendency of the Anglo-Saxon gene pool. One might also conjecture that if genetic distance measures were calculated, North American "liberals" on abortion would be found to be significantly distant from the WASP average. If so, might it be of interest to know what percentage of the estimated 16 million women having legal abortions in the United States since 1973 were Anglo-Saxon? The growth of "white survivalism" and militant "Christian Identity" groups such as the Aryan Nations, and the Covenant, the Sword, and the Arm of the Lord, represent a more extreme response to these perceived threats to the Anglo-Saxon gene pool. If this overall analysis is correct, one might expect similar correlations in deviations from both genetic and ideological norms in other groups. Preserving the "purity" of the ideology might be an attempt at preserving the "purity" of the gene pool. Are ideological "conservatives" typically more genetically homogeneous than the same ideology's "liberals"?

The role of genetic similarity in geopolitics is likely to become increasingly noticeable in both the U.S. and USSR as the turn of the century approaches. Both of the superpowers have large ethnic minorities and, given the differential in birth rates between majority and minority populations, the current ruling groups are unlikely to maintain their positions much longer. One reason the USSR invaded Afghanistan was to suppress Moslem fundamentalism which, if spread to the southern socialist republics, could bring an end to the existing power structure. These genetic minorities have the highest birth rates in the USSR and can ultimately be expected to displace the currently dominant Russians. In the U.S. power shifts can be expected as the differential birth rates of Spanish-speaking Americans, black Americans, and the currently dominant North European Americans continues.

Conflicts elsewhere in the world might also be viewed through a genetic perspective. The protagonists of the struggle in Northern Ireland between Protestants and Catholics could be examined to see if they represent a continuation of a thousand-year contest between Anglo-Saxons and Celts. The Babylonian and Egyptian captivities may have ended over 2,000 years ago but it might be argued that the current Arab-Israeli conflict represents a continuation of those ancient rivalries. It might also be asked whether Israel can hope for a long term solution to the Middle-East when adjoining Arab countries are replicating their genes at the rate of the total current population of Israel each year.

Genetic similarity can thus be expected to be one of the many influences operating on political alliances. Obviously causation is complex, and it is not intended to reduce relationships between ethnic groups to a single cause. Fellow ethnics will not always stick together, nor is conflict inevitable between groups anymore than it is between genetically distinct individuals. As Johnson outlines, people can be manipulated into working for "other groups." People also work for other motives, such as economic success as well as reproductive success (although, as van den Berghe [1981] points out, from an evolutionary perspective the ultimate measure of human success is not production, but reproduction). Behavioral outcomes are always mediated by multiple causes. The Anglo-Saxon world is currently aligned primarily against the Russians, their half-cousins, while the more genetically distant Japanese are allies. It is an empirical question though whether it would be easier to manipulate antipathy in white Americans toward the Japanese than toward the Russians, or whether class conflicts become more intense when there is a racial element to them. Thus while "politics make strange bedfellows" and human alliances are constantly shifting, stable reciprocities may become more predictable as genetic distances between groups are added into the equation.

The Paradox of Differential Fertility

If the replication of genetically similar genes is as strong a biological imperative as sociobiological theorizing suggests, why are descendants of North European populations everywhere in the world currently experiencing negative growth, while concurrently allowing extensive immigration from genetically less similar gene pools? Why, at the same time have North European populations adopted an ideology of secular humanism which discourages racist attitudes and encourages antipathies toward religious sentiment proportional to the degree to which those ideologies combat the new orthodoxy?

While cultural evolution and organic evolution are undoubtedly different and yet reciprocally linked in extremely complicated ways, they may nonetheless share certain properties (Dawkins, 1982; Lumsden and Wilson, 1981, 1985). Both appear to strive to replicate their units, if necessary at the expense of the other system's units (alleles in the case of organic evolution; 'memes' or 'culturgens' in the case of cultural evolution). Their seat of battle is the individual human mind which only dimly perceives the consequences of its choices, based as they are on many competing elements. Thus ideologies can arise which have the paradoxical effect of dramatically decreasing fitness. A classic example of such a lethal culturgen is to be found among the Shakers, a religious sect which considers sex to be so sinful that it imposes celibacy upon even its married members. This ideology has nonetheless been quite successful in replicating itself through several generations; new adherents being recruited, largely via adoptions. The member's genes, of course, fail to replicate.

In fact the fertility paradox goes back centuries. Fisher (1958) raised the issue of why civilizations decay, and documented evidence in favor of the hypothesis that the ruling groups (often classes, sometimes races) failed to reproduce themselves, usually having a much lower fertility than the ruled groups. Fisher (1958) hypothesized a trade off between the capacity for economic success and fertility. There is indeed evidence that this trade off exists at a quite profound level and moreover is related to other characteristics, the whole complex being partly genetic in origin (Rushton, 1985). My own guess is that low fertility may be partly mediated by a psychological process in which the desire to be in control of both oneself and one's environment is taken to an extreme. Irrespective of the mechanism, the paradoxical fact remains that successful cultures often arise whose leading members subsequently limit their own replication, giving less genetically similar others the opportunity to replace them. Such cultures, (e.g., The Graeco-Roman Empires), and the gene pools associated with them are presumably, in the main, evolutionary dead ends. If this perspective is accurate, are North Europeans headed for the same fate as the ruling classes of ancient Greece and Rome?

To a highly evolved species such as our own, with a strong desire to know and master the world, the laws that govern gene-culture coevolution and the human mind are highly to-be-prized culturgens. With increasing knowledge of the deep structure of human nature, of the biological component in gene-culture coevolution, and of biotechnology, the time may be reached when human beings can directly, behaviorally or biochemically, intervene in the evolutionary process and control the future course of history. The question is: if that time comes, in whose image will it be shaped? People will differ in their moral prescriptions. The choices they make are likely to reflect both their genetic and their ideological interests.

Notes

The argument advanced here represents a preliminary attempt to combine the theory of gene-culture coevolution proposed by Lumsden and Wilson (1981, 1985), the extension to selfish-gene theory made by Dawkins (1982), and the work with my colleagues, Robin Russell and Pamela Wells on genetic similarity theory (e.g., Rushton, Russell, and Wells, 1984, 1985). Although references exist in the text to these works, I am pleased to more formally acknowledge my indebtedness in this note. Any errors or misapplications, of course, are entirely my own.

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AUTHOR'S RESPONSE

SOME THOUGHTS ON HUMAN EXTINCTION, KIN RECOGNITION, AND THE IMPACT OF PATRIOTISM ON INCLUSIVE FITNESS

I would like to begin by thanking the three commentators for their kind and yet stimulating reviews. I hope to be able to repay them for their efforts with at least a mildly stimulating response. I will discuss the three commentaries in alphabetical order, saving a comment for last which deals with points made by both Rushton and van den Berghe.

Of Science, Reason, and Human Extinction

Beer perceptively raises the issue of the implications of this group loyalty theory for the future of the human species. He rightly sees that if human competitiveness is biologically founded, and the behavioral dispositions for carrying out that competition are likewise biologically founded, the prospects for our species in a world with nuclear weapons are not promising. He expresses the *hope* that we may avoid the destruction which seems our fate through the emergence of loyalties which transcend contemporary patriotism. However, he rightly makes no prediction.

Scientists and journalists have frequently proposed that social scientific knowledge is the route to solving persistent human problems. In that vein, one might expect that a better scientific understanding of the roots of contemporary patriotism might lead to a reduction in one of the fruits of patriotism—international conflict. While we may *hope* that scientific knowledge helps advance such a value, it seems more likely to occur if we avoid naivete about what science can and cannot do. We should know, and should have known since the time of David Hume, that scientific knowledge itself is neutral in regard to human values. Science as actually practiced is full of caprice, passion, and dishonesty. But analytically, the scientific process is rational. Thus, while scientific knowledge itself may be considered rational, the uses of scientific knowledge are nonrational. Science, like any other human activity, serves the perceived interests of its users. For that reason, we cannot assume that scientific knowledge necessarily serves any particular human value, e.g., the survival of humankind. Scientific knowledge itself may therefore serve either to enhance or reduce the survival prospects of the species. This is the case simply because of the fundamental distinction between reason and value. As Hume put it so well: "'Tis not contrary to reason to prefer the destruction of the whole world to the scratching of my finger" (1888:416). Human extinction is not contrary to reason. Human extinction is contrary to my values and those of most other humans. However, my values have nothing to do with reason. Nuclear holocaust may simply make the world safer for cockroaches, an outcome no doubt to be valued by cockroaches. Perhaps an appreciation of this, in conjunction with better social scientific understanding, might help us realize a value which most humans must necessarily share inasmuch as species destruction would reduce the fitness of everyone to zero.

Recognition Alleles Versus Association and Phenotypic Matching

I found Rushton's extended discussion fascinating and look forward to further exploration of his perspective. For present purposes, I will concentrate my response to his commentary on the issue of recognition alleles versus association and phenotypic matching as kin recognition mechanisms. Rushton focuses most of his commentary on advancing recognition alleles or a "genetic similarity detector" as a critically important element for understanding human social behavior. If humans do possess recognition alleles, then certainly Rushton is correct. And since recognition alleles would serve the kin recognition function necessary for kin selection, research should certainly go forward on this subject. However, since research time and funds are always in limited supply, and since research efforts should therefore be concentrated most heavily in the most promising areas, I feel I should advance my reasons for thinking that research on association and phenotypic matching is most likely to be productive.

First, and aside from the theoretical arguments of some geneticists on the improbability of recognition alleles, there are empirically confirmed instances of all three methods of indirect kin recognition. For association and phenotypic matching, there are such instances for several and diverse species. We do not yet have any empirically confirmed cases of the use of recognition alleles.

Second, Rushton says that the use of an innate recognition capacity "would be maximally efficient." It may be true *in the abstract* that a direct genetic similarity detector would be maximally efficient. However, organisms do not operate in the abstract. Efficiency must be relative efficiency, taking into account the wide variety of selection pressures on a species. That is why organisms evolve based upon optima rather than maxima—all characteristics are compromises among competing selection pressures. If an innate recognition capacity were "maximally efficient" under normal circumstances in nature, it is difficult to understand why carpenter ants (as cited in the article) would employ a kin recognition mechanism that could lead to rejection of genetic sisters and acceptance of workers of *a different species* (Carlin and Hölldobler, 1983:1027). Of course, under natural conditions it would be very unlikely that ants of different colonies would be reared together. Consequently, under natural conditions an odor label used for phenotypic matching is probably the simplest and most efficient mechanism for producing high reliability kin recognition. Investment in an innate recognition mechanism would probably be organically costly and unnecessary.

Third, phenotypic matching by itself seems capable of explaining the cases Rushton advances as probable instances of the operation of an innate recognition capacity, including assortative mating, ethnic nepotism, and within-group altruism. To appreciate this, the subtle but important difference between phenotypic matching and recognition alleles must be underscored. Both cases involve phenotypes as likely reflections of genotypes. However, in the case of phenotypic matching, an organism *learns* its own phenotype and matches that learned pattern against the observed phenotypes of conspecifics. By contrast, recognition alleles would involve genetic programming for preferring certain phenotypes over others *without* the learning of one's own phenotype.

To make the distinction as clear as possible, imagine a black child reared to adulthood in a white family, with white friends, and described by everyone as white. Further, imagine that this black individual has always perceived his own skin as white and his features as Caucasian. If phenotypic matching is the relevant kin recognition mechanism, the prediction would be that this black person who perceives himself as white would prefer whites over blacks. On the other hand, if recognition alleles were operating, the self-perception of this individual would be irrelevant—he would prefer blacks over whites.

Rushton cites evidence he and his colleagues have collected which suggests that assortative mating occurs in significant measure on the basis of traits with high heritability, like wrist size and nasal breadth. He seems to suggest that such evidence supports recognition alleles over phenotypic matching as a kin recognition mechanism. It does not. If humans prefer mates who have wrist sizes similar to their own, this preference may proceed either from an innate preference for wrists of a certain size or from a preference for wrists that are the same relative size as one's own. The same point applies to ethnic nepotism and within-group altruism.

A fourth reason for thinking that association and phenotypic matching are important kin recognition mechanisms for humans is the life style of hominids for most of their existence. The life style of carpenter ants apparently makes phenotypic matching a generally reliable and efficient mechanism of kin recognition. Given that hominids have apparently spent most of their existence living in small bands of mostly kin, association and phenotypic matching should have been highly reliable and efficient mechanisms. It is difficult to imagine how an innate mechanism could evolve that would be any more reliable under these conditions and that would also be organically cost effective.

Turning to a fifth point, and as I pointed out in the article, we seem to have at least some prima facie evidence against an innate recognition capacity in humans. Both unrealized hospital mistakes and the loving adoption of unrelated infants suggest that humans do not possess recognition alleles, or that if they do, the capacity is weak. While it may be true, as Rushton suggests, that adoptions are most successful when children look like their adopted parents, phenotypic matching would explain this just as well as recognition alleles.

Sixth, and finally, association and phenotypic matching as kin recognition mechanisms for humans appear capable of helping us explain a wide variety of human behaviors, from friendship to socialization practices to several kinds of discrimination. Recognition alleles appear much less fruitful as an explanatory device. In other words, the former seem to explain more than the latter. Potential explanatory power is a consideration not to be taken lightly.

For these six reasons, then, I believe we are justified in putting considerable research emphasis upon association and phenotypic matching. That is not to argue, however, that the possibility of recognition alleles should be entirely discounted. Since recognition alleles are a theoretical possibility, since their expression might be confused with phenotypic matching, and since recognition alleles might be operative *in addition to* association and phenotypic matching, research designed to expose the operation of recognition alleles should be highly welcome.

Patriotism, Manipulation, and Inclusive Fitness

I share van den Berghe's elation over the phenotypic similarity of our ideas. It is reinforcing to discover that others have already generated ideas similar to one's own, especially when their work is so admirable in a variety of ways. My response to van den Berghe's kind commentary consists of two useful clarifications based on areas of agreement, and a partial disagreement stimulated in part by van den Berghe's comments.

Van den Berghe points out in his commentary that "there are many good and selfish reasons for taking risks in combat: access to plunder and to women, reward to relatives, and others." I think he is quite right, an agreement reflected in part in the article's note 9. However, the article in general is not as clear on this point as it should be, and I therefore welcome this clarification.

A second area of agreement needing clarification involves van den Berghe's point that soldiers in combat may be activated significantly by fear of their own officers, fear of the enemy, etc. Again, I agree. It seems unlikely that battle-remote manipulation of kin symbols, patriotic rituals, etc., plays a significant role in actual battlefield behavior. However, socialization to patriotism probably is important to behavior which may eventually get the soldier to the battlefield, i.e., enlisting in the military, accepting conscription, etc. Once on the battlefield, fear and coercion probably play major roles. Comaraderie is likely also important on the battlefield, as I pointed out in the article, especially for behavior like falling on a grenade. Altruism growing out of such military comaraderie is, of course, explained by the theory.

I turn now to an area of partial disagreement with van den Berghe. This subject also involves part of Rushton's commentary. The discussion here allows for clarification of a point made in the article, and also an expansion I did not originally see.

Rushton began his commentary by maintaining that "Patriotism is more than just 'manipulated' altruism working to the individual's genetic detriment, being instead, a genetically influenced strategy by which genes more effectively replicate themselves." While my article does suggest that evolutionarily produced cues are manipulated to help produce patriotism, I do not see patriotism as "just 'manipulated' altruism working to the individual's genetic detriment. . . ." For this reason, I also disagree with what I see as van den Berghe's overemphasis on the state as "the prime parasite" and on patriotism as an "ideology propagated by the ruling class to. . . induce the ruled to behave against their best interest."

The broad issue, then, is whose inclusive fitness interests, if any, are served by patriotism in large-scale societies. Rushton thinks that somebody's are, although he is not explicit on whose. Van den Berghe also thinks that somebody benefits, viz., the ruling class at the expense of the ruled. My view, as stated in the section on "The Nature of Post-Band Human Society," is that in many cases, and at some level, everyone (or almost everyone) benefits. This seems likely to be the case because everyone in a society both manipulates and is manipulated. It therefore seems to me inappropriate to assume that the interests of political elites only are served by patriotism. After all, the offspring of political elites sometimes do die in battle. Moreover, it is no doubt frequently in the interest of everyone in a society to respond, at some level, to patriotic appeals. This is the case, in part, because the citizens of an enemy society are probably greater enemies to both the elite and non-elite of a society than these latter are to each other (a position supported empirically by the quick self-abandonment of the international brotherhood of workers at the onset of World War I). Patriotic cooperation thus probably serves the interests, on average and at some level, of all of a society's members. For example, it is no doubt in the interest of all members that a society be able to defend itself against predation by other societies and that it also be able successfully to practice predation itself.

Given this situation, and without consideration of any additional rewards or penalties, it would be in the self-interest of every individual to have his non-kin neighbors sacrifice themselves to this goal while they themselves find some way to avoid participating in the sacrifice. It being the case that all have an interest that the task be performed, while each also has an interest that others and not themselves perform it, all will have an interest in the invention of techniques for eliciting the patriotic response by as many as possible. These techniques will include not only patriotic oratory, ritual, and symbols, but mundane inventions like military pay, pensions, conscription, social ostracism, firing squads for cowardice, etc. The only techniques reliable enough to bring in many will probably also bring in most. Indeed, given the potential benefits of participation in the system, and the probable penalties for avoidance, participation may often be a good bet for enhancing one's inclusive fitness.

If this account is accurate, we may view non-kin members of a society, vis-a-vis each other, as competitors for advancing inclusive fitness. However, vis-a-vis other societies, those same members are involved in a system of reciprocal cooperation that advances the inclusive fitness interests of all. In that sense, it appears to be inappropriate to view patriotism simply as a means by which a society's political elite exploits the rest of society to enhance its own inclusive fitness. Most—or even all—members of a society are manipulated by the appeals of patriotism, no doubt including most patriotic orators themselves (cases of self-deceit, as Trivers and van den Berghe might put it).

Even if all may be considered to have their inclusive fitness interests advanced to some extent by patriotism, I assumed in the article that interests of "dominant members" were advanced to the greatest extent. If "dominant members" are those whose inclusive fitness is most enhanced, this position would be tautologically sound. However, if we mean by "dominant members" those who are political elites (my original meaning), then we may well question the accuracy of the assumption. Rushton, following Fisher, proposed that political elites are stimulated by their situation to underreproduce relative to non-elites. If this involves something more than merely different selection strategies (K-selection versus r-selection), the patriotic manipulation of non-elites by elites would actually be in the long-term interest of the non-elites themselves. Indeed, if political elites, in their competition for wealth, status, and power, tend to underreproduce, we might say that non-elites tend to manipulate elites into playing important social roles even though it is to the elite's ultimate inclusive fitness disadvantage. In that case, the preferments which we often consider to be evidence of elite exploitation may perhaps just as appropriately be viewed as the inducements by which the many manipulate the few into occupying roles necessary for the advancement of their interests (a situation about which non-elites could deceive themselves in the same way we often assume that elites deceive themselves). We should perhaps even investigate the provocative hypothesis that in democracies the few serve the inclusive fitness interests of the many. If that were empirically confirmed, the rewards which some have assumed are the products of the few exploiting the many may actually turn out to be the mechanisms through which the many manipulate (and exploit) the few![1]

I do not intend to advance this position as a hypothesis or an alternative assumption. The problem is that most of us *have assumed* that political elites are necessarily advantaged in important ways by their positions. This *may* be, but it is something we should investigate empirically rather than assume. We need to explore empirically the questions of when, where, and to what extent, if any, political elites enjoy an inclusive fitness advantage over non-elites. We may find variation over time in particular societies, as well as differences across types of political systems. The results might be highly intriguing.

—Gary R. Johnson

Note

1. For the sake of curiosity, I spent a few moments investigating the number of children of U.S. Presidents. For the 39 presidents who have held office from 1789 to the present, the mean number of children is 3.67. This includes some children who did not live to child-bearing age. Six presidents had no children, and 28 out of 39 had four or fewer. Of course, number of children would be a poor index of inclusive fitness, and even if it were not, we would need to compare the figure for Presidents with a figure for others (perhaps mean number of children of white males who lived to be at least 35 years of age). If a serious study were to be done of inclusive fitness of American political elites over time, a broad index of inclusive fitness might be used for members of Congress, or governors, or state legislators.

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