Constraints on human behavior and the biological nature of man

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The contribution of biology to a better understanding of human legal behavior seems severely limited for three reasons: (I) Since laws are cognitive constructs of the human mind which must be verbalized to become effective, man is the only species in which legal behavior can be studied. All inferences from animal behavior studies and from evolutionary considerations are highly speculative with respect to human legal behavior. (2) In the ontogenetic development of human behavior there is adaptation of the behavior to the environment, including culture. There seems no reliable procedure to factor out their relative contribution, particularly since genetic adaptation can be easily phenocopied. Therefore it is only rarely possible to separate a 'biological' component of human behavior from a 'cultural' one. (3) Most theories pertaining to the evolution of behavior in animals (and more so in man) are 'weak' theories with some retrodictive but little predictive power; they allow us to define probable modes for behavioral averages but say little about the behavior of individuals, which is at issue in legal considerations.

Rules are constraints on the behavior of systems. Rules are *descriptive* if they separate the more probable behavior states from the less probable ones. They are *prescriptive* or *proscriptive* rules or norms if they differentiate between admissible behaviors and forbidden ones. Thus, in applying rules, behavior is first classified and then evaluated with respect either to the probability or the desirability of realization.

Norms or laws are cognitive constructs according to which different actions are classified and evaluated. Therefore, they can be reconstructed from the overt behavior of an organism only with very limited reliability-unless, of course, we can find ways to get access to the mental representations that guide the organism's behavioral decisions. Inasmuch as the characteristics or even the existence of mental representations in non-human beings remain in doubt (Griffin, 1976, 1978, 1982), it seems anything between difficult and futile to address the question of normative behavioral rules in animals. Analyzing the evolution of behavioral rules is, thus, particularly difficult.

Every effort to trace *human* behavioral evolution must be guided by careful consideration of the different processes through which rules can be imposed on behavior. The final outcome-a behavioral action -is the result of a multi-stage constraining process through which a particular activity is selected out of the total universe of behavioral abilities. In the course of evolution to 'higher' forms, there has been an amplification of levels at which constraining or selective influences can be exerted. Man exhibits a high degree of freedom of behavioral' choice-human behavior can be influenced, modified and manipulated throughout life more than that of any other known organism. In parallel with this seemingly limitless capacity for behavioral variability, we find a plentitude of normative rules that constrain behavior: rules that may go to such extremes that nothing is left to be decided by individual discretion. Thus, the human being is every bit as much a slave to its normative representations as any insect is to its genetic program.

This is the first point I want to make: the propensity to legal behavior seems clearly correlated with demolition of such constraints on behavior as we find typically represented in animals. This point is not new (for example, Bonner, 1980), but it needs re-emphasis each time one tries to understand the biological bases of human legal behavior. This correlation points to a crucial fact in the evolution of 'man the rule-maker'. The laborious and precarious effort necessary to constrain man's behavior by norms must have been outweighed by gains in behavioral flexibility and freedom of choice.

However, when one speculates on how 'human nature' constrains moral and legal conduct, one might just be looking at the matter from the wrong angle. It may be that the emphasis would be better placed on the adaptive benefits of being biologically underdetermined and dependent on guiding principles-poorly adapted, but highly adapt- able to, and in need of becoming adapted to, normative rules. The

pre-eminent task of human ethology and social biology would *then* be to find the causes of unleashing man's behavior from genetic constraints rather than to track down any last remnants of biological fetters. It might, in fact, be misguided to look primarily for the biological determinants of legal behavior when our main interest should be the explanation of that remarkable evolutionary process that " leaves, by its very nature, a helpless creature at the mercy of the inventiveness of his fellow beings and his forebears and their capacity to adapt their behavior. Such a process obviously has costs in cultural failures and maladaptations, but those costs may be overridden by the benefits of cultural malleability.

But even if we accept it as our task to search for the biological determinants of norm-related behavior, there is a methodological problem that seriously limits the usefulness of comparative socio-biological models in trying to understand human behavior. If sociobiological reasoning about the biological nature of man means anything at all, it refers to genetic constraints on and specific predispositions toward behavior. More specifically, it must refer to constraints on the behavioral development of the newborn: to epigenetic rules (Lumsden & Wilson, 1981) which owe their existence, if not directly to the individual's genes, then at least to the interaction of genes with external influences on prenatal ontogenesis. In an organism without learning capacity, such an innate endowment would fully specify the possible behavior potentials. But in humans we can (at least theoretically) differentiate between a whole series of constraining and directing influences. Such constraints are, first of all, the blueprint for development contained in the genome of the zygote. The directing influences are represented, second, by prenatal environmental influences on the developing embryo. Post-natally, at a third level, the child is subject to the directing influences of behavior modification in culture-dependent learning situations. At that stage, an immense richness of information is incorporated into the child's behavioral system through imitation learning, conditioning, cognitive self-structuring, and by formal teaching. Through these devices the individual can partake in the traditions of its culture. Thus, within the range of the constraints imposed on the individual by its genes and its prenatal epigenesis, learning cultural traditions further narrows behavioral options. Each culture makes specific selections from the gamut of behavioral possibilities open to a human neonate.

Looking at this process in more detail, we find that no individual can experience the whole range of information at the disposal of any

given culture. Rather, a further selection occurs: the specific culture taken in is constrained by earlier development decisions and also by cultural ideas about what is suitable for one sex or the other, by family structure, social status and parental predilections. Throughout this process" there is an additional source of behavior modification-the individual's personal experiences that are different from those of other members of the same society.

Thus, in a continuous interactive process, there is a complex mixture of genetic, foetal, cultural and personal individualization; the outcome is a unique person with unique patterns of species-typical, culture-typical, and personal capacities, constraints and inclinations.

Finally, during each moment of its life, while actual decisions about particular behavioral actions are being made, the individual decides on the basis of preparation by its genes, its ontogeny and its various learning experiences. The decision also depends on how much time for deliberation is available, on which particular fraction of all this stored information is available, on evaluation of available options and on the risks and benefits to be expected from alternative actions as they are perceived by the deciding ego.

All of these behavior-constraining factors result from selection processes. The specific genetic blueprint has been arranged by means of natural selection during the evolution of a species. The contents of the cultural tradition derive from a history of cultural selections. An individual's personal learning history makes him select particular behaviors and suppress others. And, in a situation that demands immediate decision, the actor selects the most promising alternative.

Ultimately, reproductive (Darwinian) fitness is the major criterion of selection. However, most behavioral actions cannot be immediately evaluated by the individual in terms of Darwinian fitness. Therefore, the individual's behavioral machinery is equipped, either through the genetic program or through traditional and personal experience, with intervening goals and accounting procedures. In the long run, of course, no intervening goals should be retained unless they are positively (or, at least, not negatively) correlated with Darwinian fitness.

In fact, the relationship between intervening goals and ultimate fitness soon becomes very complicated and unpredictable. Even in animals, it is often difficult to assign "adaptive values" (that is, positive fitness correlations) to particular behavioral traits. A large part of sociobiological modeling aims to explain how seemingly unfit, "altruistic", behavior could indirectly enhance the genetic fitness of the performer (Markl, 1980).

In man, conditions are given for all possible indirect ways of gaining fitness in addition to the classical direct one. Therefore, describing the relation between intervening goals and ultimate fitness for many behavioral traits and motivations becomes a prolific exercise in plausible speculation rather than one in presenting convincing evidence. The Panglossian trap is always set: explaining everything that exists as somehow secretly and miraculously profitable to inclusive fitness in the long run. This propensity is even more disconcerting in light of the argument that behavioral mal adaptations in humans are due to their biological past. It should be emphasized that maladaptability in a trait (in the biological sense of the word) has to be quantitatively measured in terms of the bearer's *inclusive fitness* as compared to competitors who do not bear the trait. Only so can maladaptability be regarded as proven. However, man's ways of gaining indirect fitness seem limited only by the fertility of the actors' (or the investigators') imagination. Many allegedly maladaptive behaviors seem to have little direct detrimental effect on man's Darwinian fitness, especially under advanced conditions of medical care, which is the *natural* environment of humankind in an evolved civilization. Therefore, we are still waiting for a demonstration of a biologically imposed behavioral characteristic that is maladaptive because of the changed living conditions of modem civilization. We still cannot point to a trait that makes its bearers suffer from lowered inclusive fitness because of the evolutionary load on their behavior. There seems to be far more convincing evidence of cultural mal- adaptations than of maladaptation in biological programming.

If it is so difficult for an assiduous investigator plausibly to relate intervening goals to ultimate fitness, how much more difficult must it be for the average individual! This may mean that these intervening goals have, by genetic selection or cultural selection or both, been carefully programmed to be positively correlated with ultimate fitness. This is a functionalist credo to which many biologists may want to subscribe (Lumsden & Wilson, 1981). But many social scientists (Luckmann, 1979) may regard it as utterly useless for explaining man's cultural diversity. This state of affairs can, however, also mean that an individual human being's Darwinian fitness counts so little in cultural evolution and in determining the historical success of competing cultures, that the intervening goals of everyday behavior are scarcely under ultimate fitness control at all. Therefore, they are not actually "intervening", but rather have become cultural ends in their own right, pursued for their own benefit, and evaluated in accordance

with standards of cultural fitness that are only remotely kept in check by ultimate Darwinian fitness limitations.

From that perspective, the amazing freedom of action in man can be seen as the result of behavioral organization in which non-cultural causes of fitness are of far less importance than cultural ones. That is to say, postnatal experience rather than prenatal endowment may set the frame for cultural performance. If "biological fitness" differentials are of little influence on "cultural fitness" differentials among members of a society, and if cultural fitness rather than reproductive fertility of its members is what determines a society's capacity for coping with the challenges of life, then we would not expect to find much isomorphic gene-culture matching at all! If that is so, then models from sociobiology or population genetics lose their explanatory power at that stage in human evolution at which cultural fitness began to be predominant over biological fitness. Biological gene pools, which are selected to *outre produce* competing gene pools, would gradually have become subordinate to, perhaps even superseded by, cultures that compete by *out producing* each other in goods, knowledge, ideas and skills. Of course, the gene pools are still there and have to reproduce. But their fitness could become less and less dependent on the primary biological phenotypes of their members and more and more so on the store and tradition of cultural experience of their particular societies.

The direct way to test the limits of biological nature on human behavior would be to discover the constraints on and predispositions for behavior in the human neonate. Raising animals under conditions of stimulus deprivation or stimulus substitution has proved to be the most effective method for animal ethologists to tackle the question of the conditions under which behavioral modification by experience is possible or necessary. For ethical reasons we cannot systematically manipulate the environment of a human child in a similar way. I do not belittle the imaginative efforts of human ethologists in exploring human nature when I add that what we have actually learned about biological constraints on human behavior from studying sensory discrimination, spontaneous or conditioned responsive behavior, vocal or other expressive behavior in normal babies or babies with defined congenital defects (Eibl-Eibesfeldt, 1973, 1979; von Cranach, Foppa, Lepenies & Ploog, 1979) is soberingly little. Such studies have indeed demonstrated that the newly born human is far from being a *tabula raJa* on which experience inscribes the person's future character. The baby is prepared by nature to communicate in an adaptive way with its social environment, especially with its caretakers. It is prepared to

respond to language and to produce human vocal sounds. Above all, it is prepared to construct from its limited experiences, in an orderly step-wise fashion, its world of cognitions and its cognition of the world, as Piaget has demonstrated (Piatelli-Palmarini, 1980).

However, it is just here that the trouble sets in. By constructing this subjective and interior world of cognitive representations, by actively interacting with and probing the outside world, and by developing an ability to perform a variety of rational and emotional operations on these mental representations, the child escapes from the grip of our ethological methods. The older it grows, the more irrevocable its escape-and the more interesting it would be to see how much biological (genetic) program lies behind the different aspects of its behavior. This is *not* a matter of "not yet having found the right techniques to disentangle nature and nurture." If we want to talk at all about real human beings, we have to talk about the constructors and creators of their cognitive selves as an intricate tapestry of interactions between genetic nature and empirical experience. To try to separate the contributions of nature and of learning would be about as sensible as to ask whether the human species is male or female. It is the pattern of the tapestry and not the origin of the threads that makes the person! Therefore, the question of how inborn nature influences norm-related behavior of the adult becomes almost devoid of reasonable meaning.

There will be strong objections to these ideas from many human ethologists and sociobiologists. Don't we have the inferential methods for searching for behavioral universals such as communications rituals (Eibl-Eibesfeldt, 1979) or for demonstrating by cross-cultural and cross-species comparisons that social organization follows sociobiological model predictions, e.g., with respect to the avunculate (Alexander, 1979)? Alas, these methods will not solve the problem.

Neither is it so that genetically programmed behavior must be species-universal. Evolutionary game theory has taught us to see the adaptive potentials of mixing strategies and behavior-genetic polymorphism. Nor is it so that species-universal behavior must be genetically programmed: the ontogeny of bird song, among other studies, has taught us how firm the grip of learned programs can be on a whole population. Nor would the proof of a particular behavior or behavioral organization favoring its producers' inclusive fitness-that is, being demonstrably biologically adaptive-tell us anything about the causal origins of such organization. Who said that cultural tradition or individual experience should result in fitness-detrimental behavior? The potential of phenocopy looms over all inferences from

function to cause. There is no doubt that culture can phenocopy, nature, since all these behavior-guiding mechanisms are selection, processes according to functional outcome criteria.

Pursuing all this, we end with the quaint conclusion that we can recognize a biological adaptation only from a maladaptation under changed living conditions. I have already considered how difficult it seems to prove maladaptiveness of behavior in man-and, after all, biological (genetic) maladaptations too can be nicely phenocopied by culture-traditional maladaptations.

Even if we grant that demonstration of universality- or model- conforming fitness-adaptiveness of a behavioral trait gives us, if not convincing proof, at least plausible indications of agenetic hangover from our animal past, would that be a strong, predictive piece of behavioral theory? Or would it be one that sometimes fits the data and at other times not-that is, a suggestion of low predictive value? I am afraid the latter would be true. The funny thing about most alleged human behavioral universals or adaptive dispositions seems to be that social scientists have little difficulty in coming up with exceptions to the rule. We slide easily from universal and preprogrammed to probable and inclined.

Now, if someone claims that aggressiveness is a human universal, and if this is to mean that some aggressive behavior is highly probable in man under appropriate circumstances, then that is no news. What is *really* interesting about this universal propensity is what makes different people so differently aggressive. The human nature argument states that something *can* occur. But what we want to know is *when* it will occur and when not, and *how* its occurrence can be modified. And that is surely less a matter of preprogrammed nature which sets the range of modifiability than of specific education, individual experience, and previous success-all of which determine specifically where the individual ends up within the total range.

The comparative method of Darwin and Lorenz is undoubtedly a powerful tool of evolutionary investigation for tracing relations between organisms, if the causative mechanisms behind the traits com- pared are principally the same and if we can assume historical continuity between these traits. In other words, if we can regard them as homologous. For many strictly genetically controlled traits in plants and animals, the comparative method is a resounding success. It is no less so for some purely cultural traditions such as those of concern to comparative linguistics. But where there is a complex mix of causative influences which can replace (phenocopy) each other, the method loses grip.

Another pitfall of the comparative method that one must carefully avoid is the assumption that those traits that are common {"universal") to different systems are somehow more fundamental in the sense of important than more recently acquired or restricted characters. The opposite may very well be true if we talk about behavioral adaptations. The universals may just as well be old-fashioned remnants of little importance for the adaptation of a system to its particular environ- mental niche, while specialties may make all the difference for the goodness of this fit and for competitive success. The comparative method, almost by definition, tends to emphasize generalities and to neglect specifics in precise reverse of their actual adaptational importance.

This is not the place to go through the different human behavioral traits in order to weigh the plausible evidence for more or less contribution of “biological nature." I find it difficult to draw strongly nativist conclusions for those human behaviors that involve the participation of our cognitive capacities. Cognitive processes are involved at every step in the evolution of man as the animal with culture. The ability to reify conceptual representations {beginning with the concept of self) and the ability to value such reified representations motivationally in widely varying forms and degrees according to one's cultural socialization, individual experience and insights, are the most interesting behavioral characteristics of man. At the same time, this capacity to create a world of facts and goals of one's own- derived from experience but able to detach itself from outer reality to such a degree as to become virtually a world of independent subjective reality of its own-seems most loosely connected with the "biological nature" from which it undeniably originally derived.

When one tries to define the minimal set of plausible biological dispositions that preform such a cognitive system sufficiently that its imprints can be found in human behavior, one may find only very few of them. Primary among them must be a disposition to define and to value a concept of personal identity and to guard its integrity {Luckmann, 1979). There is the inevitable disposition to construct this identity as one of asexual being-male or female, or even both, but never neuter. Further, there may be a natural inclination always to organize the social surrounding into three circles around the *ego:* one that can be labeled the kin group and often, but not always, comprises the closest biological kin; a second that may be designated the in- group {the set of kin-groups that together make one's band, tribe or nation, one's cultural allies) and beyond that the circle of strangers,

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the foreigners, the out-group people. This three-circled, self-centered organization would not make much sense, unless it were connected with specified behavioral tendencies to treat kin-group and in-group and out-group people differently in various subsistence-relevant aspects. What these aspects and tendencies are, and how they are enacted in behavior, can be subject to great cultural diversity. But from sociobiological theory we would always expect to find a polarity gradient from assistance/cooperation to discrimination/aggression- from the inside to the outside of the circles. This may be part of our natural endowment: to be nepotistic, to make a difference between kin and non-kin, between group-members and group-strangers. Incest avoidance and exogamy could be derived from or grafted upon such a behavioral gradient. I am not sure whether this list of biological minima has to be made very much longer. None of these surmised propensities will functionally develop without environmental, especially social, interactions. They must not be taken as causally determinant tracks, but as facilitated valleys of developmental flow. Nature seems rather to suggest than to prescribe human behavioral development.

I am not convinced that the concept of property (beyond the idea of something being presently under one's control as a kind of extension of one's personal identity) must be based on human nature as these other dispositions have been assumed to be. The same holds for the notions of reciprocity and distributive justice, although it is clear that no human culture can do without them. They could just as well be cultural phenocopies (if the genetical model ever existed) or new inventions that put human social groups on a different level of organization from that of social animals. This is, they may be based on cognitive representations of time, of cause-effect, of rules of conduct and of relations and obligations between oneself and group members.

Whether, on the motivational level, we have to assume anything beyond aversive and rewarding feelings with respect to the basic physiological homeostasis of the body (which by necessity for the baby includes social interactions) and the sexual urge as natural emotional endowment, again seems doubtful to me. It seems possible to derive all other emotional capacities and motivational goals from the action of experience on these basic motivations. However, this may be an oversimplified picture-it may be that more specific basic, unlearned tendencies have to be postulated if we are to arrive at a parsimonious description of such behavioral facts as our inclination to rest undis- turbed, to explore, to dominate, to care for offspring, to communicate

feelings and ideas and skills, to teach and conversely to learn from and imitate other group members.

What can all these deliberations mean for the natural bases of human legal behavior? First, there seems to be very little evidence of specific biological determinants for norm-controlled behavior except for the strong tendency to invent, to expect, to conform to and enforce norms. Since norms are cognitive concepts they can only derive from the interactionary social construction of the self and of interindividual relations. Whether there are any other specific biological constraints on norm-related behavior than the mere fact that nature provides us with a brain that is capable of these cognitive constructions, can be disputed.

Second, one could expect to find some limits to entirely free malleability of norm-related behavior in man where natural dispositions are most probably involved. Thus the value given to one's own personal integrity, the value given to kin-relations (nepotism), the value given to in-group versus out-group people and sex-related propensities should be 'natural' friction areas for legal behavior. Whether property-related or contract-related behavior, or behavior that involves domination, could be expected to be under comparable biological influence, with similar consequences in legal behavior, remains to be seen.

Beyond that, I see little that I can suggest with much confidence as an evolutionary biologist's contribution to the understanding of legal behavior in man. There are a number of more or less suggestive, plausible or frankly speculative ideas that could be contributed from a general sociobiological perspective. However, I doubt that these can marshall any more evidence in their favor than a number of other, competing, theoretical explanations.

Legal behavior has to postulate freedom of behavioral choice. Freedom of behavioral choice demands cognitive representation of the world and selective operations (like thinking) on these representations. This limits the explanatory possibilities of sociobiological, Darwinian modeling of extant human behavior decisively, in spite of the fact that it is certainly called upon to explain how thinking man could have evolved.

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