



On a forest as a commodity and on commodification in the discipline of forestry☆☆☆



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ABSTRACT

This essay revolves around two dates separated by a decade: a retrospective look based on Samuelson (1976), and a prospective one that relies on Mitra-Wan (1985–1986). It concerns a tension between two communities: to understand the basis of this dissonance, and to open lines of communication that seek to dispel it. More specifically, it relies on two frameworks (Walrasian general equilibrium theory, as in Arrow-Debreu-McKenzie-Uzawa-Gale-Nikaido-Kuhn and others, and the Ramseyian theory of optimal growth, as in Samuelson-Solow-Cass-Koopmans-Uzawa-Srinivasan and others), formalized and continually refined in the last half of the 20th century to deal with *interaction* and with *time*, both essential considerations in any kind of economics of forestry. It also gives prominence to the Muir-Pinchot controversy at the very beginning of the 20th century, and thereby underscores its relevance to current ongoing tensions and anxieties regarding issues of sustainability and global-warming. From a purely analytical point of view, it alludes in passing to the potential relevance to forestry economics of mean field theories in physics, and of subgame-perfect equilibria in the theory of non-cooperative games.

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Everybody loves a tree and hates a businessman. Perhaps this is as it should be, and perhaps after the profession of economics is 1,000 rather than 200 years old, the human race will be conditioned to abhor economists as it has become to abhor snakes. (Paul Samuelson 1976)¹

Economists know the price of everything and the value of nothing. (Oscar Wilde 1892)²

Wood is only wood, just as coal is only coal, plastics are only plastics, and, some would say, as bubblegum is only bubblegum. (Paul Samuelson 1976)³

My idea of heaven is an occasion when a piece of pretty economic theory turns out to suggest a program of empirical research and has implications for the formulation of public policy. [But] we are not to consume humanity's capital in the broadest sense. (Solow, 1993)⁴

What kind of a commodity is a forest and how is one to value it? The *OED* gives three meanings of the word, none of which really help in tracking it down sufficiently to illuminate the nature of the commodification that needs to be resolved before some sort of analysis is to be undertaken.

☆ This essay draws on the author's invited address "Intertemporal allocation of resources and the economics of forestry", delivered at the conference on *New Frontiers of Forest Economics (neFFE)*, Peking University, Beijing, China, August 17–23, 2015. It was finalized when the author held the position of Visiting Research Fellow at the *Australian National University*, February 15–April 15, 2016.

☆☆ This article is part of a special section entitled "New Frontiers of Forest Economics: Forest Economics beyond the Perfectly Competitive Commodity Markets", published in the journal *Forest Policy and Economics* 72, 2016.

¹ See Samuelson (1976, p. 467.) As we shall see in the reading of Samuelson's article provided below, this citation, and the one that follows it, are both relying on sophisticated rhetorical tropes to set up a position so that it can be all the more effectively dismantled; also see Footnotes 3, 10, 17 and 38 below.

² A variant of the response in *Lady Windermere's Fan* (Act III) to the question as to what is a cynic.

³ See Samuelson (1976, p. 485.) This sentence is the rhetorical prelude to the one that follows it. Samuelson's style is reminiscent of the time, now long gone, when journal editors would not insist on a uniform style in which economic science had perforce to be written.

⁴ See Solow (1993, pp. 164 and 168.) I lift the second sentence out of context so as to suit my purposes. One of these is to highlight issues of sustainability, and Solow's sentence does refer to an attempt to give precision to the idea. I return to his definition in Footnote 25 below.

(i) An extensive tract of land covered with trees and undergrowth, sometimes intermingled with pasture. Also, the trees collectively of a “forest”. (ii) a woodland district, usually belonging to the king, set apart for hunting wild beasts and game, etc. having special laws and officers of its own, and finally (iii), a wild uncultivated waste, a wilderness.

So how extensive is the tract of land? And how is it to be subdued? How is the “wild country to be forested” and brought into cultivation, to base questions on the 18th-century usage of the word as a verb? What are the laws of its own? Are there autonomous principles of forest science, and how complementary or substitutable are they for the principles of economic science? Is it all a question of common-sense, or are there different perspectives, different communities, each with its own irreconcilable cultural and political stance, each straining for toleration and accommodation of its other?⁵

In this essay, I attempt an answer to these questions through the reading of two texts: a 1976 *tour de force* of Paul Samuelson’s on the “economics of forestry in an evolving society,” and the 1985–1986 work of Mitra-Wan on “some theoretical results on the economics of forestry [and on the] Faustman solution to the forest management problem.”⁶ With the Muir-Pinchot rivalry serving as the hinge between these two texts, I view one in light of the other, and find it interesting that the latter does not really engage with its Samuelsonian antecedent, but charts out a Ramseyian path of its own.⁷ As such, this makes both texts even more fundamental for my purposes and for the objectives that I have set for myself in this essay: a retrospective, economic-anthropological inquiry of sorts into the economics and forestry communities, and an analytical, mathematically- focused inquiry into a formulation that can be seen as a specific instance of the theory of intertemporal resource allocation. In bringing the tools of economic and of forestry analysis to bear on a forest conceived in its manifold dimensions, my investigation hopefully also allows a questioning of the tools, perhaps nudging them to look at themselves. In particular, I ask what have economists to teach the foresters, and what do they have to learn from them? How does economic science contribute to forestry science? and the other way around? And whether in such an engagement, either retains its identity? whether the doctor herself is not doctored by the patient as she seeks to doctor him? I engage these questions in different parts: I mean these parts to shed light on each other, to foster communication and release productive synergies between departments that typically find themselves in different locations in the same university.⁸

I.

In this section, sub-sectioned into four parts, I provide for myself a textual exegesis of Samuelson (1976); I read now, with all the benefit of hindsight, what was written then.⁹

I(i).

Samuelson’s 1976 article is an amazing literary construction sectioned into eighteen parts¹⁰ that range from general considerations of sustainability, private ownership, conservation, forest decimation, extinction of species, flood control, and the claims of posterity; to the specifics of perfect competition and the theory of capital and of natural resources. He uses the word *forest*, both as a noun and as an adjective, and it, along with its various derivatives such as *forestry* and *foresters*, occur at least a hundred and forty times. But he never formally defines the term. In my re-reading of Samuelson’s article, I begin with what he sees at the outset as the “apparent clash between economists and foresters (467).”

The issue is one between forestry experts and the general public on the one side and professional economists and profit-conscious businessmen on the other. At first blush this would seem to suggest that economists are on the side of the interests and are not themselves members of the human race. But really, these matters need arguing in court so the informed jury, and I do mean the informed jury of human beings, can make up its mind (467). [A]s I hope to show, sound economic analysis is needed to do justice to the cases put forward by either of the adversary parties (466). I am naive enough to believe that all economists would be found on the side of the angels, sitting thigh next to thigh with the foresters (467–468).¹¹

The symmetry, and the asymmetry, of Samuelson’s position surely cannot go unnoticed. He wants to do justice to the cases of *both* parties, but relies on the language of only one of them. It is to make the case for one vernacular in that of the other – the more persuasive and compelling the case that is made, the more the categories of one gain at the expense of the other. Nonetheless, we read:

[My] remarks are not intended to give a harsh indictment of foresters or of economists who have worked in the field of forestry. The mistakes made in the forestry literature can be duplicated aplenty in the intermediate textbooks of pure economics (469).

The punch line is of course the following:

If an unambiguous solution to the problem is to be definable, of course certain definite assumptions have to be made. If the solution is to be simple, the assumptions must be heroic. Assumptions would not be heroic if they could easily be taken for granted as being exactly applicable (470).

There is an irony in theorizing – it must include and exclude, and in his inclusions and exclusions, Samuelson seeks justice when he knows that complete justice is not to be had. We must continue to do what we know we cannot adequately do.¹² And towards this end, I shall bring into prominence two underlying analytical themes that form an essential background for, and to, what he refers to as “sound economic analysis”: the Walrasian theory of general competitive analysis, as formalized in the so-called Arrow-Debreu-McKenzie (henceforth ADM) conception of the economy, and the Wicksellian theory of capital, as informed by the conceptions of Ramsey and of von Neumann. I begin with the first.

I(ii).

⁵ For the type of different perspectives I also have in mind, see Appadurai (2005), van Houtan and Northcott (2010) and their references. Also the references in Footnote 41 below.

⁶ Despite the publication dates, Mitra and Wan (1986) predates Mitra and Wan (1985); see the reference in the latter to Cornell University Working Paper number 266 dated 1981.

⁷ To be sure, they cite Samuelson, but only once in each paper: in the 1985 work, they note that a “survey of several issues in the forestry literature is contained in Samuelson (1976),” and in 1986, simply use Samuelson’s words to give a rendering of tradition in the forestry literature of the prescription of “maximum sustained yield, somehow defined.”

⁸ At my own university, the economics department is squarely located in the School of the Arts and the Sciences, whereas forestry is done, if it is done at all, in DOGEE, a department located in the school of engineering.

⁹ The reader undoubtedly recalls Stigler’s notorious distinction between scientific and textual exegesis, and one who is impatient with the former, can move on to my next section, or better still, to Samuelson’s article itself.

¹⁰ From a literary point of view there is an ebb-and-flow, a give-and-take, to Samuelson’s rhetoric. In his very first footnote, he mentions his “innocence of forestry economics” and being “inveigled into making these preliminary researches”; mentions his “cursory glance at the literature of forestry, both technical and economics (468)”; saying finally, “Although I am not a specialist in the field of forest economics, I have been reading a couple of dozen different analyses ranging over the last two centuries. The economic analysis in most of them is wrong, in some it is very wrong. In others it is not quite right. In at least one case, ... it comes close to an essentially correct solution (469).” All numbers in brackets appended to quotations in Section I refer to page numbers in Samuelson (1976).

¹¹ I mix and match Samuelson’s prose for my own purposes, and I warn the reader on this score.

¹² For a more detailed explication of what I have in mind, see Khan (1993).

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