Harris, Jonathan M. "Overview Essay: Historical Perspectives," Part I, Frontier Issues in Economic Thought, Volume 1: A Survey of Ecological Economics. Island Press: Washington, D.C. 1995. pp.1-5.

Social Science Library: Frontier Thinking in Sustainable Development and Human Well-being

"Historical Perspectives" by Jonathan M. Harris

The history of economic theory is today a neglected field. If the evolution of economic ideas is studied at all, it is generally viewed as a linear, progressive process leading inevitably to the highest embodiment of economic analysis: today's neoclassical model. The average student of economics will encounter the names of some bygone economists appended to concepts: Smith's invisible hand, Ricardian rent, Keynesian fiscal policy, Marshallian demand curve, Walrasian general equilibrium. But these concepts are merely embedded in what is generally taken to be a complete and consistent theory of economic activity. Missing is any sense of intense controversy, internal conflicts, fundamental divisions, wrong turns, and neglected insights in the history of theory. The major remaining controversy centers on the efforts of "new classical" economists to purge the last vestiges of the Keynesian heresy from the field, against the resistance of aging Keynesians and a few post-Keynesian radicals. But little attention is given to the history of theory for insights into this or any other modern issue.

The selections in this section offer a contrary perspective. From varying viewpoints, they suggest that crucial issues raised by pre-classical and classical economists have been neglected, leading to fundamental weaknesses in present mainstream theory. New life is thus breathed into old controversies, and apparently minor or outdated views are seen to hold clues to modern dilemmas. Issues such as the productivity of land, population growth, resource and energy limits, and the moral/philosophical basis of economic activity gain a new currency in the context of modern environmental crises. This discussion defines the theoretical background for the emergence of ecological economics as a discipline.

Paul Christensen outlines the major theme of this section: the roots of ecological economics are to be found in the physiocratic and classical schools of economics. Both placed emphasis on the productive power of "land," a concept which is usually taken broadly in economics to encompass all natural resources. Specific attention to the importance of energy flows is also seen in the works of some pre-classical and classical authors. However, these concerns were then lost in the further evolution of neoclassical economic thought. As economics moved toward analytical formalism and mathematical modelling, material and energy flows were subsumed under the homogenous categories of "capital" and "labor." "Land" survives in formal models only as a one-dimensional

concept which fails to reflect the physical realities of natural resources and energy. The complexities of the real world are sacrificed on the altar of mathematical simplification.

Christensen suggests that these neglected themes from classical thought can form the basis of a new "biophysical economics" focusing on energy and resource use in production, and on the specific and complementary nature of productive inputs. (*Complementary* here refers to the essential role of energy and resources in the operations of physical capital, in contrast to the neoclassical convention of viewing all productive inputs as substitutes.) A convergence is seen between this classically-based alternative theoretical approach and some of the twentieth-century non-mainstream theories such as Sraffa's commodity analysis and Post-Keynesian disequilibrium theory. Christensen thus draws together some of the threads of opposition to the formal mathematical models of equilibrium which dominate contemporary economics.

Gerald Alonzo Smith offers an overview of a different but equally important dissenting theme in the history of economic thought. Early opponents of the doctrine of economic growth such as Sismondi and Ruskin argued that true human welfare is not best served by expanding production of material goods. Hobson and Tawney continued this critique of consumption as the goal of economic activity. None of these thinkers had much impact on the course of standard economic theory, but their ideas have gained new relevance in the post-World War II period, as mass consumption has expanded beyond anything they could have foreseen. As we will see in later sections of this volume, the moral/ethical critique of economic growth deriving from their work combines with the biophysical critique of ever-expanding production to shape the world-view of ecological economics.

D.H. Judson pursues the issue of convergence between ecological economics and neo-Ricardian value theory. In both, the source of value is identified with productive factors, a theme common to the Physiocrats, Smith, Ricardo, and Marx. This contrasts with the neoclassical derivation of value from individual demand or utility. Energy theorists share with neo-Ricardians several important assumptions about the nature of value: they both proceed from the social rather than the individual level, see value as objective rather than subjective, and are concerned with dynamic processes of growth and change. Differences arise, however, over the delicate issue of whether a single ultimate determinant of value can be identified, or should even be sought. Neo-Ricardians tend to look to commodity inputs as the basis of value, while ecological economists favor energy content or entropy measures.

Some energy theorists have attempted to formalize value determination in analytical paradigms demonstrating that embodied energy is the source of all value - reminiscent of the Marxian labor theory of value. This initially attractive identification of a basic source of value runs into numerous problems of consistency and application to actual prices. Philip Mirowski's "Energy and Energetics in Economic Theory" notes that this "neo-energetics" school can be criticized for oversimplifying the problem, just as neoclassical theory oversimplifies it in a different way. Objections to identifying energy as a unique source of value include the problem of quality differences in energy, the difficulty of actually measuring net energy use, and the many important properties of materials which

are not correlated with energy content. But even if it falls short of offering a complete theory, the focus on energy opens up new and important lines of theoretical and empirical investigation.

Juan Martinez-Alier's book *Ecological Economics: Energy, Environment and Society* offers an extensive discussion of the history of energy flow analysis in economics and related fields. Although much of the work on energy analysis has been done by non-economists, there has been a fascinating, intermittent dialogue between economists and natural scientists on the role of energy in economic analysis. Agricultural energetics, energy use in industry, and issues of resource use and conservation, among other themes, are prominent in this dialogue, involving economists such as Jevons, Marx, and Walras as well as ecologists and energy theorists such as Podolinsky, Sacher, Popper-Lynkeus, Liebig, Clausius, and Soddy. Martinez-Alier also discusses a possible convergence between Marxism and ecology, proposed by Podolinsky but resisted by Marx, Engels, Lenin, and other orthodox Marxists.

Robert Kaufmann also suggests that Marxist and ecological analysis need each other's insights in order to explain the interplay of social, technological, and environmental factors in shaping economic history. Theories of the exploitation of labor under capitalism can find some common ground with theories of exploitation of resources. Kaufmann presents only a sketchy outline of the complementarity of the two approaches, and a very simple thesis relating energy availability to class conflict, with echoes of familiar Marxist dogmatism. Whether or not this line of thought is considered fruitful, it certainly raises the issue of the relationship between ecological and social/political critiques of economic theory, a topic which is pursued further in sections VI and VII of this volume.

Cutler Cleveland goes further into the issues associated with the evolution of energy theory and biophysical economics. Tracing the line of descent from the Physiocrats through Joseph Henry, Herbert Spencer, Ostwald, Frederick Soddy, W.F. Cottrell, and M. King Hubbert to today's energy and ecological theorists such as Howard Odum, Robert Costanza, Nicholas Georgescu-Roegen, and Herman Daly, he identifies two central themes. These are the limitations imposed on economic activity by the laws of thermodynamics, and the complementary nature of energy and capital in production. Taken together, these place strict limits on the ability of economic systems to expand based on technological progress and flexibility in production. Standard economics, of course, has been far more influenced by the immense potential of technological progress and market adaptability. This faith in technology has been embodied in a formal neoclassical theory which essentially recognizes no limits to technological progress, substitutability in production, or economic growth. The experience of two centuries of economic growth, and especially the rapid expansion of the past fifty years, might seem to support this more optimistic paradigm. The case for the alternative must then rest on the argument that conditions are changing, in accordance with the physical laws of energy and resource flow, in such a way that the next fifty or one hundred years of economic development will look fundamentally different.

The articles by J.F. Richards and Lynn White, Jr. introduce the historical perspective which is essential to this debate, and which is often lacking in mainstream economics. Richards ties the history of economic development to the massive impacts of human activity on soils, forests, wetlands, arid lands, and grazing lands throughout the world. This offers a systematic view of environmental impacts which appear only as disjoint "externalities" in most standard economic analysis. Lynn White, Jr. discusses the ethical world-view which has accompanied the ever-increasing technological appropriation of Nature for human purposes: a predominantly Christian anthropomorphism which justifies resource expropriation and even ecological vandalism in the cause of economic growth.

Robert Goodland's article presents "The Case that the World has Reached Limits," an application of these themes to the current world economy. Numerous "red flag" indicators show that resource use trends which have accompanied economic growth for centuries are now stressing ecosystems to the point of collapse. Goodland focuses on biomass appropriation, CO_2 emissions, ozone depletion, land degradation, and biodiversity loss; other such indicators could be cited. While there is controversy over the specifics, a good case is presented for the proposition that population and economic growth have now fundamentally altered the relationship between human activity and planetary ecosystems.

If indeed the current ecological crisis necessitates a reevaluation of the "neglected" trends in economic theory emphasizing energy and resource use, there will be major implications for development theory. One of these implications, of course, is a renewed emphasis on population. Paul Harrison provides an overview of the history of the population growth debate, counterposing the Malthusian tradition with pro-natalist theories maintaining that population growth complements and stimulates technological and economic progress. Economic theorists in general have not worried much about population; as world population approaches six billion they clearly must. Issues of carrying capacity, food production, and environmental stress, as well as the more general issue of quality of life, are all dramatically affected by population size and growth rates. This insight must become fundamental to theories of economic development.

A second major implication of an ecological perspective on economic development is the obsolescence of what F.E. Trainer calls the "indiscriminate growth and trickle-down-someday" approach. Trainer argues that it is patently impossible for the growing population of the less developed nations to attain "first world living standards" as they are currently conceived. Yet this is the implicit goal of current development theory: to make the poor richer, while the rich become richer yet. In a world of biophysical limits, development must be redefined in terms of adequacy and self-sufficiency for all rather than ever-increasing affluence for the rich with the rest coming along in their wake. The implication of this redefinition is that material improvement for the poor is linked to a kind of "reverse development" - *reduction* of resource consumption by the rich. (A notable example of this is seen in current proposals for a "trade-off" of CO_2 emissions whereby increased developing nation emissions would be balanced, or exceeded, by developed nation cutbacks.) Clearly this line of thought requires overturning economic assumptions which have predominated since the time of the later classical economists.

Thus the historical background for ecological economics unfolds. Debates in history of theory are seen to have a strong relevance to current environmental crises; yet the answers to current problems cannot be discerned merely by reviewing historical controversies. A new theoretical enterprise is indicated; the shaping of this new effort is the subject of the current volume.