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## The Eco-socialist Roots of Ecological Civilisation

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### Abstract

The notion of ecological civilisation has become central to Chinese efforts to confront and deal with environmental problems. However, ecological civilisation is characterized by its proponents in different ways. Some see it as simply an adjunct to the existing system designed to deal with current ecological crises. Its more radical proponents argue for a socialist ecological civilisation that should be developed globally and transform every part of society, changing the way people perceive, live and relate to each other and to nature, and the goals they aspire to. Ecological civilisation is a translation of the Russian notion of ecological culture, and tracing the history of ecology and the concept of culture in the Soviet Union, particularly in the 1920s, I will support this more radical view, arguing that ecological civilisation is not only underpinned by eco-socialism; it provides the means to clarify the meaning of socialism generally in a way that accords with deep assumptions of Marx's critique of capitalism. That this notion has been officially embraced within China establishes a tradition of socialist thought that now has the potential to challenge and replace global capitalism.

**Keywords:** Eco-socialism; ecological civilisation; China; proletkult; cultural hegemony; ecology.

### Introduction

In November 2007 “ecological civilisation” was incorporated into the Central Commission Report to the Chinese Communist Party's 17<sup>th</sup> National Congress and embraced as a central policy objective by the government, and in 2012, the Party included the goal of achieving ecological civilisation in its constitution, and included this goal in its five-year plan. Then, in 2017, the 19<sup>th</sup> Congress of the Party called for an acceleration of ecological civilisation construction. Ecological civilisation is associated with the quest for a circular economy “where one facility's waste, including energy, water, materials—as well as information—is another facility's input” (Geall and Ely 2018, 1189). Expenditure on technology to ameliorate environmental damage, reduce pollution and reduce greenhouse gas emissions has been massively increased, although environmentalists believe far

more is required. Hardly surprisingly, given the centrality accorded to ecological civilisation in Chinese political culture, what is meant by ecological civilisation is highly contested (Gordon 2018).

Ecological civilisation is often characterized as what comes after industrial civilisation, and this can be interpreted to mean that China has to fully industrialize before it can afford to fully deal with ecological problems. It can also be interpreted as dealing with ecological problems generated by industrialization by utilizing technological solutions, much as in Western capitalist countries. A more radical view is that the centralization of power engendered by capitalism and industrialization needs to be challenged, and that ecological civilisation requires institutions to subordinate markets and empower people at local levels. This is the view defended by Pan Jiahua, Director of the Institute for Urban and Environmental Studies at the Chinese Academy of Social Sciences (Pan 2016; Martinelli 2018, 380ff.). More broadly, Zhang Yunfei (2019) of Renmin University argues that a dimension of ecology characterizes all civilisations to different degrees, with those societies which fail to achieve a sufficient level of ecological civilisation destroying the conditions of their existence. Zhang suggests that ecological civilisation at present is relatively weak and it is necessary to recover and advance the lost wisdom of earlier eras. Not necessarily inconsistent with this, Lu Feng (Huan 2016, 101) argues that global ecological civilisation now has to be the goal of humanity to overcome the current global ecological crisis, along with addressing local ecological problems. Since the dynamics of capitalism are seen as the main driving force behind ecological destruction on a global scale and behind the paralysis in efforts to avert such destruction, this more radical view is often, if not always, explicitly linked to the struggle for eco-socialism as socialist ecological civilisation. This is the view of Pan Yue, the Vice-minister of China's State Environmental Protection Administration until 2015, who was the leading exponent of ecological civilisation at the government level. In 2016 he was appointed executive vice president of the [Central Academy of Socialism](#) in [Beijing](#) (rank equivalent of minister), and in 2017 was Alternate Member of the 19<sup>th</sup> CCP, Central Committee (Pan 2005; Gare 2012; Huan 2016). He has been strongly supported by leading academics, including Huan Qingzhi from the Research Institute of Marxism, Peking University, editor of a major international anthology on eco-socialism – *Ecosocialism as Politics: Rebuilding the Basis of Our Modern Civilisation* (2010).

For these eco-socialists, the logic of capital is the prime culprit in ecological destruction. Consequently, as Pan Yue (quoted in Wang 2014, 10) argues, “we must use Marxist theoretical weapons to ‘fight against any forms of production and lifestyle that deviate from ecological civilisation.’” He claims that “socialism is more likely to provide system motivation and system security for ecological civilisation” (10). In accordance with this, Lu Feng from Tsinghua University argued that ecological civilisation and its practice will negate and transcend modern and urban civilisation, being connected to new kinds of economic, social and cultural institutional frameworks through which people will be able to live more meaningful lives (Huan 2016, 55). In this case, ecological civilisation and an advanced form of eco-socialism are one and the same. As previously mentioned, however, that is not always the case. To show that ecological civilisation is underpinned by and implies eco-socialism, it is necessary to understand the historical background to the development of ecological civilisation as a concept.

### **The Russian Source of Ecological Civilisation: From Tektology to Ecological Culture**

The Chinese term for ecological civilisation was first used by Qianji Ye, an agricultural economist. In 1984 he published an article in an edition of *The Journal of Moscow University* devoted to scientific socialism, and in 1987 this was translated in a Chinese newspaper (Huan 2016, 52). The initial term was “ecological culture,” rendered “ecological civilisation” (*shengtai wenming*) in the translation, but

in Chinese, the words for culture (*wenhua*) and civilisation (*wenming*) are sometimes seen as synonymous, and the way the word “civilisation” is used in China corresponds more closely to the way the word “culture” is used in Russia. The Chinese allow civilisations to have component civilisations (material, spiritual, political and ecological), each of which is a condition for the others and for the broader civilisation, just as the cultures of nations can have a variety of sub-cultures. The notion of “ecological culture” was initially promoted by Marxists in the Soviet Union and widely used from the 1970s onwards, for instance, by Yu. M. Manin (1983) in “Ecological Culture and Communism” in *Social Aspects of Ecology*, and by V.S. Lipitsky (1983) in “Ecological Culture of Personality and Ways of its Formation.” Then a leading government figure, Ivan T. Frolov, along with T.V. Vasileva, V.A. Elk (1984) and others, took up the notion of ecological culture in a paper published in *Ecological Propaganda in the USSR*, and Vasileva defended a thesis on this topic that same year.

Frolov was a philosopher of science specializing in biology, and an advisor to Mikhail Gorbachev. He later became editor of the main ideological journal in the Soviet Union, *Kommunist*, and then of the main newspaper, *Pravda*. He argued at a conference at the Center for Philosophy and History of Science at Boston University in 1985, just before Gorbachev became General Secretary of the CCCP, that confronting the global ecological crisis could and should unite humanity in a common goal, overcoming the Cold War. Detailing the implications of this ecological orientation, he argued that “it would be a mistake to conceive of the biosphere merely as a source of resources or a ‘disposer’ of wastes” (Weiner 1999, 399). It is equally important to reintegrate both aesthetics and ethical values into our way of relating to the world and into our science, Frolov argued. He called for a switch from anthropocentrism to biospherocentrism. Elsewhere, arguing against sociobiology, according to which social behaviour is determined by genes, the doctrine that revived social Darwinism and legitimated the rise of neoliberalism, Frolov invoked Marx’s characterization of humans as ensembles of social relations, arguing that humans are essentially cultural beings (Frolov 1986).

Although the proponents of ecological culture might not have been aware of this, the place they accorded to culture was really the continuation of a tradition of Marxism originating in the 1920s. It was part of a radical form of Marxism promoted by the *Vpered* (Forward) wing of the Bolsheviks, and it included the Commissar for Education, Anatoly Lunacharsky, who had been placed in charge of environmental protection by Lenin. Rejecting the crude interpretation of the base-superstructure model of society as technological determinism, the interpretation that led Marx to proclaim that if there was one thing he knew, it was that he was not a Marxist (Engels 1962, 486), and arguing that technology and ideology were different components of culture, these radical Marxists believed that to create a socialist society, it was necessary to create a new culture, including a new form of science—without which it would be impossible to move past the deficiencies and distortions of understanding generated by capitalism and to counter the cultural hegemony of the bourgeoisie and their managers. This was endorsed by Lenin in 1918, although he wanted a more practical orientation (White 2019, 392).

The movement for a new socialist culture, *Proletkult*, was inspired originally by Lunacharsky’s brother-in-law, Aleksandr Bogdanov (Gare 1994; White 2019, ch.13). In characterizing the base-superstructure model of society in the “Preface” to the *Contribution to the Critique of Political Economy* (1970, 19), Marx had argued that “It is not the consciousness of men that determines their existence, but their social existence that determines their consciousness.” Bogdanov pointed out

that social existence is conscious existence, and merged these in the category “culture.” Consciousness is involved in the technological component of culture, and also in coordinating people, the ideological component of culture. While Marx had written critiques of the bourgeois mode of production, showing how the categories of economics were not eternal but expressions of historically specific forms of being structuring relations between people, he mostly hinted at the categories required to replace these categories (except in unpublished works such as the *1844 Manuscripts* and the *Grundrisse*). Developing some of Marx’s observations in his own *The Philosophy of Living Experience* (2015) and later *The Science of Social Consciousness* (White 2013), Bogdanov argued that science is organized collective experience of humanity and showed how categories articulating relations between people in their organization of production are entrenched and developed by being used as metaphors or “substitutions” for nature, which are then used to interpret and explain society and legitimate its existing social relations, helping to reproduce these social relations (Bogdanov 2015, 47ff.; Gare 1994; White 2019, ch.11).

In making this argument, Bogdanov was not denying the achievements of science. However, he suggested that new advances in science would be stifled under capitalism as they challenged the interests of its ruling class, and to advance science further would involve a struggle to overcome capitalist culture (Gare 2000). The development of Proletkult was not merely the basis for the proletariat to unite and act effectively; it was to be a culture that would overcome the cognitive deficiencies of all past cultures while incorporating all that was best within them, and would prevail by virtue of its superiority. This view of Proletkult was very different from the top-down imposition of correct views associated with the cultural revolution from 1928-1931 which gave rise to Lysenkoism, as Sheila Fitzpatrick pointed out (1978, 10). Influenced by Marx and Engels’ *Eleven Theses on Feuerbach*, with its emphasis on praxis and concern with changing the world, Bogdanov believed that this new culture was required not only to advance our comprehension of the world but also to provide the concepts through which people could redefine their place in nature and their relations to each other, enabling them to organize themselves to create the future.

This would be a future in which the division between manual and intellectual labour, workers and managers, would have been overcome; workers, with the help of these concepts, would be able to manage their own work, and people would understand themselves as part of nature. In other words, humans would overcome their alienation from each other, from nature, and from humanity and their own creative powers. This would involve overcoming Descartes’ dualism and the mechanistic view of nature, expressions of class divisions of capitalist society with a sharp differentiation between the conscious ruling class and workers, who, along with nature, tend to be objectified as the stuff of control in the struggle by the ruling class for greater profits (surplus value). Scientists, or philosopher/scientists, who in their work had already overcome the opposition between intellectual and manual labour and were able to organize themselves, were advancing science accordingly. They were coming to recognize that they are active agents in the world they are striving to understand, and working towards overcoming this dualism in their scientific theories. Building on advanced science, most importantly on thermodynamics and relativity theory, where scientists, being part of nature, had come to be appreciated, Bogdanov (1984) called for and set out to develop a general theory of organization, *Tektology*, as the basis for an integral world view. From this perspective, “[t]he entire world consisted of an organising process, an infinitely developing series of complexes of different forms and levels of organization in their mutual relations, in their struggle or their unification” (White 2019, 289). This overcame the opposition between the natural sciences and the

human sciences while providing people with the means not only to understand their place in nature, society and history, but also to organize and govern themselves rather than be organized by managers (Gare 2000). Tektology inspired general systems theory and was a precursor to complexity theory.

### **Proletkult, Ecology, Theoretical Biology and Ecosemiotics**

Biology had a major role to play in creating this new culture. Initially, the biology that gained favour in the Soviet Union was anti-vitalist and anti-Idealist, and instead expressed an essentially positivist and reductionist orientation. However, as Engels' *Dialectics of Nature* began to exert its influence, Soviet biology, along with psychology, became a major centre of what came to be known as the Third Way—neither vitalist nor mechanist; that is, an anti-reductionist naturalism. Ecology, with its focus on the inter-relatedness of organisms and its challenge to previous disciplinary boundaries (most importantly, between physics, geology, chemistry and biology), had an important place in advancing this new science (Gare 1994) and was strongly supported in the 1920s by Lunacharsky, who also supported the work of Vladimir Vernadsky and his concepts of the biosphere and noosphere. Such ideas were very much in accordance with Bogdanov's Tektology (Gare 1993). Even before the Bolshevik revolution, Russia had been a major centre for research in ecology and other geosciences, with a particular focus on symbiosis in biotic communities (Rispoli 2014). Ecology was characterized as the study of biocenoses or biotic communities rather than the study of ecosystems, focusing on the relationship between organisms and how their interactions worked to augment the conditions for their existence and further evolution. This had been the basis for Peter Kropotkin's democratic federalism, founded on the significance accorded to mutual aid as a defining feature of life. In the 1920s research in ecology in the Soviet Union, incorporating thermodynamics along with ideas from Engels, was highly original and more advanced than anywhere else in the world (Weiner 1987, ch.6).

This did not last. With the triumph of Stalin and the implementation of what Bogdanov had warned against—"war communism" rather than "worker socialism"—freedom of enquiry was severely limited. Lunacharsky resigned as Commissar for Education in 1929 in protest at government interference in education. While many ecologists were persecuted by Stalin and his followers, who were hostile to any claims that nature could not be completely dominated, this movement of radical science was not completely destroyed, and was sustained in the Soviet Union in what Weiner characterized in the title of a later book as, *A Little Corner of Freedom* (1999).

However, it was not only in this little corner of freedom in the Soviet Union that this new culture was being developed. Work in the Soviet Union was attracting the attention of radical scientists, particularly biologists, in Britain. A delegation from the Soviet Union led by Nicolai Bukharin participated in a conference on science in London in June, 1931, conveying Soviet findings on the relationship between science and society (Bukharin 1971; Ienna and Rispoli 2019). The Russian contribution to this conference, edited by Bukharin, was published as *Science at the Crossroads*. This had a huge influence on some British biologists inspired by advances in physics, Marxism, including Engels' *Dialectics of Nature*, developments in German and Russian biology, and the process philosophy of A.N. Whitehead (Peterson 2017, 55). These were committed socialists trying to develop new ideas in biology, focusing on embryology, with J.D. Bernal and Joseph Needham, who attended the 1931 conference (Needham wrote a preface to the second edition of *Science at the Crossroads* when it was republished in 1971), and C.H. Waddington, the most prominent of them.

They established the theoretical biology club in 1932. After the group failed to get support from Cambridge University and the Rockefeller Foundation withdrew its own support in turn, largely due to the influence of Warren Weaver, who was opposed to their communist sympathies (Peterson 2017, 119), Waddington moved to the University of Edinburgh and continued to promote the development of what they had characterized as mathematico-physico-chemical morphology.

This provided an alternative to the reductionist agenda of the vitalists and the molecular biologists, who did succeed in getting support for their research. While the molecular biologists synthesised their ideas with Darwinian evolutionary theory to develop the synthetic theory of evolution, culminating in the development of sociobiology according to which, as Richard Dawkins put it, organisms are survival machines for reproducing genes, Waddington and those aligned with him were arguing for a creative universe of relational processes generating not only life, but new values, culminating on Earth with the evolution of humanity. While this whole research program was ignored and marginalized in the fifties, with growing awareness of ecological destruction and the rise of radicalism in the 1960s, it became possible to gain support for and successfully promote these ideas. Waddington organized major world conferences in theoretical biology in the late 1960s and early 1970s in Bellagio, Switzerland (Waddington 1968-1972), the proceedings of which, edited by Waddington himself, were published in four volumes as *Towards a Theoretical Biology*. These generated an international theoretical biology movement that provided a reference point for the subsequent development of post-reductionist biology, including dialectical biology, catastrophe theory, complexity theory and hierarchy theory (Gare 2017a). Waddington was a strong supporter of Piaget's genetic epistemology, which not only challenged behaviourist psychology, but was a major influence on Thomas Kuhn's anti-positivist philosophy of science.

While the initial focus of these theoretical biologists was on morphogenesis in individual organisms, they were also concerned with developing ecology. Waddington supported the work of the avowedly Marxist dialectical biologists and ecologists Richard Levins and Richard Lewontin. He also supported the hierarchy theorist, Howard Pattee, who argued that emergence, including the emergence of life, human culture and human institutions, is a matter of new enabling constraints. This idea later became central to theoretical ecology associated with the work of Timothy Allen, Stanley Salthe and their colleagues. Waddington also published the work of C.S. Holling () on stability and resilience of ecosystems. Holling was involved in establishing ecological economics and founded the journal *Conservation Ecology*, later renamed *Ecology and Society*, and also founded the *Resilience Alliance*, a movement aiming to incorporate ecological thinking into public policy based on the notion of maintaining or creating resilient ecosystems. In general, the work of such theorists countered the influence of reductionist forms of Darwinism and social Darwinism and their dogma of progress through competitive struggle and the survival of the fittest, instead emphasising the role of symbiosis and synergies in evolution achieved through enabling constraints. They legitimated as evolutionary progress the socialist quest to subordinate the egoism of *homo economicus* as necessary for providing the conditions for people to develop their full potential to advance the conditions for their existence. Waddington himself was increasingly concerned with the environmental problems engendered by global capitalism. His last work *The Man-Made Future* (1978, 9) began: "Whatever the future will be, it will have been made by Man. The great problems the world-wide species is facing is essentially and inescapably complex. It is made up of a series of major world problems—of population, food supplies, energy, natural resources, pollution, the condition of cities, and others—and they are inextricably interconnected, so that no one of them can

be properly dealt with in isolation.” Waddington’s argument is that humans will make their future by understanding this, and taking appropriate action, not by allowing the forces of the market to determine the future.

Despite this resurgence of these radical ideas in the 1960s and early 1970s, they were beginning to be marginalized even before Waddington died in 1975 (Peterson 2017, ch.15 & “Conclusion”). They were pushed aside over the next three decades by what Waddington characterized as COWDUNG – the conventional wisdom of the dominant group. This was the Democritean-Cartesian philosophy on which capitalism had been founded (Waddington 1977, 18ff.). In this context, Waddington corresponded with theoretical biologists and ecologists in the Soviet Union. He corresponded with Kalevi Kull from the Department of Systems Ecology of the Institute of Zoology and Botany of the Estonian Academy of Sciences between 1974-1975, and sent him the four volumes of *Towards a Theoretical Biology*. A theoretical biology group was set up in Tartu in 1976, reviving an anti-mechanistic tradition of Estonian biology going back to Karl Ernst von Baer and Jakob von Uexküll as well as more recent work in ecology and theoretical biology, and holding international conferences on theoretical biology (Kull and Tiivel 1989). This was highly regarded by scientists in Moscow.

Semioticians in Tartu along with those in Moscow had set up the Tartu-Moscow School of Semiotics, which has continued up to the present, publishing the journal *Sign Systems Studies* from 1964 onwards, later characterized when it was published in English in 1991 as an international journal of semiotics and sign processes in culture and nature. While similar in some ways to Western work on semiotics, and influenced by Saussure, contributors to the journal were also influenced by the ideas of Mikhail Bakhtin and his circle, including the humanist Marxism of P.N. Medvedev and V.N. Vološinov, which flourished in the 1920s, and in more recent years they have aligned themselves with C.S. Peirce rather than Saussure. These semioticians have provided an alternative to the work of French semioticians and their Anglophone epigone. Kull joined this school of semiotics and later became an editor of the journal. He made contact with the biosemioticians in Denmark, notably the politically radical environmentalist, Jesper Hoffmeyer, who developed the notion of the semiosphere (previously put forward in a more limited form by the Estonian semiotician Juri Lotman), the realm of semiosis that originated with life and is central to the biosphere. Between them and along with biosemioticians from Czechia, Austria and elsewhere, they have developed an international biosemiotics movement, with annual “Gatherings.” From 2008 onwards they have published the journal *Biosemiotics*. Kull has made Tartu a leading international centre for biosemiotics and ecosemiotics.

While focusing on ecosemiotics, Kull and his colleagues are strive to redefine the place of humanity in nature, interpreting human culture as a more complex form of semiosis (Kull 2009). This has facilitated a reformulation of Marx’s critique of political economy relating this immediately to ecological concerns. As the Swedish human ecologist Alf Hornborg pointed out in “Money and the Semiotics of Ecosystem Dissolution” (1999), money is a code with only one sign, or a language with only one phoneme. It cannot possibly provide the feedback required to deal properly with complex situations, and in fact by disguising the nature of the relationships between people is driving humanity to ecological destruction. He illustrated this in “Vital Signs: An Ecosemiotic Perspective on the Human Ecology of Amazonia” (2001), published in *Sign Systems Studies*. In the same journal Max Oelschlager (2001) published “Ecosemiotics and the Sustainability Transition.” Referring to Marx’s

observation “that philosophers have long speculated about the world, forgetting that the most important task is to change it,” he went on to show how the ecosemiotic thesis could facilitate international cultural change. As he put it,

If ecosemiotics is to be more than academic entertainment, then an outline is in order, however provisional or elliptical, of how pragmatic ecosemiotics must at some point affect “eco-semiotics”, that is, the overlap of human ecology and biophysical ecology, the chaotic interface of the body of culture and the body of nature. The divide of biophysical ecology or nature and human ecology or culture is not only intellectually untenable but also dangerous, threatening catastrophic and irreversible change in biophysical processes ... The dominant cultural codes – economics, politics, ethics, psychology, and so on—perpetuate that separation, thus leading the human species toward a fateful rendezvous with natural selection. A theory of ecosemiotics should describe the process by which adaptive cultural changes might be facilitated. (226)

Ecosemiotics, incorporating human culture in its understanding of nature and according a place to human ecology (closely associated with “economic anthropology”), is providing the means to not only understand the failures of capitalism (Hornborg 2001b; Gare 2007) but also for rethinking received concepts and transforming societies by integrating the sciences and the humanities to achieve a civilisation based on ecological thinking (Hornborg 2018).

### **Joseph Needham and Science and Civilisation in China**

While Waddington continued his work on theoretical biology, grappled with environmental problems and also engaged with the arts, Needham, who retained his position as Professor of Biochemistry at Cambridge, had turned to the history of science. Initially he focussed on the history of embryology in Western science, but then, inspired by the Russians to understand the past successes and then-current failures of Western science, took up the mammoth project of contrasting the development of science in Europe and China. His later historical work explained in much more detail than the Soviet historians of science the relationship between the development of capitalism and rise of scientific materialism in the 17<sup>th</sup> century. He showed how nature came to be conceived of as matter in motion, moving blindly and meaninglessly according to immutable laws, by using the new developments in codified law as a metaphor for nature, which in turn legitimated the emerging social order of capitalism, and the subsequent bias in a capitalist society towards upholding and extending this conception of nature, incorporating it into economic theory and other human sciences. Needham’s Marxist approach to the history of science was continued by Robert Young, who in *Darwin’s Metaphor* (1984) showed how Darwinism overcame a cultural crisis in Victorian England where economic progress was associated with impoverishment of the working class and imperialism, with devastating consequences for colonized people, by using capitalist social relations, as characterized by economics, as a metaphor for nature, and then using this to defend economics itself and the brutal consequences of capitalism.

However, Needham also identified a counter tradition beginning with Leibniz and running through Herder, Schelling, Hegel, Marx, Engels, Alexander, Lloyd Morgan and Whitehead and the work of the theoretical biology movement. In place of matter in motion, such thinkers conceived nature as a realm of relational processes, or patterns of activity, capable of giving rise to sentience, consciousness and spirit. Needham argued that the fundamentally different ways of thinking characterizing this tradition were inspired by the influence of Chinese thought, particularly the 12<sup>th</sup>-century Song Dynasty neo-Confucian philosopher Zhu Xi (Chu Hsi), on Leibniz. The spectacular



originality of Leibniz, the ultimate source of the opposition to the tradition of Galilean-Newtonian science, Needham argued, derives from the influence on him of Zhu Xi. According to Zhu Xi, nature consists of patterns (*li*) of energy (*qi*) developing through the interaction of two opposing but interpenetrating and mutually supporting principles or forces, *yin* and *yang*. Of Zhu Xi, Needham (1956, 291) wrote: "Behind him he had the full background of Chinese correlative thinking, and ahead of him he had—Gottfried Wilhelm Leibniz." While modern science originated in Europe, post-reductionist science has absorbed ideas from China to transcend reductionist scientific materialism and is now becoming a global science, drawing on the best of all civilisations. As Needham put it, "Chinese bureaucratism and the organicism which sprang from it may turn out to have been as necessary an element in the formation of the perfected world-view of natural science, as greek mercantalism and the atomism to which it gave birth" (339).

What is now required, Needham suggested, is a new ordering of society to facilitate the full development of the revolution in thought begun in the late 19<sup>th</sup> century, and the assimilation of this thought into the organization of society. Not surprisingly, then, Needham was sympathetic to the Communist Revolution in China. He suggested that "perhaps socialism was the spirit of un-dominating justice imprisoned within the shell of Chinese medieval bureaucracy. Basic Chinese traditions may perhaps be more congruent with the scientific world co-operative commonwealth than those of Europe" (Needham 1969, 202). From Needham's perspective, the attraction of the notion of socialist ecological civilisation in China can also be understood. While Marxism was embraced in China primarily to assimilate Western ideas on industrialization in order to overcome its poverty and military humiliations, Chinese traditional culture kept alive the value accorded benevolence and respect for people promoted by Confucianism and respect for nature promoted by Daoism. Confucian values are inimical to treating people as nothing but commodified instruments. Daoist cosmology, incorporated into Confucianism by the Song Dynasty neo-Confucians Zhang Zai, Zhou Dunyi, the Cheng brothers and Zhu Xi, which had dominated Chinese philosophy for 700 years was inimical to accepting reductionist scientific materialism. Needham's work on China, aligned with Waddington's work in theoretical biology, explains why Chinese scientists with some appreciation of their own intellectual traditions (fostered by Needham's work), should be able to take up and advance ecology and ecological thinking. Needham's prognostications are now coming to be realized (Gare 2014).

### **Ecological Civilisation as the Culture for Eco-socialism**

The call for ecological civilisation in China and the Russians who originated the quest for ecological culture in the Soviet Union were only a part of this much broader global movement of radical scientists and philosophers struggling, very often against hostile intellectual environments, to develop the forms of thinking, that is, the consciousness required to create and legitimate socialism—the form of society in which people gain control over their destinies and recognize themselves as creative participants in a creative nature. While no member of the anti-reductionist tradition of Marxist influenced science put forward the idea of a global ecological civilisation, their work provides the background against which the introduction into China and the prominent place it has gained there can be understood, and also, the failure to achieve a consensus about what is meant by it. Frolov and other Russians calling for an ecological culture were carrying forward Bogdanov's conception of culture as the forms of consciousness on the basis of which people produce and organize themselves. From this perspective, socialism requires the development of a

new culture, overcoming the deficiencies of previous cultures while incorporating all that is best in them. The development of post-reductionist science is central to this development. The central figures in developing post-reductionist science were mostly socialists who saw their work as a challenge to the science engendered by capitalism, and as such, central to creating genuine socialism. Genuine socialism, in turn, they saw as involving a new appreciation of nature. Needham's work explains why China embraced socialism and has provided the cultural environment where the notion of ecological civilisation could not only be put forward but also accepted by its government. Ecological civilisation is underpinned by this radical socialist tradition within the sciences. As such, it involves a fundamental challenge to the culture of capitalism and its legitimacy as a natural form of life, and conversely, it legitimates and maintains the trajectory of movements, institutions and governments set up to challenge capitalism, instituting socialist forms of life to create a socialist world-order.

However, this does not mean that everyone involved in this struggle appreciates the history of this quest, the aims and achievements of those on whose work they have been building, or all aspects of what it involved, or even that they have been paving the way for the creation of a socialist society. Without an understanding of this historical background and the coherence of the tradition of radical science and its relation to socialism, it has been easy for people to take up the notion of ecological culture or ecological civilisation and fail to appreciate just how radical their implications are and how radically they challenge capitalism. As noted, they could be interpreted as implying little more than the mainstream capitalist solution to environmental problems, treating these as a marginal side-effect engendered by economic growth associated with industrialization and requiring the development of some sensitivity to these problems and techniques to manage them, rather than addressing a major crisis of civilisation requiring a radical transformation of the way people understand themselves and their place in nature and how they organize their economic, social and political life. For this reason, the struggle for ecological civilisation is a struggle against cultural amnesia, that is, the loss of memory of what has been achieved in the past to recognize and maintain the coherence over time and the radical implications of this radical tradition of thought.

Even with this history, the full import of these ideas are likely to escape most people, at least to begin with. People are formed by a culture in which every part seems to support every other part, and it is often difficult for people to free themselves from such a culture. The more capitalism dominates, the more the commodity form is imposed, the more difficult it is for people to appreciate its historical relativity and the possibility that a different relationship between people and between humans and nature is possible, or that the world could be understood differently. Any breaks with the old ways of thinking will tend to be marginalized and then forgotten about, or misinterpreted and reformulated to fit the dominant culture. Those involved in developing ideas which could challenge the culture of capitalism, often embodied in conventional disciplinary boundaries, have frequently been suppressed, or their efforts crippled by lack of funding. This is what happened to the theoretical biology movement of Needham and Waddington (Peterson 2011, "Conclusion"). Theoretical ecology and human ecology also tend to be underfunded and marginalized. With neoliberalism, people challenging prevailing ideas have been undermined by transforming universities into transnational business corporations and integrating them into the economy, commodifying education, research and knowledge so that only education and research that generates profits to corporations are supported.

There is even a perversion of language making it difficult to articulate radical ideas and have them and their significance understood. This is illustrated by notions of culture and civilisation which initially were developed to enable people to characterize and reflect on their forms of life and ways of thinking and to uphold higher values. These terms have been trivialized through being defined from the perspective of capitalist culture. Consequently, despite Marx's efforts and influence, there is a failure to appreciate that the categories of economics, expressing the forms of being within a capitalist society, as Marx characterized these categories in the *Grundrisse* (106) are the core of one particular culture and civilisation and could be replaced. No one who is genuinely civilised could countenance treating people and the rest of nature as nothing but means to satisfy their appetites, and knowledge as nothing but an instrument of control. Freeing the concepts of culture and civilisation from their trivialization allows us to appreciate science as a major achievement and component of culture and civilisation, upholding the quest for truth as the coherent and comprehensive understanding of reality, both facilitated and constrained by its relation to the rest of culture.

Because capitalism is dependent upon science, it is here that the challenge to the hegemony of capitalist culture can be most effective, and the advance of science is showing that the world-view on which capitalism is based and which legitimates it, is being invalidated. Efforts to neutralize this challenge by "managing" science to make it serve the economy, are destroying it (Charlton 2012). Climate science and ecology are now spearheading this challenge to prevailing assumptions. This challenge has the potential to rescue science from its current fragmentation, with Robert Ulanowicz arguing that ecology should become the reference point for defining science, overcoming the conceptual logjams that currently hinder progress in understanding evolutionary phenomena, development biology, the rest of the life sciences, and, conceivably, even physics (Ulanowicz 1997, 6). Such science is as likely to reveal the limits to how much nature can be controlled as to show how to control nature, while at the same time facilitating an appreciation of its intrinsic significance. Through the development of the concepts of resilience it should also provide guidelines for how to diagnose the sickness of modern civilisation and how to maintain the health of ecosystems and create healthy societies, replacing economics with human ecology as the core framework for formulating public policies (Gare 2002b; Ho and Ulanowicz 2005; Hornborg 2019a).

Once the seeds of radically new ways of thinking have gained a foothold, especially when they are included in narratives defining communities, they can set in train the system innovations that can totally transform societies and civilisations. Making ecological civilisation the official narrative in China might look to some like a public relations exercise. However, having this in place has resuscitated the grand narrative of socialism in its eco-socialist form. As Sam Geall and Adrian Ely (2018) argued in "Narratives and Pathways to Ecological Civilisation in Contemporary China", this narrative is likely to gain strength and influence pathways to a sustainable social order both in China and internationally over the coming years, a view supported by Marinelli (2018, 375ff.). What is emerging is a new, reinvigorated grand narrative of socialism as ecological civilisation that can challenge and replace the reductionist, materialist and social Darwinist grand narrative of neoliberalism, the grand narrative that launched the last major advance of capitalism in the 1970s.

## **Conclusion**

This history of the background to the quest for ecological civilisation explains its rise in China and the diversity of its interpretations. To avoid being subjugated, China had to embrace and assimilate a

huge chunks of culture from European civilisation, and this was undertaken by embracing Marxism. This facilitated the industrialization of China while enabling the Chinese to maintain a critical distance from European traditions. However, the history of Marxism has been confused and often misunderstood, and in some cases this has led to an almost uncritical adoption of Western culture, despite its problems. In these cases, ecological civilisation can be understood as little different from forms of environmental protection characteristic of Western societies. However, there are still strong Chinese cultural traditions that have survived, traditions that Needham showed had indirectly influenced the work of Marx and Engels. This placed the Chinese in a position to appreciate the resonances of the notion of ecological culture developed in the Soviet Union with socialism without full knowledge of the eco-socialist roots of this notion. Arguing that ecological civilisation has some presence in all societies is a way of recovering and defending superior aspects of past cultures, including Chinese culture, that have been suppressed with commodification, standardization, homogenization and debasement of reality associated with the advance of capitalism. Defending cultures of the past is not inconsistent with defending socialist ecological civilisation and calling for a global ecological civilisation, and this is the grand narrative that is now emerging as a global cultural force (Gare 2017b). Even without referring to eco-socialism, the unfolding of the core ideas of ecological civilisation as it orients people towards action will inevitably reveal its eco-socialist roots.

Once the full implications of ecological civilisation are understood, it should be clear that there is no need to speak of “socialist” ecological civilisation, since in the modern world, ecological civilisation could not be anything else than socialist. In fact, ecological civilisation not only brings into focus the ultimate failure of capitalism and the ultimate reason why it must be replaced; it also clarifies what socialism is and what humanity should be striving to create. It can provide the coherence required for an alternative hegemonic culture capable of overcoming the hegemony of capitalist culture and the opposition between the sciences and the humanities. Civilisation has usually been defined in opposition to barbarism and decadence, and in late capitalism we are facing a combination of hi-tech barbarism with the decadence of consumerism (Stiegler 2011). For the Ancient Romans and for Renaissance philosophers, civilised people were those who could govern themselves, who have been cultivated or educated to do so, with the virtues required to understand, value and defend their liberty, and more broadly, to understand the value of life. In ancient “civilisations” only a minor proportion of the population could be civilised, dependent upon slaves, serfs or peasants to do the backbreaking work required to support them. Marx realized that, for all its faults, capitalism was creating a world in which all this oppressive work could be done by machines and the entire population could be civilised, realizing their full potential to augment the life of their social and natural communities. Late capitalism is rendering people powerless by decivilising them, portraying lives of irresponsible self-indulgence as free, despite even their consumption being proletarianized and their economic conditions rendered increasingly precarious. Marx also appreciated the disastrous effects of capitalism on the environment, brought about not only by creating a metabolic rift between cities and the countryside, but also through destruction of forests and changing the climate (Saito 2018, ch.6). Ecology, focusing on the system of “homes” or “households” of organisms, including people, examines how the interaction between these organisms succeeds or fails to provide the conditions where they can develop in such a way that they can augment these households, and thereby the resilience of their immediate biotic communities and broader communities of these communities. Ecology, including human ecology, is providing the forms of thinking required to remake economics and the other human sciences, ethics

and politics (Gare 2010; Gare 2017b; Hornborg 2019b). Marx wrote of a future in which the free development of each will be the condition for the free development of all. The triumph of ecological civilization will involve creating an order generalizing this idea from individuals to communities and to communities of communities. 'Communities of communities' will include the whole of humanity along with biotic communities, the current regime of the global ecosystem among them.

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