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What have economists learned about valuing nature? A review essay

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ABSTRACT

The question of value has occupied the human mind for millennia. With the ascent of neoclassical welfare economics in the twentieth century, "value" was constrained to chrematistics, or exchange value in a market economy. This narrowing of meaning allowed economists to use a precise mathematical framework to highlight the contributions of nature both to local economic activity as well as to economic growth in general. Nevertheless, current controversies in valuing the cost and benefits of long-lived environmental changes like climate change and biodiversity loss have exposed serious flaws in standard welfare economics. Many of these arise from the assumption that social value can be calculated using the revealed or stated preferences of self-regarding, narrowly rational individuals. New findings in behavioral psychology, neuroscience, and social anthropology have shown that human decision-making is also a social, not only an individual, process. This review essay examines the contributions of standard welfare theory, its shortcomings, and the necessity for more realistic valuation models based on truly social preferences.

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1. Introduction: a short history of economic value theory

Contemporary notions of economic value have deep roots in Western belief systems. Specifically, anthropocentric concepts of value are deeply rooted in the Helenic and Judeo-Christian tradition. In 1440, Cusanus (Nicholas of Cusa) reasoned that human will and judgment was God's way of establishing the value of the things he created. God created human preferences as a way of organizing the world as a *system of values.* Without human judgments, created things would be mere material goods, which in and of themselves have no value.

> For although the human intellect does not give being to the value [i.e., does not create the things valued], there would nevertheless be no distinctions in value without it….Without the power of judgment and of comparison, every evaluation

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> ceases to exist, and with it value would also cease. Wherewith we see how precious is the mind, for without it, everything in creation would be without value. When God wanted to give value to his work, he had to create, besides the other things, the intellectual nature (Cusanus, quoted in Cassirer 1963, pp. 43–44).

Cusanus' view foreshadowed the idea of the centrality of the individual that came with the enlightenment and even the idea of value creation in a self-regulating market. Thus the germ of the idea of purely self-interested beings assigning value within a self-regulating system seems to predate by centuries contemporary theories of economic value. As Sahlins (1996) observes, the universe was commoditized long before commerce and commodity exchange became the central organizing principle of human society. He traces the definition of economics as the "allocation of scarce resources among alternative ends" back to the creation story of Adam and Eve. By disobeying God in the Garden of Eden, man became a slave of his insatiable desires. But, as Sahlins (1996, p. 397) writes:

> Still, God was merciful. He gave us Economics. By Adam Smith's time, human misery had been transformed into the positive science of how we make the best of our eternal insufficiencies, the most possible satisfaction from means that are always less than our wants. It was the same miserable condition envisioned in Christian cosmology, only bourgeoisified, an elevation of free will into rational choice, which afforded a more cheerful view of the material opportunities afforded by human suffering. The genesis of Economics was the economics of Genesis.

It is always disconcerting to discover that ideas we think are new and fresh have in fact been in the air for hundreds if not thousands of years. But it is important to recognize that ideas central to the Judeo-Christian world for millennia are encapsulated and reincarnated in economic theory. These ideas continue to influence (and frequently cloud) our understanding of economy, society, and the relationship of humans to the natural world. In the words of Jorge Luis Borges (1962, p. 189) "It may be that universal history is the history of a handful of metaphors." Certainly the history of "value" in economics revolves around a few powerful metaphors—equilibrium in a field of forces, optimization via the invisible hand, and rational economic man independent of society (Gowdy et al., in press). These metaphors were enshrined in neoclassical economics and the rapid acceptance of that theory was in due in part to its compatibility with the general themes of Western cosmology.

An age old struggle in developing a coherent theory of value has been to understand the relationship between use and exchange value. As far back as Aristotle philosophers understood that exchange value was somehow derived from use value, but were unable to explain the paradox between these two values, as in the diamond–water paradox. Water, essential to life, has a high use value, but its exchange value is very low. Diamonds are unessential for life and have a low use value but they have a very high exchange value. Galiani (1751) was among the first to suggest that price was derived from utility and scarcity, foreshadowing the concept of marginal utility which solved the paradox (Schumpeter, 1955). Commodities have exchange values when they can be exchanged for money in societies which have markets and commodity production. Commodity production is not a direct way of satisfying needs, but is a means of acquiring money from exchanging a product, which can then be used to obtain other commodities (Hunt, 2002). As neoclassical economics became dominant in the twentieth century, it began to focus exclusively on exchange value and the field of economics became *chrematistics*—the study of market price formation for the purpose of making money (Martinez-Alier, 2005).

During the era of Classical economists, the discipline of ecology did not exist and the notion of ecosystem services did not appear in the literature. However, some Classical economists explicitly recognized the contribution of these services, referring to them as "natural agents" or "natural forces." This recognition was only in relation to their use value, as these services were considered free gifts of nature and therefore did not play any role in exchange value (Gómez-Baggethun et al., 2010). "Natural agents", as (Ricardo, 1817, quoted in Gómez-Baggethun et al., 2010) noted, "are serviceable to us, by increasing the abundance of productions, by making men richer, by adding to value in use; but as they perform their work gratuitously, as nothing is paid for the use of air, of heat, and of water, the assistance which they afford us, adds nothing to value in exchange." Marx agreed but he also commented on the relationship between nature and use values in his critical response to the *Gotha Program* (a party platform of the German Social Democratic Party): "Labor is *not the source* of all wealth. *Nature* is just as much the source of use-values (and these, certainly, form the material elements of wealth) as labor, which is itself only the expression of a natural force, human labor-power" (Marx, 1922, p. 19). By making this distinction between wealth and value, Marx recognized that, although markets establish exchange values based on given resource endowments, the human economy ultimately depends on the natural world (Foster, 2000; Gowdy, 1984).

With the so-called *marginalist revolution* of the 1870s, the economic problem was re-cast as the optimal allocation of scarce resources using the mathematics of classical physics (Jevons, 1871; Menger, 1871; Walras, 1874). Earlier, more nuanced, notions of value were replaced by one compatible with the application of differential calculus, namely marginal utility—the value of one additional unit of a good, keeping the amounts of all other goods constant (for an excellent discussion of the transformation of classical into neoclassical economics see Mirowski, 1989). The marginalist revolution was in part a challenge to Marx's labor theory of value—an answer to the dangerous idea that if labor created all value, labor was entitled to the surplus product of production. John Bates Clark (1938) posited that under perfect competition, each factor of production would receive a return equal to the value of its marginal product; hence, returns could be given to not only labor, but to capital as well. Issues of exploitation and unearned incomes were rendered moot, as all factors of production should be awarded fairly according to their contribution to the product (Landreth and Colander, 2002). The power of the marginalist revolution lay in the mathematization and simplification of the economic process of consumption, production and exchange (for a full discussion see Mirowski, 1989, Chapter 5). Psychology and interpersonal comparison of utility were banished from the discourse. In the history of economic analysis, the exclusive focus on the self-regarding individual as the unit of analysis represented a sharp break with the past in the sense that it removed psychology from economics (Bruni and Sugden, 2007). Pareto was explicit about this: "It is an empirical fact that the natural sciences have progressed only when they have taken secondary principles as their point of departure, instead of trying to discover the essence of things…Pure political economy has therefore a great interest in relying as little as possible on the domain of psychology" (quoted in Glimcher et al., 2009). There also exists a vast anthropological literature documenting the very different value systems of other, non-Western, cultures (see the articles in Gowdy). Polanyi (1944, 1977) described the incorporation of nature (land) into markets as tradable commodities as "commodity fiction" (Gómez-Baggethun and Ruiz-Pérez, 2011). By relying on an economic model composed of self-regarding,