

ON THE CONFLICTS BETWEEN BIOLOGICAL AND SOCIAL EVOLUTION AND BETWEEN PSYCHOLOGY AND MORAL TRADITION

by *Donald T. Campbell*

A major thesis of this address is that present-day psychology and psychiatry in all their major forms are more hostile to the inhibitory messages of traditional religious moralizing than is scientifically justified.

Within this thesis, one background argument not stressed in this article is that in the areas of disagreement (as to how people should live their lives, child rearing, sex, duty, guilt, sin, self-indulgence, etc.) we are unable to experiment or in other ways to put well-developed theories to rigorous test. On these issues, psychology and psychiatry cannot yet claim to be truly scientific and thus have special reasons for modesty and caution in undermining traditional belief systems.

An argument that receives more attention has to do with the possible sources of validity in recipes for living that have been evolved,

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Campbell writes: "The honor of being elected to the presidency of the American Psychological Association is more than sufficient to create an ambivalence about one's presidential address. To begin with, the odds are against coming up with a speech of sufficient quality to rejustify the honor. In my case there is also an additional problem of consistency in self-presentation. I like to believe that the image which justified my election is that of a hardheaded methodologist, trying to bring to social field research some of the rigor of laboratory experimentation, albeit with informed sympathy for the situational problems that usually preclude this. An address in this area would have been more appropriate. Unfortunately, in this area my store of unsaid things worth saying is temporarily exhausted. Such an address would have had to have been just one more rehash of a point of view I have already shared with you several times under titles such as 'Reforms as Experiments' [*American Psychologist* 24 (1969): 409-29], 'Methods for the Experimenting Society' [paper presented at the meeting of the American Psychological Association, Washington, D.C., September 1971], and 'Assessing the Impact of Planned

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tested, and winnowed through hundreds of generations of human social history. On purely scientific grounds, these recipes for living might be regarded as better tested than the best of psychology's and psychiatry's speculations on how lives should be lived. This argument comes from a natural-selectionist theory of social evolution and is taken up in the first section of the article to follow.

A further argument draws on biological evolution, in particular on an issue that current evolutionary geneticists discuss under the terms "group selection" and "genetics of altruism," to support a thesis about basic biological human nature that is in agreement with traditional religious moral teachings. The religions of all ancient urban civilizations (as independently developed in China, India, Mesopotamia, Egypt, Mexico, and Peru) taught that many aspects of human nature need to be curbed if optimal social coordination is to be achieved, for example, selfishness, pride, greed, dishonesty, covetousness, cowardice, lust, wrath. Psychology and psychiatry, on the other hand, not only describe man as selfishly motivated but implicitly or explicitly teach that he ought to be so. They tend to see repression and inhibition of individual impulse as undesirable and see all guilt as a dysfunctional neurotic blight created by cruel child rearing and a needlessly repressive society. They further recommend that we accept our biological and psychological impulses as good and seek pleasure rather than enchain ourselves with duty.

If this article is to be a scolding of my fellow psychologists for excessive and unjustified iconoclasm, its contribution to the preservation of social values may be undermined by the fact that I myself am

Social Change' [in *Social Research and Public Policies*, ed. G. M. Lyons (Hanover, N.H.: Dartmouth College, Public Affairs Center, 1975)].

"The lack of new things to say in this area supported a temptation to give a broad-brush speculative talk dealing with human nature in very general terms and asserting a common bias in present-day psychology's diverse approaches. The theoretical skeleton for this address comes from a long-standing, avocational interest in evolutionary theory [see his "Adaptive Behavior from Random Response," *Behavioral Science* 1 (1956): 105-10; "Perception as Substitute Trial and Error," *Psychological Review* 63 (1956): 330-42; "Methodological Suggestions from a Comparative Psychology of Knowledge Processes," *Inquiry* 2 (1959): 152-82; "Blind Variation and Selective Retention in Creative Thought as in Other Knowledge Processes," *Psychological Review* 67 (1960): 380-400; see also his articles cited in nn. 11, 5, 17, and 97 below]. But, while it may introduce some of you to the exciting and controversial new area of sociobiology, I cannot claim this as an area of genuine professional competence.

"The role-image conflict is severe. Whereas in 'Methods for the Experimenting Society' I am future oriented, reformist, and on the social science edge of psychology, in this address I emphasize respect for tradition and a concern for the roots of human nature in biological evolution. You are hereby warned—this address is not hardheaded science but an exercise in quasi-scientific speculation. Here are no facts to depend on but at best provocations about new areas of scientific concern to which psychology should attend."

forced to adopt an iconoclastic approach. On the grounds of deep intellectual conviction, I speak from a scientific, physicalistic (materialistic) world view. The evolutionary theory I employ is a hard-line neo-Darwinian one for both biological and social evolution, the slogan being "blind variation and systematic selective retention." Generally speaking, my orientation would have to be called reductionistic, although I do reject "microparticulate reductionism" and accept the limited emergentist principle that laws of biology, psychology, and sociology exist which are not described by the laws of physics and inorganic chemistry. These "emergent" laws are compatible with the laws of physics and chemistry but not derivable from them. I also accept a kind of "downward causation" from higher levels of organization to lower levels, where natural selection operates at a higher level. I do recommend that scientists cultivate an awe for the as yet not understood wonders that biological and social evolution may have produced. But I reject teleological or supernatural explanations for these teleonomic facts.¹ Moreover, I qualify my "respect-for-tradition" argument by emphasizing that the wisdom produced by evolutionary processes (biological or social) is wisdom about past worlds. If there are grounds for believing that the relevant aspects of those worlds have changed, past adaptations may now be judged to be maladaptive.

THE CASE FOR SOCIOCULTURAL EVOLUTION

By sociocultural evolution I mean, at a minimum, a *selective* cumulation of skills, technologies, recipes, beliefs, customs, organizational structures, and the like, retained through purely social modes of transmission rather than in the genes. Given a stability in the selective system, the cumulated culture and social system will become more and more adapted to the selective system. If different social systems are adapting to different ecologies, then divergent speciation will occur. If there are general principles of organizational effectiveness, as in the division of labor, then quite independent streams of social cumulation may be shaped by this common selective system so that these streams converge on similar structures, moving from simple social systems to complex social systems along parallel routes.

By 1900 a belief in such a social evolution totally dominated sociological and anthropological thinking in Europe and America, shared by pacifist thinkers and militarists, by capitalist theorists and socialists.² This school of thought was under way before Darwin's *Origin of Species* but received a great boost from it.³ H. S. Maine, E. B. Tylor, Herbert Spencer, and L. H. Morgan are but a few leading representatives of a great many other contemporaries and disciples.⁴

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This dominant fad soon ebbed, along with the social Darwinists' emphasis on the social policy implications of biological evolution. By 1930 this fad was essentially extinguished in sociology, anthropology, political science, and psychology.⁵

Today such theories are coming back very strongly in anthropology.⁶ This revival even includes students of Franz Boas, who led in the dethronement of evolution, such as Margaret Mead and A. L. Kroeber, although Kroeber had never followed Boas on social evolution as he had in rejecting evolutionary racism.⁷ The new tide is also present in sociology, although less strongly.⁸ Similar trends are present in political science.⁹ In all of this, social evolution is seen as a separate process from biological evolution, although made possible by it, as in the innate capacity for language, memory, and perhaps group-affiliative tendencies. A number of modern evolutionary biologists have stressed the importance of social custom cumulation and the biological survival value of biological developments making sociocultural evolution possible.¹⁰ (There is also a parallel rise in social science attention to the social implications of biological evolution which I deal with below.)

In my judgment the case for social evolution is so strong that psychologists should take it very seriously. In considering human behavioral dispositions we should attend not only to the biological sources of behavioral tendencies—and not only to the person's own past history of reinforcement—but also to the culturally inherited baggage of dispositions, transmitted by example, indoctrination, and culturally provided limitation on perspectives and opportunities. On evolutionary grounds this cultural inheritance can be regarded as adaptive and treated with respect. Note that an evolutionary biologist, when encountering some ludicrous and puzzling form of animal life, approaches it with a kind of awe, certain that behind the bizarre form lies a functional wisdom that he has yet to understand. I believe the case for sociocultural evolution is so strong that psychologists and other social scientists, when considering an apparently bizarre, incomprehensible feature of their own social tradition or that of another culture, should approach it with a similar awe, expecting that, when eventually understood, when our theories have caught up with it, that seemingly bizarre superstition will turn out to make adaptive sense. I find such an attitude totally missing in psychology and psychiatry today. Instead, our fields are apt to invoke tradition and religious heritage only to explain malfunctions, be it neurotic individual guilt or collective social prejudice. (When one considers the theory of sociocultural evolution in more detail, it becomes clear that what psychologists should show toward tradition is a grudging, skep-

tical respect rather than a gullible awe. Nonetheless, even this would be far more respect than is now being given.)

My own fascination with evolutionary theory is centered around the general model for adaptive processes illustrated in natural selection. I date this fascination from my reading in 1952 of W. R. Ashby's *Design for a Brain*, in which the formal analogy between natural selection and trial-and-error learning is made clear.¹¹ Since then I have traced this point back to J. M. Baldwin and many others and indeed have discovered it very clearly stated in my notes from Egon Brunswik's lectures of 1939, attributed to Karl Bühler.¹² I have come to the conclusion that this model—which I summarize as “blind variation and systematic selective retention”—is the only and all-purpose explanation for the achievement of fit between systems and for the achievement and maintenance of counterentropic form and order.

Most of the treatments of sociocultural evolution—both nineteenth century and modern—pay no attention to natural selection analogues in the process of social evolution. (The uneven works of A. G. Keller and T. N. Carver are exceptions.)¹³ These early social evolutionists originally borrowed imagery from embryology rather than from biological speciation, as illustrated in the use of the word “survival” for nonadaptive vestigial features and in Spencer's law of development from an “indefinite, incoherent homogeneity to a definite coherent heterogeneity.”¹⁴ Still more commonly, sociocultural evolutionary studies are descriptive of the course of human social development without attention to the mechanisms that would make an adaptive evolutionary progress possible. So much is this so that my own brief effort is still the most complete treatment of socioevolutionary mechanisms available.¹⁵

When we look at the three basic requirements (variation, selection, and retention), the first, variation, seems unproblematic in the case of social evolution. No doubt there has always been a sufficient raw dross of both haphazard and “intelligent” variations on the social tradition to provide the “mutations” or “trials” the process requires, imperfect transmissions of the tradition being only one source. Selective systems are another matter. The social-evolutionary sequences in human tool and weapon development probably provide the most convincing evidence of continual progress in social evolution. For such developmental sequences, the selective systems involved in individual learning may be adequate without invoking any social or group-level selective process. For tools and weapons, the physical environment participates rather directly in the selective system, as it does in biological evolution, and the superiority of one manufacturing custom over another may be perceptually “obvious.”

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Establishing the social-evolutionary case for tools, weapons, or even medicines does not necessarily make it plausible that social system features such as rules of social organization, inhibitory moral norms, and beliefs in transcendent gods have been subject to a systematic selection process that would have produced an evolutionary sequence of steadily improved functional adequacy. For this, it is necessary to make a plausible case for selection at the social system level. Such selective systems need not, of course, involve the biological death of group members at all. Since time immemorial, human populations have continually been reorganized under different organizational systems with different beliefs and customs. In this flux there may well have been a selective retention of organizational principles and ideologies, independent of the fate of individuals, if these organizational forms and belief systems contributed to the social system functionality as expressed in the conquest and conversion of other peoples.

Even without conquest, groups are continually borrowing ideology and organizational skills from other groups. This, too, provides an adaptive selection if the more prosperous and effective social groups are the more imitated and if the beliefs and organizational principles borrowed have contributed in fact to the adequacy of the group being imitated. Such processes need much more specification and can obviously go wrong. Imitation of the apparently successful involves a "vicarious selector" rather than direct selection by the laws of optimal social organization.¹⁶ Nonetheless, I am convinced that in past human history an adaptive social evolution of organizational principles, moral norms, and transcendent belief systems took place. Instances of independent but convergent evolution help make the case for systematic selection systems that are not directly observable. In the case of a complex division-of-labor, urban, apartment-house, stored-food society, this has independently occurred for human beings a half dozen times, ranging from ancient Mexico and Peru to ancient China. Something quite similar has occurred twelve separate times among the social insects. I take these collectively as evidence of a set of laws of social organization, of achieving complex social coordination and collective purpose on the part of multiple discrete actors, which social scientists as yet incompletely understand. The selective advantages no doubt include economies through information sharing (all the social insects have functional equivalents of language much more effective than those of any subhuman vertebrate), economy of work specialization through the division of labor, and mutual defense. For human urban systems, the adaptive value of preserving effective technology traditions must be added.

For a social evolution to have taken place, the selective system must

have operated consistently over extended periods of time, for hundreds and hundreds of years. Adaptive evolution is a negative feedback steering device and therefore works best when the evolving social organization is a small part of the total environment, so that variations in the social organization do not substantially change the selective system, that is, the overall environment. It is on these grounds that one might well doubt that any adaptive social evolution is going on at the level of nations today. Major nations are so few in number and so much the dominant part of one another's environment that each variation initiated by one nation may fundamentally change the overall system, thus altering the selective system and creating something closer to a runaway positive feedback rather than a stabilizing negative feedback.

This is perhaps also the place to mention the truism that the wisdom produced by any evolutionary system is always wisdom about past worlds, a fittedness to past selective systems. If those worlds have changed, the adaptations may no longer be useful, may in fact have become harmful. Because we social scientists still imperfectly understand the selective system laws underlying past social evolution, it is hard for us to be certain when such changes occur. With this caution in mind, let me assert my judgment that the invention of modern military weaponry and related developments have outmoded ethnocentric military patriotism, a universal social-evolutionary product.¹⁷ My judgment that the great bulk of other social system adaptations is still valid is, of course, also questionable. But even a recognition that the puzzling products of tradition have been adaptive in the past would represent a great deal more respect for tradition than now exists and, through this, an improvement in the scientific validity of assessments of religious traditions by psychology and psychiatry.

So much for the requirement of selection. The third essential—retention and duplication—is also more problematic for social than for biological evolution. What are required are mechanisms for loyally reproducing the selected variations. For biological evolution, today we have an impressive if incomplete understanding of the intricate, integrated rigidities of the genetic code, of nucleic acid templates for protein types, of the double-helix machinery for loyal gene duplication, of the elaborate maypole spindle dance of the chromosomes in meiotic and mitotic cell division. No such exquisitely rigid conservation machinery is recognizable for social evolution. Yet, through social mechanisms of child socialization, reward and punishment, socially restricted learning opportunities, identification, imitation, emulation, indoctrination into tribal ideologies, language and linguistic

meaning systems, conformity pressures, social authority systems, and the like, it seems reasonable to me that sufficient retention machinery exists for a social evolution of adaptive social belief systems and organizational principles to have taken place in addition to the less problematic social evolution of technological devices.

The mechanisms making possible such a social retention system would themselves be a product of biological and social evolution. C. H. Waddington argues that biological evolution has predisposed children of the preadolescent latency period to be eager orthodoxy absorbers.¹⁸ The biological evolutionary developments making possible language are of obvious importance, leading human beings to be reared in a pervasive conversational environment of linguistic meanings which precategory much of the physical environment.¹⁹ Are there perhaps also biological tendencies toward gregariousness, fear of ostracism, social conformity, and the like, furthering cultural cumulation? This is a moot point to be discussed more in detail in a subsequent section. But, whether social or biological evolution is behind them, such tendencies obviously provide retention systems in social evolution.

To get a proper perspective on such mechanisms, it is well to remember that natural selection describes a process by which stupid, blind, unforesightful processes can produce adaptive wisdom. Just as human and octopus eyes have a functional wisdom of which none of the participating cells or genes has ever had self-conscious awareness, so in social evolution we can contemplate a process in which adaptive belief systems, which none of the innovators, transmitters, or participants properly understood, can be accumulated—a tradition wiser than any of the persons transmitting it. We can imagine such a system operating in ancient Egypt, India, or Mexico, among superstitious populations dominated by priests equally ignorant of the true adaptive functions of the belief systems they perpetuated. For a natural-selection type of sociocultural evolution to work, the retention system must be capable of perpetuating uncomprehended functional recipes. The retention system must operate, as in biological evolution, by perpetuating everything it receives from the edited past. Inevitably, this includes a lot of noise, maladaptive mutations, and chaff, along with the selected kernels of wisdom. The retention system, not being omniscient, is powerless to tell dross from gold. It must dutifully hang on to both.

Such a perspective on social-evolutionary retention mechanisms should make my fellow social psychologists much more sympathetic than they now are to aspects of human nature now seen as weaknesses. Conformity or suggestibility to majorities and prestige figures has

been extensively studied from the beginnings of experimental social psychology, but almost always as a popular character weakness.²⁰ Only in S. E. Asch does gullibility become a virtue as socially essential as honesty, "conformity" being interpreted as "trust."²¹ Such a universal tendency for conformity to the opinions of others may be essential to an adaptive social custom cumulation. Not only do individual tendencies to conform to others work in this direction, but also do the tendencies documented by L. Festinger for group members to put the most conformity pressure on those group members most deviant and the tendency to reject with more hostility former group members who defect than those who never were group members.²² This is true also for obedience to authority.²³

Seen in this light, we psychologists should also have more sympathy for the fanatical conformity pressures that adults put on children and groups put on their members on nonfunctional items such as hair and clothing style. As I have said, for the mechanism to have worked as the retention part of a natural-selection adaptive device, the mechanism had to operate blindly without regard to apparent functionality. (The group-level functionality of otherwise nonfunctional symbols of group uniqueness, of groups being homogeneously different for difference's sake, is something that would need analysis in a more expanded treatment.) In this light, we psychologists should also be more sympathetic to a socially useful, age-specific role, if one exists, for women past child-bearing age to become tradition-enforcing, moralizing scolds, instead of interpreting this as a dysfunctional, neurotic reaction formation.

Too strong a retention mechanism, of course, jeopardizes the production of variations and thereby jeopardizes further evolution. Too much variation also jeopardizes retention. For an adaptive evolution to have taken place, some kind of compromise had to exist. Where the optimal compromise exists for modern man is going to be very hard for us to estimate because we lack the total system knowledge that would be required to make that determination. I myself am ambivalent on this issue. I have criticized Konrad Lorenz for playing too one-sidedly the roles of tradition-enforcing scold and rejecter of countercultural deviants in his recent popular essays.²⁴ On the other hand, when addressed to most psychologists, my message is a plea to recognize some adaptive value in tradition-perpetuating mechanisms and in the traditions they perpetuate, adaptive values probably going far beyond our present social-scientific understanding. If we give credence to the past existence of an adaptive sociocultural evolution, we can have at least some sympathy with Lorenz's cry of alarm when he thinks he sees a whole generation of young people who do not want to

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grow up to be like their parents and who thus may fail to transmit a precious treasury of adaptive recipes for living of whose total value we are at present unaware.²⁵

A biological analogy may help. On a superficial understanding of the value of mutations in biological evolution one might expect evolutionary geneticists to favor anything that would increase the mutation rate, such as X-ray diagnosis and atomic weapons testing, because this would provide new raw material for further and more rapid evolutionary progress. In fact, the reaction of the evolutionary geneticists has been the opposite—they have uniformly opposed anything that increases the mutation rate. In their judgment there is plenty of variation already available; what is in jeopardy is the retention of the already selected and accumulated treasure of intricate adaptations. The degree of complexity of the adaptation already achieved makes a difference in where the variation/retention compromise is drawn. The more complex the adaptation, the more likely that any change or mutation will be deleterious (holding the selective system constant). Over 99 percent of biological mutations can be estimated to be maladaptive or neutral.

Over the course of social evolution, until very recently, it was no doubt the case that the more complex the civilization, the stronger the conformity pressures, the longer the apprenticeships, and the more punishment systems preventing a craftsman from leaving his specialty. The first British social evolutionists were properly impressed with the case of India, where the extreme conformity pressure that had made possible a great urban civilization had become a handicap in adapting to a new selective system. Phrases like “the dead hand of the past” and “the cake of custom” epitomize this perspective.²⁶ Since the industrial revolution and the invention of the printing press, there has been a reversal of this trend for the technological aspects of social evolution. Increased technological complexity has been accompanied by reduced conformity pressure, shorter apprenticeships, and immeasurably greater freedom to change jobs. This is in part because so much of the cumulated technological wisdom is now embodied in industrial machines rather than in individual memories. These machines become a readily learnable part of the physical environment, whereas the corresponding previous wisdom storage was in less tangible cultural and mental processes. Printed instructions and illustrations and the widespread ability to read no doubt also contributed to this reversal of trend. For these aspects of adaptive cultural cumulation, the new retention mechanisms no doubt have reduced the need for strong tradition-enforcing mechanisms, increasing the system’s tolerance of variation.

Has a similar reversal of trend on conformity pressure taken place for the other aspects of sociocultural evolution, those that have to do with social coordination, organizational structure, moral norms optimizing group effectiveness, belief systems generating commitment to collective goals? The problem needs thorough study (as indeed does my sketch for technological development). At present I see no equivalent substitute retention system, and this gives me sympathy for that too much despised social evolutionist, Spencer (who incidentally also was a democratic pacifist and vigorous antimilitarist), when he says:

The establishment of rules of right conduct on a scientific basis is a pressing need. Now that moral injunctions are losing the authority given by their supposed sacred origin, the secularization of morals is becoming imperative. Few things can happen more disastrous than the decay and death of a regulative system no longer fit, before another and fitter regulative system has grown up to replace it. Most of those who reject the current creed, appear to assume that the controlling agency furnished by it may safely be thrown aside, and the vacancy left unfilled by any other controlling agency. Meanwhile, those who defend the current creed allege that in the absence of the guidance it yields, no guidance can exist: divine commandments they think the only possible guides.²⁷

Of course, this must be tempered by our judgment as to how much the world adapted to—the selective system—has actually changed in regard to these matters. And, on still another hand, we must consider whether selection for social-cultural optimization (as opposed to individual optimization) is still taking place. (Although I clearly believe it once did, there are those who doubt this, too.)

Not only Spencer but many others produced sociocultural evolutionary analyses of morality, many of sufficient subtlety to be worth rereading today by anyone convinced that an adaptive sociocultural evolution of moral exhortations has taken place.²⁸ All of these analyses assume that morality systems exist to optimize collective social interests in addition to or rather than individual interests. Their speculations on the social functions of various moral injunctions may still be of value. All justified a set of morals nearly identical to those of contemporary religion, although some scolded the cruelty of religious moral teaching methods and the ineffectuality produced through unrealistically high and absolutistic demands.²⁹ All assume a steady progress in the quality of moral systems, including increased equalitarianism and universality, without specifying what conceivable selective system would have made this an improved adaptation (a weakness shared to a considerable extent by this paper). Indeed, many social evolutionists implied that popular individual acceptance

of new religious beliefs will be automatically accompanied by a higher morality; most also implied that, once a social-evolutionary scientific ethical system was available, individuals would adopt it out of an enlightened self-interest—two features that the present article finds cause to doubt.³⁰ A number of the analyses contain extensive and still valuable data on historical and cross-cultural morality system, emphasizing the great diversity and change.³¹ These social-evolutionary ethical theories have been astutely criticized by T. H. Huxley primarily on biological evolutionary grounds and in considerable extent defended by Julian Huxley through a renewed emphasis on social evolution.³²

W.S. Quillian and Antony Flew have produced recent philosophical reviews of the evolutionary ethics literature—biological and social.³³ These reviews are useful, although from the present perspective needlessly negative, because they accuse evolutionary ethics of failing to provide logical grounds for imperative moral norms, a failing shared with all other ethical theories! My own interests and those of most evolutionary ethicists are properly called descriptive and in these two ways: descriptive of the moral and ethical standards that various cultures past and present have exhorted their members to live up to; and hypothetically descriptive of laws of social organization, including optimal modes of individual behavior for optimizing collective goals. The second meaning could be translated as a science of ethics, were the term not pretentious, considering the state of the field. If perfected, the science could produce derivative normative ethics or mediational ethics. It could never prove that continued human existence in large cooperative groups was a desirable goal or prove any other ultimate goal and thus would fail to provide the “normative basis” for ethics which philosophers have sought. But, for persons who had already made such a value choice (however logically unjustified), a science of ethics, once developed, could provide sets of derived, mediational values which, if adhered to, would further the achievement of the chosen ultimate values. A descriptive ethics, using biological and social evolution, should also be able to predict which ultimate values animals such as social humankind are likely to choose, even though it would not thereby philosophically justify such normative values.

BIOLOGICAL EVOLUTION

Although they usually distinguished social evolution from biological evolution and gave it an important role, these ethical social evolutionists saw social evolution as a harmonious extension of biological evolution (unlike the present article) and, indeed, often failed to

specify which type of evolution they were talking about. There is a parallel tendency for biologists (mainly ethologists) interested in social systems and morality to present evolutionary arguments in which social evolution is mentioned as an incidental, unproblematic extension of the biological process.³⁴ This, too, is a literature that psychologists should examine for social-function hypotheses about individual behavioral dispositions and for important hypotheses about biologically based human nature, even though I shall challenge some of these later.

Psychologists are already well aware of the enormous relevant literature on the biological evolutionary roots of aggression, individual and group.³⁵ (Relevant to this problem, I insist on a distinction between self-serving acts of hostility to conspecifics and individually self-sacrificial participation in organized group hostility.)³⁶

Stimulated by the biology of aggression, dominance, and related ethological hypotheses, a new field of political science has emerged, called biopolitics, to which social psychologists should give close attention.³⁷ There is also an increasing tendency for biologists to expound on the social implications of their field and for social scientists to speculate about biological evolution.³⁸ Except for totally overlooking the biopolitics literature, E. O. Wilson, in his *Sociobiology*, has assembled these trends in the founding book for a new field, a magnificent volume that every psychologist should own, even though we will want to feel free to disagree with it at many points.³⁹

From this vast new field I want to borrow a specific theme, neglected in all the works cited so far except Wilson's. This theme goes under the name of "group selection" and "genetics of altruism" among the evolutionary statistical population geneticists. Before getting into specifics, I want to apologize for a style of armchair psychologizing that these highly scientific mathematical geneticists have fallen into. Without giving a single personality test or doing any systematic behavioral observations, they are willing to talk about characteristics of "species personality," using terms like "altruism," "coyness," "spite," "jealousy," "selfishness," "deceitfulness," "greediness," and "cooperativeness," with the explicit assumption that there are specific genes determining these traits. This can easily be dismissed as mathematicized and computer-assisted armchair psychology. Without denying some truth to such a charge, I feel that this is a source of speculation and hypotheses to which psychologists should pay close attention.

What has happened is that, after several decades of trying to discover the selective systems that produced well-established behavioral and structural characteristics of animals, modern mathematical

evolutionary theorists now feel confident enough of their current theory of natural selection to work the other way, generating hypotheses about behavioral tendencies from analyses of selective systems. In contrast to psychology's experimental behavior genetics, where laborious experiments are done to demonstrate the heritability of a carefully measured behavior trait and to estimate the number of genes involved and their dominant or recessive character,⁴⁰ these population geneticists assume that genes exist for every behavioral tendency. Aware that there are millions of genes, each with multiple effects and interactions, population geneticists assume that an unspecified subset is available to influence any behavioral trait in any direction. Then, for simplicity's sake, they plot the hypothetical fate in a population for a single gene, for example, one determining self-sacrificial altruism in the form of bravery in group defense. This is apt to seem a totally unacceptable form of speculation to psychologists. One of the reasons for this is our incredulity that a behavioral tendency as abstract and polymorphic as "bravery" could be influenced by a single gene. But, if we are willing to accept learned habits, beliefs, or values as determining such a tendency, our objection may reflect an unresolved dualism in forgetting that learned habits, attitudes, thoughts, and values must have an anatomical and physiological embodiment just as full and complete as do unlearned behavior tendencies. Mutations that modify specific neural networks, synaptic thresholds, engrams, and hormone distributions are just as likely as mutations affecting any other anatomical feature and would have direct behavioral effects, some quite general. In any event, I suggest psychologists interested in "human nature" pay attention, however skeptically, to this rich source of hypotheses.

The combination of modern genetics with evolutionary theory took place in the 1930s. In one of the three founding books J. B. S. Haldane devoted an appendix to the barrier against selecting traits that are adaptive for the group but costly to the individual, in species in which there is genetic competition among the cooperators.⁴¹ He initiated the use of the term "altruism" for such traits (meaning "self-sacrificial" altruism) and started the talk about genes for altruism and what would happen to them in the course of natural selection. This argument lay largely neglected until the excessive claims of V. C. Wynne-Edwards for group selection led it to be revived.⁴²

As presented by G. C. Williams, the argument runs as follows: An effective, self-sacrificially altruistic trait benefits the whole group, including those lacking it. For individuals with the altruistic trait, this gain is reduced by the risks run, the self-sacrificial costs. For those lacking the altruistic gene, the group benefits are enjoyed without this

cost. Thus the net gain in procreational opportunities is greater for the nonaltruists, and the proportion of the altruistic gene in subsequent populations should steadily diminish to some asymptote determined by the mutation rate.⁴³ Wynne-Edwards and other group selectionists argue that this individual-level selection tendency could be countered by the selection of whole groups in competition with other groups. Against this possibility, Williams raises two objections: First, the only way in which sizable groups can become different in the frequency of a given gene is through individual selection within the group, which is ruled out if the trait is sacrificial of individual procreational opportunities. Second, even if once established by group selection, intragroup individual selection would soon erode it.

This extreme emphasis on the dominant role of individual selection is shared by M. T. Ghiselin, but most experts in the field probably take a more moderate position.⁴⁴ Wilson provides an excellent review of the literature with an emphasis on the numerous, albeit very specialized and unlikely, conditions in which some degree of group or kin selection could take place.⁴⁵ The field is one of the most active in population genetics, with new articles appearing each month, offering mathematical models and computer simulations. Because of its implications for an understanding of human nature, this is a literature which a number of psychologists should pay close attention to and participate in. (It covers many more personality traits than altruism and selfishness.)

Even with the qualifications regarding the possibility of group selection, the portrait of the biologically based social personality that emerges is one of predominantly self-serving opportunism even for the most social species, for all species in which there is genetic competition among the social cooperators, that is, where all members have the chance of parenthood. Human beings and all of the vertebrates are in this genetic condition, this selective system.

Before I go ahead and expand on this, some caveats are in order. Most aspects of animal sociality (and human culture propagation) are advantageous to the cooperating individual. Indeed, much of the literature on altruism and group selection is devoted to explaining how specific group-advantageous traits, including group hunting and sharing and even population control, are also individually advantageous and thereby positively selected without violating Haldane's principle.⁴⁶ For example, warning cries of birds probably have a net advantage for the warning bird in spite of the increased risks of predator attack.⁴⁷ The "selfishness" being selected for includes many traits we would normally think of as altruistic, especially parental altruism in the defense of and caring for one's own offspring, be-

cause, under the basic model of natural selection, it is propagation through offspring and subsequent descendants that is being selected for. W. D. Hamilton makes it clear that what is being optimized is gene frequency, not individual procreational opportunity, and, although the two are usually cooptimized, this need not always be so.⁴⁸ Thus, because of haploid males, a female ant or bee shares more genes with a full sister than with a daughter and may propagate her own genes better by furthering the procreational opportunities of a sister rather than having offspring herself. Similarly, a vertebrate can optimize its own gene propagation by an altruistic act to a sibling (with whom it shares 50 percent of its genes) if the act benefits the sibling's procreational opportunities twice as much as it costs the altruistic sibling. The cost-benefit ration becomes more unlikely for more remote relatives: "To express the matter more vividly, in the world of our model organisms, whose behavior is determined strictly by genotype, we expect to find that no one is prepared to sacrifice his life for any single person but that everyone will sacrifice it when he can thereby save more than two brothers or four half-brothers, or eight first cousins."⁴⁹ Hamilton goes on to state the corresponding principle for selfishness: "In the model world of genetically controlled behavior we expect to find that sibs deprive one another of reproductive prerequisites provided they can themselves make use of at least one half of what they take; individuals deprive half-sibs of four units of reproductive potential if they can get personal use of at least one of them; and so on. Clearly from a gene's point of view it is worthwhile to deprive a large number of distant relatives in order to extract a small reproductive advantage."⁵⁰ (Hamilton now regards this simplistic formula as needing modification, particularly as regards male-female relationships, but not in ways that change these overall conclusions.)⁵¹

R. L. Trivers has added an important dimension to the discussion by considering the fact that tendencies to enforce altruism and non-cheating behavior on others are readily selected because the tendencies are not subject to the genetic costs of being altruistic oneself.⁵² His 1971 article is a gold mine of psychologically important hypotheses.⁵³ Thus biologically or socially evolved tendencies to reduce the procreational opportunities of selfish, cheating, and cowardly individuals would be positively selected. He posits the evolutionary development in social species of moralistic aggression and retaliation. In turn, this creates a selection tendency for subtle cheating. Paradoxically, tendencies toward showing guilt and offering reparations when caught cheating are selected along with the tendency to cheat when it is to one's own advantage. When the individual's procreational opportunities are not reduced, tendencies for showing gratitude toward

altruists are selected, along with a generalized desire to curry the favor of others and to establish reciprocally altruistic trade-offs with specific others, accompanied by a murderous rage when such partners cheat. In Trivers's later articles the theme of genetic competition and the resultant selfish tendencies are carried into close kin relations.⁵⁴ Not even the genetic interests of parent and child are identical because the parent's chances of propagating other offspring are jeopardized by too heavy an investment in one child. This leads parents to preach "honor thy parents" and children to selectively evade parental instructions, rightly intuiting that some of them are nonoptimal for the child as a biological individual. Siblings are, of course, in competition, only somewhat restrained by the 50 percent shared genes. Mates are in genetic competition, with different interests in the sex of the offspring produced and a motivation for a double standard, because interest in the monogamous loyalty of the spouse is positively selected, while one's own fidelity usually is not. Williams and Ghiselin are also rich in similar hypotheses and related personality traits; for example, they posit that coyness and selectivity (versus promiscuity) are selected for the mate (not always female) bearing the greatest risks and costs in childbearing.⁵⁵

All of these sources are much richer in psychologically relevant hypotheses than I have been able to communicate. As to altruism per se, many are more pessimistic about human nature than is Trivers. Ghiselin, for example, ends a chapter entitled "The Antisocial Contract" with this paragraph:

The evolution of society fits the Darwinian paradigm in its most individualistic form. Nothing in it cries out to be otherwise explained. The economy of nature is competitive from beginning to end. Understand that economy, and how it works, and the underlying reasons for social phenomena are manifest. They are the means by which one organism gains some advantage to the detriment of another. No hint of genuine charity ameliorates our vision of society, once sentimentalism has been laid aside. What passes for cooperation turns out to be a mixture of opportunism and exploitation. The impulses that lead one animal to sacrifice himself for another turn out to have their ultimate rationale in gaining advantage over a third; and acts "for the good" of one society turn out to be performed to the detriment of the rest. Where it is in his own interest, every organism may reasonably be expected to aid his fellows. Where he has no alternative, he submits to the yoke of communal servitude. Yet given a full chance to act in his own interest, nothing but expediency will restrain him from brutalizing, from maiming, from murdering—his brother, his mate, his parent, or his child. Scratch an "altruist," and watch a "hypocrite" bleed.⁵⁶

R. D. Alexander adds the hypothesis that biological evolution has selected human beings so as to repress from conscious awareness the

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ruthless selfishness of their own behavior, so as to produce a more sincere hypocrisy.⁵⁷ Although Wilson would not be happy with so extreme a rejection of genuine, genetically based altruism, even he expects social vertebrates to fall within a range running from opportunistically selfish to ambivalently and inconsistently altruistic; the models he presents provide no possibility of self-sacrificially altruistic genes being stabilized in a vertebrate species at a frequency higher than 50 percent.⁵⁸

There is another group-selection hypothesis that should be noted for further analysis. This is the hypothesis that in the course of human evolution there was selection in favor of a genocidal aggression against other groups which speeded the course of brain evolution and selected for self-sacrificial bravery in warfare, in-group solidarity, and hostility toward out-groups.⁵⁹ To my knowledge, this hypothesis has not been subject to the mathematical modeling and computer simulation that disciplines so much of the speculation in this area. It is hard to see how selection against self-sacrificial, aggressive bravery within the victorious group is avoided. Possibly, when combined with the Boorman-Levitt or Levins models, which require frequent colonization and extinction of small inbred groups, this could be handled. Selection against predominantly cowardly groups would be furthered by a custom of killing the vanquished. If just the vanquished males were killed, a compensatory genetic advantage to the surviving brave might be achieved. Wilson calls attention to Moses' instructions on the occasion of the victory over the Midianites as a remnant of such a stage in human evolution: "And they slew all the males. . . . Now therefore kill every male among the little ones and kill every woman that hath known man by lying with him. But all the women children that have not known a man by lying with them, keep alive for yourselves."⁶⁰ Wilson cites similar primate examples, although the latter involve only individual males who have just taken over a harem.

Although most of the Victorian evolutionary moralists, including Darwin, regarded war as dysgenic, killing off the best and noblest, and although most of the moderns such as R. Bigelow, Alexander, and Wilson regard war as something urgently needing control, A. Keith provides an evolutionary ethic favoring war, totally neglecting the arguments against group selection.⁶¹

Even if we take this thesis seriously, it seems specific to military bravery rather than to other altruistic traits such as self-sacrificial honesty, generosity, and sexual restraints. And, even for bravery, the selective system would produce tendencies for opportunistic cheating, sham bravery that fluctuated into self-saving flight, an ambivalent mixture of cowardice and heroism.

ALTRUISM IN THE SOCIAL INSECTS

The social insects—bees, ants, wasps, termites—have developed more complex social systems than has any other animal but man. Their “urban” social order includes stored foodstuffs that do not spoil; full-time division of labor with castes that, being fed by other castes, do no food gathering; apartment-house living; and extremes of self-sacrificial altruism found nowhere else in the animal kingdom.⁶² In Wilson’s *Sociobiology* this gets less stress than it should because of his tendencies to present together social insect and vertebrate examples and to stress any altruistic traits found in the vertebrates.⁶³ A careful reading, however, will enforce the point that on every topic the examples from the social insects are far more self-sacrificially altruistic than are the examples from the vertebrates.

These extremes of genetically based, complex social coordination and altruism are made possible by the elimination of genetic competition among the cooperators. A cowardly soldier has no more offspring than a brave soldier that sacrifices her life in battle, for both are sterile. It is only the queen mother and her drones that have offspring, and their procreational opportunities are increased by effectively brave soldiers. Likewise, the soldier that stands and fights is not in genetic competition with the worker that flees back to the nest.

The first stage in the evolution of every social insect starts with a prolongation of infantile sterility into adulthood, producing a sterile worker class morphologically undifferentiated from the fertile mother or queen. Caste sterility is maintained as a prerequisite to the later elaboration of the division of labor, anatomical caste differences, and self-sacrificial altruism. The mechanisms by which caste sterility is maintained are not fully understood. There are conditions, such as the loss of a queen, in which workers may become fertile, as perhaps through the removal of an inhibitory pheromone that the queen produces while alive. The mechanisms releasing fertility in an egg or in adult workers are mediated by the activities of other workers and not by acts of the to-be-fertile individual. The castes most specialized and most self-sacrificially altruistic, such as all varieties of soldiers and such monstrosities as the food-storage-vat castes, are never fertile. However achieved, sterility of the cooperating castes seems absolutely fundamental to the extremes of innate sociality found in the social insects. By comparison, this further dramatizes the great restrictions that genetic competition among the cooperators places upon vertebrate sociality.

At the turn of the century, intellectuals concerned with the problem of social order frequently used the social insects as a model of social

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perfection with which to compare man ambivalently. Spencer used them as models showing the future direction in the evolution of more perfect social dispositions in man:

All who take the evolution view, cannot in consistency deny that if we have in lower orders of creatures cases in which the nature is constitutionally so modified that altruistic activities have become one with egoistic activities, there is an irresistible implication that a parallel identification will, under parallel conditions, take place among human beings. Social insects furnish us with instances completely to the point; and instances showing us, indeed, to what a marvellous degree the life of the individual may be absorbed in subserving the lives of other individuals.⁶⁴

Literary intellectuals as disparate as Lafcadio Hearn and Maurice Maeterlinck made similar observations, albeit with more reluctance to see man enter that state:

What I want to talk about is the awful propriety, the terrible morality, of the ant. Our most appalling ideals of conduct fall short of the ethics of the ant—as progress is reckoned in time—by nothing less than millions of years. . . . The intelligence of the little creature in meeting and overcoming difficulties of a totally new kind, and in adapting itself to conditions entirely foreign to its experience, proves a considerable power of independent thinking. But this at least is certain: that the ant has no individuality capable of being exercised in a purely selfish direction;—I am using the word “selfish” in its ordinary acceptation. A greedy ant, a sensual ant, an ant capable of any one of the seven deadly sins, or even of a small venial sin, is unimaginable. Equally unimaginable, of course, a romantic ant, an ideological ant, a poetical ant, or an ant inclined to metaphysical speculations. . . .

Most of us have been brought up in the belief that without some kind of religious creed—some hope of future reward or fear of future punishment—no civilization could exist. We have been taught to think that in the absence of laws based upon moral ideas, and in the absence of an effective police to enforce such laws, nearly everybody would seek only his or her personal advantage, to the disadvantage of everybody else. The strong would then destroy the weak; pity and sympathy would disappear; and the whole social fabric would fall to pieces. . . . These teachings confess the existing imperfection of human nature; and they contain obvious truth. But those who first proclaimed that truth, thousands and thousands of years ago, never imagined a form of social existence in which selfishness would be *naturally* impossible. It remained for irreligious Nature to furnish us with proof positive that there can exist a society in which the pleasure of active beneficence makes needless the idea of duty—a society in which instinctive morality can dispense with ethical codes of every sort—a society of which every member is born so absolutely unselfish, and so energetically good, that moral training could signify, even for its youngest, neither more nor less than waste of precious time.⁶⁵

Maeterlinck, speaking of the termites, said:

Their civilization, which is the earliest of any, is the most curious, the most complex, the most intelligent, and, in a sense, the most logical and best fitted to the difficulties of existence, which has ever appeared before our own on this globe. From several points of view this civilization, although fierce, sinister, and often repulsive, is superior to that of the bee, the ant, and even of man himself . . . a political, economic and social organization . . . of a destiny prefiguring perhaps, at the pace we are proceeding and unless we react before it is too late, the destiny which awaits ourselves. . . .

The species which appear to us to be the most highly civilized seem also the most enslaved and pitiable . . . their absolute devotion to the public good, their incredible renouncement of any individual existence or personal advantage or anything that remotely resembles selfishness . . . their complete abnegation, their ceaseless self-sacrifice to the safety of the state. . . . They practice the three most formidable vows of our severest orders: poverty, obedience, and chastity.⁶⁶

Even Freud, in *Civilization and Its Discontents*, made this point:

The natural instinct of aggressiveness in man, the hostility of each one against all and of all against each one, opposes this programme of civilization. . . . Why do the animals, kin to ourselves, not manifest any such cultural struggle? Oh, we don't know. Very probably certain of them, bees, ants, and termites, had to survive for thousands of centuries before they found the way to those state institutions, that division of functions, those restrictions upon individuals, which we admire them for today. It is characteristic of our present state that we know by our own feelings that we should not think ourselves happy in any of these communities of the animal world, or in any of the roles they delegate to individuals.⁶⁷

Haldane and his followers have given us the answer to Freud's question.

Two modern biologists in a literary essay make this imagery explicit for war: "In principle, the whole system of ant aggression is clearly designed to ensure complete peace within the nest and merciless hostility to all potential rivals of the community as a whole. There could not be a more complete contrast with monkey bands, more prone to internal dissension than war, or human communities, oscillating between civil and foreign conflict, and requiring every encouragement of mass redirection to make them engage in warfare."⁶⁸

HUMAN CULTURE CONTRA SELFISH HUMAN NATURE

Up to this point, even with the section on the social insects, I have been a reasonably dependable educator on sociobiology and evolutionary genetics. But from here on I am no longer a secondary source one should trust. A few evolutionary biologists have looked

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upon an earlier version of the point I am about to make with either cautious approval or noncommittal citations.⁶⁹ Reactions in letters from Sherwood Washburn and Ghiselin are no better. Lauren G. Wispé invited experts in biopolitics and comparative psychology to react, and both ended up totally unconvinced.⁷⁰ Indeed, each still prefers an earlier article in which I overlooked the problem of selecting altruistic genes when there is genetic competition among the cooperators, an article that I now reject in that respect.⁷¹

My own explanation for my (temporary) isolation is that, more than the others, I have taken social evolution seriously and thus have included in the total range of facts to be explained the religious systems that emerged with ancient urban civilizations, treating these as having, or having had, an evolutionary adaptive value, an underlying functional truth, which modern social and behavioral scientists need to understand. There may also be sociology-of-science reasons for the rejection of such a thesis, as discussed below. In any event, readers are warned that the following speculations relay no scientific consensus or even the beginnings of one.

Before getting to my controversial thesis, I need to assert two more facts, relatively uncontroversial. The first is that urban humanity in its ancient and modern forms is far more social, achieves more complex social interdependence, than any of the vertebrates, be they baboons or beavers or whatever. Indeed, urban human beings are the only vertebrates approaching the social insects in division of labor, apartment-house living, etc. More controversially, I see urban humankind as the only vertebrate that approaches the social insects in self-sacrificial altruism. In this I would include such admittedly exceptional but still remarkable examples as kamikaze pilots and other military suicide squads, celibate priesthoods, and instances of honesty, generosity, and promise keeping which reduce individual procreational opportunities in anticipatable ways. (More analysis and data on this point are of course needed.)

Second, because for humans there is genetic competition among the cooperators, this extreme sociality cannot have been achieved on a genetic basis. For vertebrates that share humankind's genetic predicament, the degree of sociality and altruism achieved by some baboons (hamadryad, chacma, or savanna), monkeys (howler, langur, or rhesus), and on specific features by turkeys, California woodpeckers, and Mexican freetail bats may well represent the maximum social coordination and altruism achievable. Early humankind at the small-band hunting stage might have been in a selective system supporting more gene-based sociality, as evolutionary biologists such as Alexander, Bigelow, and Wilson would argue. Features that would support

this according to various models would include the frequent colonization of new isolated sites by small inbred groups, with a high rate of colony extinction, long life, good memory, an ability to discriminate relatives from strangers, and genocidal cannibalistic behavior toward other groups. But the early development of incest taboos and rules of exogamy would have worked against this, as would urban life. Whatever the status of very early humankind, detailed analysis would probably show that the urban human of ancient Egypt, Babylonia, China, India, Mexico, and Peru was farther away than all other social vertebrates from those very specialized conditions, that "narrow window" for the selection of altruistic traits, which Wilson describes.⁷²

All this leads me to my two controversial conclusions:

1. Human urban social complexity has been made possible by social evolution rather than biological evolution.
2. This social evolution has had to counter individual selfish tendencies which biological evolution has continued to select as a result of the genetic competition among the cooperators.

The thesis of biological selfishness is not all that new and strange. After all, the dominant modern psychologies are individualistically hedonistic, explaining all human behavior in terms of individual pleasure and pain, individual positive and negative valence, individual needs and drives.⁷³ In social psychology the elaborate exchange theories of J. W. Thibault and H. H. Kelley, G. C. Homans, and a vast number of later contributors explain all social interactions in self-serving terms.⁷⁴ Even the conflict between biological and social evolution is not entirely unfamiliar, in that it generates the prediction that social in-group membership is inevitably frustrating, a prediction familiar to psychologists from the Freudian and behavioristic studies of aggression.⁷⁵ What is shocking to modern psychologists, psychiatrists, and other social scientists is that my conclusions assert a social-functional utility to an aspect of traditional culture that they have rejected as superstitious and harmful. G. Whitney flags this reaction in the title of his critique "Original Sin Rides Again."⁷⁶ For him, if he can validly assert that I am making a case for the concept of original sin, my thesis is thereby obviously proven wrong. Ashley Montagu has similarly raised the charge of reviving the notion of original sin against Lorenz and R. Ardrey.⁷⁷ But this is much less appropriate than Whitney's charge against me because Lorenz and Ardrey, worshipping biological evolution as a perfection-producing process and unaware of the genetics-of-altruism problem, have an overall attitude that what is biologically natural is good and right, including aggres-

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sion, which is not really undone by their few token paragraphs on the dangers of modern war. They are romantic naturalists, akin to the romantic individualists that R. Hogan criticizes.⁷⁸ In addition, the capacity for risking life in group aggression, which is central to their discussion of aggression, is technically altruistic and, furthermore, is not on traditional sin lists. Indeed, I am asserting a social functionality and psychological validity to concepts such as temptation and original sin due to human carnal, animal nature. This orientation makes me sympathetic to psychotherapists such as O. Hobart Mowrer and K. Menninger who have come to regard much human sin with an almost traditional disapproval and who are recommending that guilt feelings often should be cured by confession, expiation, restitution, and cessation of guilt-producing behavior rather than always by removing the demands of conscience, interpreting away feelings of guilt as neurotic symptoms.⁷⁹ I can only hope that, by raising this conclusion in the context of modern scientific concerns about the problems of complex social coordination and the population genetics of altruistic traits, I can make the point more convincing to psychologists and psychiatrists than Mowrer and Menninger have been able to do.

SOCIAL SYSTEM VERSUS INDIVIDUAL SYSTEM

The issue is, of course, much more complicated than my two dogmatic conclusions indicate. Neither Mowrer nor Menninger (nor I) would deny the occasional, or even frequent, occurrence in patients of socially and individually destructive neurotic guilt. It may help in this regard to make explicit the systems analysis implicit in the evolutionary theory I am using. On the one hand, there is biological evolution optimizing an individual person and gene-frequency system. On the other hand, there is a social-organizational-level social evolution optimizing social system functioning. For many behavioral dispositions, the two systems redundantly support each other. For others, the two are in conflict and curb each other. If these evolutionary processes were to take place for a long enough time in a stable, negative-feedback ecology, a stable compromise or minimax solution would be achieved. At such a time one would expect the modal-average, socialized adult to be optimally inhibited and repressed in the areas where the social and biological systems are in conflict. Around this optimum the inevitable stochastic error would result in equal frequencies of overly repressed, overly unselfish individuals and under-repressed or underinhibited persons. In Freud's day patient selection was probably such that he got patients primarily from the over-repressed edge rather than from the modal optimals or the underinhibited. It is conceivable, but to my mind not likely, that prior shifts in

ecology had led in Freud's day to an overproduction of overrepressed persons. It is more likely that losses in social-evolutionary retention systems have led in our present day to a nonoptimal production of underinhibited, overly narcissistic, and overly selfish individuals and that this, plus the great increase in psychiatric services, has changed the client population. But, even if there has been no ecological or patient-selection shift, this systems perspective makes clear the error in basing a normal psychology and recommendations for all child rearing on a psychiatric-patient population. Regarding possible shifts in the social inhibitory system, it is noteworthy that classical hysterical symptoms, such as functional paralysis and blindness, seem to have greatly decreased since Freud's day. V. E. Frankl reported another interesting patient-problem-frequency shift—a decreased number of cases of sexual repression and an increase in cases of loss of purpose in life.⁸⁰ This also makes sense in the systems-theory terms explicated below.

Modern justifications of concepts such as original sin and temptation, being parts of their archaic religious tradition that they would happily edit out, gain one no more popularity with modern liberal theologians than with psychologists. Perhaps, for some, the overriding emphasis on love and commitment to the welfare of others implies a natural human state of nonlove which their preachments are designed to correct. If so, the functional equivalent of an original sin notion is still present. But if the pervasive nonlove against which they preach is perceived as due to human institutions and traditions rather than basic human nature, they join with Hogan's romantic individualists such as Rousseau, John Dewey, and Carl Rogers and would be unsympathetic to my thesis.⁸¹ Note that one liberal, modern Protestant theologian was moved to return to a more traditional orientation on original sin by observations of fellow missionaries and other ethically committed individuals during a wartime internment experience.⁸²

In addition to the content of sins, temptations, commandments, and religious moral law, other aspects of religion make more sense when the dual-system perspective is applied. For the social system to work best, the participants in it should have behavioral dispositions optimizing social system purposes rather than individual purposes, where these differ. These purposes usually cannot be reified effectively in terms of particular leaders, for these leaders are transient and themselves need judging against social purposes. They, too, are selfish animals, tempted to misuse their special power for personal rather than group goals and may even be recruited from the most narcissistic and egocentric of the group's membership.⁸³ Thus tran-

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scendent reifications of these real and persisting collective interests were needed.⁸⁴ Although the truths were social-structural, the available metaphors for expressing them were in personifications.⁸⁵ Committing oneself to living for a transcendent Good's purposes, not one's own, is a commitment to optimize the social system rather than the individual system. Social groups effectively indoctrinating such individual commitments might well have had a social-evolutionary advantage and thus have discovered a functional, adaptive truth. It seems from cross-cultural surveys that belief in transcendent deities that are concerned with the morality of human behavior toward other human beings occurs more frequently in more complex societies.⁸⁶ This fits in with the view that such an influence furthering altruistic behavior was more needed in urban civilizations than in more primitive ones either because of the greater complex social coordination required or because urban humankind lacked the genetic supports for altruistic behavior that their predecessors had.

Religious beliefs leading a person to optimize behavior over a longer time perspective than one's own life, especially beliefs in after-life with compensatory rewards for deprivations in this life, would also further social system functioning and would also reflect a fundamental social truth.⁸⁷ Burial customs of antiquity the world over give testimony to the many times such belief systems have evolved independently. Without the hypothesis of such a function these burial customs would be anomalous from the point of view of both biological and social evolution since the deliberate waste of useful tools, domestic work animals, and, in many cases, even human workers represents a dysfunctional cost. The hypothesis is needed that the contribution of these burial customs to social effectiveness outweighed the more direct costs in economic productivity.

A TWO-SYSTEM ANALYSIS OF SOME SPECIFIC MORAL PRECEPTS

My thesis suggests a new look at the moralizing teachings of the ancient and independently evolved urban societies. When spelled out in detail, the theory should predict certain uniformities in their ethical teachings. Uniformities discovered could be hypothetically examined as reflecting on universal characteristics of the social and biological systems involved. New social patterns and the moralizing that goes with them could also be examined with profit, be they utopian communities, kibbutzim, Soviet Russia, or Maoist China.⁸⁸

Before discussing what such a program would look like, let me spell out in more detail the interaction of the two systems on a single-control system dimension.

Let us imagine in figure 1 a meter with values from zero to one hundred on a dimension ranging from total selfishness to total altruism. On this meter the optimum biosocial compromise is also indicated, at the sixty value for illustrative purposes. (Note that neither Spencer nor I put this at the altruist extreme, although we might judge it a little nearer than the sixty setting. As Spencer makes clear, without egoism sufficient to support individual health and vigor, contributions to group welfare are impossible.) In the slot of the meter a sliding indicator is pulled by spring tension in two opposite directions. One of the springs is anchored at the biological optimum, at the level which biological natural selection is selecting. To judge from the other social vertebrates, this anchor is not at the selfish extreme of zero but considerably nearer the center. Illustratively, it has been set at thirty. The other spring is anchored at the ideal norm of social behavior that the social system seems to be advocating in its preaching. This tends to be expressed in such a language of uncompromised perfect absolutes that I have set the number at one hundred. The extremity of the preached ideal can be seen as an effort to overcome, to balance out, the biological bias in the opposite direction. It also can be explained on grounds of ease of linguistic communication and the use of a low-cost, one-sided homeostat setting or reference signal,⁸⁹ as I try to explain below. As a result of these competing tensions the sliding indicator shows the moral behavior actually obtained, perhaps at fifty.

Consider a seemingly simpler system in which no biological bias was present but in which there were deviational tendencies in both directions that needed correction. In such a case one might expect a two-sided correction system, one side to correct for deviations below the norm, the other to correct for deviations above, analogous to a temperature-control system with both heating and refrigeration capacities. The social system in such a case would have two opposite preachments: "Don't be too selfish" and "Don't be too altruistic." We

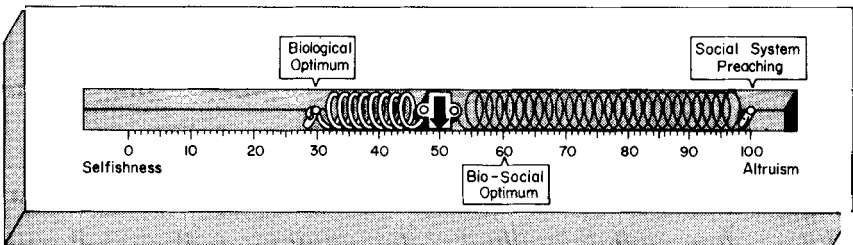


FIG. 1.—Meter illustrating conflicting tensions on a dimension of a selfishness-altruism

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seem to have such dual-control systems for some dimensions, as in our paired proverbs advocating opposite poles on caution ("Look before you leap"; "Nothing ventured, nothing gained"). But if the biological bias is such that no deviations on the too-altruistic side of the biosocial optimum occur, then a simpler, lower-cost, one-sided control system will do. In Moses' day, as in ours, there was indeed a valid functional commandment, "Look out for your own interests." But people then were so spontaneously complying with it that it did not need the continual, social system preaching which "thou shall not covet" did. In Moses' day, as in ours, honoring one's parents would have been dysfunctional carried to the 100 percent extreme, but such excesses were so little a social problem that "thou shalt show independence from thy parents" was usually omitted from the limited list of reiterated commandments.

Similarly, because none of the commandments were being lived up to anywhere near the 100 percent mark, the preaching language could safely imply that the commandments were a logically consistent set and that all could be maximized simultaneously. In actuality, moving any one commandment up to one hundred in practice would preclude optimizing the others.

From this perspective any recurrent, single-pole moral preaching becomes an indicator of a biological bias away from the biosocial optimum in the opposite direction. For example, from a sketchy survey, it appears that the ancient complex civilizations in China, India, Mesopotamia, Egypt, Peru, and Mexico all preached against human selfishness and cowardice, in conformity with what one would expect from the population genetics of altruism.

It would seem to me a high-priority joint task for the behavioral sciences and the humanities to produce a detailed analysis of the moral precepts of the ancient and novel complex societies in conjunction with such a two-system analysis of behavioral dispositions. I have participated in some preliminary soundings for such a project through seminar papers produced by C. E. Barshinger, R. J. Bulman, V. M. Carulli, J. R. Cole, J. M. Duffy, L. W. Heath, M. A. Horwich, H. M. Gonzalez, M. D. Langberg, S. M. Moffet, D. J. Neuman, and D. R. May in seminars taught jointly with E. F. Perry and C. Boehm and through related seminars by R. Cohen and J. A. Caporaso. The 1975 honors thesis of R. K. Tschannen is probably as complete a survey of the voluminous Aztec sources as is possible.⁹⁰ There is also a growing interest in the area on the part of modern anthropologists.⁹¹ Already there is sufficient detail so that a preliminary trait-by-trait analysis would be profitable as a guide to a more sustained search of primary sources. This has not been done.

But it is now clear that there are more universals for these complex societies than has been generally asserted, that many of these universals fit in with the two-systems model, but that an adequate model would have to be more complex and would have to include homeostats designed to curb excesses produced by more fundamental, lower-level systems. This complexity will inevitably reduce the testability of at least some aspects of an overall model. For example, the obvious functionality of altruistic good works and of praise to altruists would point to the social utility of pride in one's own altruism. And, indeed, the first-person coffin texts of ancient Egypt contain frequent bragging of such virtues, including generosity to widows and orphans.⁹² Yet in other precept systems from the Aztecs to the ancient Chinese such pride in one's own virtue is scolded, even while the constituent virtues are being commanded. What is the social system dysfunction created by such pride?

The sins of selfishness, stinginess, greed, gluttony, envy, theft, lust, and promiscuity, all close to biological optimization for self and children, recur in confirmation of the simplest version of the two-system model. Cowardice is there, too, but perhaps with less emphasis than in simpler societies or perhaps neglected because of a segregation of military morality from civil morality in sources or in social indoctrination systems. Rage and anger are omnipresent in sin lists, perhaps in part as evidence of the need for system curbing of vertebrate territoriality.

Dishonesty is regularly among the sins, reflecting no doubt recurrent temptation for self-serving dishonesty, even though for most communications honesty would serve individual biological optimization through social sharing as well as social optimization. Stubbornness and pride are also regularly present. In this regard, I suggest we need a purposive-behaviorist, cybernetic model of the biological individual, producing a basic need to set goals and complete them, a self-indulgence in autonomy and self-direction even when this autonomous purpose effecting serves no simpler self-serving motive. Even when we are being self-sacrificially altruistic, we do not enjoy having others tell us how to do it. Still more socially relevant are the sins of disobedience and nonconformity. Blasphemy is a recurrent sin, well articulated among the Aztecs. Deference to parents and to authorities universally needed preaching.

All this and much else seem to fit well with the two-system model I am advocating. Some other sets of sin and virtues do not. Biological natural selection cannot easily account for temptations to indulge in nonreproductive sex acts, monosexual, heterosexual, or homosexual. Where does the motivation for these sins come from? Are they dis-

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placements produced by too great effectiveness in the social system inhibiting lust and promiscuity and thus second-order sins? In view of the many ancient social system curbs seemingly directed toward population control, including infanticide, why does the social system seek to curb nonreproductive sex?

Another puzzling set of sins centers around preachments against gossip, backbiting, scolding, or what Trivers calls "moralistic aggression."⁹³ These traits seem obviously useful in curbing selfishness. Even witchcraft accusations serve a useful, social control function in simpler societies.⁹⁴ Is it that, with increased social organization, these do-it-yourself social control mechanisms acquire a second-order, disruptive dysfunction reducing cooperation? Perhaps, when combined with egoistic self-deception, they become socially destructive tools for disguised self-aggrandizement. The well-established traditions of social pressures among males against civil virtues (promachismo, antisissy) also call for more complexity. Are they compensatory indulgences in social rebellion making up for or disguising the extreme sacrificial conformity which warfare entails? Or are they a part of a male social system exploiting women?⁹⁵ While these puzzles do not move me to abandon the model, they point to a need for a more disciplined systems theory of much greater complexity.

THE NEED FOR EPISTEMIC HUMILITY

The epistemic arrogance of behavioral and social scientists is perhaps as much an obstacle to understanding these matters as is the epistemic arrogance which traditional religionists exhibit in their claims of revelation and absolute certainty. A kind of literalism on the part of scientists when looking at religious matters matches the biblical literalism of the fundamentalist as a hindrance to communication. If scientists were to take seriously the lessons of modern philosophy of science and epistemology, they could internalize a thoroughgoing epistemic humility and relativism that could make them more sympathetic to social system truths when packaged in nonscientific or metaphorical language.

Karl R. Popper, Michael Polanyi, W. V. Quine, Stephen E. Toulmin, N. R. Hanson, Thomas S. Kuhn, and others have convinced us of the message of Hume and Kant: All scientific knowing is indirect, presumptive, obliquely and incompletely corroborated at best.⁹⁶ The language of science is subjective, provincial, approximative, and metaphoric, never the language of reality itself. Evolutionary epistemology reinforces this description of humanity's disadvantaged and relativistic epistemological predicament: Cousin to the amoeba that

we are, how could we know for certain?⁹⁷ The best we can hope for are well-edited approximations. Although evolutionary epistemology makes clear that our predicament of epistemological relativity does not justify an ontological relativity, it portrays the scientist's knowledge of hydrodynamics, for example, as a useful approximation on an epistemological par with the knowledge of hydrodynamics embodied in a fish's musculature, for all its greater subtlety, multipurpose usefulness, and relative completeness. Both have been achieved by selection from a blind, fumbling, trial-and-error process, with no direct confirmation or revelation.

Sophisticated behavioral scientists are apt to acknowledge this for their own field, but they relapse into an epistemic arrogance and literalism when dealing with religious claims for truth. Because such behavioral scientists no longer believe in what they assume to be the literal referents of religious words, they lose sight of the possibility that these words refer to truths for which there is no literal language, which must be metaphorically or figuratively expressed if to be communicated at all. They hold up for religious discourse the requirements for a direct realism, a literal veridicality, even though they may recognize that this is impossible for science itself.

ON THE CONFLICT BETWEEN PSYCHOLOGY AND TRADITION

Having spent so much space on the conflict between biological and social evolution, I will be very brief on the conflict between psychology and the moralizing, inhibiting, repressive components of tradition. Nor have I really done my homework in this regard. It is certainly my impression, after forty years of reading psychology, that psychologists almost invariably side with self-gratification over traditional restraint. I would expect a content analysis of the program at this American Psychological Association convention to support this. But, for systematic documentation, I must refer you to others such as Mowrer and Hogan.⁹⁸ David Bakan and Philip Rieff are also relevant, and, no doubt, I have missed much of the relevant literature.⁹⁹

If, as I assert, there is in psychology today a general background assumption that the human impulses provided by biological evolution are right and optimal, both individually and socially, and that repressive or inhibitory moral traditions are wrong, then in my judgment this assumption may now be regarded as scientifically wrong from the enlarged scientific perspective that comes from the joint consideration of population genetics and social system evolution. Furthermore, in propagating such a background perspective in the teaching of perhaps 90 percent of college undergraduates (and increasing proportions of high school and elementary school pupils), psychology

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may be contributing to the undermining of the retention of what may be extremely valuable, social-evolutionary inhibitory systems which we do not yet fully understand. Although on some specific issues careful study under this fuller perspective will leave us convinced that the world (ecology, selective system) has changed in ways that make the traditional moral norms wrong, I would recommend that as an initial approach we assume an underlying wisdom in the recipes for living with which tradition has supplied us. I also recommend that we use this perspective to edit our teaching materials in those areas where they conflict with traditional dogmas, removing any arrogant scientific certainty that current beliefs in psychology are the final truth on these matters, emphasizing our need for modesty on topics on which we can do no experiments, broadening our narrowly individualistic focus to include social system functioning, and expressing a scientifically grounded respect for the wisdom that well-winnowed traditions may contain about how life should be lived. With such a perspective we might even find occasionally that fundamentalist watchdogs over school texts were correct in some of their objections to our text materials, correct in ways expressible in scientific terms.

If there has already been a transmission decay in still adaptive moral traditions, psychology and psychiatry may of course be as much its cosymptoms as its causes. Note the state of affairs reported by Spencer in the first quotation from him above, published in 1879 and planned, he says, some twenty years earlier, before scientific psychology was born.¹⁰⁰ Representative testimony from adults on the moral impact of the teachings of psychology (and of evolutionary thought) in their own lives would be of value. Lacking such a survey, my anecdotal evidence indicates that, frequently, psychology does reduce obedience to traditional moral standards, no doubt often in ways genuinely therapeutic but more often in ways dysfunctional from this larger perspective. Of course, from my theory, individuals should be overeager for liberation from the oppressive yoke of moral culture, more eager than is good for society as a whole, and the teaching of psychology may just provide a rationalization.

Not only the general public but also psychologists themselves should be especially receptive to the prohedonic message of liberation. As fellow animals also described by the two-systems model presented here, psychologists, too, should be overeager to discover and believe antitraditional, antirepressive theories. Such a psychology-of-science argument can be extended into sociology of science. The recruitment of scholars into psychology and psychiatry (as into literature) may be such as to select persons unusually eager to challenge the cultural orthodoxy. In fact, the social and behavioral sciences do over-

lap much more in knowledge claims with traditional moral belief systems than do nonhuman biology, chemistry, and physics. It is a prerequisite to a scientific approach in the social sciences that investigators be willing to challenge the cultural orthodoxy. But a science with this entrance requirement may end up recruiting persons who are not only willing to make this challenge but in fact overeager to do so. If the discipline of experimentation were available, such motivational biases might have little long-run effect, but it is not available on these important concerns.

Considering the complexities of our field and our models from the history of the successful sciences, a strategy of deliberate initial oversimplification has to be recommended to psychology. But this guarantees that in the early stages of development the theoretical orthodoxy will be misleadingly reductionistic and will portray humans as simpler machines than they actually are. If psychologists at such a stage were to lose the perspective that this view was a product of their long-term strategy, were instead to exaggerate the degree of perfection of their current theories, and were to propagate these immature theories as final truth, the net result could be destructive of popular values, as Polanyi and Paul A. Weiss have argued.¹⁰¹ Here again a science requiring the strategy of deliberate initial oversimplification may recruit scholars overeager to adopt a demeaning, mechanistic, reductionistic view of human nature.

Sociology-of-science considerations also point to the great rewards to scientific innovators and the exaggerated pressures for pseudoinnovation which result. With our conceptual framework still heavily shared with popular culture, our narcissistic motivation for creative innovation lapses into the motivation to advocate shocking new perspectives (a motivation that I not only share but have indulged in this article).

In one particular, psychology and psychiatry may have contributed to the present levels of human discontent by forgetting one of their earliest principles—hedonic or sensational relativism.¹⁰² Where pleasure is concerned, humans are insatiable animals, shifting their criterion level or adaptation level upward when the level of pleasurable input increases, so that once again experience is scored as one-third pleasure, one-third pain, and one-third blah. In spite of this ancient and well-documented principle, psychologists and psychiatrists have led people to believe that they are being cheated if their experience samples are not totally pleasurable. Thus psychologists and psychiatrists have joined forces with a popular ideology which united the two previously separate traditions of marriage and romantic love, producing the frustratingly high expectation levels that may

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be increasing the fragility of present-day marriages. A similar situation exists for the work experience. In both cases a doctrine recommending duty rather than one promising pleasure might produce more overall pleasure.

DISTRUST OF HUMAN NATURE IN POLITICAL IDEOLOGIES

A major background issue in the public policy decisions in which psychologists should participate is whether political machinery should be based on a trust or a distrust of human nature. Increasingly, some insightful social scientists are opting for distrust. Mancur Olson, for example, comes out of the tradition of economics started by Adam Smith in which it is assumed that, if everyone is intelligently selfish and has full information, both individual goods and collective goods will be optimized.¹⁰³ Now, using the conceptual tools of that tradition, Olson demonstrates that Smith's optimism was wrong, that many collective goods are ruled out by individual optimization. Olson's specific illustrations have to do with compulsory union membership and compulsory taxation, both of which he finds necessary. On these two issues psychologists might agree, but the argument can be extended to many issues of institutional restraint versus optional participation where psychologists now automatically side with extreme permissiveness and freedom of choice even for the very young and uninformed. Garrett Hardin and T. C. Schelling provide similar analyses.¹⁰⁴

In his pessimistic *Inquiry into the Human Prospect* Robert L. Heilbroner tells of his reluctant conversion from an advocacy of a permissive utopia to a reluctant recognition that future societies will require great restrictiveness if humankind is to survive at all.¹⁰⁵ Olson and I would disagree with Heilbroner if he concludes that this restrictive society must necessarily be totalitarian. As the examples of union membership and taxation show, democratic societies can operate and have operated restrictively and can include still further restrictiveness, democratically decided upon. Totalitarian systems are particularly weak in curbing the selfishness of the rulers. But legal restrictions alone, either democratic or totalitarian, may not be effective in the absence of strongly supporting internalized, individual, altruistic restraint.¹⁰⁶ Scientific analyses proving that it would be better for everyone if everyone abided by restraints, even if understood and believed in by each individual, would still leave it in the rational best interests of single individuals to be "free riders" or to cheat on the system.¹⁰⁷ (L. Stephen recognized this problem in 1882.)¹⁰⁸ Further analysis might eventually convince social scientists that awe-inspiring indoctrination was needed to the degree, at least, that produced mor-

ally committed persons such as ourselves. The classic, successful democracies of the past certainly had such support.

The alternative political systems before us should be analyzed in these terms. Anarchism historically has been based upon a trust of human nature, differing profoundly from socialism in this regard, in spite of occasional tactical alliances. Contemporary libertarianism is akin to anarchism in this, with the exception of advocating interference with human nature in the protection of private property, both earned and inherited. The pure theory of capitalism has a similarly great trust in human nature. The fact that in contemporary United States politics capitalist advocacy is associated with distrust of human nature is perhaps a historical accident because of the tendency for well-adjusted persons to advocate all aspects of the status quo, no matter how contradictory. In the United States this results in a statistical association of such logical incompatibles as capitalism, Christianity, militarism, racism, and distrust of human nature.

In any event, there is no necessary connection between evolutionary perspectives and political conservatism, as I have been at great pains to point out in an essay in praise of Lorenz for his contributions to evolutionary epistemology and cybernetic behaviorism.¹⁰⁹ Biological evolution predicts no race differences on intelligence and speed of running because all races have been in ecologies selecting for both. For skin color and sickle cells, on the contrary, evolutionary biologists can point to specific, unique ecological situations selecting them. The specific use of evolutionary theory which I recommend to psychologists and have reviewed in this article leads to concern with modal species characteristics rather than concern with inheritable individual differences. Although there is some kind of conservative advocacy in my present position, it will take a new packaging of political orientations to epitomize it.¹¹⁰

In discussing political alternatives and, indeed, in this address I have assumed that I shared with readers the goal of a future society which, while improved and pacified, would be as complex, populous, and interdependent as the present one. This goal may not seem very attractive. Even Spencer did not really want us to become more termitelike, as he made clear in opposing the social evolutionary trend which he saw in his day as culminating in a militaristic, nationalistic socialism such as Bismarck's Germany. Our present degree of antlike, complex social interdependence may seem more than is desirable to many reasonable persons. Reduced complexity, coordination, and interdependence might be advocated consistently if one were ready to do without manufactured goods, live in small agricul-

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tural villages, and have the world's population reduced by nine-tenths. (That solution, however, would provide increased environmental monotony and no reduction in conformity pressures.)

Again, since evolutionary adaptations represent wisdom about past environments, an evolutionary orientation is compatible with evaluating specific adaptations as currently maladaptive. In reviewing Heilbroner from this point of view, I have found it clear that more of the sources of impending disaster which he foresees are due to the persistence of social adaptations now outmoded (such as military nationalism, environmental conquest, and taboos against birth control) than are due to a failure to retain once-functional, inhibitory morality systems.¹¹¹

SUMMARY

Urban humanity is a product of both biological and social evolution. Evolutionary genetics shows that, when there is genetic competition among the cooperators (as for humans but not for the social insects), great limitations are placed upon the degree of socially useful, individually self-sacrificial altruism that biological evolution can produce. Human urban social complexity is a product of social evolution and has had to counter with inhibitory moral norms the biological selfishness which genetic competition has selected continually.

The issues are so complex and the data available so unconvincing that all of this should be interpreted more as a challenge to an important new area of psychological research than as established conclusions. I have flip-flopped on a crucial aspect of the argument and could do so again. But I hope I have convinced you that these are important issues for psychology, to which we should give much greater attention, and that scientific reasons exist for believing that there can be profound social system wisdom in the belief systems with which our social tradition has provided us.

NOTES

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