

Evolutionary Theory of History

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# EVOLUTIONARY THEORY OF HISTORY

MARTIN STUART-FOX

## ABSTRACT

Several attempts have been made recently to apply Darwinian evolutionary theory to the study of culture change and social history. The essential elements in such a theory are that variations occur in a population, and that a process of selective retention operates during their replication and transmission. Location of such variable "units" in the semantic structure of cognition provides the individual psychological basis for an evolutionary theory of history. Selection operates on both the level of cognition and on its "phenotypic" expression in action in relation to individual preferred sources of psychological satisfaction. Social power comprises the principal selective forces within the sociocultural environment. Sociocultural evolution takes place both as a result of the unintended consequences of action and through the struggle of individuals and groups in pursuit of opposing interests. The implications for historiography are methodological in that evolutionary theory of history sharpens the focus of explanatory situational analysis, and interpretive in that it provides a paradigmatic metanarrative for the understanding of historical change.

Over the last decade and more, social scientists in a number of disciplines have attempted to apply Darwinian evolutionary theory to human societies and cultures.<sup>1</sup> One only has to think of R. D. Alexander and William H. Durham among anthropologists; W. G. Runciman and Stephen K. Sanderson among sociologists; Roger D. Masters and Glendon Schubert among political scientists; J. Tooby and L. Cosmides, and David M. Buss among psychologists; and J. Hirshleifer and Kenneth Boulding among economists.<sup>2</sup> Such scholars have sought to understand in Darwinian evolutionary terms how cultures evolve, the processes of social and political change, why the human psyche has the form and function it does, and how economic enterprises compete. Historians, however, have been slow to

1. No longer can it be claimed that sociocultural evolution based on a generalized Darwinian model is an "untried theory." Cf. Marion Blute, "Sociocultural Evolutionism: An Untried Theory," *Behavioral Science* 24 (1979), 46-59.

2. Richard D. Alexander, *Darwinism and Human Affairs* (Seattle, 1979); William H. Durham, *Coevolution: Genes, Culture and Human Diversity* (Stanford, 1991); W. G. Runciman, *A Treatise on Social Theory. Volume II: Substantive Social Theory* (Cambridge, Eng., 1989); Stephen K. Sanderson, *Social Transformations: A General Theory of Historical Development* (Oxford, 1995); Roger D. Masters, *The Nature of Politics* (New Haven, 1989); Glendon Schubert, *Evolutionary Politics* (Carbondale, 1989); J. Tooby and L. Cosmides, "Psychological Foundations of Culture," in *The Adapted Mind*, ed. J. Barkow, L. Cosmides, and J. Tooby (New York, 1992), 19-136; David M. Buss, "Evolutionary Psychology: A New Paradigm for Psychological Science," *Psychological Inquiry* 6 (1995), 1-30; J. Hirshleifer, "Economics from a Biological Viewpoint," *Journal of Law and Economics* 20 (1977), 1-52; Kenneth E. Boulding, *Evolutionary Economics* (Beverly Hills, 1981).

adopt an evolutionary perspective.<sup>3</sup> The questions I want to ask in this article, therefore, are: is a Darwinian evolutionary perspective on history of explanatory value for historians; and if so, what would be the implications of adopting such a perspective for the researching, writing, and understanding of history? Any answers to these questions rest necessarily, however, on the answer to another: what would an evolutionary theory of history be like?

### I. DARWINIAN EVOLUTIONARY THEORY

Let me begin by defining my terms. I do not by “evolutionary” want to imply any sense of unfolding or development of some inherent potential. Nor do I want to imply any notion of progress. My interest is in evolutionary theory in the form of a generalized Darwinian model providing a causal mechanism to explain how change occurs over time in social groups and human populations. The mechanism in question is simply that change comes about through the selective retention of variation: in the case of biological evolution through the selective retention of variant genes.<sup>4</sup> This is a deceptively simple, but extraordinarily powerful means of bringing about change in any population of composite structures formed epigenetically through interaction between an environment and a set of variable “units.” Selective retention of variation only works, of course, as an adaptive response in the face of some selective force and in relation to some existential drive. In the paradigm case of biological evolution, the selective force is exerted by adverse environmental conditions (Darwin’s “hostile forces”) in the face of which organisms strive to maximize reproductive outcomes.<sup>5</sup>

Social scientists who apply Darwinian evolutionary theory to human affairs deny that theirs is an exercise simply in seeking analogies with biological evolution. Rather they are attempting to apply the generalized evolutionary model (that change in any system can be brought about by the selective retention of variation) to social phenomena.<sup>6</sup> Even so, it is impossible to escape consideration of biological evolution, if only because the evolution of behavior and culture

3. Some attempts have been made to apply Darwinian theory to history in a macro sense, for example, L. Betzig, *Despotism and Differential Reproduction: A Darwinian View of History* (Hawthorne, N.Y., 1986); Sanderson, *Social Transformations*. I have expounded my own views at some length in Martin Stuart-Fox, “Evolutionary Theory of History” (PhD dissertation, University of Queensland, 1986).

4. It is possible to generalize this further and talk about “replicators” and “interactors.” See David L. Hull, “The Units of Evolution: A Metaphysical Essay,” in *The Philosophy of Evolution*, ed. U. J. Jensen and R. Harré (Brighton, Eng., 1981), 23-44. The summary mechanism “variation and selective retention” was popularized by Donald T. Campbell in a number of articles; for example, “Variation and Selective Retention in Socio-Cultural Evolution,” *Social Change in Developing Areas*, ed. H. R. Barringer, G. I. Blanksten, and R. W. Mack (Cambridge, Mass., 1965), 19-49.

5. Charles Darwin, *On the Origin of Species: A Facsimile of the First Edition* (Cambridge, Mass., 1964). Darwin also of course took significant account of “sexual selection,” or mating preferences. For the structure of Darwin’s theory of natural selection, see Michael Ruse, “Charles Darwin’s Theory of Evolution: An Analysis,” *Journal of the History of Biology* 8 (1975), 219-241.

6. For example, V. Csanyi, “The Replicative Model of Evolution: A General Theory,” *World Futures* 23 (1987), 31-65.

(animal as well as human) has in all cases been an adaptive biological response to environmental exigencies. How biological and cultural evolution are related in human populations has given rise to much highly charged debate and a number of sophisticated attempts to model their interaction.<sup>7</sup> This whole realm of socio-biology I intend to sidestep, with the exception of the following observations.

Just how culture evolved among our hominid ancestors is the concern of anthropologists, who have generally taken the lead in modeling biological and sociocultural "coevolution." From their work two things are obvious. One is that though our biological inheritance continues to influence particularly certain semi-instinctual behaviors directed by more primitive parts of the brain, most human action is not so influenced; and the second is that what makes the difference between biological and sociocultural evolution is the emergence of the conscious human mind.<sup>8</sup> Consciousness, culture, and the capacity to learn are not uniquely human phenomena. They evolved, in both animals and humans, to provide an adaptive advantage, specifically the capacity to learn through observing and replicating the behavior of conspecifics.

What we call human consciousness is a function of the complexity of the brain, of the multiple circuitry that intervenes between perception and action. This circuitry provides the capacity to run alternative response scenarios to problem situations, rather than to rely on biologically evolved instinctual behavior; that is, it provides the capacity to represent the external world, to form cognitive maps. Images, signs, symbols, and with the evolution of language, words, can all be manipulated to provide possible solutions, one of which is chosen to serve best, given the prevailing circumstances, as the basis for action. But consciousness brought with it much more than an improved response mechanism, for it extended awareness from external stimuli to internal memories and emotions. Consciousness, as it evolved, led also to awareness of the passage of time, and thus of the inevitability of death; it allowed a capacity for wonder, and stimulated a need to interpret the world around us, to construct meaning.<sup>9</sup>

Consciousness and the capacity for learning co-evolved, each reinforcing the other. Human beings, as Pulliam and Dunford have noted, were programmed to learn.<sup>10</sup> But in the course of the four million years of hominid evolution, learning became the basis for a second evolutionary process, one that at first reinforced but then went beyond biological evolution. In the human species, the faculty of consciousness evolved to provide a more flexible response mechanism by which individuals and groups could respond more rapidly to hostile environ-

7. The most sophisticated attempts to date are those of R. Boyd and P. J. Richerson, *Culture and the Evolutionary Process* (Chicago, 1985); L. L. Cavalli-Sforza and M. W. Feldman, *Cultural Transmission and Evolution* (Princeton, N.J., 1981); and Durham, *Coevolution*.

8. Cf. L. Dewart, *Evolution and Consciousness* (Toronto, 1989); M. Donald, *Origins of the Modern Mind* (Cambridge, Mass., 1991); W. Noble and I. Davidson, *Human Evolution, Language and Mind* (Cambridge, Eng., 1996).

9. As Ervin Laszlo has noted: "The search for meaning is perhaps the most basic activity of the human mind," in "Evolution: The New Paradigm," *World Futures* 23 (1987), 152.

10. H. R. Pulliam and C. Dunford, *Programmed to Learn: An Essay on the Evolution of Culture* (New York, 1980).

mental forces, and could pass behavioral innovations directly to their offspring (and others). Such a Lamarckian process solved the serious problem for a neotinous species with a long generational span of how to respond effectively to rapid environmental change. Thus human populations became subject to two evolutionary processes based on genetically encoded information and cognitively encoded information.

The two are logically, but not existentially (and thus not theoretically) distinct. A feedback loop continues to exist between culture and genome, but it is an attenuated one, calculated by two authors to take a thousand years.<sup>11</sup> Between genetically influenced behavior and culture, consciousness intervenes. Though maternal instincts may be strong, women may choose to reject their offspring. Most do not, however, and thus cultural behaviors associated with maternal care continue to reflect the frequency of genes that favor it. William H. Durham has argued that such interactions (either way—via “genetic mediation” and “cultural mediation”) constitute only two of five possible modes of relationship between genes and culture. In the other three there is correlation rather than interaction, so that culture enhances, is neutral to, or in certain extreme cases even opposes genetic fitness (the measure of reproductive success of genes in a population).<sup>12</sup>

Whatever the outcome of the debate over the continuing relationship between genes and culture as evolutionary systems, however, what is evident is that the two have become increasingly uncoupled, and that whatever interaction remains involves behaviors of minimal interest to historians. Such behaviors may continue to evolve, but they do so on a timeframe beyond the concern of all but the most macro-historians. As proof of the extent to which sociocultural evolution has broken free of its broader biological context, one has only to recall that many socio-economically successful couples in advanced industrial societies deliberately limit the number of offspring; they do not use their wealth and power to maximize genetic fitness. Historians can therefore disregard any vestigial linkage between genes and culture, and approach culture as an autonomous system, with its own variation-and-selective-retention mechanism allowing an accelerating pace of change. Whether or not a theory of sociocultural evolution is of value to historians will depend on the power of the theory to explain the nature of historical change.

## II. CULTURE AND SOCIETY

Anthropologists have taken the lead in constructing a Darwinian evolutionary theory of culture change. In doing so they have tended, like William H. Durham, to draw a clear distinction between culture comprising an “ordered system of meaning and of symbols” and social system comprising the “actual existing network of social relations.”<sup>13</sup> This is not a distinction that historians, except perhaps cultural historians, would want to make; and Durham himself admits that

11. C. J. Lumsden and E. O. Wilson, *Genes, Mind, and Culture: The Coevolutionary Process* (Cambridge, Mass., 1981).

12. Durham, *Coevolution*, 436-444.

13. *Ibid.*, 30.

even anthropologists cannot entirely ignore social context, especially the “cultural implications of power relations in a society.”<sup>14</sup> But though historians are crucially interested in the social structures and individual agency whose interactions comprise the social system, we need to begin with culture broadly understood in order to situate human societies in the biological context within which they developed and continue to stand (the natural as opposed to the sociocultural environment), and in order to specify the essential elements of an evolutionary theory of sociocultural (that is, historical) change.

So let us begin with culture. Culture popularly understood comprises three components: material, behavioral, and cognitive. Archaeologists label the material remains of ancient civilizations “cultures.” Anthropologists seek the cultural meaning of ritual. But just as material products are the result of human activity, so forms of behavior express beliefs and worldview. Culture may be thought to include material (economic productive) and social (behavioral) components, but these lead back to the beliefs, values, plans, and rules that reside in human cognition. For this reason, what has been called “the new consensus” in anthropology takes cultures to be “systems of symbolically encoded conceptual phenomena.”<sup>15</sup>

Culture among early hominids (as among animals) was designed to modify the environment in ways that assisted human survival, and thus reproduction. Where cultural activity went beyond simple modification of environment associated with reproduction (construction of nests, burrows) to a more profound economic transformation through tool-making, building of shelters, and production of food (what Niles Eldredge calls “matter-energy transfer processes”),<sup>16</sup> what was created was a system, a culture, which itself required constantly to be reproduced. The reproduction of a culture requires reiteration of behavior, in the human case the learned behavior necessary to replicate environmental modification. What evolved at first biologically as additional capacity to ensure survival (the economic component) and reproduction (the genealogical component) thus took on a necessary dynamic of its own.

What was transmitted in the process, however, were not particular activities (shaping a stone axe, making a shelter), or culture traits, but the cognitive processes that lay behind them. What was observed was represented in the structure of the mind, there to be consciously drawn upon to replicate action. Action may thus be thought of as the phenotypic expression of cognition, whether that action is productive in a material sense or symbolic, as in speech, ritual, or art. Particular actions that could be separately specified (“do this; do that”) reflected conceptually distinct cognitive phenomena which could be put together in different, perhaps innovative, combinations (to make differently shaped axes, or shelters, or bowls, or figurines).

14. *Ibid.*

15. *Ibid.*, 8.

16. Niles Eldredge, “Ultra-Darwinian Explanation and the Biology of Social Systems,” in *Evolution, Order and Complexity*, ed. E. L. Khalil and K. E. Boulding (London, 1996), 94.



## III. COMPONENTS OF A THEORY OF CULTURAL EVOLUTION

A general Darwinian theory of evolution comprises certain essential elements. There must be a set of system components which can vary in some way; some means of producing variation; some means of transmitting those variable components under conditions where selective forces are operative; and some way of separating the differential outcomes of this process. Moreover, the selective forces must function in relation to some existential drive inherent in the system itself (in the case of biological evolution, the drive to reproduce). If all these elements are present, the system will, indeed must, evolve.

It is not difficult to identify these elements in cultural systems. Cognitive "information units" can vary enormously, as can be quickly verified by reference to their behavioral expression and material product. Such variants result not just from the mysterious process we call creativity, but from inaccurate learning and other forms of replication errors, and from differential recombination. "Cognitive units" (ideas, plans, programs) are transmitted by various communication media (speech, writing, example). Selective forces include social pressures to conform and other forms of social power wielded by others, limitations on what "cognitive units" are transmitted, and cognitive pressures exerted by competing ideas and plans, or through judgments based on principles or values. Different cultures may evolve through geographic isolation, migration, or the process known as "cultural drift."<sup>17</sup>

There is, however, one element more difficult to identify, and that is the existential drive inherent in the system. For sociobiologists there is no need to identify any existential drive applying specifically to cultural evolution, for they conceive the purpose of culture as remaining essentially biological; that is, to enhance "inclusive fitness."<sup>18</sup> Those who conclude that culture has largely escaped its genetic leash, however, need to specify what it is that drives culture forward on its own evolutionary trajectory, especially as there is evidence that culture can on occasion be maladaptive and lead to a collapse of population (as for example, occurred on Easter Island); that is, that cultural evolution may fail to enhance inclusive fitness.

In order to see what the existential drive in cultural evolution might be, it is necessary to go back to the earliest hominids. The capacity to learn techniques for modifying the environment without these becoming genetically hard-wired behavior traits obviously carried with it great adaptive advantage, since early hominids were thereby able to respond much more rapidly to changing, often adverse, environmental conditions.<sup>19</sup> Evolution of the capacity to learn would

17. On isolating mechanisms in sociocultural evolution, see J. Hill, "The Origin of Sociocultural Evolution," *Journal of Social and Biological Structures* 1 (1978), 382-385. See also Fred Eggan, "Cultural Drift and Social Change," *Current Anthropology* 4 (1963), 347-360.

18. Defined by Hamilton in terms of the total genetic representation of a specific genotype in the next generation. W. D. Hamilton, "The Genetical Evolution of Social Behavior. I and II," *Journal of Theoretical Biology* 7 (1964), 8.

19. Innumerable studies are available on human origins. One recent study is Richard Leakey and Roger Lewin, *Origins Reconsidered: In Search of What Makes Us Human* (London, 1992).

have been accelerated through reinforcement by certain psychological mechanisms, such as avoidance of pain. Such a negative response undoubtedly played a part, but just as significant would have been the positive reinforcement of pleasure, the sense of well-being generated by meeting essential needs for sustenance and protection. As consciousness evolved, human beings must have become progressively aware of other needs forming the hierarchy that Abraham Maslow identified.<sup>20</sup> Fulfillment of those higher needs would also have brought a sense of well-being, a sense of psychological satisfaction that powerfully reinforced those activities bringing them about, activities associated with maintaining social relationships and replication of culture.<sup>21</sup> So as consciousness evolved and material culture met basic needs, the sense of well-being increasingly became associated with the fulfillment of higher needs—for the love and esteem of others for whom one cared and respected, for the sense of social solidarity through participation in religious ritual, for the cognitive integration of a logically constructed worldview that gave meaning to existence, even for “self-actualization” and cosmic awareness.<sup>22</sup>

What I am suggesting is that what drives sociocultural evolution (to expand the cultural system to take in all social activities) is active pursuit of a sense of psychological satisfaction or well-being. This may be, and too often is, a selfish pursuit, and it is certainly only individually experienced. But satisfaction can be derived from altruistic behavior that is given meaning in a wider cognitive context, or experienced when values and ideals overcome selfishness in the cause of a common good in which the individual is or will be included (whether as a member of a group, a community, a nation, or even humankind as a whole). What brings satisfaction to one person will count little for another, but the actions of both will contribute, in different ways, to the complex process of sociocultural differentiation and change.

#### IV. UNITS OF REPLICATION AND THE STRUCTURE OF MIND

In an earlier paper I tried to link the units of replication in sociocultural evolution to the structure of mind.<sup>23</sup> Various attempts have been made to define the units of information that are passed from mind to mind through the processes of social learning. Examples include culture traits,<sup>24</sup> concepts,<sup>25</sup> “culturgens,”<sup>26</sup> and “memes.”<sup>27</sup> The last of these appears to be winning the day, not least because it is the most flexible and variable (Dawkins defined it originally as including

20. Abraham H. Maslow, *Motivation and Personality*, rev. ed. (New York, 1970).

21. For the argument that emotions acted as genetically programmed evaluatory mechanisms, see Pulliam and Dunford, *Programmed to Learn*, 41-43.

22. Abraham H. Maslow, *The Farther Reaches of Human Nature* (New York, 1971).

23. Martin Stuart-Fox, “The Unit of Replication in Socio-cultural Evolution” *Journal of Social and Biological Structures* 9 (1986), 67-89.

24. Cavalli-Sforza and Feldman, *Cultural Transmission and Evolution*.

25. J. Hill, “A Model for Social Evolution,” *Sociological Analysis* 1 (1971), 61-76.

26. Lumsden and Wilson, *Genes, Mind and Culture*.

27. Richard Dawkins, *The Selfish Gene* (Oxford, 1976).



“tunes, ideas, catch-phrases, clothes fashions, ways of making pots and building arches”).<sup>28</sup> Memes thus encompass everything from simple concepts to complex ideas, goals, values, and plans—whatever can be transmitted as “coherent, functional units.”<sup>29</sup> Such a variable “unit” of cultural information may be all that anthropologists need, but this will hardly satisfy psychologists, or historians interested in individual agency, for a theory centered on the transmission of memes tells us little or nothing about the structure of mind, and the selective influence this has on learning. A comprehensive evolutionary theory of sociocultural change must include both psychological and social dimensions; that is, it must go beyond cultural evolution to become an evolutionary theory of history.

Let us return briefly to culture. We tend to think of culture as uniformly relating to social groups. So the culture of the Sioux refers to a communal production to which each individual Sioux contributes. But each individual does not contribute equally: some are chiefs, others are braves, others again are medicine men. Different individuals carry within their minds the cultural information required to perform their respective roles.<sup>30</sup> The way the totality of this individual cultural information is organized and integrated with mental representation of the natural and social environment (laden with cultural meaning) constitutes individual structure of mind.<sup>31</sup> This structure is built up throughout the life of the individual, but tends to be more malleable in the young and more inflexible in the elderly. Individual mental culture at any moment in a person’s life therefore comprises the semantic structure of mind (which we can call individual world-view).<sup>32</sup>

The semantic structure of mind is built up through learning. But this is not simply a matter of adding new information: throughout life what is learned has to be integrated into the structure of cognition (the representation of the world)<sup>33</sup> that already exists. Two things need to be noted about this process of cognitive integration. The first is that it entails establishing relationships with existing knowledge. The second is that it takes place in long-term memory, even if some elements may be suppressed to the level of the unconscious.

This means that the semantic structure of mind or cognition is the semantic structure of long-term memory. There is still much debate among cognitive psychologists as to how the structure of long-term memory should be understood in relation to the structure of the brain. One mapping of the structure of long-term memory pictures representational nodes linked by a network (field) of relationships. By “node” is meant not some point like a specific nerve cell, but the “particular set of [cognitive] elements that represents (encodes, stands for) [an]

28. *Ibid.*, 206.

29. Durham, *Coevolution*, 421.

30. This individual culture is what Goodenough has termed “propriospect”—an individual’s “private, subjective view of the world and its contents—his personal outlook.” W. H. Goodenough, *Culture, Language and Society* (Reading, Mass., 1971), 36.

31. Cf. Stuart-Fox, “Evolutionary Theory of History,” 197.

32. I have argued this at much greater length in Stuart-Fox, “Evolutionary Theory of History.”

33. What Johnson-Laird has called “structural analogies of the world.” P. N. Johnson-Laird, *Mental Models* (Cambridge, Eng., 1980), 165.

idea,”<sup>34</sup> which could be a number of nerve cells, neurons, and synapses firing simultaneously. In other words, nodes are composite, so under different circumstances all or some of the elements comprising them may be recalled to consciousness. Moreover, the set of elements will be different for different people. Even nodes standing for concepts with defined lexical meanings (such as “uncle”) will take on additional meaning from personal or vicarious experience (did some uncle pamper, or molest, a child?).<sup>35</sup> It is these additional, subjective links that provide the multivalent meanings that characterize human thought (lead to misunderstandings, make responses to poetry so personal).

Two corollaries follow from the semantic structure of long-term memory I have sketched above.<sup>36</sup> One is that meaning is relational, it depends upon making connections, and so is relative to the set of those connections. The second is that such connections based upon hypotheses about reality that may be erroneous (though our very survival as a species makes it pretty certain that our mental processes provide a relatively accurate picture of our immediate environment). Nevertheless the possibility always exists that the mapping of external reality (the way the world is) in any mind is inaccurate. Yet this is not something we usually bear in mind. Rather we hold to our beliefs with extraordinary conviction (for example, in the existence of spirits, angels, djinn, and so on). Meaning relations in the structure of cognition at superordinate levels greatly influence the process of inclusion of new knowledge. What reinforces such superordinate beliefs tends to be incorporated, often uncritically, into the core structure of cognition that comprises the individual’s worldview and forms the basis for behavior; what does not is either filtered out (in the sense of being excluded before it can lodge in the long-term memory) or is banished to the structural periphery and labeled “untrue.”

We are now in a position to identify the units of replication in cultural evolution. In doing so, we are particularly interested in their phenotypic expression as behavior or action, for it hardly matters what ideas someone may have if they are never acted upon (even in speech acts). Pure representations (encoded as nodes) cannot of themselves serve as the basis for action: rather the meaning relations that connect them to other representations provide the basis on which to act. Nor are representations per se (say the image of a pot) transmitted from mind to mind. What is transmitted are the meaning relations that connect an object to other objects or purposes in the real world (how to make such a pot, what to use it for). The same goes for abstract concepts. The notion of duty is the name given to a set of meaning relationships that situate “duty” in semantic space. We can only transmit that notion by communicating the set of relations which define its meaning, and which specify how duty can and should form the basis for action. These

34. Wayne A. Wickelgren, “Human Learning and Memory,” *Annual Review of Psychology* 32 (1981), 24.

35. I have developed this argument more fully in Stuart-Fox, “The Unit of Replication in Socio-cultural Evolution.”

36. The model draws largely on the work of W. A. Wickelgren, *Learning and Memory* (Englewood Cliffs, N.J., 1977)

socially learned meaning relations are the replicative units that structure every individual mind and comprise the basic elements of individual culture. I have called them “mentemes.”<sup>37</sup>

Variable sets of mentemes, I have suggested, are what underlie human action. But the relationship between mentemes and action is never straightforward. This is because, like genes, mentemes have both polytypic and pleiotropic properties. Not only do combinations of mentemes make up a single complex idea, but a single menteme may contribute to the meanings of several different ideas. Moreover, similar behavior may rest on quite different menteme sets. Thus behavior is never enough of itself to permit the identification of specific mentemes. Conversely, as suggested above, even contradictory mentemes can and do exist in structures of cognition, though in different regions of mental space where they may or may not find expression in action. It all depends on particular circumstances, and how they are perceived in relation to individual needs, goals, and plans.

Mentemes are seldom transmitted as single units. More often mentemes, like genes, cohere and are communicated as interlocking sets comprising concepts, ideas, symbols, theories, and so on. We can identify complex combinations of mentemes as any of these, or we can use a general term of variable extension, such as “meme.” The point to be aware of, however, is that though memes can be transmitted from mind to mind, mentemes are the building blocks of cognitive structure.

#### V. SELECTION IN SOCIOCULTURAL EVOLUTION

I shall pass over the variation of mentemes because the possibilities inherent in human creativity, directed research, innovation of one kind or another, recombination of mentemes, and so on are obvious.<sup>38</sup> Selection, however, is much more complex, for it takes place on several levels. At the level of individual learning, mentemes are selectively included in the structure of cognition (individual mental culture). At the level of individual action, actions are differentially expressed in relation to selective environmental influences, both natural and social. And at the level of group action, decisions committing social organizations and institutions to particular courses of action are taken in response to selective forces perceived to be affecting those institutions and organizations by leaders, committee members, and others involved in decision making.

Let us look first at the selection that operates at the level of cognitive structures in the process of social learning, that is, the selective positioning of mentemes in cognitive space. The actual pool of mentemes potentially available to a growing child is largely a matter of accident—the accidents of birth and one’s personal life trajectory. But how a selection of those mentemes comes to structure individual cognition is by no means a passive process, for what has already been learned biases subsequent learning. Such biases may be negative or

37. These remain theoretical entities, until such time as they can be identified in brain structure.

38. Cf. H. G. Barnett, *Innovation: The Basis of Cultural Change* (New York, 1953).

constraining, exercised by beliefs, values, or ideals; or positive and enabling, where learning is channeled in the direction of certain goals.<sup>39</sup>

Cognitive selectivity is a well-known phenomenon that takes place both unconsciously and consciously through the process of rational thought. Cognitive selectivity works in relation to what I have called the “core” structure of mind within the broader concept of cognitive space. A menteme such as “the earth is flat” (establishing a meaning relation between the earth and flatness as shape) hardly forms part of the core structure of cognition that underlies the actions of an astronaut. It may, however, find a place in the minds of those people who still refuse to believe the overwhelming evidence that the earth is round.

In order to understand how a person thinks, we need to understand how the structure of cognition has developed through the course of that person’s life (socialization, education, experience). That is, we need to know as historians attempting to explain thinking underlying overt action, what selective biases have been at work, who influenced an agent’s thinking, and how the memes and mentemes transmitted were differentially incorporated into individual cognitive structure. Of course, this historical process can never be retrieved in any but the crudest way, but this is essentially what biographers set out to do in tracing the development of their subjects.

The selective expression of mentemes in overt action may be all but unconscious. Indeed actions may be instinctual, as when we duck when something is thrown at us. Where action is conscious, however, selective pressures operate on two levels: in imagination when the subject is considering what to do; and in practice when the action decided upon is actually carried out. Imagination (consciousness) permits a choice to be made as to how to act on the basis of estimated likely outcomes judged according to the criterion of maximizing individual satisfaction. It is in imaginative pre-enactment that differential recombination of mentemes can be tried out in what Donald Campbell has called a “substitute trial-and-error process.”<sup>40</sup> This is the level of intention.

Once the decision has been taken to act overtly and the action is performed, it is, as the phenotypic expression of individual cognition, subject to selective pressures, primarily sociocultural, but also natural environmental. The outcome of the action may or may not be as foreseen; it may or may not elicit favorable responses in return. The effectiveness of the outcome thus forms the basis for judging the efficacy of the representational set of mentemes underlying the action, and thus determines whether or not that action will be repeated and those mentemes again transmitted. This process occurs whether the resultant action is a speech act or some symbolic or physical action; for in all cases selective pressures will be brought to bear that will affect the subsequent frequency of expression of the underlying mentemes.

39. What Boyd and Richerson call “biased transmission.” Boyd and Richerson, *Culture and the Evolutionary Process*, 9-11.

40. Donald T. Campbell, “Blind Variation and Selective Retention in Creative Thought as in Other Knowledge Processes,” *Psychological Review* 67 (1960), 389.

Finally let me turn to selection at the social group level. The social groups I am interested in are not those defined by some putative involuntary membership (such as classes) or by geographical location (communities), but which are organized in some way (as associations, institutions, enterprises). In all such organized groups, decisions are taken that determine the activities (policies, procedures, goals) of the group. The selective elimination of such a group in a competitive environment (say, a financial institution) can be, and has been, interpreted in a Darwinian sense as analogous to the extinction of a species. This might suggest that sociocultural selective pressures also operate at the group level, a conclusion W. G. Runciman avoids by arguing that what is selected are social roles. These are defined by particular institutions (“interrelated sets of rule-governed practices”<sup>41</sup>), and in being played out constitute the (social) structure of the institution. In effect this reduces organized social groups to collective individuals; while social roles become the units of selection.

This may be a satisfactory solution for a sociologist interested primarily in social institutions, but it leaves human beings strangely disembodied, their tasks in life merely to act out a variety of roles. But there is no need to construe organizations or institutions as individuals, despite their emergent properties (to be discussed below). Decisions by organized groups still depend on individual action open to selective pressure in the discussion stage. Once a decision is taken, it is presumably carried out by all members of the organization—even those who believe it to be mistaken (unless they resign). Thus selection of mememes continues to take place at the individual level, whether through inclusion in cognitive structure where arguments win over doubters, or more importantly as expressed in individual action (voting for a particular policy change, and then carrying it through).<sup>42</sup>

## VI. THE SOCIOCULTURAL SELECTIVE ENVIRONMENT

In biological evolution, the natural environment exerts selective pressure on the developing organism in the form of what Darwin called the “hostile forces” it faces in its struggle to survive and reproduce. Most species have virtually no means of mitigating the impact of a hostile environment, though others (such as the communal insects) do construct extensive nests. Human beings have gone much further, however, in largely creating their own sociocultural environment. This exerts the primary selective influence on the range and availability of mememes, on their inclusion in structures of cognition, and on their expression in action. It is largely in response to the sociocultural environment that behavior

41. W. G. Runciman, *Confessions of a Reluctant Theorist* (New York, 1989), 25.

42. This leads to adoption of methodological individualism as a research strategy, even though much of the evidence a historian might need may be lacking. It is not, however, what might be termed “radical methodological individualism” (caricatured by L. J. Goldstein as the claim that “all sociocultural concepts are, in the end, psychological” in “The Inadequacy of the Principle of Methodological Individualism,” in *Modes of Individualism and Collectivism*, ed. J. O’Neill [London, 1973], 276), for the evolutionary theoretical position takes full account of the emergent properties of social systems in the exercise of social power (see below).

is adaptive in pursuit of individually preferred forms of psychological satisfaction. But as the sociocultural environment is by definition socioculturally constructed, it is up to us as human beings individually and collectively to shape it in ways that will exert more, or less, or different selective pressures on strategies for achieving psychological satisfaction. Also, because human beings are conscious of time, the sense of well-being (satisfaction) they seek may be immediate or deferred. In other words, actions may not seek immediate psychological satisfaction: rather they may seek to construct an environment more conducive to obtaining desired forms of satisfaction in the future.

Actions taken in response to particular situations depend on how those situations are represented to consciousness, how those representations relate to existing cognitive structure, and thereby how the situations themselves are interpreted as providing opportunities to achieve some desired future outcome. In the words of I. C. Jarvie: "The social situation confronted by an actor is shaped and defined both by his actions and by the idea on which he based his action. Thus by both thought and action he is constantly shaping and reshaping the actual and perceived situation."<sup>43</sup> Thus environment selects action (designed to be adaptive), and action shapes environment (to make it more conducive to achieving psychological satisfaction). Of course, much action fails to achieve its desired outcome, and instead produces unintended consequences because it conflicts with the actions of others pursuing different outcomes, seeking to construct different future environments. These consequences create new situations that will have to be re-examined, conceptualized, and acted upon. And so on. This interaction between environment and consciousness is a continuous process: it constitutes the underlying dynamic of all social change.

The means used to exert sociocultural selective pressure is the exercise of social power: the capacity to influence the behavior of others.<sup>44</sup> Social power functions as a selective force on the expression of mentemes, in speech and other behavior. It thus constitutes a "transformative capacity."<sup>45</sup> Social power enters into all social relationships, for in all of them some selective pressure is exerted (in families, between friends), even by those clearly in a less powerful position. Abraham Kaplan has defined power as "the ability of one person or group of persons to influence the behavior of others, that is, to change the probabilities that others will respond in certain ways to specified stimuli."<sup>46</sup> What this kind of definition lacks, however, is any reference to the purpose for which power is exercised, no doubt because purpose is so variable. But in the context of evolutionary theory of history, social power is exercised in pursuit of psychological satis-

43. I. C. Jarvie, "Social Perception and Social Change," *Journal for the Theory of Social Behaviour* 11 (1981), 227.

44. I accept Mann's categorization of social power into coercive, economic, political, and ideological. Michael Mann, *The Sources of Social Power*, Volume I: *A History of Power from the Beginning to AD 1760* (Cambridge, Eng., 1986).

45. Cf. Anthony Giddens, *Central Problems in Social Theory: Action, Structure, and Contradiction in Social Analysis* (Berkeley, 1979), 88.

46. Abraham Kaplan, "Power in Perspective," in *Power and Conflict in Organizations*, ed. R. L. Kahn and E. Boulding (London, 1964), 12.



faction (which may be the satisfaction that comes from the exercise of power for its own sake), and it is up to the historian to analyze the explanatory logic of any particular situation.<sup>47</sup>

Social power as selective pressure can be exerted in a variety of ways. It depends, for example, on the kinds of dependency that exist between an individual and group relationships; and perhaps on the threat or exercise of force. Social power may take the form of persuasion, the offer of advice, emotional exhortation, moral appeal, or logical argument presented in face-to-face encounters or through some other means (editorials, essays, advertising). All forms of social power thus attempt to influence the way people act, both by shaping the way they think (that is, by exerting selective pressure on inclusion of mentemes in cognitive structure), and by constraining the way they act (through selective pressure at the levels of imagination and behavior).

Two particularly potent forms of social power that affect the structure of cognition are the exercise of legitimate authority and hegemonic control over socializing processes. Both straddle the uneasy divide between politics and ideology. Authority may derive from personal charisma or social position; that is, it may rest on personal or/and social systemic bases. Hegemony refers to the collective control exercised in their own interest by a social elite over the processes of socialization and enculturation.<sup>48</sup> Both ultimately depend on some notion of legitimacy, some conviction that persons in authority have the right to command. Both, in other words, rest on structures of cognition that selectively interiorize religious conviction or political ideology; structures that include certain menteme sets in the core structure of mind underlying behavior, and exclude others.

## VII. THE STRUCTURATION OF SOCIAL SYSTEMS

Social power is exercised not just on structures of cognition, but also on the expression of cognition in behavior. Selection at this level acts not on a random set of behaviors, however, but on actions that are tailored to instantiate membership of multiple, even overlapping social groups (for actors may simultaneously be members of several such groups). This is a two-way process that is central to social learning. Group expectations exercise powerful constraints on individual behavior, shaping them into the roles whose collective expression constitutes the structure of the organization or institution. This is the process Anthony Giddens has called "structuration."<sup>49</sup> It is the social equivalent to the way form or structure (biological *bauplan*) determines (selects) the relatively narrow range of possible alleles that can exist at a certain locus.<sup>50</sup> Mutations for monsters are elimi-

47. Historians must take account both of constraints limiting awareness of options (variation) and of constraints on the choice of options (selection).

48. The classic formulation is by Gramsci. See Walter L. Adamson, *Hegemony and Revolution: A Study of Antonio Gramsci's Political and Cultural Theory* (Berkeley, 1980), 170-179.

49. Giddens, *Central Problems in Social Theory*, 69-73.

50. Stephen Jay Gould has emphasized the importance of form in directing different lines of biological evolution (*The Panda's Thumb* [New York, 1980]). An analogous role is played by constitutional and legal precedent in sociocultural evolution.

nated: so too are behaviors so disruptive that they would destroy the structural cohesion of the group. This occurs through the critical response of other group members, with the ultimate sanction being expulsion from the group.

Membership in various groups, formal or informal, voluntary or involuntary, provides both opportunities for individuals to pursue their interests through taking part in group action, and a selective social environment within which other actors influence individual thought and behavior. Membership in voluntary groups is itself selective, taken in order to advance the possibility of extending sources of psychological satisfaction (friendship, social status, sense of in-group solidarity, exercise of social power, and so on). The rules and expectations of the group define the limits of variation possible at any one time, but these too may change (that is, adapt) in response to changing conditions or at the urging of persuasive leaders.

The vexed issue of individual-group relations and how these are effected by the emergent properties of groups should be mentioned here, although this is not the place to defend methodological individualism in the social sciences. I would point out, however, that structuration conceived of as a selective interactive process in which social structure, as the principal emergent collective property of social systems, both constrains individual choice of action and facilitates pursuit of preferred individual interests, clearly situates the locus of selection at the level of the individual, not the group. When we say that social groups (organizations, associations) make decisions or pursue projects, what we really mean is that these outcomes resulted from the interaction of individual members. As historians we may not possess the evidence to reveal how the decision was ultimately made: the minutes, if they exist at all, often record only the final vote. But we recognize that the group decision is the end result of a complex selective process.<sup>51</sup>

Individuals exist within a multiplicity of social structures, each of which exerts selective pressures. We are subject to the demands and expectations of our family, friends, and colleagues with whom we work; to the rules and regulations of the organizations to which we belong, and of government at local, regional, and state levels; and to the semi-moral, semi-legal suasion exercised by the international community through the United Nations and its various declarations. Of these I want to focus on the modern state, and the forms of social power it makes available to those who gain control of its instrumentalities. The Marxist view of the state as the instrument of a dominant class, which uses it to further its own class interests, needs to be modified for modern industrial societies. In such societies, the state is better conceived as an arena in which competing groups struggle to gain a greater share of social power.<sup>52</sup>

The modern state provides a vast variety of means for exercising social power. But this power, no matter how concentrated, should not be conceived of as inte-

51. Sanderson makes the same point (*Social Transformations*, 383-384), but then all but ignores the individual human level.

52. Cf. Boris Frankel, "On the State of the State: Marxist Theories of the State after Leninism" *Theory and Society* 7 (1979), 199-242.

gral. Rather the state and its coercive and persuasive organs constitute the most broadly comprehensive, even hegemonic, sociocultural environment affecting individual thought and behavior. Yet within state structures—even the most repressive—interstices in social space permit individuals and groups to pursue sources of psychological satisfaction even if these are strictly limited. In the looser structures of a democratic state, not only are those interstices larger, but they are also incorporated into feedback loops that constitute part of the structure of social power. In other words, they permit individuals greater say in the construction of their own sociocultural selective environment, and thus in the direction of their own future evolution.

#### VIII. SOCIOCULTURAL EVOLUTION

The evolution of separate cultures occurs, like speciation in biogenetic evolution, when the frequencies of mentemes in the core structure of individual cognition differ sufficiently markedly to result in incompatible processes of behavioral structuration (for example, when new religious beliefs and observances evolve). Changes in menteme frequency occur through innovation (in patterns of meaning, knowledge, technology, and so on), through differential selection, the migration of people, or diffusion of mentemes (“menteme flow”), or as a result of “cultural drift” (as when non-typical groups found new colonies). Such effects are magnified by geographical isolation and social exclusion and marginalization. They may also be reinforced by social custom and taboo (for example, against intermarriage).

In sociocultural evolution, convergent evolution is as important a process as divergent and parallel evolution. Indeed over the past four centuries, since European exploration of the globe greatly increased the contact among different cultures and civilizations, convergent evolution has been most marked. At the same time, however, new kinds of differentiation increasingly occur in complex, post-industrial societies as individuals and groups exercise their ingenuity opportunistically to create some new sociocultural niche, or meet some new social demand. This has resulted in the proliferation of subcultures, of groups characterized by some common interest, the members of which strive through the levers of social power available to them to shape the environment in their own interests (that is, to ensure continuing opportunities to obtain preferred psychological satisfaction).<sup>53</sup>

Conflict is endemic in all modern societies, even though sometimes repressed by coercive means, simply because there will always be differences over how communal resources should be divided (that is, the means of obtaining preferred sources of psychological satisfaction). In most cases, such conflicts are settled either through compromise or through differential exertion of social power (in the selection of behavior). Where conflict deepens, radically different visions of the future sociocultural environment may motivate the opposing sides in a revo-

53. A process known as social differentiation; Sanderson, *Social Transformations*, 6.

lutionary struggle. Where a revolution is successful, rapid sociocultural change will result before a new balance of social power creates a new sociocultural environment to which individuals and groups must adapt (a process analogous to “punctuated equilibrium” in biogenetic evolution).<sup>54</sup>

Conflict as a factor in sociocultural evolution operates on a series of levels. Within groups social power selects behavior that benefits some individuals over others in that it enables only some to obtain psychological satisfaction. At the inter-group level common interests of members of one group are pursued in opposition to the common interests of members of other groups. At the level of large political units, such as nation-states, the interests of the group as such (the state nominally acting on behalf of all its citizens) are pursued in opposition to other groups (states). At all levels in a globalizing world those wielding the social power that effectively selects the behavior of others face the challenge of responding to and shaping ever more extended and complex sociocultural environments. This not only requires expanded consciousness and greater knowledge of interacting factors, but opens the way to miscalculations with vast consequences. In other words, despite our growing knowledge, there is an ever greater risk of unintended consequences of action that will create new and unforeseen situations exerting new selective pressures. So despite apparent convergence, there is no point towards which sociocultural evolution is tending.

One further point is that the uncoupling of biogenetic and sociocultural evolutionary processes might be problematic with regard to the natural environment. That is, sociocultural evolution may not necessarily yield better adaptation to the natural environment. Human culture has undoubtedly been highly successful in facilitating proliferation of the human genome, but our methods may lead to ecological catastrophes in a seriously depleted (degraded) environment and so to population collapse. As a species, we must necessarily build the appropriate mentemes making this connection into core structures of cognition, and act accordingly.

#### IX. IMPLICATIONS FOR HISTORIOGRAPHY

At the methodological level at which most historians work, the implications of even such an inclusive evolutionary theory of history as the one I have sketched above are less than might be imagined. It is part of the biographer’s brief to attempt to explain how a subject’s thinking (cognitive structure) evolved, where key ideas (menteme sets) came from, what emotional charges they carried, and why, and how they were appropriated and acted upon in specific situations.

Explanations given in the form of what Karl Popper called “situational analysis” take account of selective pressures at what I have defined as the level of intention.<sup>55</sup> That is, we explain an actor’s choice of action in terms of how the confronting situation was conceived (represented to consciousness), and what

54. As developed by Stephen Jay Gould and Niles Eldredge, “Punctuated Equilibria: The Tempo and Mode of Evolution Reconsidered,” *Paleobiology* 3 (1977), 115-151.

55. K. R. Popper, *The Open Society and Its Enemies*. Volume 2: *Hegel and Marx*, 5th rev. ed. (London, 1966), 265.

alternatives seemed possible given that conception. Any alternatives that might have but apparently did not occur to the actor also require explanation in the same terms.

Once an action is decided upon (for example a speech act, as when advice is sought), the historian then wants to know how it was received, how criticized, how praised; what counter-actions it evoked, what unforeseen outcomes it had. In other words, the historian analyzes the selective pressures that impinge upon the action (political decision, legal constraints, military force, and so on). Such pressures, in the form of feedback, in turn act selectively to reinforce or exclude mentemes from individual core cognitive structure.

What evolutionary theory of history that is firmly based in individual psychology does, therefore, is primarily to sharpen the historian's analysis by pointing to the key elements necessary to explain events. These include the cognitive basis of action, how one action rather than another furthered the adaptive interests of the actor (by maximizing the potential sources of psychological satisfaction), and which competing selective environmental pressures had most impact in bringing about the action that occurred. Of course the historian will never have access to sources that might permit a complete account of significant action in terms of selection of mentemes (their inclusion in structures of cognition of the various actors, their expression in action), any more than evolutionary biologists are able to reconstruct the selective processes that have led to the extant gene pool of any living species. The value of both theories lies in the more detailed understanding they bring of the processes of change over time, whether biological or historical.

The process of historical change investigated within the parameters of an evolutionary theory of history is a seamless process that may proceed slower, or faster, or catastrophically, depending on the sociocultural selective environment, but that does not necessarily entail any sequence of stages. So-called "primitive" societies remained so probably because they were isolated from contact with (and so not subjected to selective pressures exerted by) other social groups and their different ways of thinking and behaving. They were effectively adapted to their relatively unchanging natural environments in terms of utilization of resources (in the case of hunter-gatherer societies), and it was only exposure to a changed, powerfully selective sociocultural environment that set them upon new adaptive trajectories in order to compete and survive. Some did, and some did not; but there is no sequence of evolutionary stages to follow. The people of Papua New Guinea, in constructing a modern state, have done so by incorporating menteme sets associated with present-day ways of organizing and behaving, not those associated with feudalism.

Finally, evolutionary theory of history has implications for the way we understand human history as a whole. To begin with it sets human history within both natural and sociocultural contexts as part of the ongoing record of life on earth. It eschews teleology and does not pretend to predict the future. Evolutionary theory of history, however, does not prevent us from identifying certain historical

trends, such as increase in scientific knowledge, or improvement in technology, nor from interpreting these to provide meaning for our ongoing activities (by taking the collective decision to push them further). But it does warn us that trends are not laws, and can be reversed if sufficiently adverse environmental conditions exert sufficiently powerful selective pressures. Given our evolved ability to invent and plan our own future selective global environment, however, we have the means to prevent such forces arising, providing the collective will exists to do so. Of course, the outcome of decision and action is not at all likely to be precisely the one any individual or group desires, and the struggle to construct competing futures will continue. So the future writ large will always lie open; but as any good historian well knows, its shaping is up to us alone.

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