From Universal History to Holocene History: From the Teleologies of Modernism to the Darwinism of Long-Run Societal Transformation

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Abstract

This paper discusses the philosophical assumptions of universal history as developed from the 18th century and as manifested in certain forms of world history in the late 20th century. The general genre is criticised for its reliance upon implicit and explicit teleological assumptions and its corresponding connections with the 'modernization project'. The critique is developed from the perspective of the anti-teleological thinking that is embryonic within Marx and fully-realised in the Darwinian 'natural history' perspective of Gould and others in the late 20th century. A new framework for very long-run history can be constructed if it rejects teleology but a rational-choice basis for such history replicates the failings of the old universal history. The new framework must incorporate elements drawn from complexity, chaos, and catastrophe theories and take a rigorously historical rather than deductive approach to the research. An outline of such a theory will be presented in the paper.

Modes of Universal and World History: The Role of Teleology

The dissatisfaction with the traditional primary focus of historical enquiry upon the national state and the associated issues of state formation and politics, national culture and identity, and the roles of social classes and other groups of social actors in the national story, has produced several varieties of new historical writing recently. The western-oriented state/imperial/colonial/postcolonial story has dominated historical scholarship around the world until recent times. While there can be no doubt about the importance of state-oriented processes and of western imperialism to the history of the world during recent centuries there is now a large range of historical writing that focuses upon wider, more universal entities and processes, above and beyond state-based processes. A world or global focus has now become the framework for much important historical theorising and research.

This broad development has raised crucial issues both about the construction of objects and problems for study and about historical methodology and explanation that are not yet resolved. These issues may be susceptible to some resolution, in my view, by a comprehensive double-level argument that is made on the interconnected terrain of methodology and theory. Historiography rarely tries to connect these two levels but they should be seen as strongly implicated in each other. In other words, an argument about historical methodology must be conceptually distinct from but reinforced by an argument about theory. Each must be adequate to and reinforce the other. I shall argue that only a Critical Realist and Neo-Darwinian approach to Holocene history is able to achieve this methodology/theory nexus, with potentially beneficial results for historical explanation generally. These results can be achieved only by the abandonment of the vestiges of teleology in historical writing.

The recent upsurge in theoretical thinking about very long-run history has roots in the enlightenment and modernism but, I argue below, has largely been unable to escape its teleological roots within these modes of thought. Ideas about the unfolding of religious r structural essences and the postulation of progressive stages has been a constant nature of historical thinking from the earliest days. The ideas of modernization and even globalization are but the latest form of progressivist thinking. Non-teleological thinking (stressing historical and contingent evolutionary processes) grows out of modernism as the critique of it. But Neo-Darwinism is not post-modem, in the sense f the contemporary use of that term, nor is it pre-modem. Darwinism, like Marxism, is both a product of modernism but also the scientific (because resolutely historical) contradiction of it, which is now only just being grasped for its full significance.

Universal History

Attempts to comprehend the universal experience of civilized humanity have existed as a genre since ancient times. Attempts to capture within single religious formulations and concepts the entire experience of human civilization have been a recurring theme within literate civilizations (eg Ibn Khaldun). As a part of the 18th century Enlightenment, Vico in Italy and, especially, German historians such as Kant, Gatterer, and Herder, developed a much more conceptually rigorous approach to universal history that attempted to comprehend the whole story of mankind and of

their state formations. Their historicism attempted to comprehend the idealised and particular history of nations and great powers and, in the most rationalistic version, especially of Hegel and von Ranke in the 19th century, of the unfolding of the human essence of reason. They emphasised the great variety of human experience within the broad universal theme. Both Vico and the Germans emphasised the complete separation of human history from natural history and the necessity of completely different methodologies for their study.**1**

Evolutionary History

The evolutionary approach to the history of society, economy, and the state, which also developed from the 18th to the early 20th century as an Enlightenment project, has a fundamental difference from universalist history for it conceptualises its object in developmental, directional, and structural terms. "Evolution" to most writers hitherto and unlike Darwinians (and particularly Neo-Darwinians) has implied a process of change through stages towards a more or less determined result. The early developers of evolutionary history in Britain and later in Germany saw their task as providing an all-encompassing account of the stages of social progress from barbarism to industrial civilization. From Adam Smith and the Scottish enlightenment thinkers, through the German Historical School of Economics, the English Historical Economists and Sociologists, and the Leninist Marxists, to the 1950s and 60s Modernization School, the task was seen as one of examining paths to progressive development and the role of the state in furthering that development. All nations and peoples could achieve development of their economies and societies and all could be examined according to their degrees of development on the pattern exhibited by western capitalist and communist states.

Structuralist History

A peculiarly French approach to general history developed in the late 19th and early 20th century that aimed to study all of history as a process of complex structural change in which the visible manifestations of daily life could be explained by hidden, inexorably moving, geo-eco-social processes that had to be uncovered via an archaeological investigation of the unconscious levels of social structural history. The French *Annales* historians combined influences from linguistics, geography, anthropology, sociology, and economics, in the greatest attempt to that time to build a synthetic social science around the structuralist vision of long-run, social change as being a natural process of autonomous and determinant history.

World-Systems History

World-system history was an outgrowth from within the same broad tradition of ought as evolutionary and structuralist history and one of the most influential recent developments within historical methodology and theory. Drawing upon the general theorising of Marx, Weber, and other historical sociologists of the late 19th and early Other centuries, the world-system writers constructed a comprehensive theory and methodology for explaining all parts of the history of the world during the past five centuries (and all of the history of humanity in one sub-genre). The history of states, economies, and social structures were all explained as part of an approach that aimed at comprehensive explanation of economic development and backwardness in the

modern world capitalist system. Some world-systems theorists have generalised the theory to incorporate the whole of civilizational history.

World History

As a critique of and alternative project to theoretically-elaborate structuralist and revolutionary history of the world-systems and evolutionary/modernization kinds, and of nationalistic state-oriented history, the genre of "world history" has grown rapidly recent years. World history tries to encompass, somehow equally, the history of all the peoples of the earth, especially during the past five centuries following the major rust of European expansion into other continents. World history is both broader, in one sense, but much less theoretically constructed and encompassing than World-System history. They share a concern about the necessity of grasping the history of all arts of the world in one framework. But their differences are greater than their similarities for world history, as commonly understood, is a project of restoration of a degree of identity and autonomy to the history of all ethnics and nations and a rejection of the subordination of their peculiarities to concepts of metastructures and metaprocesses that are often western-centric, such as feudalism, imperialism, colonialism, and modernization. They want to downplay the significance of world-encompassing systemic processes and elevate local differences and trajectories to be the rime focus. Empirical particularity rather than structural similarity is the chief theoretical idea.

Big History and Holocene History

As a recent development within "world history" there has begun to be articulated a subgenre of very long-run world history, in which the histories of particular parts of the world and of the whole human-environmental evolutionary history are traced back to pre-civilizational eras. Sometimes this very long-run history is called Holocene history or even "big" history. The latter usually attempts to conceptualise and explain the whole history of humanity during at least the Holocene epoch and in one form tries to encompass the whole 4.5 billion year history of the earth.

The development of the genre of very long-run or big history has indeed grown apace in recent decades, exemplified by work in the journals *Review, World History, Environmental History, Ecumene, Current Anthropology,* and others. Enquiries into and explanations of very long-run history now constitute a large and growing branch of historical writing and are merging to some extent with the historical sciences of geology, biology, and ecology. We can observe that the sites of convergence of these historical disciplines are around the issues of the socioeconomic and environmental histories of humanity in the very long run. **2** Much work is being done on the topic of the role of evolutionary processes in long-run social history and their interconnections with the biological evolution of humanity and of the ecological conditions of humanity's existence. A central debate concerns the applicability of Darwinian theory to this study of long-run social history.**3** And within Darwinian theory there is a fundamental debate regarding continuous adaptation versus punctuated equilibrium.

During the Holocene, humanity has collectively experienced a series of fundamental transformations of material, social, and cultural life, which, necessarily, have greatly transformed the socio-biosphere of the planet. The structural forms of social life, or

socio-cultural formations, within their biospherical contexts, have greatly diversified and proliferated during this 12000 year era. The very long run history of these formations and their biospherical context, and thus of the collective experience of humanity, is a field of enquiry that would seem to demand theorisation of a sort that draws upon recent developments in evolutionary and systems theories. This field can e called "long-run social history" or "societal history" but perhaps most correctly called "holocene history", as I will explain in a moment.

Constructing a holocene-oriented theoretical framework for the history of Social formations promises to provide a way out of the teleological vestiges that much historical writing still contains. Non-teleological history requires an approach that is ble to explain the ***contingent***, ***chaotic***, ***and yet determinant evolution*** of the long-run process of human history as it has actually occurred within its biospherical context. I argue in this paper that such an approach would emphasise the endogenous environmental forces (including catastrophes resulting from shocks) and structural forces of continuity and rupture, that have produced what can be viewed as a punctuated equilibrium process of very long-run history. A Neo-Darwinian approach to societal history, incorporating ideas of catastrophism, chaos, and complexity, directs attention to the value of societal ***innovation*** and ***selection*** as well as ***structural equilibrium*** in producing a history of social formations during the past 12000 years. Such an approach is supported by the critical realist methodological framework.

Critical Realism and the Critique of Teleological History

Critical realism is mainly an account of scientific methodology and a program of reconstructing the philosophical foundations of social science to make them akin to the foundations of natural science in terms of their explanatory claims **4** Critical realism denies the reliability of sensory perception in scientific explanation but also denies the validity of postulated essences and undiscoverable forces and powers. Critical realism is the articulation of the actual activities of those branches of science that have been successful in discovering the hidden powers, structures, and complexities of ***natural*** kinds, ***natural*** systems, and ***natural*** processes. This articulation claims that scientific success has sprung from a combination of the abandonment of essentialist, phenomenalist, and atomist conceptions of reality; the adoption of an attitude of constant critique of appearances and conceptions; and the postulation of unknown but ***discoverable*** layers of intercausal complexity within nature.

The sciences have long been bedevilled by their legacy of teleology, a legacy bequeathed by premodern European religious thought. The enlightenment critique of romanticism and irrationality adopted the new telos of reason rather than rejecting all teleology. Modernity, a product of enlightenment and capitalism, extolled the power of the master narrative of rationality and the domination of nature by individual creativity harnessed to the goal of liberation from all natural constraints. Science was to be the handmaiden of that liberation and free market capitalisation its manifestation and goal.

Thus an interest in the study of long-run social and economic history is really a product of and feature of the Modern Capitalist Age. Long-run history was the

process of economic development culminating in the capitalist triumph over nature, individualisation, and the satisfaction of all earthly desire. Therefore the way into understanding and criticising existing approaches to writing very long-run history is to examine their interconnection with modernist thought. This interconnection is rather complex but we can identify two main closely-related strands of the interconnection.

One has to do with the teleologies of modernization - that is, with the way in which history has been understood, articulated, and justified by a mode of historical discourse based upon teleological reasoning about the necessity of modernization as the goal of history. The other has to do with the emergence of anti-teleological or scientific reasoning, inspired mainly by Darwinism, about long-run history. These may seem quite contrary but in fact, I argue, there is a close relationship between them. Anti-teleological reasoning has its necessary foundation in teleological thought and in criticising it moves beyond it while retaining much of its scope and corpus of work. **5**

Rational teleologies, usually espousing some progressivist notions about humanity and its history, (such as Pre-Darwinian evolutionism in sociology and biology and early geology, Idealist philosophy, and some forms of socialism and eco-socialism, all espousing the perfectibility of humanity and society) have been a central feature of Modern thought since the Enlightenment. Teleologies posit an ahistorical prime mover of history - an external deity or the necessary progressive unfolding of an internal essence or human trait, such as rationality or acquisitiveness or competitiveness, or the pull of some universal goal - which drives the history of the earth and/or humanity inexorably towards some final state of history. On the other hand, the *post facto discovery* of an ordered structural process and pattern in history, even a directionality towards 'progress', such as the evolution of complexity, does not necessarily imply that a teleology was at work. Nevertheless, theorisations and explanations of such processes need to be expressed carefully and understood to avoid even the idiom of teleology for that would strongly influence the objective scientificity of the explanation.

Teleological theorising is fundamentally flawed in its unnecessary positing of a goal-directedness or essentialism in nature and society but it retains a lingering appeal in the biological sciences as well as being still central to the social sciences. Teleology seems to have been eliminated from the physical sciences, including geology. In biology its vestiges are besieged by anti-teleologists, such as Gould. The elimination of teleology from social science will take much longer, however, and will require a good deal of attention to the *duality* of human agency and structure and the *contingency* of history, as well as the adoption of ideas of punctuated equilibrium, catastrophism, innovation, selection, and other key concepts from Neo-Darwinism, to add to existing concepts of structure, action, and structuration. Theological progressivist thinking will have to be rigorously criticised and expunged if social scientific history is to be made adequate to its object in the way that cosmology, geology, and much of biology have become genuinely explanatory. Teleology has been a major hindrance to construction of genuine scientific explanations, as the history of the macrohistolical sciences of nature has revealed.

The most important contribution of critical realism is to provide a *philosophical framework* for the critique of teleology in science and, more particularly, for the construction of a non-teleological theory of history. But such a non-teleological theory must still have a central place for human purposive agency at individual and collective levels. Human purposiveness does not imply a teleological social system. Individual and collective goal-directed behaviour is confined by the structural evolution of social organisations and implies nothing about purposiveness and goal directedness in long-run history as such. It may be thought that civilizational, technological, and economic, histories display goal-directedness. The written accounts of these histories often do but of course those histories have been written from the point of view of the modemist/capitalist apotheosis. However, real short-run directionality in the form of so-called "progressive complexity", especially in capitalist societies, implies nothing about goal-directedness. Viewed in a longer perspective, social processes are usually stochastic, cyclical, and occasionally catastrophic and regressive, and even when directionality is identified in reality there is no necessity to posit unfolding essences.

Environmental and Societal Histories of the Socio-Biosphere During the Holocene

Human collective agency transforms the natural environment and has done so for many thousands of years, perhaps for as many as a hundred thousand years, consequent initially upon the mastery of fire. Humans transform the environment in ways quite distinct from other species who also mould the environment in strictly limited ways to their strictly limited purposes. There is seemingly virtually no limit to humanity's power over nature, thanks to the growth of science and technology. Thus the natural biosphere of the planet has become subordinated to and largely influenced by the sociosphere of the planet. But we must fully grasp that the sociosphere is a structured complexity of ***organised social formations*** and not simply a large set of individual behaviours. Socialised humanity only has a history as a history of social formations, and the behavioural patterns and myriad individual behaviours within those patterns and forms are subsidiary to social formations. Analogously, we would say that natural history is concerned with the history and behaviour of species, not individual members of a species; social history is concerned with social structures or formations, not with individual human or small group behaviour.

It could be argued that because of human technological development the planet now has a socio-biosphere as a single, evolving system. The long-run history of this supposedly single system is sometimes taken to be the subject matter of environmental history as a discipline or science. Clearly, there have been phases of increased interpenetration of the two throughout the history of the late Pleistocene (40,000 12,000 BP) and the Holocene (12,000 BP to present). This is especially the case with the onset of the Holocene, at the end of the last ice age, which saw the rapid spread of waves of Mesolithic and neolithic peoples to all parts of the planet, then the invention and adoption of agricultural systems, the growth of civilisations and large states, and the eventual emergence of industrial economies and societies. All these transformations necessitate a science that studies the interpenetrating complexities of nature and humanity during this era that gave rise to the present socio-biosphere and our global environmental/social predicament.

But to say that there is a single socio-biological system is to go too far. The history of the biosphere, while increasingly influenced and moulded by unintentional human social impact and intentional manipulation, is still a history that has its own powerful structure and dynamics. And the same can be said of the social systems of the planet. Thus holocene history has two sub-branches (biological and social) that deal with the increasing interpenetration of the social and biological systems *qua systems* over the past 12000 years. Ideally, the two sub-branches of holocene history should strive to develop a unified theory of structural change for they are both natural systems evolving within the same space and time. Such a grand theory would attempt to unify the domain of holocene history and form a framework for the sciences of ecological evolution, paleoanthropology and archaeology, palaeobotany, paleoclimatology, historical sociology, and historical economics. On a deeper level, philosophical foundations deriving from critical realism and structurist methodology are required to construct Holocene history. .

Darwinian and Lamarckian Theoretical Foundations for Holocene Social History

The task for theory construction for Holocene social history is, therefore, to provide the basis for a general account of the long-run processes of socioeconomic formation and transformation and the shorter-run processes of social ruptures, cycles, innovations, developments, and declines that constitute the long-run history of social forms in this long era.

The only truly successful theory of long-run change in the biological and social sciences, if success be measured by survival and spread at least, is evolutionary theory. But 'evolution' is really only a vague concept that has to be given content and specificity. In the biological sciences Darwinian evolutionary theory has survived all challenges even though there are major internal debates, especially regarding adaptationism and punctuationism. Lamarckian theory has long since been ejected from biology. But there are still vestiges of teleological thinking in biology. In the social sciences Darwinian theory has made some limited impact, especially in a part of the broad field of economics, and in paleoanthropology. Nevertheless, teleological thinking is still prevalent in the social sciences.

There is a long history of evolutionary thinking in the social sciences, pre-dating Darwin, beginning in a rudimentary form with Smith and other Scottish Enlightenment thinkers in the late 18th century, developing with Malthus in the early 19th, and continuing with writers such as Comte and the german historical economists, and then with post-Darwin social theorists and social Darwinists, such as Tylor and Spencer in England. **6**

The essence of all evolutionary theories is the idea that a very long-run process of change and history is one in which certain fundamental features of a structure are preserved while others change. This of course involves the development and acceptance of a taxonomy of the subparts or natural kinds that constitute a system and the development of a conceptualisation of structures as being ***naturally*** structured in reality, *a la* the philosophy of critical realism and the methodology of structurism.

An evolved structure is one that still carries the remnants of its early manifestations in some organic or structural sense or, to put it another way, is structured by a deep level of causal mechanisms that persist beneath various manifestations. Evolved structures always emerge from earlier forms but the connection with earlier forms may be partly discontinuous, at least in terms of morphology, owing to catastrophic shifts. An evolutionary process may be gradual or punctuated by sudden shifts thus marking a series of stages or phases. However, since teleologies can exist within some evolutionary theories, usually in the form of progressivism, evolutionary theory in general cannot serve alone as the vehicle of critique of teleology in social science. And since explanatory ideas of progress are prevalent in the social sciences, combined with the essential concept of purposive agency, the task for non-teleological theorists is large. The vehicle of critique of teleology must be a combination of neo-Darwinian theory, in which there are concepts of innovation, selection, adaptation, contingency, and structural shifts, and neo-Lamarckian socioeconomic theory, in which there is a conceptualisation of the inheritance and spread of acquired social characteristics.

Evolutionary theories can posit several kinds of fundamental forces, mechanisms, or causes of evolution. These can be divided into exogenous and endogenous kinds but neither are miraculous. In the case of social structural history the evolutionary mechanisms are partly Darwinian, in the sense of selection of endogenously generated innovations within structures, which sometimes allow adaptation to changed environments through better manipulation of environments. Environmental changes, including catastrophic shifts, happen both exogenously and endogenously to the totality of social Organisation. But since societies also have human purposive agency and rational choice operating within them, allowing for Lamarckian-type inheritance of acquired characteristics, which have sometimes arisen in response to social necessity, social scientific theory must go beyond neo-Darwinism while building upon it. Part of the social scientific form of Neo-Darwinism must now be a place for chaotic processes within complex systems. This will be discussed further below.

The biological sciences in recent times have come to understand that there are essential interconnections between biological history and the geological history of the planet within its solar systemic context. Biological history is increasingly understood as a history of discontinuities, contingencies, and chaotic processes. According to Gould, Eldredge, and many other natural historians (properly so-called)**7**, the history appears in the natural record as one of punctuated equilibrium. That is, the history of life is not one of steady accumulation of progress in terms of direction or of succession or of improved adaptation. There seems to be a tendency towards equilibrium which is disrupted by contingent environmental events and chance structural shifts, resulting in episodes of rapid speciation. There is also some degree of gradual adaptation and drift. There is no teleology within Darwin's theory that posits progress or long-run directionality although some Darwinians do hold that the history of life exhibits directionality. The Gouldian critique of this view **8** is highly persuasive.

The Darwinian theory of natural selection is a theory of speciation or biodiversity and it implies that speciation is closely related to processes of extinction of species. More than 95% of all species that have ever existed have perished from the earth. Together the two processes of speciation and extinction constitute the biological history of the planet. Biological history is also closely interconnected with the geological and

climatological history of the planet. Geology and climate are partly separate but connected systems and together they interact with biological processes to form the history of the geosphere, which has to be understood as a unified history. Not part of this complex, multi-layered, system but impacting strongly on it is the solar system.

Speciation is explainable by two alternative interpretations of Darwinian theory. The first, dominant, interpretation sees it as a process of gradual adaptation to gradually changing environmental conditions at various rates within the totality of the biosphere. Similarly, extinction is explainable by the failure of adaptation to new conditions. The second interpretation is that of the Gouldian natural history approach, which has developed the punctuated equilibrium theory. The Gouldians argue that speciation is a spasmodic occurrence, as the fossil record attests. For much of biological history there is a high degree of stability in both the totality of species and within each species. Species are not always undergoing gradual adaptation to gradually changing environments but exhibit great stability. Exogenous shocks or just endogenous spontaneous innovations sometimes rapidly allow for the emergence of new species or variations within species, with no adapta6onist directionality.

Environmental change is clearly a major influence on speciation and extinction. One of the causes of major environmental change is bolide impact. Another is continental drift and collision. A third is major volcanic eruption. A fourth are perturbations in the earth orbit. All have the capacity to shift climates into new patterns or new semi-equilibrium (attractor) states within chaotic systems. Hence the history of species is a history of relatively (or very) sudden shifts interspersed with periods of relative stasis (i.e. punctuated equilibrium). Thus punctuated equilibrium is a *description* of the pattern of natural history which is explicable by this set of interlocking themes.

Does long-run social history present a pattern of punctuated equilibrium? If so, can there be a Darwinian-type theory to explain it? What sort of general theory or set of theories is needed? The theory would have to offer explanations on several levels:

(a) The nature and sources of social organisational structure and stability.

(b) The sources and genesis of social and cultural innovations.

(c) The processes of selection/rejection of innovations.

(d) The kinds of organisational change and innovation that help explain the adaptation,alteration, and/or extinction of whole societies.

Therefore we have to ask are social formations such that they are entities or systems that generate and evolve through space and time and die and thus present a long-run history of social forms? In a general answer to this we can say that societies are structures of internally coherent and relatively discrete sets of social relations of interacting people who engage in sets of multiple exchanges of manifold kinds and have various kinds of organisational cohesion and control. Societies are internally self-organised and interact externally with other societies on various levels. Societies are indeed multi-levelled or have within them many sub-societies of different scales and many kinds of organisational cohesion and have histories of scale, complexity, and interaction.

We can say that societies are indeed analogous to species. Species are sets o organisms systemically organised internally through biological and sometimes ver limited social exchanges, primarily for biological reproduction. Societies are organised internally as systems of biological, socioeconomic, and cultural exchanges for social and biological reproduction. Thus, unlike other systems, social systems are organised both socially and biologically. Social Organisation cannot simply be reduced to biological Organisation. Social Organisation emerges from biological Organisation an has to be studied and theorised as a set of structures, interactions, and exchanges that i self-organised, complex, and chaotic. The totality of the Organisation of any society contains processes of innovation, and selection and rejection of innovation, leading t equilibration and/or structural change.

Thus we are led to the question of whether there can be a unified general theory of al natural and social systems of the planet, deriving perhaps from neo-Darwinism? Some of the theorists of so-called 'Big History'9 argue there can be but the problem of Lamarckian-type inheritance arising from purposive agency in the social world would seem to preclude any simple unification of biological and social theory.

Towards a Natural History of the Holocene

There have been many attempts to theorise and write the long-run socio-economic history of the Holocene 10 While it seems that none are explicitly Darwinian, some have had a degree of influence from Darwinism, although usually in a somewhat distorted and/or underdeveloped sense. The lack of a Darwinian or Neo-Darwinian perspective is a result, I suspect, of an inadequate appreciation of the essential propositions and therefore power of Darwinism to help explain long-run processes especially when combined with closely related concepts of chaos and complexity from new systems theories. Graeme Snooks' recent writings are somewhat vitiated by this absence, I believe, and North and Thomas's emphasis upon the centrality o institutional innovation without a theory of selection and extinction, prevented their book from developing a viable theory. Similarly, Sanderson's work is somewhat incoherent for it fails to provide a genuinely evolutionary theory in spite of his desire t do so.

A "natural history", Neo-Darwinian approach to the social history of the Holocene would contain the following elements:

(i) Chaotic Dynamics of Natural systems

At the most general and ultimate level of analysis there has to be an awareness of the strength of powerful long-run and sudden forces operating endogenously an exogenously upon social structures. Geo-astronomical, climatic, biological, an structural continuities, changes, and events; wars and conquests; disease epidemics invasions of unoccupied territories; and so on; operate as the basic forces of social systemic evolution. This level of determination in turn is the context for the co evolution of physiology, culture, social structure, and humanised environments.

(ii) Co-Evolutionary Interconnections of Culture, Social Structure Material Production, and Environment

At the evolutionary level, then, there is growing evidence of long-run intercausal connections between all these aspects such as to form a complex system of innovation selection, reinforcement, and divergence in all of them. Environments are moulded by human impact for many thousands of years prior to agricultural adoption and in turn environmental interaction for survival sets the contexts for culture, social structure, an production. Long-run socioeconomic experience serves to select or reinforce aspect of physiology and culture, and so on. This is probably compatible with Marx's notio of a long-run tendency to economic development. But must humanity necessarily hav undergone economic development? That is very doubtful. To say so is to posit a telos which is what Marx could be read as doing. At a more concrete level it can be argue that the dynamic interaction between changing resource base and population size, or th carrying capacity of a terrain, is altered by either or a combination of climatic change o population growth. Food security could decline under these conditions necessitating innovation. Similarly, it has been argued that megafaunal extinctions (possibly human caused) of the late Pleistocene and early Holocene greatly reduced carrying capacity necessitating a radical innovation such as agriculture. But environmental changes o such magnitude would have occurred many times in the human past globally and locally and they did not elicit a radical socioeconomic response. Changes in rudimentary environmental management practices can be seen as mutations in socio-economic behaviour that may occur anywhere at any time, given certain environmental condition such as suitable plants and animals. Whether this mutation survives will then depend on the survival advantages it bestows on the group that harbours it.

(iii) Rational Choice

A human rationality hypothesis has been central to economic and social theory for tw hundred years in the sense of the idea of a human desire for maximisation of material benefit from environmental interaction and from investment. In recent rational choice theory there have been the additional assumptions of a uniform utility function for all individuals, sound reasoning about opportunities, and a more or less optimal exploitation of knowledge. Economic choice ideally takes place when there is a market for things and extensive knowledge about the costs and benefits of possible courses of action. But a weaker form of rational choice theory does not have to posit a uniform utility function nor increases in knowledge.

Conclusion: Socio-economic Change as the Outcome of Social Structuration under Specific Conditions of Adaptation

Putting all this together on several levels of theory and empirical explanation serves to push the analysis of social history firmly in the direction of *historical* enquiry of a structurist kind. That is, just as structural processes in the modern world, such as industrialisation, modernization, revolutionary upheavals, and all kinds of socioeconomic transformations, should be approached in a methodological structurist and natural historical manner, as is indeed the case with many historians of an interdisciplinary comparative kind, so too can much earlier transformations be

approached in this manner. If the transition to agriculture, for example, is understood, in the first place, as a process of social structuration arising, to some extent, out of the necessity for adaptation under changing social and environmental circumstances, as well as from contingent exogenous emergence and adoption of an innovation, and that the force of agential structuring is as potentially powerful in neolithic times as in the postindustlial world, then this framework points toward enquiry into local variation and contingency as much as to general processes. In a natural historical approach to explaining social processes and events detailed empirical enquiry is of course necessary. This means gathering as much information from as many neolithic sites as possible. Such archaeological work continues across the earth.

Notes

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