

stratified, and in circumstances in which there are fewer other social controls (e.g., less family control) and greater "relational" (social, genetic) distances among interactants (e.g., more during interactions between distant relatives, or nonrelatives, and "strangers"), than in the opposite kinds of societies, social groups, and circumstances. Within societies "more" law is directed (or law is directed more often and more effectively) at individuals and groups that are relatively low-ranking, uninfluential, transient, not "respectable," socially marginal, and more distantly related than in the opposite direction.

Black's approach treats law as a singular phenomenon whose traits can be analyzed and generalized. Because law is obviously not without function, and is not independent of the motivations of people, Black's success in locating a small number of general rules, despite the enormous variation in legal systems, suggests that a certain singularity of function, therefore of motivational background, may exist for law as a whole. That is also the argument made in my paper. Moreover, the particular correlates discovered by Black sometimes are the same as those I have emphasized, and his findings seem to support the arguments about the origins and functions of law described in my paper.

Commentary

Sociobiology and Evolving Legal Systems: Response to Richard D. Alexander

Kenneth F. Schaffner

I. Introduction

Professor Alexander's essay is an inquiry into the light that modern construals of Darwinian evolutionary theory can shed on the development and nature of societal laws. Alexander notes that he wishes "to utilize the approach of generalizing and predicting from the process of adaptation as a vehicle for studying human sociality, especially to consider the nature and probable background of societal laws, norms, and traditions" (p. 250).¹ Alexander believes that we *must* pursue this type of inquiry, and he writes "whether we like it or not, . . . we are required to accept that *background explanations for all activities of life including our own behavior, will eventually be found in generalizations deriving from cumulative effects of an inevitable and continuing process of differential reproduction of variants*" (pp. 253-54).

Later on in his essay, after considering various prime movers of human social evolution—a matter to which I shall return in the next section—Alexander makes several most interesting and dramatic claims. "The kind of argument I am making here," he

writes, "cannot fail to be disconcerting, or even bizarre, to many modern scientists, philosophers, and humanists, especially those who are satisfied with their present way of looking at things; it is too novel for anything else to be the case" (p. 261). He adds that he believes that "application of Williams's refinement of Darwinism, as I am attempting to do here, seriously threatens current philosophical thinking at its base and cannot fail to alter dramatically the theoretical underpinning of the social sciences . . . in the sense that interpretations of history, and predictions about the future of humans not yet cognizant of these matters, will be facilitated by this kind of thinking more than by any other aspect of human understanding" (pp. 261-62).

Let us look at the arguments that support this almost imperi-
alistic claim for evolutionary biology.

II. The Outlines of Alexander's Thesis

There is, in my view, a curious dualistic aspect to Professor Alexander's view about the evolution of societal laws. The two components of his evolutionary model for societal laws are not necessarily incompatible, but they are not well harmonized in his presentation. (The two components may even be incoherent, but it is difficult to determine this because the components are characterized in rather vague terminology.)

One component of Alexander's model is the war-balance of power, "prime mover" of human evolution. In the early part of his paper, Alexander reviews all the "benefits" which might accrue to individual organisms as a result of group living. He discerns three such main benefits:

1. predator protection either because of (a) group defense or (b) the opportunity to cause some other individuals to be more available to the predator;
2. nutritional gains when utilizing food such as (a) large game, difficult to capture individually, or (b) clumped food difficult to locate; and,
3. simple crowding on clumped resources. (p. 255)

Benefits are construed as benefits to the individual in line with Alexander's acceptance of George C. Williams's thesis that selec-

tion is at the genic or individual level,² but not at the group level, a point to which I shall return in later sections. Alexander rejects alternatives (2) and (3) and elaborates the concept of predator protection in human groups to include both protection against other human groups and also a balance of power between such groups. What I term the first component of Alexander's model, then, is the premise that a combination of war and balances of power is the prime mover of human evolution.

The second component of Alexander's model is developed in his discussion of societal values and of justice. Here Alexander presents a eudaimonistic descriptive ethics, proposing that what individuals proximately strive for is happiness and pleasure. Evolutionary biological insights, however, tell us that happiness is "an evolved means to an end." Alexander writes that "pleasure and happiness associate with events and stimuli that are beneficial to us in the usual environments of history" (p. 264), and " 'beneficial' is defined, in terms of history, as leading to reproduction, i.e., as leading to genetic survival" (p. 264). Our ultimate interest then, according to Alexander, is in reproduction, and it is in terms of this second component—*reproductive striving*—that Alexander analyzes the evolution of societal laws. Alexander writes that:

The basis for conflicts of interest among individuals—hence the basis for the unresolvability of the question of justice—evidently derives from our history of reproductive competition acting primarily at the individual level. I am saying bluntly that social conflict derives from biological facts. (p. 266)

Alexander then adds another premise—that the main function of societal law is to preserve order and, in the light of the second component of his model, this translates into his interesting claim that "*the function of laws is to regulate and render finite the reproductive strivings of individuals and subgroups within societies, in the interests of preserving unity in the larger group* (all of "society" or the nation-state). Presumably, unity in the larger group feeds back beneficial effects on those segments or units which propose, maintain, adjust, and enforce the laws." (p. 267).

Alexander then goes on to test this hypothesis by looking for correlations between groups and stages of development representing peaks of reproductive striving, and law-breaking behavior.

A very brief section on "Nepotism and Reciprocity" follows in which it is asserted but not argued that "nepotistic behavior toward nondescendant relatives evolves out of parent-offspring interactions, and that reciprocity derives from nepotism" (p. 272). (This derivation is presumably important since it would tie the two general classes of social interaction to an evolutionary biological base of maximizing reproductive self-interest, but I have serious doubts that it can be made.)

The following section traces "Changes in Rules with Development of Nation-States." Alexander acknowledges that this section is indebted to Flannery's account of the rise of the nation-state through the stages from bands to tribes to chiefdoms to states.³ Though I will in general restrict my comments to the next sections, I cannot pass without noting that there is very little in this account laying out detailed examples of rules and relating specific changes in the rules to the twin movers of war-balance of power and of reproductive striving.

Alexander does present a tripartite classification of the laws of nation-states which he believes is explained by the reproductive striving hypothesis. Laws against murders, assault, rape, kidnapping, treason, theft, extortion, and breach of contract are viewed as restrictions which "prevent individuals or groups from too severely interfering with the reproductive success of others" (p. 276). Laws against polygamy, nepotism, tax evasion, draft evasion, and monopolies are construed as restrictions preventing "individuals or groups from too dramatically enhancing their own reproductive success" (p. 276). Finally, laws concerning patents, copyrights, and wills are concerned with promoting "industry and creativity in individuals and groups in ways that may be exploited or plagiarized by the larger collection" (p. 276).

Professor Alexander ends his paper with some comments on his view of the relation between evolutionary biology and normative ethics to which I shall return later after critically analyzing the main argument just outlined.

III. Criticisms of the Main Argument and Its Assumptions

At the beginning of the previous section I noted that what I discerned as the two main components of his model of societal

evolution were both rather vaguely defined and were not well harmonized, in the sense that the two components were not shown working together in a joint explanatory process. To be more specific on the first point, it would appear that the striving-for-reproduction is an active force which is constrained and modified by the other prime mover, the war-balance of power component. Both of these "movers" are extremely general terms, and each presumably admits of multiple forms of realization and interaction. In order to develop a set of concepts that are clearly coherent and sufficiently precise to be incorporated in testable hypotheses, more exact specification of what is meant by reproductive striving and balance of power is required. Otherwise the terms are, I believe, sufficiently vague and elastic to account for almost *any* conceivable historical development of societal laws. The point I want to make here then is that more precision and detail is needed in conceptually clarifying the foundation of Professor Alexander's theory.

The second point I want to consider is the coherence of the two components of (1) war-balance of power, and (2) reproductive striving. In his section on "Group Living and Rules" (pp. 262-63), Professor Alexander suggests that rules (or laws) are introduced because they benefit the individual and the group. After reviewing certain complexities associated with the notion of justice, Alexander concludes that the benefits introduced by laws are a consequence of the law's main function to preserve order, or more specifically, "*to regulate and render finite the reproductive strivings of individuals and subgroups within societies, in the interests of preserving unity in the larger group . . .*" (p. 267).

Now presumably this crucially important, for Alexander, function of law could be related to the prime mover war-balance of power, which would act as a cause or shaper of the law. This, however, is not worked out in any detail in Alexander's essay. In addition, there is no evidence provided that the regulation of the reproductive strivings of individuals and subgroups is increased in circumstances of war or external threats. In point of fact, our intuitions lead us to suspect the reverse. What we seem to have then in Alexander's model are two prime movers which *may* function coherently to account for the rise and modification of law, but which are not shown to do so.

A third point of criticism I want to raise is in connection with two methodological and one substantive premises of Alexander's argument. As noted in Section II above, Alexander has accepted wholeheartedly George C. Williams's thesis that one ought to construct evolutionary arguments in the simplest terms or on the lowest level possible—at the level of the gene or at most the level of the individual. Alexander accepts this methodological assumption as one of his premises—he does not argue for it but refers us to Williams's (and also Lewontin's) work. (In point of fact, however, Lewontin's data only supports selection at the level of the chromosome.)⁴

Now to me, this begs the question in an important way, and I think it also introduces incoherence into Alexander's own view of the evolution of societal laws. I shall come back to this latter point below, but suffice it for now to note that other evolutionary biologists, such as E.O. Wilson, think this methodological assumption of Williams's is too restrictive and not yet proven. Wilson points out in his *Sociobiology* that "group selection and higher levels of organization, however intuitively improbable they may seem, are at least theoretically possible under a wide range of conditions. The goal of investigation (in sociobiology) should not be to advocate the simplest explanation, but rather to enumerate all of the possible explanations improbable as well as likely, and then to devise tests to eliminate some of them."⁵

There is a second methodological assumption in Alexander's approach which I think also needs additional defense. This is his preference for a "singular" or unifactorial explanation of human behavior (p. 260). The only argument given here relies on the (questionable) acceptance of Williams's thesis noted above. Accordingly it would seem that a more sympathetic consideration of multifactorial explanations of social evolution might be warranted.⁶

This point brings me to my comment on the substantive assumption which Alexander makes regarding a combination of war and balance of power as the prime mover of human social evolution. Alexander's summary of possible agents of evolution was partially restricted by his acceptance of Williams's methodological assumption, and further supported by Alexander's preference for a singular explanation. It should be noted,

however, that additional factors to those which Alexander considers have been invoked in the sociobiological literature to account for social evolution. Professor Alexander does not discuss the possibility of sexual selection, of multiplier effects on cultural innovation and in network expansion, or the effect of the development of agriculture. Other writers, for example Adams,⁷ have also preferred more complex multifactorial accounts of the state.

What I am urging here is a more explicit comparative mode of argument than Alexander gives. One *could* rejoin that systematic development of one plausible thesis about the evolution of societal laws is sufficient, but it seems to me not to be the case. For in an area where one is at least initially (1) dealing with vague concepts, (2) proceeding with little control by a general theory—note the lack of *any* population genetics arguments in Alexander's essay, and (3) lacking broad paleontological evidence to serve as an empirical control over speculation, it is methodologically desirable that one should proceed *comparatively*, considering the strengths of alternative theories in offering "as good" or better explanations. It would seem that only in this way can we ferret out the weaker speculative claims and put more effort into conceptually clarifying and seeking additional evidence to test the more plausible approaches.

Let me now return to a point I mentioned briefly above. I suggested that Alexander's view of law might not be coherent with his acceptance of Williams's assumption rejecting group selection. As I noted above on p. 295, Alexander's view of the role of law is "to regulate and render finite the reproductive strivings of individuals." Now if Alexander is willing to admit that the individual is the unit of selection, we must remember that there are *intra*-individual control systems that regulate and render finite the reproductive strivings of an individual's *cells*. When a cell escapes the normal constraints of genetic control (and immunological surveillance), and proliferates in an uncontrolled way, the result is a cancer. The parallel should be obvious. If law regulates individuals in a society, modifying their behavior in significant ways, I do not see that there is not sufficient cohesion of a law-regulated social group that the group can count as an individual in Williams's sense.⁸ To suppose

otherwise is to subscribe to a kind of "beanbag sociobiology," to use a modification of Ernst Mayr's felicitous phrase,⁹ in which only the actions of individual organisms are considered.

This view would, I think, introduce the law as a new, partially emergent factor affecting social evolution. This is not a novel thesis and it has been held by a number of authors, though not by Alexander. It is sufficiently interesting and yet also philosophically troublesome, because of the complexities of the notion of "emergence."

IV. Emergent Social Evolution?

It has often been suggested that human evolution over the last hundred thousand years or so is strongly conditioned by cultural factors which are importantly decoupled from their biological base. The late eminent geneticist, Dobzhansky, for example, wrote in 1963 that:

Culture is not inherited through genes—in a sense human genes have surrendered their primacy in human evolution to an entirely new non-biological or superorganic agent, culture. However, it should not be forgotten that this agent is entirely dependent on the human genotype.¹⁰

Now I would like to argue by analogy with the relation between chemistry and biology, that we should give serious consideration to the view that cultural evolution involves a set of interactions *originally arising out of a biologically determined ground*, but which has for a long period been severely *under-determined* by purely biological principles. The biological under-determination is sufficiently extensive, I would speculate, that we will obtain at best very partial explanations of social evolution by sociobiology in its purely biological aspects.

Now I advance this qualified emergentist thesis as a speculative one—as one alternative to a biological determinism. To make it plausible let me turn to a discussion of the parallel with DNA, genes, and chromosomes.

The "qualified emergentism" which I should like to urge is based on an analogy with the relation of biology to chemistry. In

1967 Michael Polanyi¹¹ and I¹² independently advanced the thesis that "boundary conditions" (Polanyi) or "initial conditions" (Schaffner) in extant biological systems caused problems for reduction. Briefly put, these initial conditions describe the *organization* of the chemical components—and this organization is not dictated by purely chemical constraints except as those constraints are provided by templates given by already living systems. An example from molecular genetics may help in making the point clear. From a *purely chemical* perspective, there are no constraints on the sequence of DNA nucleotides, namely of adenine (A), thymine (T), cytosine (C) and guanine (G) on a single strand of a DNA helix. The sequence CAATG . . . is as chemically stable as GCGAT . . . , or any other such sequence. This was noted by Watson and Crick in their original paper on the double helix structure for DNA, where they wrote, "The sequence of bases on a single chain does not appear to be restricted in any way."¹³ Specific sequences of DNA daughter molecules are, however, dictated by the (complementary) sequence of the parent strands: the parent strands serve as templates for the synthesis of specific sequences of nucleotides which in strings of several hundred nucleotides constitute genes. (The genes are further combined into chromosomes.) The organization that constitutes the organism's genome then "supervenes" on the simple chemical rules governing DNA sequences, even though the organization is stable in chemical terms.

Polanyi and I drew radically different implications from the existence of this organization, he seeing a series of levels of irreducible organizing principles which harnessed the underlying material. I, on the other hand, saw the need for a *chemical* evolutionary theory to explain reductionistically the historical genesis of these supra-chemical constraints.¹⁴ Subsequent discussion with Polanyi did not lead to a resolution of these divergent interpretations: he seemed to distrust Darwinian evolution in general and chemical evolution in particular.

I would now like to suggest that something analogous to the relation between biology and chemistry is at work in the relation between sociocultural disciplines and the biological sciences. The conclusion of the argument is that we must take sociocultural organizing principles as at present given, and that these, from a

current point of view, "supervene" on the basic biological systems including behavioral dispositions. One crucially important set of such sociocultural organizing principles is the set of *laws* that regulate societies. The stages of my argument are that (1) evolutionary explanations in biological terms i.e., in genetic, phenotypic, and selection pressure terms, are only partially reconstructable. Fossil records are fragmentary and behavior traits do not leave strong paleontological traces. (2) Social organizations of organisms are likely due to a combination of genetic determinism and stochastic behavioral innovations which can become fixed by mimicry, and these innovations can in turn exercise an important influence on the evolutionary adaptability of populations. These innovations thus can result in sociocultural modifications which, because of both their stochastic origin and the gappiness of the evolutionary record, are best treated or characterized in sociocultural terms, conditioned, but not fully determined in purely biological terms by the underlying biological systems. (3) Sociocultural evolution should accordingly be treated as a set of forces partially decoupled from the biological base. Explanations of a group's behavior may well involve both sociocultural factors and biological factors, but from what is possible on the basis of currently available information (and I think all information available in the future), one must utilize this dual, nonreductionist approach in accounting for social evolution. This view bears some resemblance to what Edward Wilson has termed, following earlier ideas of Pringle, Bateson, Skinner, Levins, and others, a partially decoupled hierarchical tracking system.¹⁵

This dual nonreductionistic approach is functionally equivalent to a qualified emergentism. The emergentism is qualified for two reasons. First, if the *complete* evolutionary record were available, then I would be disposed toward the likelihood that the behavior of humans in society could be explained as a consequence of evolution operating over millions (if not billions) of years. Second, the emergentism is qualified because even in the absence of the complete evolutionary record, the view outlined here does not argue against the *in principle* reducibility of human behavior (including sociocultural behavior) to physics and chemistry, when the extraordinarily complex physicochemical initial conditions are

added to the reducing science's general laws, models, and theories.

V. Evolutionary Biology and Normative Ethics

In this last section of my comments, I would like to respond to some of the provocative ideas which Professor Alexander advances concerning the relation between his view of evolutionary biology and normative ethics.

It strikes me that Alexander is taking both a too pessimistic and a too optimistic view of the implications of an evolutionary theory of ethics. He suggests that humans are "sufficiently plastic in their behavior to accomplish almost *whatever they wish*" (pp. 277-78). This is too optimistic—the thesis is not defended and anyone but the most complacent conservative would, I think, dispute it. Genetic and social inertia are powerful constraints on the plasticity of behavior.

This is also why I think Alexander is too pessimistic in his view of the irrelevance of evolutionary biology for normative ethics. Though I have severe doubts about the current state of the intellectual credentials of a sociobiology extended to human behavior, in principle sociobiology could tell us important facts about human disposition and potentialities. A theory in normative ethics is rarely if ever fully insulated from factual implications. The consequences of eliminating "pleasure" from utilitarian theories,¹⁶ for example, should suggest that there are interactions between ethical theories and at least a philosophical anthropology with partial factual pretensions.

Evolutionary biology might also help normative ethics because it may provide deeper and more far-ranging explanations of human behavior than explanation in terms of motivation by "proximate rewards." Alexander thinks that "proximate rewards" are the basis of normative ethics. A deontologist such as Kant would question this,¹⁷ but I believe that even a deontologist who was not committed to an a priori ethical theory would find a potentially deeper knowledge of the behavior of humans and groups of humans helpfully relevant to formulating an ethical theory.

NOTES

1. Page references given in text are to Professor Alexander's essay in this volume.
2. G.C. Williams, *Adaptation and Natural Selection* (Princeton: Princeton University Press, 1966).
3. K.V. Flannery, "The Cultural Evolution of Civilizations," *Annual Review of Ecology and Systematics*, 3 (1972): 399-426.
4. Alexander cites G.C. Williams, *Adaptation and Natural Selection*, and R.C. Lewontin, "The Units of Selection," *Annual Review of Ecology and Systematics* 1 (1970): 1-18. But see I. Franklin and R.C. Lewontin, "Is the Gene the Unit of Selection?" *Genetics*, 65: 707-35, and R.C. Lewontin *The Genetic Basis of Evolutionary Change* (New York: Columbia University Press, 1974), esp. chap. 6, for data and arguments implicating the whole chromosome as the unit of selection.
5. E.O. Wilson, *Sociobiology: The New Synthesis* (Cambridge: Harvard University Press, 1975), p. 30.
6. In fairness to Alexander, it should be pointed out that in footnote twelve of his essay he admits that other factors in addition to the war-balance of power "prime mover" may affect social evolution. He views these factors as secondary, however, which exert some rather small influences on the main balance of power factor.
7. R. McC. Adams, *The Evolution of Urban Society* (Chicago: Aldine Publishing Co., 1966).
8. For a discussion of a related notion of species as individuals see M.T. Ghiselin, "A Radical Solution to the Species Problem," *Systematic Zoology* 23 (1975): 536-44 and L. Van Valen, "Individualistic Classes," *Philosophy of Science*, 43 (1976): 539-41.
9. See E. Mayr, "The Unity of the Genotype," *Biologisches Zentralblatt*, 94 (1975): 377-88, as quoted by Alexander, in footnote five of his essay.
10. T. Dobzhansky, "Anthropology and the Natural Sciences—The Problem of Human Evolution," *Current Anthropology* 4 (1963): 146-48.
11. M. Polanyi, "Life Transcending Physics and Chemistry," *Chemical Engineering News* 45 (1967): 54-7.
12. K.F. Schaffner, "Antireductionism and Molecular Biology," *Science* 157 (1967): 644-47.
13. J.S. Watson and F.H.C. Crick, "A Structure for Deoxyribose Nucleic Acid," *Nature* 17 (1953): 737.

14. K.F. Schaffner, "Chemical Systems and Chemical Evolution," *American Scientist* 57 (1969): 410-20.
15. Cf. Wilson, *Sociobiology*, chaps. 7 and 27.
16. Cf. J.S. Mill, *Utilitarianism* (London: Longmans, 1907).
17. Cf. I. Kant, *Foundations of the Metaphysic of Morals: Text and Critical Essays*, ed. Robert P. Wolff. (New York: Bobbs-Merrill, 1969) [originally published in 1785].

Richard D. Anderson

**Volume III
The Foundations of Ethics
and Its Relationship
to Science**

Morals Science and Sociality

**Edited by
H. Tristram Engelhardt, Jr.
and Daniel Callahan**

THE HASTINGS CENTER
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Morals, Science, + Society
ed. H.T. Engelhardt, Jr.
D. Callahan.

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