

MORALITY AS  
A BIOLOGICAL  
PHENOMENON

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# MORALITY AS A BIOLOGICAL PHENOMENON

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THE PRESUPPOSITIONS OF  
SOCIOBIOLOGICAL RESEARCH

Edited by GUNTHER S. STENT

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# ON THE PHYLOGENY OF HUMAN MORALITY

N. Bischof

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## INTRODUCTION

"Morality" is understood here as a human behavioral complex that is (a) essentially cross-cultural, or *universally* human, and (b) apparently absent in animals, or *specifically* human.

The first point suggests that morality is at least partly based on genetic adaptation, the second that this adaptation is a recent occurrence in phylogeny.

In the following paragraphs I shall examine:

1. What phenomena are meant when we speak of "human morality";
2. what kind of analogs to human morality can be found on the animal level;
3. how the emergence of these analogs can be explained phylogenetically; and
4. how human morality may have developed in the framework of these analogs.

At present, theories in this area cannot meet the usual standards of scientific verifiability. The following statements

are presented as heuristic hypotheses and intended to stimulate discussion.

## CHARACTERISTICS OF HUMAN MORALITY

### Form Characteristics

*Norms:* In every human society we find certain generally accepted value judgments, or norms, that define a profile of differential approval for the total range of possible human behaviors. In the simplest case, these norms are reflected in the predominant behavioral patterns of the society: some behaviors meriting disapproval simply never, or hardly ever, appear. Moreover, these norms may be expressed in gossip or rumor (e.g., about neighboring enemy groups), or in the form of legends or myths. Only in high cultures are norms expressed explicitly as an oral or written code of law.

*Sanctions:* If an individual's behavior deviates from the norms, he must expect a hostile reaction, either from the injured person or his representative, or from the entire group or its delegated representatives. Such a reaction might consist in: (a) mild or severe *excommunication* (ranging from derision to casting out), (b) special *punishment*. Punishment is based on the idea that one action can counterbalance another: breaking norms disturbs an equilibrium which must be restored through expiation. In expiation the emphasis is not on the guilty person but on the offense, which explains phenomena like vicarious atonement.

*Internalization:* Norm-conforming behavior also occurs under conditions which preclude sanctions, for example, in the temporary absence of a punishing authority. The inhibition felt under such conditions is called "conscience," and acting against this inhibition results in negative affects (feelings of *guilt* or *shame*). Feelings of guilt seem to be related to disobedience to authorities. Feelings of shame connote the loss of social esteem. They reflect a regression to the stage of an irresponsible infant who is not yet to be taken seriously. Feelings of guilt and shame appear not only after norm-violating action but can also accompany the intention, and thus can prevent or foil the action. These feelings can also follow unintended norm violations. There is a certain tendency to develop milder social sanctions in this latter case except when an offense occurs unintentionally



while *another* norm-offending intention is being carried out.

### **Content Characteristics**

One set of moral norms can be understood as attempts to protect group members from the unbounded *self-interest* of others (the banning of murder, theft, witchcraft, slander, adultery).

A second set of norms, which some anthropologists see as the prototype of morality, is composed of *marriage rules* proscribing a too "near" and too "far" choice of partner (the incest and racial taboos, respectively).

A third set of norms regulate the relations with the *spiritual* world: prescriptions dealing with honoring gods, ancestors, or totems. The first three Mosaic commandments belong to this set. In pictorial allegories, they appear together on a special tablet.

A fourth set of norms apparently serves to establish and corroborate the individual's *personal maturity* (rules of moderation, asceticism, abstinence, rules against excessive or infantile drive gratification).

Finally, without claiming completeness for this list, we may mention a fifth set of norms that serves to spare the society of having to take notice of certain forms of behavior (norms of discretion in sexual intercourse, defecation, menstruation, birth, and death).

There appears to be no "general moral principle" from which all the concrete norms may be deduced, just as there exists no "general drive" or "general animal." Phenomena of life cannot be systematized as being special applications of a general formula. They are special branches of a common tree, a substantially different proposition.

## **MORAL-ANALOGOUS BEHAVIOR IN ANIMALS**

### **Content Analogies**

The specifically human character of morality might imply that intentions suppressed by morality are "bestial." This idea is illustrated in the figure of St. George as the dragon-slayer. However, "amoral" behavior does not appear in the animal world as frequently as such a suggestion would lead one to expect.

Lorenz (8) has introduced the notion of "moral-analogous" animal behavior. It denotes a group of instinctive inhibitions

that constrains selfishness and guarantees a relatively uniform distribution of advantages and disadvantages in the group. According to Lorenz, rank orders in the animal world serve to help the weaker members, since the alpha-animal usually attacks the beta, as if in support of the gamma. Furthermore, animals possessing dangerous weapons do not frequently use them in intraspecies conflicts, but rather perform ritualized combat. The superior in such a contest contents himself, even though he could kill his opponent, with inflicting a comparatively minor "disadvantage." Lorenz also mentions the warning against, or even the attacking of, predators threatening a group member, even though this involves a risk for the warner himself.

Inbreeding, hybridization, and homosexuality are efficiently avoided in most animal species through behavior patterns based on a complicated interplay of instinctual forces. (For instinctive inbreeding barriers, see refs. (1), (2), and following section on Possible Explanations of Moral-Analogous Behavior.)

Animal behavior exhibits many analogs of lying and cheating, even toward members of the same group. Nevertheless these practices are kept within limits. Counteractive mechanisms are therefore postulated to exist (14), but have not yet been analyzed. In some species, if an individual has found access to certain resources, even higher-ranking group members do not compete for them. This has been established for food-resources in chimpanzees (5) and for claims to females in *Hamadryas* baboons (7). Frequently, the respecting of alien territory is also assigned to this group of behaviors.

### **Formal Analogies**

*Habit formation and "superstition":* Animal behavior is never entirely predictable. Particularly animals that are able to learn from experience must be capable of making alternative choices when confronted with new situations. After the learning phase, behavioral variability is reduced by way of habit formation; the experienced animal behaves more predictably.

The pattern of habit formation seems to have the following motivational background. Unfamiliarity is dangerous and leads to emotional "arousal." This may be a fascinating experience if arousal tolerance is sufficiently high, as is typi-

cal in the juvenile stage. Otherwise, arousal produces anxiety. A situation is unfamiliar as long as no appropriate response to it is known. The appropriate response is learned either (a) from other group members, without substantial increase in arousal, or (b) through unaided exploration. The latter method presupposes a high arousal tolerance.

Signs of arousal reappear when an animal happens to deviate from a learned response. This may be expected since, in a way, the breaking of a habit renders the situation unfamiliar again (9). The animal may be prepared to cope with this increased arousal. Otherwise, considerable anxiety may result from the deviation. In this way, habits often appear to have a "superstitious" or "compulsive" flavor.

*Mobbing and "shame"*: The rule that anything unfamiliar produces fear and anything familiar lends security applies also to encounters with conspecifics and leads to socioethologically fundamental distinction between group members and strangers. Conspecifics become familiar (a) through imprinting, (b) through certain forms of intimate social contact (feeding, copulation, grooming, duetting, also, notably, aggressive conflicts), or (c) through long association.

Generally, familiar conspecifics release attachment behavior, while strangers are apprehensively avoided or attacked. High degrees of familiarity are normally limited to members of the core family. If animals live in larger groups, they are forced to stay in close contact with conspecifics that are only slightly familiar and, therefore, represent a potential source of arousal. In such cases low familiarity has to be compensated by high uniformity of behavior.

If group members become conspicuous, whether through a physical deformity (5), or through unusual behavior (in wild geese: first copulation of a pair in spring), arousal is activated and the group will react, mildly or violently, by "mobbing" them.

Is there any indication that animals "mobbed" by their own group do experience something like "shame"? Unfortunately, the response to "mobbing" has not yet been studied explicitly. In wild geese a "cringing posture" appears in this situation, a posture also displayed by low ranking animals. Interestingly, the signal through which young males indicate courtship motivation is formally related to this posture.

### **Rank order and "conscience"**

In hierarchically organized groups it may be observed that a behavior which could lead to intervention by high ranking animals is shunned even in the absence of such animals.

Frequently, alpha-animals will not tolerate sexual activities on the part of low ranking group members. In this situation, the affected group members may even undergo physical atrophy of their sexual organs (1). Chimpanzees (6) and dogs (16), when kept under human control, may permanently "internalize" prohibitions. They show signs of fear when tempted—even if encouraged by their master—to deviate from the "good" behavior pattern and they display a "bad conscience" if caught in or briefly after a transgression.

### **POSSIBLE EXPLANATIONS OF MORAL-ANALOGOUS BEHAVIOR**

Biological systems establish a particular interplay of situations and behaviors. A scientific "explanation" of this interplay may attempt either (a) an analysis of the internal (physiological, psychological) causality that determines the course of this interplay, or (b) an analysis of the external (phylogenetic, selective) causality that explains why the system can survive only with exactly this form of interplay. In keeping with common scientific usage, I refer to the first kind of analysis as "causal" (in a narrower sense), and to the second as "functional."

The earlier assertion, favored by anti-Darwinian diehards, that moral-analogous behavior contradicts the principle of natural selection because selection can produce only unconstrained selfishness has been refuted by the recent work of sociobiology.

### **Ritualized Fights and ESS**

*Functional explanation:* J. Maynard Smith has clarified the selective advantage of ritualized combat by applying his concept of "Evolutionarily Stable Strategy" ((10, 11, 12), see also his paper, this volume). An ESS is a strategy of behavior that, if used by all members of the group, could not be bettered by any individual group member adopting an alternative strategy.

Maynard Smith has shown that reckless, uninhibited aggressivity ("hawk"-strategy) is not necessarily more advan-

tageous than ritualized combat ("dove"-strategy). Admittedly, a "dove" fighting a "hawk" might not be able to retreat uninjured, as the model supposes. A rattlesnake only willing to box and wrestle with his rival could not retreat quickly enough if the latter suddenly began to use his venomous teeth. But he would still have time, in a quick reflex movement, to bite back! This is not "dove"-behavior, though; it is what Price has called "retaliator" strategy. It turns out that retaliation is the ESS in the given case, with a sizeable minority of true "doves" tolerated. Generally, in animals with dangerous weapons a preference for ritual combat can be expected to evolve, but this should not go so far as to render a majority of individuals unable or unmotivated to retaliate if the partner violates the ritual.

### **Causal explanation**

The causal analysis of these behavioral strategies is still in its infancy. Lorenz (9) reasonably argues that refraining from injurious fighting is not due to an overall reduction of aggressivity, but rather to the development of additional inhibiting factors.

### **Kinship and Altruism**

*Functional explanation:* Altruistic behaviors (care of the young, social grooming, group defense, etc.) which are to the advantage of the recipient at a cost to the donor can be evolutionarily stable, as long as these behaviors are directed at relatives or the marriage partner, that is, at individuals whose descendants share part of the donor's genotype (15).

*Causal explanation:* To ensure that preferential treatment can be correlated positively with degree of kinship, it must be the case that the probability of meeting a relative is greater than that of meeting a nonrelative, or that the individual is able to process cues that are correlated with the degree of kinship.

The most important cue for kinship is *familiarity*, especially when established in early childhood, for example through imprinting. Familiarity established through sexual partnership is another example, since mates, albeit nonrelative, have common progeny.

The necessity of cues for kinship has been stressed by Dawkins ((3), p. 110). He mentions as an example the ability of some birds to distinguish their "own eggs" from those of

strangers. But it must be noted that the category "strange" has two possible opposites—namely, what is my own and what is *familiar* to me. "Ownness" is cognitively far more complex than mere familiarity (= low level of stimulus novelty) is a sufficient signal for kinship.

The following mechanisms are important in this regard:

1. Mothers or parents quickly become familiar to their newborn or hatched offspring, perhaps even become imprinted on them.

2. Parents generally limit caretaking behavior to familiar children; unfamiliar ones are rejected, attacked, or even eaten.

3. Offspring accordingly seek out familiar conspecifics ("attachment motivation") and avoid unfamiliar conspecifics ("fear of the stranger").

4. As long as the attachment motivation persists in the life of an individual, it is more probable that an encountered conspecific is a relative.

5. The coupling of altruistic behavior with the familiarity requirement exerts the intragroup conformity pressure mentioned in the discussion of "mobbing."

### **Genetic Variability and Incest Barriers**

*Functional explanation:* Homogeneity of the group is counteracted by outbreeding. If the infantile attachment motivation persisted until and throughout sexual maturity, inbreeding would be the obligatory result. Homozygosis, thus affected, would limit genetic variability, and hence evolutionary adaptability, to such an extent that the line could no longer compete with an outbreeding variant (1).

*Causal explanation:* The mechanism effective in inbreeding-avoidance is basically the following (2): in early childhood familiar conspecifics are markedly responded to with attachment, unfamiliar ones with fear. In adolescence, this pattern diminishes or even reverses: the family is avoided ("surfeit reaction"), unfamiliar conspecifics become objects of fascinated approach. This reversal is owing to an increased appetite for arousal and a reduced dependency in this phase. The same factors lead to dissatisfaction with a possibly low position in the intra-family rank order. All these changes entail the departure from the family and the formation of new relationships. In the adult stage some need for security reappears, but the new partner has meanwhile be-

come sufficiently familiar through exploration and sexual interaction to be an appropriate attachment object.

## POSSIBLE PHYLOGENETIC ROOTS OF HUMAN MORAL CATEGORIES

Are the moral-analogous motives that keep animal behavior balanced still present in man? Anthropologists often point to Frazer's argument (4), according to which culture would not need to proscribe what nature already prevents. If this were correct, only the excitatory forces in animal motivation would be preserved in man, whereas the inhibitory ones would have atrophied. But there is evidence in favor of moral-analogous inhibitions having survived anthropogenesis. Persons familiar since early childhood are conspicuously avoided as sex partners (1). An inhibition against infanticide, postulated by ethologists (9), has been reasonably substantiated in the case of infants who have been nursed at least once (13).

In the following, the thesis will be presented that the phylogenetic transition from moral-analogous behavior to human morality is characterized by three processes:

1. The instincts regulating animal behavior, both excitatory and inhibitory, are damped in man. They do not disappear, but they do lose their compelling character and turn into emotional appeals.
2. Their spectrum is broadened through additional differentiation.
3. Cultural superstructures shape this basic material into new and specifically human forms.

These changes are seen as corollaries of a development that took place not primarily in the realm of motivation but rather in the realm of *cognition*.

### **Time-Representation**

The basic hypothesis is this: the evolutionary step decisive for man, achieved halfway only by chimpanzees, consists in "time-representation."

Every organism normally responds with *behaviors to situations* in such a way that the probability of survival of his genome is kept near a local maximum. A "situation" is defined through momentary features of the *environment* and through the current *needs* of the organism. The maximum

achievable reproductive benefit of a behavior depends on the current environment-need constellation. If the situation is such that the two do not match (e.g., rich supply of solid food in the state of thirst), then even an optimal behavioral strategy can achieve only insufficient benefit.

Animal intelligence partly overcomes this limitation. When solving problems, higher primates appear to shift things around in their "imagination." In other words, they are able to *represent* not only the perceived environment but also other environments which are possible, but at the moment not yet extant. These environments are tested for their potential benefits, as compared with the current state of need. The best of these alternatives is then realized.

This basic strategy is limited to anticipating potential environments while the momentary state of need remains unchanged. Man has adopted a higher strategy. Here future states of need also play a role in the decision process. Such a strategy involves two features: (1) possible environments are tested relative to present *and* future needs for maximal benefit; and (2) the environment belonging to the maximally beneficial outcome is realized whenever this can be done, independently of, or even in contradiction to, the current need.

### **Emotional Consequences of Time-Representation**

This behavior strategy goes far beyond the reaches of animal intelligence. Anticipatory imaging based on the current state of need remains fixed in the present. With the representation of future needs, the temporal fixation becomes movable. The set of situations with which the organism can cope, and now also *must* cope, is thus extended by one dimension—from the present space to the represented space-time continuum. This leads to an increase in strategic efficiency, but it also has drastic emotional consequences that basically affect and shape human morality.

### **Existential anxiety**

The newly represented time-space is mostly filled with *uncertainty*. Its intellectually manageable parts remain tiny compared to the rest. Uncertainty is related to *unfamiliarity* and, like the latter, evokes *anxious*, rather than merely neutral, feelings. These feelings combine with whatever general threat is characteristic of the time (atomic bomb, war,



pollution, plague, cancer) and culminate in the foreboding of our own inevitable death. This "existential anxiety" is specifically human; it is the first price we pay for time-representation.

### **Motivational instability**

Even at the animal level there are always several needs competing in the determination of current behavior. As a rule, only one need can be met at a time; the others must be suppressed, at least temporarily. This feature alone gives rise to conflicts, which increase manifold when time-representation is introduced and future needs are also taken into account.

If future needs are to have a chance to compete with actual needs, it is necessary that the "energy" of the latter be somehow attenuated. The actual needs—excitatory and inhibitory—must be reduced from the status of massive determiners of behavior to that of motivating appeals.

Thus the individual force of conflicting motives is reduced, while at the same time their number is increased. The result is a poor stability of motivation. This is the second price to be paid for time-representation.

### **Simultaneous identification**

Identity, or "sameness," is a phylogenetically old cognitive category. It achieves object constancy over time (the rabbit disappearing behind the bush and the one appearing on the other side are identical). Identity does not require equality—things can change, but remain themselves. In contrast, two *simultaneously* appearing objects may be equal, and they may be mistaken for each other, but on the infra-chimpanzee animal level, there is no behavior indicating that they are kept apart and nevertheless regarded to be the "same." The situation changes when future processes can be incorporated into the present. An object, or one's own body, must then be imaginable in a place different from the one actually occupied. Time-representation would not work without the identity relation being capable of simultaneously bridging spatial distance.

The most amazing of the now possible achievements is the awareness of the identity of oneself with one's own reflection in the mirror. This reflection shows a conspecific. Once the identity with *this* "conspecific" has been estab-

lished, man cannot but see himself, to a degree, mirrored in *any* conspecific. The gap between "ego" and "others" is partly bridged by the new identity category.

As a consequence, man is capable of directing *social* motives (love, aggression, responsibility, etc.) toward *himself* (which has little to do with a neglected chick compulsively plucking its own feathers). Conversely, an individual's *selfish* feelings may begin to protect *others*—since he cannot help identifying with them. (Greedy people cannot bear it when *others* waste their money; a young man emotionally exploited by his mother may participate in a demonstration against exploitation of the working class; we laugh when a clown stumbles.)

Again the space of motivational possibilities is substantially expanded, with numerous new sources of conflict opening up (an example is the conflict between expulsion and care of sick group members). This is the third problem incurred in time-representation.

### **Human Morality**

An immense diversity of motives, ambiguous in directing action, but taking vengeance if neglected and overshadowed by omnipresent existential anxiety—this is the problem to be solved by human morality.

### **Mythological ideas**

Human imagination, capable of dreaming up possible future environments and ego-states, is not bound to a strict down-to-earth level. It can produce mythological ideas that reduce the inherent emotional tensions. Here we find the consoling eschatologies of religions, and also the socialist utopia of a paradise of general solidarity, or the capitalist ideology of the unlimited possibilities of personal development.

### **Psychological realization**

For such mythological motifs to become effective shields against anxiety and a solid foundation for emotional stability, their "psychological reality" must be raised to the highest possible level. The "psychological reality" of an idea depends on its being grounded in everyday experience. Unlike scientific or technical ideas, myths are not well confirmed by experience. Dogmatic repression of contradicting experience is of some help here. But by far the most effective

procedure in translating myths into reality is to let them gain influence on *behavior*: to act them out, and to provide that others do the same. This is why myths breed morals.

### **Ritualization**

An anxiety-reducing strategy practiced already on the animal level—the strategy of adhering rigidly to behavioral patterns that have once proved successful, or at least not harmful—is maintained by man. The previous success of such patterns may have been purely accidental, as in some magic superstitions, or it may have reflected causal connections actually encountered, albeit poorly understood. Such causal connections may involve *physical* factors, as in the experiences leading to dietary proscriptions, or *psychological* factors, as in experiences involving the emotional consequences of time-representation. Particularly the latter factors, being universally human, should lead to a certain uniformity and universality in basic moral norms.

### **Clan formation**

A natural counterbalance to anxiety is attachment to familiar conspecifics. In man, the capability of imagination to move along the time axis allows genealogical conceptions to develop; the family can thus be extended to the clan. Because of its size, the clan provides more security than the relatively defenseless single family. But an individual cannot know each of his fellow clan members. *Familiarity* must therefore be supplemented by meticulously maintained *uniformity*, through common vernacular, common cultural knowledge, common totem, and especially through a common moral code. Since the readiness for altruistic behavior increases with familiarity, and since, therefore, the practice of such behavior is a means to raise the “psychological reality” of familiarity, there exists especially emphatic moral norms of altruism toward clan members. In fact, in primitive cultures altruistic norms apply only to clan members, and are often reversed for foreigners. This dichotomy is mitigated only slightly by the all-human identification process mentioned earlier.

### **Shame**

Group members who violate norms are “mobbed.” An animal that does not conform to the group usually behaves as if it does not understand why it is mobbed. It may react with conflict behavior, anxiety, or depression. The human,

capable of self-reflection, can compare himself to the others and perceive himself to be deviant. Through identification with the group, he participates in their emotional reaction to his deviance. This intrinsic conflict may be the new element in human shame.

A person who is ashamed feels as if he has "lost face." Face, in this context, is something like a mask, concealing his identity from unauthorized eyes. So is the garment he wears. To recognize oneself in the mirror is to understand that one has two sides—an internal self and an external face. The internal self is centered on a core, but has no distinct *boundaries*. Only the mirror reveals that I am a Gestalt, with definite boundaries, constant over time.

These boundaries define how *others* perceive me. What I am to others may be different from what I am to myself. Tolerating such a discrepancy may be a comfortable way to conform to group expectations and at the same time gratify individual needs. *This* kind of insincerity has no counterpart in lower animals. Such a discrepancy, however, causes tensions in my feeling of identity: core and face do not match. Tensions of this kind seem to be typically involved in human shame.

### **Obedience and awe**

Among the familiar conspecifics providing security, the parents are of paramount importance because they are most strongly motivated to offer protection and assistance. But to get the benefit of their protection one has to accept their superior rank position. Thus a connection between security and obedience is preestablished. Moreover, in a human group the parental figures are the ones who are in possession of the traditional knowledge accumulated by the culture; it is from them that one hopes to receive all the remedies for emotional disorder and anxiety. From this point of view we understand the particularly strong moral demand for awe of the parents, and also, the apotheosis of parental figures to deities acting as warrantors of the moral norms. Amoralism can thus become a form of metaphysical disobedience.

### **Revenge and guilt**

Retaliation can occur, even as an evolutionarily stable strategy, in animals. But in animals it remains bound to the current situation: reports of delayed revenge among ani-

mals are anthropomorphisms. With time-representation, revenge in the true sense is possible. Unlike animals, man must live with the expectation that anyone injured by him may *at some time* retaliate.

This retaliation expected at some uncertain time is an extremely grave cause of anxiety, particularly if it is believed to come from mythological powers retaliating for disobedience of moral norms. The expectation of inevitable but delayed punishment is manifested in the feeling of guilt. In order to reduce the tension of this expectation, actions are often performed that *anticipate* what is feared ("self-punishment"). Moreover, negative experiences (illness, loss, war, natural catastrophes) tend to be interpreted as retaliation for unnoticed personal offenses and hence arouse guilt feelings. Conversely, the interpretation of positive experiences as a reward for personal virtue, such as the (Calvinistic) view of prosperity as a visible sign of personal uprightness, originates in the same source.

### **Exogamy and original sin**

In view of the special role of the theocratic kinship group as a factor compensating for existential anxiety, it is all the more difficult to act in conformance to the emotional aversion against incest. Therefore, particularly strict exogamy rules are necessary to prevent group members from trying to escape existential anxiety by allowing themselves to be devoured by the ogre-mother-goddess Kali. Emancipation from the familiar, however, must not result in the breaking up of cultural tradition. This is no simple task, as the corresponding mechanisms of family dissolution in the animal kingdom entail the serious challenge of parental authority and the discontinuance of all relations.

The tension created by this problem area is probably inescapable. In myth, the unavoidable step of gaining personal maturity is therefore frequently seen as original sin (Adam and Eve, Lucifer, Prometheus).

## **CONCLUSION: MORALITY AS A SELF-REPLICATING MEME COMPLEX**

Dawkins (3) outlines the idea that cultural contents, such as moral norms and their mythological context, which he calls "memes," are propagated in a way that makes them comparable to genes.

## Replication

Memes are structures that can, through imitation, spread from their material carrier (a human brain) to other carriers. Imitation can take place voluntarily, or by suggestion, or simply in response to threat: a meme can be successful just because it is appealing to particularly violent brains which then begin to spread it on crusades.

Similar to genes, which construct organisms to insure their own replication, some mythologies have created a kind of superorganism: the *institutions* of the churches, states, societies, and the like. And just as the archaeologist finds skeletons of organisms which no longer have any genes to pass on, we too may encounter cultural fossils—petrified institutions, or rigid dogmatic skeletons from which the myth has long escaped, but which may persist for hundreds of years until they crumble to dust under the powerful arrival of new, vital ideas.

## Variation

Memes can emerge spontaneously, and they can undergo change at each replication. Variation is an important precondition to evolution: selection needs a rich supply of variants to be able to ensure adjustment and improvement.

To produce variation, memes take advantage of a genetically preformed feature: the autonomy claim of adolescence. Having actually come into being as an incest barrier, the youthful fever of independence, with its disgust at familiar surroundings and its setting out into the world of the unknown, is the appropriate nutrient soil for new ideas. It is therefore, in all cultures, the youth who ensure that old forms are reinfused with new vitality, or destroyed when their time has come.

## Selection

The chance that a meme will be passed on or be forgotten depends upon, among other things, its content. It is aptly stressed by Dawkins that the selection of memes is independent of the selection of genes. There are interactions: memes can have a genetic effect; a society that hangs young thieves breeds honesty. However, it is not a necessary condition for the "success" of a moral norm that it somehow enhances the reproductive chances of the moral individual, let alone of his group. Faulty assumptions of this kind encumbered the older "biological" explanation of the

incest taboo, according to which cultures allowing incest died out due to inbreeding depression.

But what is it that makes a moral idea successful? In genes success depends on "adaptation." What are memes adapted to? Each behavior is based on a complicated interplay of excitatory and inhibitory motives which are accompanied by corresponding affects and feelings. Such affects can be pleasant or unpleasant and the organism behaves in such a way as to seek and secure pleasant affects and avoid unpleasant ones. To this extent his behavior is purposive. The pleasantness of affects is in some way correlated with the reproductive payoff of the behaviors concerned. But the individual knows nothing of this connection, and even if he knew of it he would continue to do the things he likes because he likes them, and not because they perpetuate his genome.

The connection between affective reward and reproductive benefit is only a *statistical* one: behaviors carry the premium of being "pleasant" when the carrying of this premium has frequently enough paid its way in the past. And the premium is then rigidly adjoined to them even when, because of particular conditions, their biological purpose is missed.

*Happiness*, defined as the quintessence of all toward which we strive, is thus an archaic *signal* of reproductive success, but basically one that may be misleading, particularly in man. The acquisition of time-representation has led to dislocations in the realm of emotions: There are behaviors that appear as both duty and trespass, that harbor both happiness and horror; there are impulses with goals to be reached only if one acts against them, and so on. This does not impair the reproductive efficiency of man; but he is expelled from Paradise.

Mythological or moral ideas, then, do not evolve because they promote the physical survival of mankind. They are accepted or rejected according to the degree to which they assist in finding and holding on to points of equilibrium in the paradoxical field of human emotion. When they find their niche in *this* ecology, they then have the chance to endure, the chance that temples and palaces be built for them, virgins consecrated, and human hearts sacrificed in their

honor, the chance that they be immortalized in hymns and carved into the face of rocks, the chance that martyrs bear witness to them, and that missionary conquistadores lay the world in ruin so as to make them triumph in millions of subjugated brains.

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