Social Ecological Economics: Understanding the Past to See the Future

By Clive L. Spash*

Abstract. The attempt to provide insight into the interactions between the economy and the environment has been an on-going struggle for many decades. The rise of Ecological Economics can be seen as a positive step towards integrating social and natural science understanding by a movement that aims to go beyond the confines of mainstream economics towards a progressive political economy of the environment. However, this vision has not been shared by all those who have associated themselves with Ecological Economics and there has been conflict. An historical analysis is presented that shows the role of mainstream theory in delimiting the field of environmental research. The argument is put forward that rather than employing a purely mechanistic objective empirical methodology there is a need for an integrating interdisciplinarity heterodox economic approach. In order to distinguish this approach—from the more mainstream multidisciplinary linking of unreconstituted ecological and economic models—the name Social Ecological Economics is put forward as expressing the essential socio-economic character of the needed work ahead.

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Introduction

Ecological Economics has developed as a modern movement since the late 1980s (see Spash 1999). This movement has gathered together a variety of perspectives and interests concerned to address the modern environmental crisis. A crisis because environmental degradation—species loss, long range transport of air pollutants, contamination of soil and water, introduction of synthetic chemicals, desertification, deforestation—has only belatedly been recognized as integrally linked to the way the economy is run.

In economics, the appearance of environmental problems has for long been minimal and attention largely left to sub-disciplinary specialists (e.g., agricultural, resource and environmental economists) easily sidelined and disregarded by both mainstream micro and macro economists. In micro economics, core theoretical ideas have set the stage in terms of price theory for over a century (see Lee 2009: 2–3), providing a restricted orthodox worldview.[1] In macro economics, the type of subjects that dominate (e.g., money supply, unemployment and inflation) have seemed divorced from environmental problems. This has meant economists working on the environment could easily be dismissed as having consigned themselves to irrelevance. Even amongst heterodox schools (e.g., post-Keynesians, critical institutionalists, neo-Marxists), where a voice might have been more readily expected to be heard, there has been little or no attention. Economists of all schools have generally been able to ignore the evidence of environmental problems as having anything to do with their work. Yet in more recent times this seems to have been changing.

Since the early 1990s a range of Nobel economic prize winners (e.g., Arrow, Kahneman, Ostrom, Sen, Solow, Stiglitz) have been found imparting their wisdom on environmental matters,[2] and some have even associated with ecological economists (e.g., Arrow, Ostrom, Sen).[3] This appears to indicate a new engagement by economists with environmental issues and a newfound respect for the field of research. Thus, the magazine *The Economist* has moved from relegating occasional environmental articles to its science section to running regular features and leaders. An economist may now apparently study and publish on environmental topics while maintaining some collegiate

standing. Indeed, specialists in the area appear, in neoclassical economic terms, as rather cunning speculators who foresaw the potential personal returns of an early investment.

That the environment is now a headline economic issue goes hand-in-hand with the fact that controlling pollution is big business. The high political profile given to human induced climate change and neo-liberal support for multi-billion dollar carbon trading markets have made this very clear. For example, the European emissions trading scheme had an estimated worth of $US51 billion in 2007 (European Commission 2008: 21) and $US80 billion in 2008 (Kantner 2008). The market in carbon offsets is also a growth industry (European Commission 2008). As potentially the largest commodity market ever created, carbon trading has stimulated considerable interest in the financial markets and amongst banks and corporations (Spash 2010). All this provides an incentive for the newfound environmental interest within the economic establishment.

Unfortunately, increased popularity does not necessarily indicate serious engagement with the subject matter, even from the most hopeful sources. For example, Amartya Sen appears a thoughtful writer on economics who has expressed ideas critical of orthodox economics and offered insights on development,[4] poverty and gender issues. In a rather overlooked book, he highlighted the role and importance of ethics in economics (Sen 1987). All this fits well with arguments for value pluralism as found in Ecological Economics (Gowdy and Erickson 2005). Yet he gave a plenary at the International Society for Ecological Economics (ISEE) conference in 2006 that was not only disappointing, in offering little of substance specifically on the environment, but also finished up expressing support for the monistic global cost-benefit analysis of the report by Stern (2006) on human induced climate change. He later endorsed the published report. This support would seem in stark contrast to his ideas on economic development as opportunity, writings on problems with welfarism in economics, and general criticisms of using growth as a measure of well-being. Sen, unlike some in his audience, was apparently unconcerned by, or perhaps unaware of, Stern's underlying expected utility model, standard discounting approaches and use of GDP growth as means for justifying human action, or inaction, on this

major environmental issue (see critique by Spash 2007). At the ISEE conference he seemed oblivious to any debates in Ecological Economics of direct relevance to his own work, or the ways in which his own work might relate to environmental issues.

That eminent figures in the economic establishment talk to but not about the environment is seriously problematic and brings into question the new rhetoric of environmental concern amongst economists. Indeed, there is a continued neglect of the environment as anything to do with the core of economics as a subject. This can be explained by considering two alternative ways in which economists address environmental issues. First is the treatment of environmental problems as special cases of more general theoretical constructs in mainstream economics. This allows (both mainstream and heterodox) economists who are embedded in an establishment discourse to maintain their own preoccupations without needing to pay much attention to the specifics raised by environmental problems (e.g., transforming to a low carbon economy becomes green jobs, which are just an aspect of macroeconomic employment policy). This has been the preferred approach for most economists. Second is the recognition that serious attention to environmental reality leads to the need for a totally new way of thinking based in political economy and interdisciplinary learning. As will be shown, this is the raison d'être of Ecological Economics. Thus, work by ISEE Presidents Bina Agarwal (2001), Joan Martinez-Alier (2002), Richard Norgaard (1994) and John Gowdy (1994) has addressed the social and political as much as the economic, while emphasizing the need to learn from interactions with ecosystems. A perhaps inevitable struggle has then been on-going between this Social Ecological Economics approach and those engaged in legitimizing economics as an objective technical means for engineering society, where the environment is something external to the economy.

This paper explores that struggle and some of the resulting confusion it has created for understanding the meaning and content of Ecological Economics.[5] The central contention of the current paper is that the institutionalized power of mainstream theory has played an important role in delimiting the field of environmental research. As Lee (2009: 7) states: "The mainstream explanation focuses on how

asocial, ahistorical individuals choose among scarce resources to meet competing ends given unlimited wants and explains it using fictitious concepts and a deductivist, closed-system methodology." Adopting that approach, in part or whole, then has serious implications for the conduct and relevance of Ecological Economics.

Understanding the discourse surrounding the work that has been appearing as Ecological Economics involves more than merely focussing on the academic technical debates. This requires historical analysis, exploration of conflicts and probing of the ideological and methodological differences. The overarching objective of the project, of which this paper is a part, is to enable a better classification of relevant work and indeed explain why some is inappropriately classified while other, dispersed across a range of fields, could easily be included within the bounds of relevance. More than one paper is necessary to take such a project to completion.

The current paper provides an historical exploration of the community of scholars grouped around Ecological Economics and probes their motives and interests in order to start clarifying areas of ideological and methodological unity and division. The next section looks at the rise of environmental concern leading to the development of economic thinking in the area. This sketches the claim to deep historical roots for Ecological Economics, but clearly identifies the modern movement as arising from late 20th-century environmentalism. Environmental economics is then seen as an earlier failed attempt to create a community challenging mainstream economic thinking. This background shows how Ecological Economics was born into a divided and contested world. The next section then explores specific divisions and conflict in the recent history of Ecological Economics. Examples of scholarly interactions are employed to explain how the movement became partially entrapped by an orthodox economic dialogue. This historical analysis emphasizes the role of individuals in developing and propagating ideas amongst a community of scholars and other interested people. Rather than denying the relevance of divisions the aim is to clarify their role in creating the current community. I then outline some ideological and methodological developments relating to specific subject areas and so form a vision of the heterodox foundations of Ecological Economics. This section is an

initial attempt to bring the intellectual ideas more to the fore and has no pretense to being an in-depth analysis of the debates or their validity. The ideas proposed are part of the needed on-going discussion as to the appropriate intellectual pursuits of Ecological Economics. The overall aim is to reveal the "interwoven, interdependent narrative of ideas and community," as Lee (2009: 11) puts it. The paper concludes that if this movement is to make a substantive difference then it must pursue Social Ecological Economics as an heterodox interdisciplinary movement in political economy.

Roots of the Modern Movement

Ecological economics engages with a range of topics that recur across time and have been debated since the ancient Greeks. As such the subject matter includes the limits to wealth creation, the meaning of the "good life," how to achieve well-being individually and socially, ethics and behavior, the epistemology of value, and the psychological and social impact of ostentatious consumption. Threads of reasoning and ideas that are represented in the modern subject can be identified in a range of 18th- and 19th-century sources and call upon many topics discarded or ignored by mainstream economists, including: the writings on social motivation of Adam Smith ([1759] 1982), population and poverty in Malthus ([1798] 1986), Jevons ([1865] 1965) on non-renewable energy dependence, John Stuart Mill's (1848) steady-state economy, Marx (1867) on exploitation, class conflict and capital accumulation, and the evolutionary institutional analysis and "conspicuous consumption" of Veblen ([1899] 1991). The Romantic critique of economics is also relevant and most notably the writings of Ruskin ([1862] 1907). In Ecological Economics some limited forays have been made into this historical context (e.g., Becker et al. 2005; Christensen 1989; Smith 1980; Spash 1999), but most notably with respect to the energy-environment interface in the work by Martinez-Alier (1990).

While the subconscious roots may run deep, the conscious ones lie directly in the 1960s and 1970s, although a few economists during the 1940s and 1950s did express ideas in form and substance that are still current in Ecological Economics. Most notable is K. William Kapp, who

dedicated himself to researching the relationship between economics and the environment. He also explored the relationship between social and natural sciences, the need for knowledge integration and meaning of interdisciplinarity (Kapp 1961). He wrote on history of thought and methodology (Kapp and Kapp 1963), and produced extensive empirically based institutional analyses of environmental problems (Kapp 1950, 1978). Indeed the reason he is largely unknown is that his critique was so far ahead of its time in breadth and depth. Ciriacy-Wantrup's (1952) work on conservation, land and resource use is also noteworthy, not least for developing the concept of a safe-minimum standard. More generally, there is the work on modern industrial economies of Polanyi (1944) and Galbraith ([1958] 1969, [1967] 2007) covering the rise of self-regulating market economies and the corporation, respectively. Both at points link their thesis explicitly to environmental degradation. Like Kapp, these authors offer critical institutional analysis of the economic process. So, while few contributed at this time, some powerful ideas emerged that remain highly relevant to our understanding of environmental problems.

The Emergence of Environmentalism

In the 1960s a more general and popular awakening to environmental problems arrived with books such as Rachael Carson's ([1962] 1987) *Silent Spring* on agro-chemical pollution and Paul Ehrlich's (1968) *Population Bomb*. The issue of economic growth was also placed on the agenda (Boulding 1966; Mishan 1969). In popular culture, the hippie movement raised the ideal of harmony with Nature, dematerialization and alternative lifestyles (from self-sufficiency to communes). However, the popular environmental literature really took off in the 1970s and only then spread into economic debates. Topics expanded from population growth (Ehrlich and Holdren 1971), to general limits to economic growth (Meadows et al. 1972), to questioning the means of production (Schumacher 1973) and social impacts of growth (Hirsch 1977). Radical environmentalism was being born (Abbey 1975), and an associated protest movement became institutionalized in non-governmental organizations from Friends of the Earth and Greenpeace to Earth First and Sea Shepherd.

In economics the major factor that helped concentrate minds on environmental issues was the energy crisis (Commoner 1976; Tanzer 1974). While this crisis was created by oil producers restricting supply, leading to price increases, the general idea of economic dependence on finite non-renewable resources was brought back on the agenda after having been neglected since the 1800s. There was inevitably also a backlash against environmental concern and defensive arguments from mainstream economists. For example, Beckerman not only attacked those raising concerns over finite natural resources (Beckerman 1974), but also Kapp's environmental work (see the reply to Beckerman by Kapp 1978: 305–318).

Such economists were, and remain, out of tune with public perception and the growing awareness of pollution as a techno-industrial threat to life on Earth. The link of DDT to non-human and human birth defects was a starter. Similar consequences were feared due to nuclear fallout from weapons testing. In 1959, contamination of the food chain became evident when radioactive deposits were found in wheat and milk in the northern United States. The result was to move testing underground, although France and China persisted with above ground testing and global pollution (e.g., Simpson et al. 1981). The new nuclear power industry, which supplied weapons grade plutonium, provided another environmental concern. The threat of accidents and pollution became increasingly real from the reactor scare at Three Mile Island in the USA to the radioactive releases from the UK's reprocessing plant at Windscale (renamed Sellafield in a political rebranding exercise). Fears of a major reactor accident were ultimately realized with the catastrophe at Chernobyl in 1986 and the resulting global nuclear fallout.

The increasing geographical scope of pollution threats also slowly became accepted elsewhere. In the 1970s scientists debated the idea that air pollutants from coal fired power stations could be transported internationally. This was contested into the 1980s and persistently denied by countries (e.g., UK and Germany) responsible for large scale emission of sulphur dioxide and nitrous oxides, that is until damages became evident domestically, e.g., tree loss in the Black Forest, Germany. Confirming the sources of acidic deposition impacting Scandinavian ecosystems became a political issue and an interna-

tional research project, leading to the 1979 United Nations Convention on Long-Range Transboundary Air Pollution. Meanwhile, the aircraft industry's proposal for large fleets of supersonic aircraft, as the future for international travel, raised the specter of polluting the upper atmosphere and affecting global climate. This received some analytical attention from economists (d'Arge 1975). Another global pollution problem to get some economists' consideration was the depletion of stratospheric ozone connected to the use of aerosol propellants, mainly chlorofluorocarbons at the time (Cumberland, Hibbs, and Hoch 1982). In a few decades pollution had moved from being regarded as localized smog from domestic fires to international and global with numerous sources and seriously threatening consequences—including genetic mutation and irreversible damage to life-supporting ecosystems and their functioning.

The Rise and Fall of Environmental Economics

Environmental economics arose, along with the growth in public awareness, as a direct response to such problems (see, for example, Kneese 1971). By the late 1960s, the promise of material wealth for all and post World War II optimism in the abilities of science and technology were faltering. Boulding (1966) characterized the economy as being run like the Wild West, populated by cowboys who exploited resources, chucked their waste on the ground and rode away to infinite horizons—where lay the promise of fresh resources and new environments to exploit and degrade—this was contrast with Earth as a closed system like a spaceship. Economic growth was seen as positively misleading in terms of the consequences for human society (Mishan 1969). The challenge was for a new approach to economics.

Environmental economics then appeared both innovative and progressive, if not downright revolutionary. For example, Bohm and Kneese (1971: ix–x) introduced their edited volume, *The Economics of the Environment*, stating that this was "a profession rethinking, extending, and revising its concepts, and finding new applications for them." They drew a parallel with "the ferment in the profession when the Keynesian revolution was in progress" and claimed history was in the making. The reality was a little different.

Any serious challenge by such key figures of the time that might have been posed to orthodox economic methodology, its theoretical models, or even its non-environmental preoccupations was muted. Indeed, besides some passing rhetorical comments, time was mostly devoted to developing mainstream economic thought and applying this to environmental issues. Materials balance theory brought in the laws of thermodynamics, but for compatibility with the mainstream this needed to fit within a general equilibrium framework (Kneese, Ayres, and d'Arge 1970). Pollution was seen as all pervasive (Hunt and d'Arge 1973), but this needed to fit within an optimal control framework (d'Arge and Kogiku 1973). The environment was seen to involve a range of values neglected by and outside of economics (Krutilla 1967), but these had to fit within cost-benefit analysis and a welfare theoretic framework (Kneese 1984).

Despite this, innovation certainly did occur. Environmental valuation in cost-benefit analysis introduced new methods such as travel cost, hedonic pricing and contingent valuation. The travel cost method was the earliest to be more fully developed (Clawson and Knetsch 1966), while contingent valuation followed later, opening a whole new research agenda (Cummings, Brookshire, and Schulze 1986). Primary data collection from face to face interviews gave results that questioned the economic model of human psychology and motivation, and for some created interdisciplinary interactions (Spash 2008a). The theory behind values expanded from pure use to option, existence and bequest values (Krutilla 1967; Krutilla and Fisher 1978). This contributed to discussions over the ethical basis of economics (Kneese and Schulze 1985; Schulze and Brookshire 1982; Schulze, Brookshire and Sandler 1981). Climate change and the treatment of future generations were also topics on the valuation agenda (d'Arge 1979), which raised ethical concerns (d'Arge, Schulze, and Brookshire 1982; Spash and d'Arge 1989).

However, working inside orthodox economics—preference utilitarianizm, optimal control modeling, discounting, a monistic value system, and mathematics as a doctrine of rigor—heavily constrained criticism, innovation and the ability to address environmental and social problems. For example, in the early 1980s a key workshop on contingent valuation was run by Cummings, Brookshire, and Schulze

(1986), bringing together a range of people including psychologists (e.g., later Nobel prize winner Daniel Kahneman). Yet, those advocating the use of attitude-behavior models from social psychology were extremely critical of their reception: "We certainly underestimated the barriers to interdisciplinary communication. Our proposal that economists consider the attitudes-behaviour literature has met with indifference or hostility. CBS are no exception" (Bishop and Heberlein 1986: 141).

A second example is the experience of Jack Knetsch. Despite being a pioneer of travel cost and hedonic pricing, Knetsch has also been highly critical of valuation practice (e.g., Knetsch 1994, 2005), and in particular its failure to learn from empirical evidence with respect to loss-gain differences (Knetsch 1985, 1989; Knetsch and Sinden 1984). His work with Kahneman provoked strong and defensive reactions. This was especially so for their paper on embedding (Kahneman and Knetsch 1992b), which refers to willingness to pay under contingent valuation as the purchase of moral satisfaction rather than an exchange value. Getting the paper published in the main environmental economics journal proved problematic and it received some special critical treatment.[6]

These examples indicate the roots of dissension that would lead to Ecological Economics. While some economists posed, but never answered, various questions, others followed arguments to their logical ends. Those ends raised issues that just could not be addressed within the orthodox economic frame. The entire thrust of the work towards a new and challenging research agenda seemed to be denied. For example, long range transport of multiple air pollutants from dispersed sources is a major topic of environmental concern. Yet environmental economists have persisted in teaching a core model that characterizes pollution as a local problem between two actors, easily corrected as a one-off market failure (Spash 2010), or worse, as optimal due to transactions costs (a problem in their economic logic noted early on by Mishan 1971). By the mid-1980s university education in the area was mainly limited to North America where the approach to topics was controlled and the curriculum restricted (e.g., post graduate education excluding methodology and history of thought). In this atmosphere Ecological Economics emerged as a

challenge to what had become a captured orthodox economics of the environment.

The Rise of Ecological Economics and Conflict

Those economists voicing strong environmental critiques in the 1970s generally found themselves and their ideas marginalized within a decade. The criticisms were just too revolutionary. Kapp (1970a, 1970b) was pointing out the basic failure of a system that pushes costs onto others and characterizes them as "externalities," as if these were minor aberrations from outside an otherwise perfectly efficient system. Georgescu-Roegen (1971) wrote a major thesis on the importance of entropy for the economy that basically concluded that economic growth was infeasible over the long run and as a result policy needed fundamental reform. His reasoning led to questioning human society from the size of population and the pressure placed upon systems, to the time allowed for change and the rate at which human systems impose change. Economic systems were then inseparable from ethical judgments, both concerning others currently living and future generations. Herman Daly (1977, 1992) came to the conclusion that the best option in the face of entropy laws and critiques of growth was to aim for a steady-state economy. All three suffered marginalization, derision of their ideas and neglect.

Understanding the treatment of such economists requires being aware of how orthodoxy operates and defends itself against potential threats from heterodoxy. As Lee (2009: 6) has defined heterodoxy there are those heretical economists who are tolerated because they use many of the same tools and models and whose ideas have led to theoretical advances in the orthodoxy, e.g., Knetsch. Then there are blasphemous economists whose ideas are a rejection of and challenge to the orthodoxy, e.g., Kapp, Geogescu-Roegen, Daly. They are non-brethren and their persecution is a legitimate act in defense of the orthodoxy. Economists who are lauded as part of the establishment (e.g., Nobel prize winners) often have some heretical ideas, but they are not blasphemers because they still believe in the fundamental core ideas of the orthodoxy, they protect and defend that core and hold back from pursuing the logic of their ideas to revolutionary ends.

The arrival of Ecological Economics in the late 1980s offered the potential of picking up on the more radical literature and thinkers. That at least became the hope of socio-economists, for if the field were no different from the mainstream sub-fields of resource and environmental economics the entire exercise of galvanizing a new community would be a rather pointless repetition of what had gone before. History pointed in the direction of a more blasphemous heterodox economics of the environment that dared to reject neoclassical economics in *totalitus*. However, developing an heterodox interdisciplinary research field with a distinct methodology and approach to society-economy-environment interactions was not on everyone's agenda and has involved conflict.

In an in-depth study, involving interviews with several noted ecological economists, Røpke (2004, 2005) found the international movement started by forming an uneasy alliance of divergent ecological and economic opinions on the basis of some very broad common concerns. In general terms, the unifying positions might have been no more than the environment matters to the economy, the environment is being degraded, ecology has important messages for economics that are being neglected. Ecologists came forward who were passionate about connecting ecological understanding with socio-economics in order to better address environmental problems in the public arena. Any economist prepared to talk to an ecologist concerning the environment was a bonus. These ecologists then appear to have been largely (often willfully) ignorant of differences between types of economist, and many remain so. Yet such ecologists filled key roles running the ISEE and its journal.

The result was substantial involvement by economists supporting core neoclassical methodology and ideology. This was further encouraged by the strategy for popular recognition and headline breaking articles in *Science* or *Nature*. The bigger the name in the field the better for getting the environmental message across, and as far as economists are concerned that would clearly favor the orthodoxy. A core group of ecologists—including Bob Costanza, Brian Walker, Paul Ehrlich, David Pimentel and Carl Folke—chose to associate with mainstream economic theorists such as Ken Arrow, Karl-Goran Maler and Partha Dasgupta. The ISEE's journal, originally controlled by

Costanza, had mainstream economists placed on its board and increasingly published much falling well within neoclassical thought, including the mechanistic equilibrium models and preference utilitarianism that so constrained the earlier endeavors of the more heterodox environmental economists.

David Pearce, a noted UK mainstream environmental economist and advocate of all pervasive monetary valuation, was an early Associate Editor of the journal who became increasingly hostile to anything heterodox. He is particularly remembered for a 1996 plenary to the inaugural European Society for Ecological Economics (ESEE) Conference in Saint Quentin en Yvelines where he questioned the reason for Ecological Economics as anything distinct from neoclassical thought (Røpke 2005: 271), and went on to point at Charles Perrings and rhetorically questioned his presence. Pearce was not separated from the journal for another two years.

Perrings, later an ISEE president, has himself pursued abstract modeling in the mode of resource economics (Perrings 1987). This confines Ecological Economics to optimal control models despite all the ensuing contradictions of squeezing and remolding concepts to make them fit the method (see his collected works, Perrings 1997, and the review by Spash 2000). This can be seen as following a line of reasoning—common amongst mainstream economists—that equates rigor with mathematical formalism; an argument flawed even within mathematics itself (see Dow 2003). So mainstream economic approaches were from the outset brought into Ecological Economics, although the aim for many had been explicitly to move away from this orthodoxy (e.g., Söderbaum 1999, 2008).

The potential for divisiveness was apparent to some early on. In 1990 the Swedish Beijer Institute was rebranded under the title Ecological Economics with a Board mixing orthodox economists (Dasgupta, Maler, Pearce, Zylicz) and ecologists (Ehrlich, Holling) with one heterodox economist (Daly). The Institute was headed by Maler, the Board chaired by Dasgupta and two research programs were directed by Perrings and Costanza. As has been documented by Røpke (2005: 272) the decisions made by Dasgupta soon drove Daly to resign, which allowed the Beijer to concentrate on methods from traditional mainstream economics with models linked to ecology. The attempt to

capture what was fast becoming a successful new field relates to power in academia and the potential for wider political influence. As Daly (quoted by Røpke 2005: 272) has stated with respect to his experience at the Beijer: "I felt it was a kind of take-over—here is something called Ecological Economics, it is beginning to get a little following, it might get in the way some day, let's just take it over."

As the field has matured these divisions have remained strong and resurfaced on occasion. In 2002 the incoming journal Editor, Cutler Cleveland, expelled from the Board the more heterodox European representatives (including an Associate Editor, and both the founding and then current ESEE Presidents). This went unnoticed by most people. The ISEE executive at the time refused to take any counter action and preferred to brush over the incident in the name of avoiding open conflict.

In 2004 a more public controversy occurred concerning the award of the ISEE prize in the name of Kenneth Boulding. The recipients were Dasgupta and Maler. In the Society newsletter (distributed at the biennial conference) Perrings, then ISEE President, rejoiced in this as signifying a change towards the approach of the Beijer Institute, i.e., mainstream economic formalism. However, the award came as something of a shock to many when announced at the opening session of the biennial ISEE conference. It was debated and contested by the membership at the Society's business meeting (Røpke 2005: 284–285; Söderbaum 2007: 212–213). Neither Dasgupta nor Maler had previously engaged with the wider community (e.g., despite being European residents, never attending the European conferences) nor been (nor are) members of ISEE. Their work was felt by many to be incongruent with the developing field and Røpke (2004: 309) notes Maler's dislike of socio-economics. Obviously those making this award had a different perspective[7] from that of the concerned ISEE membership, and their active involvement with the Beijer Institute appears a unifying factor.

Such occurrences will not surprise those familiar with the book *A History of Heterodox Economics* by Lee (2009). There he explains that scientific knowledge develops within a community that defines how work is conducted, what is valid and who is part of the community of

scholars. In self-definition an academic community selects the goal-dependent central issues of research and those designated as colleagues are meant to work on broadly the same or supportive issues. Scientific knowledge is then produced by an elaborate intellectual and social organization embedded in educational systems, academic departments and research institutes. There is a system of dependency and interdependence. As Lee (2009: 12) notes:

> scientists that do not "fit" into this structure of dependency, do not produce the right kind of knowledge, can be marginalized and excluded from the community, but still exist within the field or they can be cleansed from the field altogether.

The attempts at cleansing are apparent in Ecological Economics.

At the same time a lack of clarity as to how heterodox the movement should be has permitted a confusing array of literature to appear under the title of Ecological Economics. For example, consider environmental valuation. Measurement and value issues have been high on the agenda of Ecological Economics, in part because of the various attempts to get old wine into new bottles to attract economic and political support for action. For some, mainly ecologists and conservation biologists, large monetary numbers regardless of their theoretical foundation have been lauded a success. For others, physical numeraires of environmental impact are sought and ecological footprints proposed. Yet others believe environmental economists were basically right all along and we just need more cost-benefit type studies extending into ecosystems services (e.g., Daily 1997). Treating ecosystems as if some artifact for trading in a market is highly problematic on many grounds (Spash 2008b). In addition, ecologists, or economists, simply plucking monetary numbers from the air to claim importance for ecosystems actually undermines an alternative theoretically grounded research agenda. Hence a mix, or muddle, of literature has appeared, none of which learns from past experience in economics or addresses the basic problem of developing a coherent theory of value. Pluralism is then sometimes misleadingly referenced as the reason for tolerating such diversity, but this is to misconceive the requirements for advancing knowledge, which require coherence not contradiction.

The Basis for an Heterodox Ecological Economics

There is then a need to go beyond the historical analysis to begin exploring ideology, methodology and why the movement needs to be heterodox in order to address society-economy-environment interactions. A comprehensive in-depth account would require at least a dedicated paper and need to cover much ground. A recent attempt to define the field in this way extends to four volumes and includes a hundred papers (Spash 2009a). The aim here is merely to indicate the strength of argument from a few key perspectives and point to the essential need for moving away from mainstream economics if environmental problems are to be taken seriously, and indeed if economics is to be taken seriously.

Learning from Ecology and the Biological Sciences

There is a dynamic and evolving interaction between human activity and the environment that is central to understanding the development of economic systems. Mainstream thought is resistant to the idea of economic systems as dynamic evolving structures, something recognized long ago by Veblen (1898). Physics rather than biology has been the dominant comparator and methodological influence. In contrast, a methodology is necessary that moves away from a simple belief in mechanistic cause-effect relationships as explaining social interactions, something that was criticized by both Kapp (1978: 281–301) and Georgescu-Roegen (1979). Interactions with ecology have then revived interest in biological concepts and metaphors within Ecological Economics.

Most prominent amongst the biological/ecological concepts are ideas of sustainability, resilience and co-evolutionary development (Gowdy 1994; Norgaard 1981, 1987, 1988). In an evolving system concepts of equilibrium are abstractions for convenience to describe specific states on a path of change. Managing and attempting to maintain systems in perceived equilibrium states can then prove disastrous, e.g., preventing small fires in forests eventually resulting in large scale catastrophic fires. Ecosystems understanding has developed in terms of cycles of energy and materials organization, accumulation, destruction and release. Interestingly, in the current context,

Holling (who pioneered this approach) at one point drew a parallel with work by Schumpeter on creative destruction (Holling 1986). Whether such comparisons are appropriate or not, the ideas clearly cannot fit within orthodox theory, which is built upon concepts of stasis, equilibrium and self-correction.

Yet, employing biological analogies is no guarantee of a more enlightened economics, as shown by Gowdy (1987). In the 1970s economists of the Chicago School, such as Becker, Hirshleifer and Tullock, made use of Wilson's (1975) sociobiology to effectively revive Social Darwinism. A natural science basis was given to their political ideology, which was then justified as consistent with universal assumptions for human behavior. Despite the evolutionary rhetoric, static equilibrium thinking was maintained. Others actually advocated a type of "economic ecology" where animals foraging become consumers optimizing, predators are like firms and population growth is investment (Rapport and Turner 1977).

There is also a darker side justifying a rejection of connections between economics and biology. In the early 1900s, the rise of Social Darwinism led to the justification of racism, sexism, and elitism as somehow scientifically ordained. The concept is forever tainted by the fascists use of Eugenics to justify the gas chamber for millions and similar reasoning behind more recent "ethnic cleansing." Thus, biological metaphors in the social sciences remain highly unpopular in many circles along with constructs such as Eugenics and Sociobiology (Mokyr 1991: 132). Caution would certainly seem the order of the day.

Caution is also required due to the tendency to take ecological concepts as new overarching goals that are universally applicable and from there make a jump to policy conclusions. The unquestioning faith expressed in new guiding principles (e.g., sustainability, resilience) then bears a parallel with the belief in natural laws by economists, during the late 1700s and early 1800s, who wished to match the apparent progress of the natural sciences in discovering universal truths. Sustaining something, or increasing its resilience, does not answer the fundamental questions of why and what for.

There are clearly alternative approaches in ecology and biology, as there are in economics, some helpful, others not so. Ecology in some guises is an optimizing and maximizing discipline with deterministic

mathematical equilibrium models. In other guises it is a dynamic questioning discipline that pushes the boundaries of accepted knowledge. Modeling can be part of the latter, although in a rather different fashion than the former approach assumes (e.g., Holling 1986). Thus, that a core group of ecologists writing on environmental policy issues have worked within the rhetoric of the economic orthodoxy is perhaps unsurprising. However, some have done so despite their own work being of the dynamic questioning type and appearing fundamentally at odds with mainstream theory.

In general, treating environmental issues as just a technical or modeling problem for economic and ecological scientists to solve is far too reductionist and mechanistic. For example, this leads to denying human agency, unpredictability, partial ignorance and social indeterminacy. Hodgson (1993) argues economists should pay attention to the non-reductionist forms of modern biology, rather than the atomistic and mechanistic alternatives of Richard Dawkins, George Williams and Edward Wilson. A biological metaphor then offers the potential for debating a variety of issues including: complexity, levels of abstraction, appropriate units of analysis, irreversibility, non-marginal and qualitative change, and non-optimizing behavior.

Redefining the Objective of the Economy

Modern economics has become dominated and obsessed with two goals: growth and efficiency. Ecology challenges orthodox economics by contributing the realization of alternative requirements arising from the non-human world. Thus, concepts such as sustainability and resilience have appeared as strong independent goals not achieved by economic efficiency (e.g., Common and Perrings 1992). That efficiency has come to dominate economics as a goal is interesting in itself and is ideologically driven (Bromley 1990). The insufficiency of such a goal is often remarked upon by economists themselves, before venturing to set everything else to one side and proceeding to make policy recommendations on the sole basis of supposed efficiency analysis. Efficiency is in fact a sub-goal of growth, justified as the means to maximize desired outputs, namely goods and services for consumption, by avoiding resource wastage.

Ecological Economics emphasizes the limits to material and energy throughput and the problems then posed by the modern economic obsession with increasing consumption. The idea of limits is firmly related to the literature arising from thermodynamics and energy use with its implications for the physical functioning of systems (Georgescu-Roegen 1971). The critique of consumption has connected consumer manipulation by corporations (Galbraith [1967] 2007; Kapp 1978: 224–247) to the psychological and social roles material consumption plays in a modern market economy (Reisch and Røpke 2004; Røpke 1999). The psychological treadmill of material throughput then raises concerns over how to address the scale of growth, which is something ignored in the mainstream literature where efficient allocation dominates regardless of scale (Daly 1991, 1992). Yet the growth goal remains despite its inadequacies. Signals of failure are clear in the persistence of distributional inequity, global poverty and the imposition of pollution and environmental degradation on the poor.

In addition growth has been shown to fail as a means to happiness even for the rich. Easterlin (1974, 1995, 2003) has shown that, within a country at a given point in time, the richer are on average happier, but higher living level norms ("keeping up with the Joneses") mean increased income over time does not increase happiness. Easterlin (1995) offers evidence from the USA, nine European countries and Japan. More recently, he argues the expected utility from pecuniary gains is undermined as opposed to those from nonpecuniary domains—such as friends, family life and health—where hedonic adaptation and social comparison are less important.

> Once it is recognised that individuals are unaware of some of the forces shaping their choices, it can be no longer argued that they will successfully maximize their well-being. (Easterlin 2003: 11181)

This is a conclusion guaranteed to upset the political ideologies of orthodox economics with its rhetoric of the sovereign consumer and minimalist government. Thus, Easterlin should really be less surprised by the neglect of the evidence he and others have brought forth.

Such self-reported happiness research suggests less material consumption and a search for alternative hedonic satisfiers. A tension, common to Green political thought, then appears between appealing

to better sources of experiential pleasure and identifying that such pleasures are in fact not the prime source of a good and meaningful life. O'Neill (2006) takes issue with the hedonic account of welfare because the focus is upon isolation of pleasures for the individual rather than the pattern of a life and its experiences. There is more to life than being a hedonist and to be a pure hedonist is to be nothing more than bestial. This is a denial of the human potential and richness of human relationships.

Besides the relationship of humans to each other across time and space there is the question of our relationship with the non-human world around us and the encroaching replacement of natural systems with human artifacts. This exposes how economics has rather missed the point by focusing on substitutability and the belief, or presumption, that man-made capital can be substituted for other inputs—Nature defined as "land" or capital—(Holland 1997). That economic growth creates harms, as well as goods, is heavily downplayed in mainstream economics while their incommensurability is totally denied.

These various insights have direct relevance for how economic growth is perceived to operate as a means for improving the human condition and why we need new operational goals. Economics might, for example, be redefined as achieving sustained human well-being on the basis of the maintained health and functioning of Earth's ecosystems or, more radically, how to create and maintain systems that fulfil the needs of a meaningful and worthwhile life for all moral agents (human and non-human). The critiques call for a transition in the economy away from material and energy consumption but the more radical position also calls for the abandonment of hedonism and so a fundamental redesign of the modus operandi of modern economic systems. In either case the orthodoxy is a block not an aid. Future research in Social Ecological Economics requires opening up a series of closed boxes in the orthodox cellar and dusting off the contents—what contributes to well-being, is well-being an appropriate goal, what are the aspirations of human society, who is to be taken into account, how should human society conduct its affairs from individual behavior to institutional design?

Expanding Understanding of Human Behavior and Motivation

Rejecting atomistic and mechanistic explanations as universal truths leads to opening up the black box of the individual. Rather than regarding the human as some essentially irreducible atomic structure that should remain unquestioned, the realm of human motivation is brought into question as requiring further analysis. Psychology can then offer tremendous potential for insight into behavior, but only if economists are prepared to learn from rather than dominate the subject (Earl 2005). Dropping the focus on self-interested utility maximization leads to a rich array of possibilities. Lexicographic preferences no longer appear as a strange exception to the rule of gross substitution but a relatively normal approach to choice, which may be motivated by non-utilitarian ethics, strong uncertainty, or satisficing behaviour. Needs can be differentiated from positional affluence. Social norms provide a link between individual and societal motivators and connect with the role of institutions as explored by classical or critical institutional economists (as opposed to the neoclassical "new" institutional economists). Social organizations are then seen to involve perceptions as to power, trust and control that impact how people respond to requests and incentives for behavioral change.

Taking Environmental Values and Ethics Seriously

Economic value theory is derived from Benthamite utilitarianism converted into preference theory—a move that supposedly divorces choice from ethics. In fact the basic philosophy remains utilitarian but now preference utilitarian as opposed to Bentham's theory of total utility.[8] What is found within the practice of environmental cost-benefit analysis is an implicit value theory based upon consequences telling what is right and the value of outcomes being measured in money as a shorthand for welfare based upon individual preferences. More than this, while preference theory and "new" welfare economics claim to be based only upon ordinal preferences, the way in which money is used to aggregate and make decisions means it is being implicitly converted into a cardinal measure for interpersonal comparisons of well-being.

Yet those producing policy information hardly seem to be paying attention to economic theory. The rise of transferring money numbers across time and space indicates a tendency to choose approaches on the basis of political convenience (see Spash and Vatn 2006). The danger here is that numbers become merely artificial means to an end and any means of justification will suffice. This is a form of new environmental pragmatism that has become evident in recent times (Spash 2009b). Rather than pursue the more difficult task of developing theoretically justified alternatives the tendency is to borrow mainstream tools with little attention to mainstream methodology, ideology or their implications. This is exactly why neither social ecological economists nor neoclassical economists gave any credence to the studies driven by ecologists for valuing ecosystems and the world. Ecologists themselves have then lost sight of their own expressed values, e.g., summarized by Naess (1973, 1984) as deep ecology. Concern for Nature, and the plural values that involves, is not expressible within the context of preference utilitarianism (Spash 2008b). Here is where neoclassical theory is fundamentally rejected because of its persistent monism, reducing everything, including all ethical and moral issues, to a single numeraire.

A key area in which such monism controls and distracts the discourse is in the treatment of future generations (Spash 1993, 2002). The justifications for using a single discount rate have been taken seriously and at high levels. Within mainstream rhetoric, discount rates are meant to be observable objective determinants of how society should treat the future. Unable to move outside the narrow confines of mathematical formalism, economists, from Nobel prize winners down (e.g., Arrow et al. 1996a), then write off the future on the basis that they are being empirical and objective. That is, they claim, how future generations should be treated can be determined by observing a few factors such as rates of return on capital and consumption growth. The result is a fruitless waste of time arguing over the appropriate rates rather than addressing the fundamental issue, which is fair and just treatment of the unborn, and what should determine undertaking or denying actions with long-term impacts.

Taking Institutions Seriously

Well-being in society, and social decision processes, require institutions that allow for the expression of different types of values. This may be described as the need for value articulating institutions (Vatn 2005). Indeed the general hope amongst the various institutional options that might be developed is for a more inclusive participatory approach to governance that would allow deeper environmental values than those prevalent in daily Western life to come to the fore.

Such issues of public policy and governance have been placed outside of mainstream economics in a deliberate attempt to make economics appear "objective." Yet the role of power in society cannot be removed from the analysis and merely remains hidden. This then makes economic analysis highly misleading because policies applied in reality play directly to vested interest groups (such as multinational corporations) that are not part of the analysis. Account must be taken of government power and how the institutions of governance are structured. The textbook approach of assuming state intervention is minimal, markets perfectly efficient and consumers sovereign produces highly misleading recommendations, or worse, attempts to make the world perform like the model. Realizing that markets are socially constructed institutions means taking responsibility for market design and functioning rather than pretending markets can be left to themselves.

The ways in which our institutions conduct their policy discourse is then something that affects the direction in which society heads. For example, the science-policy interface has run into serious problems in several areas of public policy (from nuclear power to genetic modification to climate change). The approach to uncertainty as weak—where probabilities and future states are known or knowable—conflicts with the strong uncertainty confronted in reality (e.g., the type of uncertainty noted by Keynes [1921] 1988). Once again mainstream economics seems unable to offer much and instead attempts to reduce all strong uncertainty to weak uncertainty (Spash 2002). Hence the rise of post normal science (Funtowicz and Ravetz 1990) as one means by which to rethink the science-policy interface and engage the technocentric establishment with wider public values

(van der Sluijs et al. 2005). This implies challenging existing institutions and creating new ones.

Conclusions

The subconscious roots of Ecological Economics run deep into the past but the modern community arose from the ashes of heterodox environmental economics. Environmental economists were taken along with the political turmoil of the 1960s but failed to realize the revolutionary potential they once saw in their field. That failure was a reflection of the power that lies in orthodox economics to control debate, forgive heretics and expell blasphemers.

Ecological Economics as a modern movement started at the basic level of trying to combine models from two disciplines, an approach popular in America. While linking ecology and economics was an interesting initial step, the narrow confines of model interactions and multidisciplinary collaboration failed to advance the movement beyond the orthodox. In addition, ecologists within the society advanced collaboration with orthodox economists who had little interest in the heterodox agenda. Orthodox economists were also placed in positions of power within the society. None of this aided the development of the new movement in providing an alternative research agenda. Instead, some adopted orthodox economic models and methods despite the conflict this creates with the realization that the environment and the economy are intertwined and neither can be meaningfully analyzed independent of the societal context. Unfortunately, the importance of social, political, ethical and institutional factors is something that ecologists are not trained to detect and orthodox economists are trained to neglect.

In Europe, where the tradition of political economy is stronger, the range of social science interactions has encouraged interdisciplinarity. In the ESEE, then, the field has in part become established as an heterodox socio-economic school of thought bridging the science-policy interface. Consistent with the historical roots, the aim of this heterodox community is very much to be able to address policy problems and environmental issues, not to sustain theoretical constructs for their own sake. At the same time "scientific" standards of

accumulating knowledge and understanding are seen as necessary for progress and theoretical consistency.

This is not to deny the potential for different factions to coexist within Ecological Economics whether in Europe or elsewhere. The question is the extent to which differences are tolerated within the frame of a pluralist methodology. There need to be some core shared ideological and methodological positions in creating the community of scholars that is Ecological Economics. That means identifying where differences are fundamentally divisive and create incoherence. This paper argues, on the basis of the history behind the movement, that an heterodox economic approach is necessary both for unity and meaning. That means excluding the incompatible orthodox and moving ahead with alternative theories and practice.

The inability of mainstream economists to engage with the ideas of Social Ecological Economics is both ideological and methodological. Such economists typically have various characteristics, for example, championing self-regulating market approaches, accepting the basic tenets of neoclassical theory, regarding humans within the narrow behavioral model of homo œconomicus. Under this system of thought, economics is believed to gain rigor from using abstract mathematical models regardless of their empirical basis or policy relevance. This is despite claims of scientific empiricism and prediction as providing validity. In practice primary data collection is rare, theory is conducted without application or hypothesis testing and evidence contradicting theory is ignored or explained away. In the extreme, arguments that persist are redefined for incorporation within the existing theory by borrowing the language of other disciplines while neutering the concepts for the sake of conformity with existing belief structures and overall ideological positions. All this mitigates the potential for learning from problem and policy oriented interdisciplinary research.

For Social Ecological Economists interactions with ecology and biology have raised the profile of evolution in relation to economics. How we understand the world is vastly different if we treat it as a deterministic mechanical system or a chaotic evolving biological system. The future becomes uncertain in a strong sense, which denies our ability to predict. This describes the large divide between reality

and the technocentric ideological dream, and macroeconomic hope, that enough capital might be accumulated, via compound interest, to enable a leisure society. A politically untenable reality is then that Western economies actually reached satisfaction of basic needs long ago, but have persisted with expanding the scale of material and energy consumption, which degrades the environment, while failing to address declines in human social and psychological well-being or increases in the inequitable distribution of resources.

Differences and divisions have in many ways become clearer due to the developing alternative research agendas. The desire to combine different heterodox schools of thought—ecological, critical institutional, evolutionary, post-Keynesian—is in direct contrast to the drive for recognition within and by orthodox economics. Rather than paying attention to methodological and ideological positions, some high profile ecologists and conservation biologists have aligned themselves with those who hold mainstream positions, and appear to have political power. Those taking this line may regard themselves as being pragmatic, in the sense of achieving an end by the easiest available means, but actually have created problems for those trying to be far more grounded in terms of changing economic thinking. Indeed, much of the ecosystems services valuation work, for example, merely buys into an existing political economy in which no substantive effort is on the agenda for challenging the idea that material and energy growth can continue ad infinitum. At the same time this work undercuts alternative efforts—increased public participation and empowerment of the disenfranchised—not least by pretending that producing simple money numbers is a politically adequate response to global environmental problems. This argument by environmental pragmatists both fails to achieve its aims and causes much damage along the way.

Thus, some clearer lines need to be drawn between what is progressive in Ecological Economics, what lacks credibility and where incoherence is preventing the advancement of ideas. Social Ecological Economics is then envisaged as a community of scholars developing a distinct ideological vision and specific methodological agenda. Ideologically there is a commitment to: environmental problems requiring behavioral and systemic change, continued economic growth through material and energy consumption being unsustainable and politically

divisive, poverty and distribution as major economic concerns, a need for balancing power (e.g., individual, group, government, corporate) at different spatial scales (from the local to international), a central role for ethical debate, envisioning markets as social constructs with numerous flaws, political economy, design of alternative institutions, public participation, empowerment and engagement as necessary to address the science-policy interface, recognizing the importance of "others" (both human and non-human). Methodologically distinct characteristics include: value pluralism, acknowledging incommensurability, interdisciplinarity, empiricism using quantitative and qualitative methods, rejection of mechanistic reductionist approaches, rejection of mathematical formalism and its claimed rigor, acceptance of strong uncertainty (i.e., ignorance and social indeterminacy). Only some of the constitutive elements have been touched upon in this paper, which serves as an introduction to stimulate debate. That debate is essential for self-understanding. If Ecological Economics is to have a meaningful future the community must show greater awareness of where it has come from as well as the methodological and ideological challenges ahead.

Notes

1. The terms mainstream and orthodox are used interchangeably to designated economists adhering to the basic textbook versions of economic theory. Neoclassical economists are equated with both terms. No strict definition is attempted in this paper and the boundaries of such classifications are notoriously fuzzy. Still the core conceptual foundations are clear and distinct from those of heterodox economics (see Lawson 2005). For more on the definition of neoclassical and heterodox economics see Lee (2009), especially Chapter 1.

2. Prior to the award in 2009 being given to Ostrom (see note 3), Kahneman was perhaps the most consistent, having been associated with the work of environmental economist Jack Knetsch from his time in Vancouver at the University of British Columbia 1978–1993 (Kahneman and Knetsch 1992b). He also contributed to early debates on contingent valuation (see Cummings, Brookshire, and Schulze 1986). Arrow and Solow were involved on opposite sides of the *Exxon Valdez* oil spill legal case for compensation and the ensuing National Oceanic and Atmospheric Administration panel on the use of the contingent valuation method for natural resource damage assessment (Arrow et al. 1993). Sen (1995) also wrote commenting on contingent valua-

tion. Arrow and Stiglitz were authors for the Intergovernmental Panel on Climate Change third assessment report (Arrow et al. 1996a, 1996b).

3. In some senses Eleanor Ostrom is an exception in terms of her level of engagement on resource and environmental problems, having been consistently focused on common property resource management in her work and actually being a member of the Society for Ecological Economics. A trained political scientist, she has taken a more critical institutional economics approach.

4. He has been attributed with inspiring the multiple criteria approach of the Human Development Index (HDI). Note, this actually ignores environmental factors.

5. Some sections of this paper are based on the general introduction to volume one of Spash (2009a).

6. After a protracted review process the article appeared simultaneously with a critique (Smith 1992), commissioned by the editor, and a reply by the authors (Kahneman and Knetsch 1992a). When a second critique was published the editor (Ron Cummings) refused the authors an opportunity to reply despite their concerns that they be allowed to defend their work. Jack Knetsch (personal communication June 2004 and January 2006). Ironically this soon became the most highly cited article in the journal and remains so by far.

7. Three ecologists Rapport D. J. (Canada) Chair, Brian Walker (Australia), Buzz Holling (USA); one environmental scientist Kerry Turner (UK) and two economists Clem Tisdell (Australia) and Charles Perrings (UK now USA) ISEE President at the time of the award.

8. Polanyi (1944: 119) states that Bentham actually failed to make the link between value and utility.

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