

Theory and Practice of Evolutionary Civilization

Discussion paper

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Abstract

Societal collapse has been a perennial concern of humanity, at least since the early Greeks. Recent publication of Jared Diamond's *Collapse: how societies choose to fail or succeed* and Ervin Laszlo's *The chaos window: the world at the crossroads* renew this concern. Despite the urgency in these and many similar calls to action, no consensus theory and practice of evolutionary civilization exists. This paper calls for collaborative action by the evolutionary systems community and related disciplines to provide insight into what has been dubbed "the most important question in the world today"(Smith, 2005, 436).

Keywords: Evolutionary systems, societal collapse, project proposal

General Introduction

Ervin Laszlo(2006) recognised four stages in humanity's traverse of the Industrial Age:

- *The Trigger Phase*(about 1800 to about 1960), in which a bundle of new technologies allowed better manipulation of nature
- *The Phase of Accumulation*(1960s to about 2005), in which benefits were derived from the new technologies with profound social and environmental consequences
- *The Decision Window*(from end 2005 to end 2012), when these cumulative impacts cause global instability, with a supersensitivity to further changes and pressures
- *The Chaos Point*(end-2012, or soon thereafter), when society becomes critically unstable, with breakthrough(evolution) or breakdown(devolution)

Laszlo believes humanity is now in the decision window between the industrial and informational eras. He reaches this view after carefully elaborating evolutionary systems theory over some four decades.

Diamond(2005a) considers the prospect of collapse(devolution) in global civilization. He does so after an illustrious career as evolutionary biologist, physiologist, and biogeographer, also spanning some four decades. These two authors examine different sides of the one coin. Both are profoundly troubled by their insights, each seeing the prospect for an imminent descent of global civilization into chaos.

Laszlo and Diamond address issues of central interest to the evolutionary systems community and related disciplines. This community could collaboratively respond to the perceived priorities. Their task, I believe, is to critically review the considerable but often conflicting theories on the evolution and devolution of human civilizations and use preferred frameworks to advise best practice of evolutionary civilization. Such a project should be engaged with promptly, and seek those best qualified to contribute. The proposal is elaborated below. By way of preparation:

- some fifty reviews of Diamond's *Collapse* are analysed, to identify critical issues for a project on human futures
- the development of general evolution theory by Laszlo to its current state is summarized

Diamond's Collapse

Introduction

Jared Diamond's book '*Collapse: how societies choose to succeed or fail*' was first published in late 2004. It is a sequel to his earlier book *Guns, Germs, and Steel*, the latter dealing with the emergence of western civilization and the former its potential demise. *Collapse* has generated much interest, with over 200 reviews/interviews in the popular and academic media, on radio and TV, and so on. More than half of these were consulted - and some 50 used - for this review. Taken together, these latter provide a perspective on societal collapse that is insightful, current, and embodies diverse worldviews. This review also contains quotes by Diamond before, in and after publication of *Collapse*, to further contextualise his thesis.

Definition

Diamond(2005a, 3) defines collapse as "a drastic decrease in human population size and/or political/economic/social complexity, over a considerable area for an extended time". Tainter(1988, 4) considered "a society has collapsed when it displays a rapid, significant loss of an established level of sociopolitical complexity". Collapse may occur at all levels, from individuals to global society, although attributes of the collapse process likely differ with level.

Thesis

Diamond believes that we are "on the brink of irreversible decline"(Anon, 2005a), that "A crisis looms, not some glitch in which a few minor organisms die out but a full-on collapse"(Green, 2005). Acknowledging that "the lessons of the past are not necessarily viable solutions for the future", Diamond believes that "looking at the way past cultures reacted to – or ignored – their environmental catastrophes can be instructive"(Fagan, 2005, 52). He examines eight past societies that failed or succeeded to avoid collapse, in the belief that the answers could "offer us the prospect of self-preservation"(Shi, 2005).

It is Diamond's(2003, 43) view that "a primary cause of the collapse of these societies [was] the destruction of the environmental resources on which they depended". He presents several contemporary case studies to emphasise that ecocide is not of only historical interest, but that global collapse may already be upon us. He predicts that such "could begin in as little as 50 years if we fail to do anything about it"(Anon, 2005a).

Worldview

Some reviewers are troubled by Diamond's belief that environmental problems were at the heart of past societal collapses and will be a primary cause of modern collapses (e.g. Tainter, 2005; Shapiro, 2005, 87; Gladwell, 2005; Smith, 2005, 423). Diamond is seen to be in the tradition of Malthus, the Club of Rome, and Paul Ehrlich: "The unstated premise of *Collapse* seems to be that the entire planet is headed for a Malthusian crisis ... But is this view defensible?" asks Shapiro (2005, 88). Some reviewers believe that Diamond does not take enough account of culture and social structure in his explanations of societal collapse. On culture, Eastbrook(2005, 10) suggests that Diamond: "... discounts culture and human thought as forces in history; culture, especially, is seen as a side effect of environment". Other reviewers with similar concerns include Steelman(2005), Geertz(2005, 6), Hornborg(2005, S94), Tainter(2005, S98), Shapiro(2005, 88). On social structure, there is a widely held view that Diamond does not appreciate its role in modern societies: "If Diamond had a better understanding of the role of institutions such as property rights, the rule of law and markets in mediating the incentives of individuals, he might have analysed the causes of successes and failures of past and present solutions in a more balanced and plausible way"(Morris, 2005, 418). According to Wiener(2005, 886): "The limits-to-growth alarmists of the 1970s overstated fears of "overshoot and collapse" because they neglected the roles of price signals, market responses, and institutional change. Even in large societies lacking close-knit reciprocity, and even in cases of externalities not reflected in market prices, collective action to protect the national or global environment can succeed...". Fukuyama(2005) sums up this issue thus: "...human societies are vulnerable, and none of us should pretend ...that a thriving condition today necessarily protects us against potentially catastrophic harms. But it does no good to sound an alarm without taking into account modern institutions, technologies and politics". Others concerned with Diamond's treatment of social factors include Morley(2005, 143), Savodnik(2005), Farrell(2004), Shapiro(2005, 88), Morris(2005, 417), Fukuyama(2005), Shaw(2005, 541), Smith(2005,423), Hornborg(2005, S94/S95), McElreath(2005, S96).

Diamond concedes that his book "limits its scope to societies in which environmental factors play a big part in failure or success" (Levins, 2005). This may explain why he relegates the roles of culture and social structure in societal collapse, but it results in too simplistic an analysis.

Theoretical basis

There is concern that Diamond does not contribute to the theory of societal collapse: "*Collapse* neglects the importance of the specific mechanisms by which social evolution proceeds. There are many nominations of influences and illusions to historical process, but nowhere is order made of the collection"(McElreath, 2005, S97). "The book lacks any conceptual or theoretical framework which would indicate which societies are more likely to collapse, which are more likely to survive"(Smith, 2005,424). To the extent that there is a theoretical basis to *Collapse* it is "the theory of *ecocide*"(Peiser, 2005, 514).

Rothman(2005) even questions the underlying premise that societies rise and fall so starkly: "More often, societies seem to ebb and flow into one another, with the boundaries between them far less distinct than the ones provided in Diamond's cases. This melding of cultures and the accretion that accompanies it are crucial dimensions in the evolution of human societies". Others address more fundamental issues, pointing out that macrohistories are challenged by many today(Shea, 2005), while neither world system theory nor non-European cosmologies were considered (Hornborg, 2005, S94/S95).

Issues of relevance

Although properly a consideration of methodology(below), the relevance of Diamond's case studies generated so much interest among reviewers that it is considered separately; six interrelated issues of relevance are noted.

Table 1: Relevance of case studies

Issue	Concerns
Premodern case studies	Malcolm(2005) is concerned that: "Most of these earlier [societies] were, from the start, operating at the fringes of economic viability, experiencing problems unknown to the rest of humanity at the time. Their scientific knowledge was extremely limited; in many cases they were illiterate, with no systematic records of their own past conditions; and they had only limited contacts with other societies and economies". Such considerations had several reviewers question whether one should generalize "from environmental failures on isolated islands to environmental threats to society as a whole"(Easterbrook, 2005), e.g. Morley(2005, 140), Hornborg(2005, S94), McNeill(2005a), Morris(2005, 416), Hanson(2005), Bailey(2005). A rather different perspective is put by McNeill(2005b, 182/183): "... [Diamond] did not try to make his case on the basis of the Roman Empire, or the city states of Harappa and Mohenjodaro, or any of a number of states of ancient Mesopotamia. These were large, complex societies with state structures, elaborate social hierarchies and divisions of labor, internal trade, and so forth; in short, much more like contemporary states than were the Greenland Norse or Easter Islanders". Other who question Diamond's choice of case studies include Kakutani(2005), Smith(2005, 437) and Rothman(2005).
Cultural theory	Smith(2005, 429/433) uses cultural theory(Thompson <u>et al</u> , 1990) to describe society's transitioning over time from a fatalist worldview via communalist and hierarchical, to an individualist perspective: "Communal and Hierarchic societies change very slowly and are, therefore, vulnerable to sudden exogenous shocks. In contrast, Individualist societies have been able to more rapidly respond to changes(internal and external)". Hanson(2005) puts this more tangibly: "A Singapore or South Korea – or Manhattan – show that modern technology, free markets, and the rule of law create a fluid and ever responsive social structure that can trump tribalism, religious fundamentalism, and the miseries of material poverty, limited resources, and an unforgiving nature".
Globalisation	Evans(2005) points to qualitative differences between largely isolated economies of the past and today's globalised economy: "Unlike those dead societies, our civilisation is global. On the positive side, globalisation means that when one part of the world gets into trouble, it can appeal to the rest of the world for help On the negative side, globalisation means that when one part of the world gets into trouble, the trouble can quickly be exported. If modern civilization collapses, it will do so everywhere". Demeritt(2005, S93/S94) and Wiener(2005, 888) express similar views.
Distinctiveness	Some reviewers describe the distinctiveness of contemporary societies more fully. According to McNeill(2005b, 182): "... the differences between Easter Island and Norse Greenland(or the Anasazi) and today's states and societies are legion. Diamond's critics [claim] that contemporary capacities to collect, assess, and distribute information, to effect technological change, and to substitute ingenuity for raw materials are now so great that what environmental problems we might face are either well within our ability to solve, or are so different from those of earlier centuries, that Diamond's argument fails". Forbes(2005), Morris(2005, 416) and Mihalca(2005) express similar views.
Resilience	Some reviewers believe that today's globalised society is more resilient: "... our modern globally interconnected economy that can draw upon a wide array of resources is far more stable and robust than either the fragile pre-modern or the marginally modern societies cited by Diamond"(Bailey, 2005, 70/71).
Complexity	According to Rothman(2005, 577): "The demise of societies on islands is clear and it is easy to isolate causation, especially with a solid archaeological, natural science, or historical record. In settings with many more variables, with influences of different kinds that are harder to track, that occur over greater stretches of time, and that are related to both the culture of the place and cultures of other places, such conclusions are not only harder to draw, but equally difficult to verify".

Diamond broadly foresaw such objections: "He acknowledges that conditions are different today from the past, and nowhere suggests that our problems are beyond our capacity to solve. But he argues that the key differences(e.g. greater population and globalization) make today's societies still more vulnerable to ecologically abetted collapse. Indeed, he says "In short, it is not a question open for debate whether the collapses of past societies have modern parallels and offer any lesson to us. That question is settled, because such collapses have actually been happening recently, and others appear imminent. Instead, the real question is how many more countries will undergo them""(McNeill, 2005b, 515/517).

Issues of method

Concerns in respect of Diamond's method can be grouped as follows:

Table 2: Issues of method

Issue	Concerns
Relevant literatures	Kasper(2005, 451) considers Diamond made little or no reference to relevant literatures on societal collapse, economic growth, institutions, political economics.
Unit of analysis	Hornborg(2005,S94) notes a "bizarre confusion of scales" between case studies, which range from an American state and small, isolated islands, through nation states(one a continent), to globalised society. "Ultimately, it is [Diamond's] notion of "societies" as a unit of analysis that is misguided ... [Most of his case studies] should be recognised as components of larger regional or global systems of societal reproduction within which some subsystems progress and accumulate at the expense of others". Hornborg observes: "A paradox of this book is therefore that Diamond's recurrent recognition of long-distance trade, interdependency, and globalization does not prompt him to abandon his atomistic approach to "societies" as geographically delineated populations managing their own destinies".
Comparative method	Diamond(2005a, 18) uses the comparative method, which entails "the systematic analysis of a small number of cases for the purpose of generating and testing theories about the causes of important outcomes in these cases"(Mahoney, 2000, 85). Morris(2005) questions Diamond's use of this method on five counts, while others find the method itself conceptually fraught(see Mace & Pagel, 1994).
Sample size	Morley(2005, 141) avers that "Diamond's case studies provide too small a sample for reliable inferences about which factors spell success and which failure". Peters(1998) provides a good discussion on this issue.
Basis of axioms	Diamond develops a five-point framework of factors possibly contributing to environmental collapse: "Four of those sets of factors – environmental damage, climate change, hostile neighbours, and friendly trade partners – may or may not prove significant for a particular society. The fifth set of factors – the society's responses to its environmental problems –always proves significant"(Diamond, 2005a, 11). Morris(2005, 401) likens this five-point framework to the axiomatic approach of economics, in which introspection, observation and scholarship generate assumptions on the probable existence of specific relationships. "From these axioms, general rules are then derived and tested". Morris finds Diamond's use of this approach notional.
Confirmation bias	Some reviewers(Fernandez-Armesto, 2005a; Grayling, 2005; Morris, 2005, 402) believe that <i>Collapse</i> suffers from confirmation bias, an often inadvertent mental process of researchers "which refers to a type of selective thinking whereby one tends to notice and to look for what confirms one's beliefs, and to ignore, not look for, or undervalue the relevance of what contradicts one's beliefs"(Carroll, 2006).

Quality and interpretation of data

Some reviewers question the accuracy of Diamond's information in respect of Easter Island, Norse Greenland, contemporary Montana and Australia (Rothman, 2005; Christoff, 2005; Peiser, 2005, 516). Morris(2005, 401) concludes that: "[Diamond] fails to consider much of the available evidence and instead develops his own line of reasoning based on dubious and often faulty data. The result is a series of rhetorically appealing but analytically dubious claims regarding the nature of collapse of past societies and the condition of present societies". On the other hand, Kirch(2005, S96) broadly concurs with Diamond's account of events on Easter Island which he finds "accurate but simplified". He also approves of Diamond's accounts of other Polynesian communities.

Others are concerned with the interpretation of data. Smith(2005, 426) notes: "There is no real discussion of the massive ambiguities and conflicts that surround all attempts to interpret history, especially the history of those isolated remote examples. Without a conceptual framework, the reader must either accept the claims or reject them". Similar concerns are expressed by Rothman(2005) and Easterbrook(2005). Although expressed specifically with respect to Easter Island, Peiser's(2005, 535) concerns may have general relevance: "The fundamental flaw in this treatment of Easter Island is that [Diamond] approaches the problems of its evolution and history with the zeal of an environmental campaigner, and not with the dispassionate detachment of a scientist. He is too much inclined to employ his historical reconstructions as a tool for the environmental agenda and subordinate much of his analysis to moralistic and preconceived intentions".

Political and philosophical concerns

Politically, Peiser(2005, 535) suggests that: '*Collapse* is perhaps the prime upshot of the amalgamation of environmental determinism and cultural pessimism in the social sciences. It epitomises a new and burgeoning doctrine expounded largely by disillusioned left-wingers and former Marxist intellectuals. In place of the old creed of class warfare and socio-economic driving forces that used to explain every single development under the sun, environmental determinism essentially applies the same one-sided rigidity to historical events and societal evolution".

Philosophically, Rothman(2005, 575) believes that: "[Diamond] sees his work as proscriptive, with an analytical framework that he hopes will help contemporary societies avoid the problems of their predecessors. He considers himself a rationalist, seeing in scientific analysis the avenues to solving human problems ... In an age when the values that science presents are contested by a range of theological and neo-scientific explanations, Diamond represents a conventional orthodoxy, one to which the scientific community and the public at large can subscribe. In a postmodern era, such positivism seems quaint, as if from an earlier, more secure time".

Proposals for change

Diamond follows his studies of environmental degradation in past and contemporary societies with some "practical lessons". Responses by reviewers to his proposals are summarised below.

Need for change

"Ultimately, [Diamond's] central point is difficult to contest. As biological creatures, our numbers and life-style are limited by our interactions with the broader biological and physical systems in which we live. Our ability to manage these limits depends on our social institutions and our ability to modify behaviour in light of new knowledge and new circumstances. Diamond's book, although flawed, is a serious contribution to greater knowledge and, perhaps, to necessary change"(Morley, 2005, 143).

Some reviewers dwell on the consequences of a failure to change: "Global collapse would probably still follow the same pattern as a local collapse but on a greater scale ... Today, as climate change makes some areas less habitable than others, increasing numbers of people will move to more habitable areas. The increasing population will make them less habitable and lead to further migration in a domino effect. Huge movements of people and capital

will put the international financial system under strain and may cause it to give way ... [collapse could entail] the deaths of billions of people, but not the end of the human race ... some would survive the end of the industrial age by reverting to a pre-industrial lifestyle"(Evans, 2005).

Diamond has clear views on a failure to change: "If we continue doing the things that we are doing now, the outcome, which is not the worst-case scenario but the actual outcome, would be that we don't arrive at the end of the century ... Most of our problems are ones with 30- to 50-year time fuses ... The worst-case scenario can range anywhere from an apocalypse to something greyer. An apocalypse would include fighting in dead earnest[over natural resources] ... There are also gentler outcomes. Today there are countries that are poor and getting poorer. Some gentler outcome would be that poverty just spreads"(Anon, 2005a). Diamond believes that "the world's environmental problems will get resolved, one way or another, within the lifetimes of the children and the young adults alive today"(Farrell, 2004).

Not all reviewers accept these views. Morris(2005, 419), for example, believes that Diamond:

- inadequately/incorrectly describes the societies he chooses
- poorly specifies cause-effect relationships he believes responsible for societal collapse
- fails to develop or apply a systematic methodology
- does not apply his own analysis appropriately
- does not consider alternative explanations which might better explain his observations

In Morris's opinion: "These five factors ... combine in *Collapse* to produce a devastatingly misleading book".

Capacity for change

If need for change is accepted, do contemporary societies have the capacity to do so? For Pountain(2005, 582): "The most provocative aspect of *Collapse* is the question it raises whether democracies like the EU and USA can ever be induced to make the horrible choices needed to avoid our own collapse, submitting to very significant decreases in living standard to ensure long-term survival".

Some are hopeful: "[The] anthropological literature is replete with examples of dramatic culture change, as well as discussion of specific forces that influence the adoption and diffusion of innovations"(Qirko, 2005). Diamond(2005b) reflects: "I also draw hope from a unique advantage that we enjoy. Unlike any previous society in history, our global society today is the first with the opportunity to learn from the mistakes of societies remote from us in space and time". Eldredge(2005) disagrees: "... there is little evidence that any society at any time has learned from mistakes committed by other societies". According to Rees(2005, 16): "The most important lesson to be drawn from *Collapse* is that resilient societies are nimble ones, capable of long-term planning and of abandoning deeply entrenched but ultimately destructive core values and beliefs. This, in turn, requires a well informed public, inspired leadership and the political will to take decisions that go against the established order of things. In this light, the astute observer of contemporary geopolitics and ecological decline might be excused a descent into quiet despair".

Strategies for change

Several reviewers were disappointed with the policy prescriptions and strategies offered by Diamond(e.g. Black, 2005; Gleditsch, 2005; Wiener, 2005, 889; Winiwarter, 2005; Qirko, 2005; Brin, 2005; Smith, 2005, 425/426). Predictably, those who offered strategies for change came from different corners. On the one hand, "[Diamond] warned that the omens were not looking good for the rich countries of the developed world to survive the 21st century without a serious and possibly catastrophic drop in their present standard of living"(Anon, 2005a). In contrast, Fukuyama(2005) argues that while Diamond's 12 environmental crises are all serious problems: "... it is not clear that any of them(except global warming) can trigger a sudden, irreversible planetary collapse, as opposed to a slow period of technology substitution and social adjustment". This view is elaborated by Kasper(2005, 454), who argues that: "The only defence against a return to the Malthusian condition is a better understanding of what drives economic growth and human progress. This depends not only on physical factors and the hardware of development, but also the software of evolving, problem-solving institutions, which allow enterprise and creativity to cope with new circumstances and changing preferences in societies". In similar vein, Smith(2005, 438) observes that: "Modern societies have evolved institutional and technological innovations that make it possible for humans to achieve more and more, while lightening our footprint on the earth. Human beings and societies make mistakes – but successful societies have evolved to learn from their past mistakes, integrating this experience with evolving circumstances into future decisions. We need to extend these feedback institutions to allow us to experiment more widely and more prudently, to more rapidly innovate as humanity's needs grow and change".

Accelerating change

Diamond is particularly aware of the accelerating pace of change: "... things that happened in the past are happening much faster today, and additional things are happening"(Anon, 2005b). He envisions an "exponentially accelerating horse race" between the processes of degradation and repair(Colvin, 2005), which will further limit humanity's window of opportunity.

Evolutionary perspectives

"Oddly, for someone with a background in evolutionary theory, [Diamond] seems not to consider society's evolutionary arc"(Easterbrook, 2005, 11). More so, "[Diamond's] view of the world presented in *Collapse* is static; he lacks an understanding of human civilization as the gradual evolution of institutions ... which permits societies to harness an ever greater fraction of humanity's energies and genius to resolve problems, to create wealth and knowledge"(Smith, 2005, 423).

Laszlo's Collected Works

Laszlo(1998, 21; 2004) describes how he began "a search for meaning to the acceptance of responsibility for the kind of actions that are constructive in light of that meaning ..." in early 1959. His interests were in systematic philosophy, particularly the work of Alfred North Whitehead, and this led to publication of his first book *Essential Society: an ontological reconstruction* in 1963, followed by *Individualism, collectivism, and political power*(1963) and *Beyond scepticism and realism: a constructive exploration of Husserlian and Whiteheadian methods of inquiry*(1966). In the latter, Laszlo recognised "The scale of evolution, from the haze of hydrogen atoms in interstellar gases to the complex patterns of thought and behaviour in civilized men, may be integrated into a vast encompassing scheme ..." (p.191); written in October 1964, this text provided the frame for his evolutionary

theory, although not the mechanism.

In 1966 Laszlo visited Yale University's Department of Philosophy, where he 'rediscovered' von Bertalanffy and found that the organic synthesis of Whitehead could be updated by the synthesis of a general systems theory(Laszlo, 1972c, viii). He started to write *Introduction to Systems Philosophy*(1972c) about this time. Three years later, Laszlo(1969) was developing "a scheme of ideas based on concepts recently developed in cybernetics, information theory, systems-analysis and general systems theory"(p.vii), and had become concerned with the development of general principles and theories.

During the early 1970s, Laszlo established critical conceptual frameworks for his emerging evolutionary theory(Laszlo, 1983). At this time he also jointly edited works on human values and human dignity, which resonate in his later writings. By 1972, Laszlo(1972a) thought that cosmic, biological and sociocultural evolution formed a hierarchy of systems and, ultimately, one giant, increasingly coordinated and complex net. He believed that "The supreme challenge of our age is to specify, *and learn to respect*, the objective norms of existence within the complex and delicately balanced hierarchic order that is both in us and around us ...[otherwise] another chapter of terrestrial evolution will come to an end, and its unique experiment with rational consciousness will be written off as a failure"(p.120, author's emphasis). At about this time Laszlo established an abiding rationale for his work: "If you want to change the world, or at least make sure that it doesn't head blindly to its own destruction, you have to understand [it] ... you have to interpret what you experience and know of it through some intelligible hypothesis"(Laszlo, 1972a, v).

Laszlo presented evolutionary conceptions of the world system in *A strategy for the future: the systems approach to world order*(1974). His inquiries became strongly influenced by Erich Jantsch, also in 1974, who introduced Laszlo to the non-equilibrium dynamics of Prigogine(Laszlo, 1987). In a report prepared for the UN soon afterwards - *The inner limits of mankind*(1978) - he recognised the importance of inner limits in respect of human futures, these being "the ways in which each of us can contribute to a self-transformation which could change the world by challenging current values, beliefs and practices", an insight he was to emphasise in later writings. Also in the mid-1970s, Laszlo recognised the irreversible transition in world affairs from nation-states to the limits of the globe and the biosphere.

Laszlo continued to work with the UN through the late 1970s into the mid-1980s. In a text on disarmament, reporting on a colloquium held in 1978, Laszlo(1981) examined the notion of 'culture lag' - a lag in values, beliefs, perceptions, and conceptions - which was to remain of concern to him(e.g. Laszlo & Masulli, 1993; Laszlo *et al.*, 1996). Laszlo(1993b) addressed another cultural dimension - multiculturalism - under the aegis of UNESCO, and brought this also into his evolutionary thinking. On leaving the UN in 1984, Laszlo returned to his long-standing interest in evolutionary systems. About this time, he acknowledged: "I should also assume the role of an active and moral human agent, helping to facilitate a movement in the direction indicated by my inquiry into the trends and dynamics of evolution"(Laszlo, 1998, 22). The endeavours of two decades finally found expression in *Evolution: the grand synthesis*, prepared since 1984 and published in 1987.

A dichotomy of interest is apparent in Laszlo's work at least since the 1980s. On the one hand, Laszlo pursued his intellectual interests in evolution through, for example, *Evolution: the grand synthesis*(1987) and *Evolution: the general theory*(1996). He was not satisfied with General Evolution Theory as a random process in a mechanistic universe, as evolution of natural and social systems would have taken much longer than geological and archaeological records suggest; a chance discussion in summer 1986 led Laszlo to surmise that: "If indeed all that occurs in the material universe remains in some way encoded in the womb of spacetime, nature may obtain that minute bias that would make randomly diverging developmental pathways into significantly converging ones"(Laszlo, 1993a, 19). Similarly, Tilly(1999, xi) noted "the ways that social action at a given point in time lays down residues that limit the possibilities for subsequent social action". Laszlo examined the leading-edge sciences for insights. This led him to postulate a fifth force - the Psi force - as the unifying principle of the known universe, emerging from the quantum vacuum of space-time(Geldard, 1997): "Such a scheme calls for an interactive evolutionary dynamic that is neither fully deterministic, nor punctuated by fully random events"(Laszlo, 1995, 25). His journey to this outcome and beyond is described in *The Creative Cosmos*(1993), *The Interconnected Universe*(1995), *The Whispering Pond*(1996), *The Connectivity Hypothesis*(2003), *Science and the Akashic Field*(2004), *Science and the reenchantment of the Cosmos: the rise of the integral vision of reality*(2006).

On the other hand, Laszlo's interest in the practical implications of his thinking was evident from the early-1980s(Laszlo, 1983), and continued to develop with *Evolution: the grand synthesis*(1987), *The age of bifurcation*(1991), *Vision 2020: Reordering chaos for global survival*(1994), *The choice: evolution or extinction?*(1994), *The insight edge*(1997). There followed a series of texts more overtly concerned with practice for the Club of Budapest - *3rd millennium: the challenge and the vision*(1997), *Macroshift: navigating the transformation to a sustainable world*(2001), *You can change the world: action handbook for the 21st Century*(2002). These texts link global sustainability with evolutionary competence and interweave the many insights Laszlo gained over time - to produce very rich pictures of the transformational activities needed of an evolutionary civilization.

Theory and Practice of Evolutionary Civilization Project Proposal

Introduction

Two leading polymaths use strikingly different approaches to reach similar conclusions about the global problematique. Diamond has made diverse contributions to our understandings of the natural world. A small but prestigious series of texts - *The rise and fall of the third chimpanzee*(1991), *Guns, germs, and steel*(1997), and *Collapse: how societies choose to fail or succeed*(2004) - document a broadening worldview of the grandest scale. There is no doubting Diamond's remarkable achievement in writing *Collapse*. He clearly feels a strong need to share his deep concerns on global futures with as many others as he can, and *Collapse* seems highly successful in this regard. Yet his critics ask the reader to pause. They fault his work on many counts, not least its inadequate theoretical basis and evolutionary interpretation.

Laszlo appeals to a more specialised audience. Unlike Diamond, he has committed much of his life's work to carefully crafting insights into a question on the grand scale identified in early adult life. He has generated a significant interpretation of the patterns humans see around them; his work continues to gain interest and support.

Similar contrasts are repeated many times over in the voluminous literature on societal evolution and devolution, a literature essential to better understanding human futures. It seems urgent, well overdue perhaps, that these contesting interpretations be critically reviewed and preferred theoretical frameworks identified. The evolutionary systems community and related disciplines seem well placed to do this. Insights from Diamond and Laszlo are now used to generate what seem to be critical considerations for any such project.

After the polymaths

Diamond and Laszlo have both been referred to as polymaths, persons "learned in many fields"(Gove, 1976). Kirch(2005, S96) identifies the benefits of such people, complimenting Diamond for "boldly daring what too few of us in academia attempt: venturing beyond our tightly patrolled disciplinary boundaries, trying to connect the dots, and inspiring broad public interest and debate around issues that are of the utmost urgency for the future of humanity and our planet". The same can be said of Laszlo.

Yet, Diamond's work has been trenchantly criticised. Laszlo's work, too, has received criticism, sometimes searing(e.g. Boulding, 1989; Anon, 1994; Skiff, 1996, 2004; Anon, 2006). At times, this criticism has merit and suggests ways forward. Other times, a depth of knowledge is sought across such breadth as to seem unreasonable of any one person. It is at this point that the polymath might hand over to those with narrower but more specialised insights. This project proposal recognises that so extensive is the body of knowledge associated with evolutionary systems thinking that sense of it is best made through collaborative effort.

Evolutionary realms

Diamond(2005a) did not examine possible evolutionary underpinnings to *Collapse*, whereas evolutionary systems thinking has underlaid most of Laszlo's work. The evolutionary literature mostly considers the realms separately. Historically, three were recognised - the cosmos(physico-chemical), biological, and sociocultural. There is now substantive enough literature on the evolutionary nature of both culture and society to consider them separately. More arguably, technological and informational evolution can be seen as primary drivers of sociocultural change, and so also warrant their own consideration. While these views have informed the following brief accounts of the evolutionary realms, it is preferable to see all these realms as one giant, increasingly coordinated and complex net and to seek theories of explanation which apply generally. It may also be helpful to envision a hierarchy of evolutionary systems, with multiple levels at which evolutionary processes occur. This view would argue for the inclusion, in time, of the evolutionary literatures on, say, economics, management, law, organisation, politics, education, health care in any formulation of civilizational rise and fall.

The short accounts which follow illustrate the diversity of current thinking; they are not comprehensive in any way.

Physico-chemical evolution

Fortey(2005) suggests that the tectonic plates of Earth provide the language of its physico-chemical evolution, "just as genes speak for the evolution of organisms". Plate tectonics has functioned for more than three-quarter's of the Earth's some 4.5 billion years of existence. It has significantly affected human history by creating landscapes, determining where agriculture is best done, triggering major geological episodes, causing climate change, and so on.

Biological evolution

Biological evolution has been defined as "... a change in the traits of living organisms over generations, including the emergence of new species. Since the development of modern genetics in the 1940s, [biological] evolution has been defined more specifically as a change in the frequency of alleles in a population from one generation to the next"(Wikipedia, 2006). This classical view is challenged by Developmental Systems Theory(DST). Essential elements of DST emerged at least from the late 1970s(Oyama, 1979, 1981). DST originated from Oyama's desire to replace the dichotomies of nature/nurture, evolutionary genetics/developmental biology, genetic/environmental influences on development, biological/cultural, and genotype/phenotype with a more systemic view: "she rather argues that developmental information resides neither in the genes nor in the environment, but rather emerges from the interactions of disparate, dispersed developmental resources ..." (Robert et al., 2001, 954: authors' emphases).

Cultural evolution

Durham(2002) defines cultural evolution in Darwinian terms. He describes two approaches to its study:

- One "takes a narrower definition of cultural evolution and focuses on the dynamics of change in the ideation systems of populations. This school attempts to trace the history of ideas, values, and beliefs that are held by groups of people, and to ask what processes have guided the historical trajectories of change in these phenomena"(p.3050)
- The other envisions "a broad, holistic definition of cultural evolution that includes changes over space and time in the combined cultural and social systems of a human population". This school looks for either universal tendencies across vast expanses of space, time, and human experience - so-called "general evolution" - or for variable trajectories of change within particular societies or groups of societies - "specific evolution"(p.3049). This approach is customarily referred to as "social evolution".

The two approaches offer complementary views of cultural evolution.

Social evolution

Social evolution describes the emergence and change of such social phenomena as economy, kinship, religion, polity, law and education. Turner, 2002, 124) regards current efforts to describe social evolution as "informed by biology, or at least biologically inspired modes of thinking". Theories of social evolution mostly rest on the Modern Synthesis, and can be grouped into four distinctive but overlapping traditions:

- theories working within the sociobiology framework
- theories based on cross-species comparisons of social forms
- theories employing biological ideas in evolutionary stage models, such as Sanderson's(1999) Evolutionary Materialism
- theories on the biological nature of humans

Turner realises that human beings and their sociocultural creations still need to adjust and adapt to the environment, and seems optimistic that one of the above lines of inquiry will lead to a viable theory of social evolution. The ongoing dynamic between biological, cultural and social evolution in the formation of social structure is evident.

Technological evolution

Technology is clearly a part of culture for, as Ziman(2000a, 8) observed, "a comprehensive model of technological innovation would have to cover almost every aspect of *cultural* change"(author's emphasis). Nonetheless, there are reasons to consider it separately(based partly on Ziman(2000b, 315/316):

- technology is among the most striking features of modern civilization, with far-reaching implications for cultural change
- it is more systematically designed than most other cultural activities
- it is highly institutionalized, requiring large corporations and financing, giving rise to complex, multilevel search processes which are integrated into a whole-of-systems approach of RDD&D(Research, Development, Design, and Demonstration). It thus "exemplifies the most macro of evolutionary phenomena: the emergence of mass modes of change"(p.315)
- There are predictions of human-machine civilization in which technology extensively and intimately interfaces with humans(e.g. Kurzweil, 2005). Some associate such developments with increasing technological autonomy, perhaps leading to a separate evolutionary realm
- Technologies "have the useful property of being concrete, relatively stable physical objects ... Their evolutionary trajectories ought to be much easier to investigate and understand than those of less tangible cultural entities ..."(Ziman, 2000a, 8/9).

Analogies between biological and technological evolution have been made since the mid-nineteenth century. It is only in the last three decades or so that technological evolution has been systematically studied. Ziman(2000a) describes the similarities between biological and technological evolution, listing some 20 shared characteristics. Even so, the two phenomena differ in important respects. Ziman(2000b, 313) believes that technological evolution demonstrates the classical components of neo-Darwinism - variation, selection, replication etc. However, behavioural and epigenetic systems which allow the inheritance of environmentally-induced, acquired, and learnt variations - leading to Lamarckian models of technological evolution - offer a different interpretation(Jablonka, 2000).

Informational evolution

Castells(2004, 9) described informationalism as: "... a technological paradigm based on the augmentation of the human capacity of information processing and communication made possible by the revolutions in microelectronics, software, and genetic engineering". He believes that "Because information and communication are the most fundamental dimensions of human activity and organization, a revolutionary change in the material conditions of their performance affects the entire realm of human activity". For such reasons, Castells considers informationalism the material basis of early 21st century societies: "Over the last quarter of the 20th century of the Common Era it replaced and subsumed industrialism as the dominant technological paradigm"(p.8). The emergence of informational evolution(see also Laszlo, 2004) renews interest in Goonatilake(1991, 1999, 2001), and invites consideration of, for example, the noosphere(Vernadsky, 1945; Wikipedia, 2005), "super-brain"(e.g. Wright, 2000), global brain(e.g. Heylighen, 2001) and the 'World Brain' of H.G.Wells(e.g. Wells, Huxley & Wells, nd).

General evolution

Three cross-realm evolutionary syntheses are briefly described:

- Universal Darwinism was first described by Richard Dawkins(1983) as explaining "the evolution of organized, adaptive complexity"(p.404). Dawkins believed that no other theories could do this. He also believed that Darwinian processes were not limited to life on Earth, but would exist wherever adaptation and/or speciation exist in the universe. Plotkin(1993, 60/61) broadened these notions of universal Darwinism to include evolution both between and within organisms(e.g. with regards to the mechanisms of the immune and central nervous systems), which he saw as identical processes. He also conjectured that the notion of universal Darwinism might explain cultural evolution(p.222). More recently, Hodgson(2002) further extended universal Darwinism to include economics. Cordes(2005), however, has doubts about these developments, seeing Darwinian evolution as providing constraints to sociocultural evolution, but not accounting fully for such evolution.
- General Evolution Theory(Laszlo, 1987), since enlarged(e.g. Laszlo, 2004). General Evolution Theory(GET) is grounded in the theories of chaos, complexity, and catastrophe. It proposes an evolutionary process common to all evolutionary realms, yet respectful of their different specifics. It thus provides an integrative basis not available to reductionist studies. Laszlo's(2004) recent work on the Akashic field conceptualises information as central to evolution, viewing the universe as "a highly integrated, coherent system, much like a living organism. Its crucial feature is information that is generated, conserved, and conveyed by and among all its parts. This feature is entirely fundamental. It transforms a universe that is blindly groping its way from one phase of its evolution to the next into a strongly interconnected system that builds on the information it has already generated"(p.3).
- While Developmental Systems Theory(Oyama, 1985, 2000) clearly originated in the biological sciences, some have explored its wider relevance. Jablonka(2000) worked on epigenesis and its potential analogical value for technological evolution - epigenesis describes "the transmission from one generation to the next of structural and functional variations that do not depend on genetic differences"(Jablonka & Lamb, 2004, 4706). It is now evident that this process can occur not only between cells within an organism, but also between individuals and even groups of individuals. Transgenerational epigenetic inheritance has been observed in both unicellular and multicellular organisms. In short, Lamarckian inheritance seems considerably more widespread than was once thought. DST is conceptually aligned with GET, both being grounded in the sciences of chaos and complexity. DST has the potential, like GET, to be relevant across all evolutionary realms. It provides a conceptual framework through which these further elaborations might proceed.

Considerations

Critical commentaries on these evolutionary realms might well take several contemporary concerns into account:

Theoretical

As noted already, evolution and devolution seem as two sides of the one coin. Diamond considers devolution, and Laszlo mostly evolution, a separation reflected in the wider literature. Much would seem to be gained from integrating these two bodies of knowledge. For instance, insights from one perspective may inform the other, a more satisfactory overview may emerge, dynamic interactions between the two phenomena may be more clearly articulated.

There is no consensus view on the primary causes of civilizational collapse. Diamond considers environmental degradation as most important, although he recognises the importance of sociocultural factors also. Tainter(1988) reviewed eleven theories of collapse, and found them all wanting. In his view, societal complexity increases over time and maintaining this complexity eventually outweighs the benefits. At this time, societies fragment into small, simpler, less stratified, and less socially differentiated parts(p.193). A whole-of-system view would see loss of fitness in any component of the overall net as a potential cause of collapse - a 'death-by-a-thousand-cuts' scenario.

Methodological

Collapse was strongly criticised for methodological reasons. Concerns were expressed about many aspects - relevance of case studies, application of method(s), sample size, unit of analysis, risk of confirmation bias and so on - to the extent that some reviewers questioned the worth of the study. A collaborative study should as far as possible be beyond methodological reproach, with knowable insufficiencies at least addressed.

Dynamical systems

This field of inquiry remains very active, with ongoing developments in our understanding of such concepts as far-from-equilibrium systems, self-organization, nonlinear dynamics, chaos and predictability, stochastic processes, complexity, bifurcations, emergence, catastrophe, modularity, entropy and information theory. Contemporary insights across this field should inform any inquiry into the evolutionary basis of civilization.

Interaction

As the focus of our understanding of evolutionary systems shifts from individual realms to more integrated visions, matters of horizontal and vertical interactivity become of greater interest. This suggests that emerging insights in such fields as coevolution, synergy, symbiosis, networks, communities, and cooperation should inform our understandings of evolutionary civilization.

Information

As Terranova(2004, 7) observes, information should not be seen just as a commodity, but that "cultural processes are taking on the attributes of information - they are increasingly grasped and conceived in terms of their informational dynamics". This cultural embedding of information requires an understanding of evolutionary realms sensitive to the implications of informationalism.

Resilience

Laszlo(1972a, 120) importantly argued that "The supreme challenge of our age is to specify, *and learn to respect*, the objective norms of existence within the complex and delicately balanced hierarchic order that is both in us and around us". Fernandez-Armesto(2005b), in similar vein, asked: "Can our cities defy history, as well as nature, and make a breakthrough into immortality". Is collapse inevitable, or can our knowledge of complex adaptive systems avoid the catastrophic effects of collapse? Such reflections point to the substantive literatures on sustainability and resilience. Carpenter & Folke(in press) describe resilience as "the capacity of a system to renew and sustain specified conditions or processes in spite of exogenous disturbances or changes in driving forces". Originating in ecology, resilience now extends to interdependent social-ecological and social systems. Concepts of resilience are being related back to ecosystem services and, hence, to the basis of life on Earth.

An holistic approach

The proposed project may require approaches which:

- *Embrace methodological pluralism*: humans have many ways-of-knowing, which can together provide the richest possible pictures of the field
- *Adopt multiple worldviews*, or paradigms which may be represented by different specialists, by people from different cultures, etc.
- *Adopt a whole-of-systems approach*: for example, understandings of both the rise and fall of societies
- *Access to human knowledge*: A particular difficulty for contemporary researchers is that of effective access across all knowledge domains. A critical task is to devise strategies which address this problem, at least some of which will be participatory
- *Employ transdisciplinarity*: As Kirch(2005, S95) observes: "We have only recently become aware of how badly we need interdisciplinary and multidisciplinary research if we are to address the world's pressing problems". Such research will require both specialists and generalists.

Strategies for change

Reviewers of Diamond's *Collapse* differed widely in their preferred strategies for change. Some focused on environmental wellbeing, while others saw the environment within the envelope of social structure. Laszlo also highlights the importance of environmental sustainability, but in a context in which all other complex adaptive systems are seen to contribute. Perhaps a whole-of-systems approach is called for, which recognises that all complex dynamic systems on this planet contribute to civilizational rise and fall; this may result in less prejudiced searching for effective strategies for change.

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