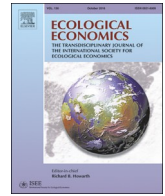




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Analysis

The value of value theory for ecological economics

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A B S T R A C T

Value theory forms the bedrock of several economic paradigms. It shapes how economists think about the purpose and functioning of the system as a whole. I identify three approaches to understanding value in economics: the British classical approach, exemplified by Smith and Ricardo, the neoclassical approach based on marginal utility theory, and Marxian value theory. The classical and neoclassical tradition explain exchange value by transhistorical use values. This gives rise to a conception of capitalism as a 'real economy', i.e. a system that produces goods and services for the purpose of satisfying people's needs and wants. Ecological economists adopt and extend the classical and neoclassical view, by predominantly studying a 'real real' economy, i.e. matter-energy stocks and flows and ultimate social outcomes. This allows an ecological critique of the economic process but fails to address underlying social drivers of ecological destruction. Marxian value theory provides a systemic (macro) understanding of value, which results in a realistic conception of capitalism as a monetary market economy. Marx's approach is the only value theory in economics that provides a fundamental critique of capitalism. I advocate a stronger integration of radical political economy and ecological economics to support social change.

"What is value? This is perhaps the most urgent, yet neglected, question of contemporary social theory" (Murray, 2017, p. 16).

"If you think you can solve the environmental question and global warming... without actually confronting... the value structure... then you got to be kidding yourself" (Harvey, 2010a).

1. Introduction

Value theory seems abstract, difficult, and Marxian value theory very controversial – why should ecological economists care? There are at least three reasons to care. First, ecological economics lacks a realistic economic theory of capitalism, spelled out from its basics. Despite promising heterodox starting points, a framework remains missing that relates ecological issues to the operation of the economic system as a whole (Adaman and Özkaynak, 2002; Burkett, 2009; Douai, 2016, 2009; Klitgaard and Krall, 2012; Özkaynak et al., 2012). After three decades, ecological economics remains "an unfinished journey" (Nadeau, 2015). Spelling out value theoretical foundations is one way of establishing realistic and systemic economic foundations for ecological economics as a more effective interdisciplinary paradigm.

Value theory in economics aims to explain what determines exchange value. This is no simple issue, but forms the "the centrepiece" of several economic paradigms (Söllner, 1997, p. 177). Many economists from left to right have acknowledged the merits of tackling exchange value as the foundation for understanding economic dynamics (Kauder, 1953; Schumpeter, 1954). This sounds simple and yet, it remains one of the biggest controversies in the history of economic thought. What

explains why different goods and services exchange in certain magnitudes? Marginal utility? Costs of production? Labour time? How can we understand how two things with very different qualities – shoes and teapots – are made commensurable in 'free and equal' market exchange? How is exchange value intertwined with use values? Value theory sheds light on these questions. Understanding what value is, how it gets reproduced, and how use value and exchange value considerations are entangled serves as a powerful starting point to understanding the system as a whole.

Second, the practical implications of different value theories are profound. Mainstream marginal utility theory leads to strategies of 'pricing nature', whereas the Marxian understanding to strategies of 'overcoming the system'. The differences could hardly be further apart. What strategies should ecological economists adopt? The purpose of theory is to illuminate about real-world dynamics, which helps to fight social ecological crises more effectively. Understanding the value theoretical underpinnings of different economic paradigms helps to trace how economists think about the emergence of social ecological problems and why they arrive at different and, at times, opposing recommendations to counter them. For this reason, value theory is key to arriving at informed decisions how to act.

Third, many ecological economists view Marxian theory as an ideology associated with failed past political projects and as one-sided for privileging labour in the explanation of value (Costanza et al., 2015, p. 45; Daly and Farley, 2011, p. xxiii, 32, 286; Fischer-Kowalski, 1998, pp. 62, 66; Martinez-Alier and Naredo, 1982). To separate the wheat from the chaff and judge what theories are better placed to explain and act upon pressing problems, we need to understand them first (or at

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<https://doi.org/10.1016/j.ecolecon.2020.106790>

Received 6 June 2019; Received in revised form 13 July 2020; Accepted 20 July 2020

Available online 25 August 2020

0921-8009/ © 2020 Published by Elsevier B.V.

least try to do so). From a Marxian perspective, value is essential for understanding more complex economic categories, such as surplus value, profits, or exploitation. Value foundations are therefore key for sceptics to judge whether consecutive Marxian developments make sense. If scholars abandon elements of Marxian theory, they should do so for good reasons rather than inherited preconceptions. This holds especially for Marxian value theory, which is widely rejected but little understood.

How is value theory debated in ecological economics? A keyword search in this journal yields 1350 and 800 hits for 'value' and 'valuation' (out of 5700 articles), but only 8 for 'value theory'.¹ This does not mean that value theory debates have been absent. Joan Martínez-Alier's seminal book *Ecological Economics* deals with value theory prominently (Martínez-Alier, 1987), as well as Giorgos Kallis' recent *Degrowth* (Kallis, 2018), and debates about energy theories of value, the incommensurability of values, and environmental values and ethics have been important (Ericson et al., 2014; Judson, 1989; Martínez-Alier et al., 1998; O'Neill, 1992). However, there is a gap in terms of appreciating Marxian value theory as a realistic and systemic foundation for understanding capitalism. Ecological economists mainly tap into a classical and neoclassical mainstream economics understanding of value, and neglect Marxian value theory.

Why does this matter? It matters if flawed theoretical underpinnings mislead ecological economists to confront the nature of the capitalist system. This is the case when analyses predominantly study and critique a 'real real economy', i.e. matter-energy flows and ultimate social outcomes such as better measures of wellbeing and quality of life. This is helpful to defend an ecological critique of the economic process and to prioritise energy and resource use to meet human needs more effectively (Brand-Correa and Steinberger, 2017; O'Neill et al., 2018), but it is not enough. It is not enough because an ecological critique does not explain economic drivers that underpin unsustainabilities and injustices. "Market value is a reality and we cannot wish it away – we have to explain it and we have to understand how it... colonizes other values" (Kallis, 2018, p. 55). This requires realistic economic theory, which can be found in Marxian value theory (Leonardi, 2019; Pirgmaier and Steinberger, 2019).

The paper proceeds as follows. Section 2 introduces the meaning of use value and exchange value, and explains how exchange value is theorised in the British classical tradition, exemplified by Adam Smith and David Ricardo, and the neoclassical marginalist school. Section 3 traces how ecological economists adopt, reject or neglect classical or neoclassical value theory. The Marxian alternative remains absent. Section 4 introduces the Marxian approach to value in five steps. Section 5 discusses its relevance for ecological economists. Section 6 concludes.

2. Classical and neoclassical value theory: the foundations of the 'real' economy

2.1. The distinction between use value and exchange value in classical political economy

How to explain value was a core question for classical political economists.² They started from a crucial distinction between use value and exchange value.

Exchange value is the quantitative worth (Shaikh, 1977) or "ratio between any two commodities or services" (Schumpeter, 1954, p. 561). It is the power of a commodity to exchange for other commodities. Exchange values express a quantitative relation between useful objects,

¹ Based on a Scopus search using 'Abstract title, Abstract, Keywords' in the journal *Ecological Economics* on 4 June 2019.

² It is no longer today. If you open a standard economics textbook, you will not find a chapter called 'value theory' (if you do, please let me know).

between use values. As a quantitative relation, a commodity does not measure absolute but relative amounts. It does not have 'an' exchange value but many different exchange values. There are as many exchange values as different commodity combinations (coffee-tea; coffee-sugar, coffee-hats etc.). In practice, money developed as socially accepted measure of exchangeability. Exchange value therefore represents the monetary side of commodities. The character of monetary categories is relative, i.e. prices or incomes make sense in relation to others (Elson, 1979).

Use value, on the other hand, means the appropriation of nature for the satisfaction of human needs and wants. The use of goods and services for people is closely tied to the specific materiality embodied in them. A wooden spoon can be used for eating soup but hardly for writing a letter. As such, use values depend on the material properties of commodities (Harvey, 2006, p. 5). Usefulness also depends on individual tastes, social norms and cultural, historical, and symbolic contexts. Use value considerations therefore are highly diverse and dependent upon the complex qualitative characteristics of commodities. However, use values have a quantitative dimension too. As use values, goods are definite quantities, such as tons of steel, litres of water or thousands of strawberries.

But why did classical political economists prioritise the explanation of exchange value, rather than use value? Because a society that produces most goods and services for sale on markets is a society that produces predominantly for exchange. How could it be otherwise? In the national and international division of labour, everyone contributes part of the social product for the reproduction of that society. In such societies, commodities are primarily produced for exchange, which implies that exchange value shapes and dominates production decisions, not use value. This perspective does not deny the existence of other market or non-market forms of provisioning. It simply emphasises the dominant form of production in market societies, including capitalism, which shapes and encroaches on other provisioning systems.

2.2. Adam Smith and David Ricardo: embodied labour time and costs of production

Smith argued that a pure labour theory of value only holds for pre-capitalist (barter) economies. He presented a beaver and deer example in which their exchange ratio is determined by time required to hunt the animals. If it takes twice as long to hunt a deer, deer will be twice as 'valuable', i.e. expensive. Capitalist economies, in contrast, are characterised by the interaction of various social classes that contribute to production. This is why Smith formulated a cost of production theory of value for capitalist societies that explains the long-run exchange value of a commodity as the summation of wages, profits and rents required to produce it (Screpanti and Zamagi, 2005).

Ricardo recognised that Smith's reasoning is circular: it explains prices by prices of land, labour and means of production. Also, he argued that profits are a residual income that remains after wages have been paid. Contra Smith, Ricardo argued for a labour embodied theory of value also for capitalist economies, i.e. the concrete labour of individuals contained in commodities. We can understand his theory as an attempt to reject the view that exchange value is governed by supply and demand.

"It is admitted by everybody that demand and supply govern market price, but what is it that determines supply at a particular price? Cost of production" (Stigler, 1958, p. 367 citing Ricardo).

This means Ricardo and Smith explained exchange value at a level that underpins the fluctuations of supply and demand (as did Marx). In ecological economics, the few contributions that touch on Ricardo's value theory suggest that not much can be learned as Ricardo suggested labour as only source of value (Farber et al., 2002; Gómez-Baggethun et al., 2010).

Even though Ricardo recognised Smith's inconsistencies, and tried

to return to a consistent labour theory of value by suggesting that fixed capital inputs could be expressed as past labour, he was left with unresolved issues. He could not adequately account for the role of technological change, changes in the distribution of income (capital-labour ratios) and differences in the time it takes for commodities to come to the market. Ricardo was aware of these problems and suggested modifications to his theory (Screpanti and Zamagi, 2005; Stigler, 1958). From here, value theory developed in two directions. Marx retained the labour theory of value but only by fundamentally critiquing Ricardo and classical political economy. The marginalists, in contrast, criticised the Classics above all for neglecting the role of demand in price formation. They embarked on a different journey.

2.3. Marginal utility theory: The subjective calculus of pleasure and pain

Bentham's concept of utility provided a different avenue to explain exchange value. Utility expresses the idea that people seek pleasure and avoid pain in pursuit of their happiness. Menger, Jevons and Walras adopted this idea and mainstreamed marginal utility as an expression for the quantities of pleasure and pain involved in commodity production and exchange. Every additional unit of consumption yields less additional pleasure, and every additional unit of production more pain or sacrifice (additional hours worked), which translate into higher costs (Persons, 1913). Value and price is determined at the intersection of decreasing marginal utility and increasing marginal costs (as disutility) (Stigler, 1950).

Marginal utility was seen to serve as ultimate standard for value as degree of well-being or satisfaction gained from consumption of one extra unit of a good (Persons, 1913). Consumption and exchange became viewed as the central organising principle of capitalist society (Shaikh, 2016).

“The theory which follows is entirely based on a calculus of pleasure and pain; and the object of Economics is to maximize happiness by purchasing pleasure, as it were, at the lowest cost of pain... value depends entirely upon utility” (Jevons cited in Milonakis and Fine, 2009, p. 99).

But how did the marginalists apply marginal utility to capture the supply side of price formation? Menger introduced an ‘analytic device’ that he called ‘genuine stroke of genius’. It was the idea that means of production serve consumers satisfaction too, though only indirectly (Schumpeter, 1954, p. 880).

“It enables us to treat such things as iron or cement or fertilizers – and also all services of natural agents and labor that are not directly consumed – as incomplete consumable goods, and thereby extend the range of the principle of marginal utility over the whole area of production and ‘distribution’” (Schumpeter, 1954, p. 880).

This is how production (and the central role of labour in it) became subject to “the general kingdom of utility” too (Böhm-Bawerk, 1894, p. 6). Formerly objective costs of production became ‘subjectivised’ as contributing to human wellbeing and explaining individual choices. The foundations were laid for a theory of exchange value that reconciles costs of production (scarcity) and marginal utility.

The marginalist turn has not remained unchallenged. Fundamental criticism came from the Austrian economists, who had fought hard to repel the labour theory of value, and were not prepared to reintroduce labour – the disutility of labour – as part of the explanation of subjective value³ (Spencer, 2004). Utility theorists themselves were aware of

³The Austrians suggested replacing the direct disutility of labour with the utility of leisure time (as opportunity costs of labour). Their view prevailed and the marginal utility of leisure time became engraved as an accepted standard of representing labour costs in mainstream economics. This is no minor technical issue. It meant that the central role of labour (work and workers) in the

fundamental problems. Bentham recognised measurement difficulties between individual and total utility of all commodities; Jevons initially denied the possibility of measuring utility at all; Walras avoided interpersonal utility comparisons; and Menger omitted explaining the relation between utility and demand (Stigler, 1950). Remedies to these problems by later economists were considered “patchwork repairs” (Stigler, 1950, p. 327). Yet, the marginalist explanation of exchange value as quantities of pleasure and pain became generally accepted.

“This became the standard theory of value (price) that has dominated neoclassical economics to this day. It has become the orthodox approach – virtually unchallenged and widely applied to a whole range of public policy issues, including ecological problems” (Patterson, 1998, p. 107).

Today, the majority view in neoclassical economics is that utility cannot measure value. The problem is that this recognition has not led to adopting or developing alternative value theory. Instead, neoclassical economists tend to stick to much looser concepts such as ‘revealed preference’ to indicate that value cannot be known, only prices observed. Flawed or no value theoretical underpinnings pose a serious dilemma for the mainstream because essential theories have been built upon marginalist foundations. General equilibrium theory, for example, attempts to prove that the aggregation of individual utility and production functions results in an overall equilibrium of the macro economy. But individualistic marginal theory is unable to grasp macroeconomic aggregates and general equilibrium has proven unstable (Kirman, 1989). However, flawed value theoretical underpinnings have not led to the demise or rejection of DSGE models, for example.

2.4. Systemic and political implications

Despite marked differences, classical and neoclassical value theories share one crucial feature. Both traditions explain exchange value in transhistorical terms, i.e. what is applicable to all societies. In marginal utility theory, “value in use is the basis of value in exchange” (Screpanti and Zamagi, 2005, p. 84 citing Bentham). Use value is transhistorical because all societies produce and consume things with useful properties. What about the classics? Smith rejected the idea that exchange value can be explained in use value terms, but by suggesting costs of production as the basis for his commanded labour theory of value, he committed circular reasoning. His theory therefore disqualifies to explain exchange value. Ricardo's ‘embodied labour’ is a transhistorical concept too because all societies, both capitalist and non-capitalist, produce things which embody specific labour activity, which give rise to specific useful properties (use value). To explain the historically specific dominance of exchange value by a non-historically specific concept mystifies the capitalist system.

The commonality of classical and neoclassical value theories is opposed to Marx's explanation. For Marx, value is a historically-specific systemic force that subordinates individuals to the market. This leads him to formulate a fundamental critique of capitalism, which paves the way for radical politics. I elaborate this argument in sections 4 and 5.

3. Value theory in ecological economics: The foundations of the ‘real real’ economy

This section reviews the value theoretical undercurrents in ecological economics. I aim to show that ecological economists rely on a

(footnote continued)

economic process was removed from the core of economic theory. Moreover, the overemphasis on monetary dimensions of work (or leisure) in mainstream theory, most prominently as wages, comes at the expense of understanding and debating substantive work-related issues, such as the quality of work. This removes spaces for debate about improving working conditions as a direct way to contribute to people's wellbeing (Spencer, 2004).

marginalist understanding of value (section 3.1), reject it (section 3.2), or draw on the classical tradition of Smith and Ricardo (section 3.3). Marxian value theory remains virtually absent (section 3.4).

3.1. Ecosystem service advocates: adoption of marginal utility theory & valuation

The valuation of ecosystem goods and services is one of the biggest sub-fields of ecological economics. Understanding value is a pre-requisite for valuation as the “process of expressing a value for a particular action or object” (Farber et al., 2002, p. 376). However, there are very few articles that explicitly address value theory. When they do, marginal utility theory is the value theory adopted. A seminal Special Issue on *The Dynamics and Value of Ecosystem Services* serves as an important reference point. Some of these articles are amongst the most-cited articles in *Ecological Economics* and provide the conceptual bedrock for ecosystem services research. Farber et al. (2002) provide a foundational theoretical contribution. The authors think that.

“The classical economists, such as Smith and Ricardo, could not resolve it [the diamond-water paradox] using their labor theories of value. It was resolved only by recognizing the importance of utility and scarcity in determining exchange values, and the role of margins in value determination” (Farber et al., 2002, p. 378).

The authors leave little doubt that they consider marginal utility theory an improvement.

“The significance of the marginal utility theory of value to the evolving concept of ecosystem service valuation is that it can be used to measure use values, not just exchange values, in monetary units... money can thus be used as a standard of measure of use value” (Farber et al., 2002, p. 378; emphasis added).

This is what happens in practice. Scholars establish typologies of ecosystem goods and services, i.e. a refined understanding of different use values (Groot et al., 2002 is the reference point), with a view to measure and capture environmental values that are otherwise neglected. Environmental cost-benefit analysis serves as the standard method. Revealed and stated preference methods are used to derive comparable monetary measures (Spash, 2015). Monetary valuation is not the only tool used to raise awareness of environmental degradation but an important and ‘useful’ one (Costanza and Farber, 2002). Regarding non-monetary valuation methods, there is much overlap to the position of Social Ecological Economists.

3.2. Social ecological economists: Rejection of marginal utility theory & alternative valuation

Social ecological economists criticise monetary environmental valuation and marginal utility theory upon which it is based. At the forefront of this critique lies an attack against value monism, i.e. collapsing multiple environmental values into single monetary numbers (Aldred, 2006; Martinez-Alier et al., 1998). As ‘prices are not much worth’ (Röpke, 1999), social ecological problems complex and uncertain (Funtowicz and Ravetz, 1994, 1993) and subject to conflicting interests, deliberative valuation approaches and value articulating institutions (Vatn, 2015, 2005) are advocated. Multi-metric, multi-method, multi-discipline approaches are considered essential to account for plural values, address conflicts, create transparency and facilitate inclusive and participatory decision making processes.

Value pluralism means that a multitude of different incommensurable use values and intrinsic values are irreducible to each other or to some other ultimate value. Value monism, the monetary valuation of nature and market provision of ecosystem goods and services are therefore categorically rejected.

The formulation of environmental policies, the evaluation of

environmental goals and the establishment of priorities require a substantive economic calculus in terms of social use values (politically evaluated) for which the formal calculus in monetary exchange values fails to provide a real measure [...] [E]nvironmental values are social use values for which markets provide neither a direct measure nor an adequate indirect indicator (Kapp 1974: 38 cited in O’Neill, 2017).

Social ecological economists discuss value mainly in normative terms (Douai, 2009). Alternative theories of value draw on multiple philosophical strands, such as Sagoff’s citizens values thesis, John Rawls’s theory of justice and Sen’s and Nussbaum’s capabilities approach (Lo and Spash, 2013; Rauschmayer et al., 2011). These normative and philosophical value theories are crucial, but they do not replace realistic economic theory.

Concerning economics, classical institutionalism is typically propagated as ‘the economics of social ecological economics’. This perspective is important but “one of the most important lacunae in institutional thought is exactly the absence of a theory of price, or value theory” (Milonakis and Fine, 2009, p. 162), which underpins what capitalist institutions have in common: they tend to serve capital, rather than human flourishing. I argue below that Marxian value theory is aligned, rather than opposed to social ecological economists, by providing a critique of capitalist markets and institutions.

3.3. Energy physicists: energy theories of value & energy accounting

Energy value theorists argue that the available energy of the sun (partly stored as fossil fuels) is required for the production of all goods and services and cannot be substituted as an ultimate input. Labour is a form of energy too, which makes energy the ultimate determinant of exchange value. Moreover, ‘free’ or ‘available’ energy is a homogenous substance (such as utility) that can be used to measure and compare commodity values. This leads energy value theorists to conclude that “the flow of energy should be the primary concern of economics” (Costanza, 1980, p. 1219 citing Soddy). This reasoning dates back to the Physicists, who considered land as the ultimate source of value (Burkett, 2003; Christensen, 1989). In the 1990s there was a debate in ecological economics whether embodied energy could be related to market value. Costanza argued for, Odum against energy theories of value (Costanza, 1980; Foster and Holleman, 2014; Judson, 1989).

These debates have vanished but their legacy remains alive in the idea that energy explains economic growth. I argue that energy physicists who explain growth (a form of economic value) in energy terms implicitly adopt an energy theory of value. This idea is associated with two traditions in ecological economics, one based on energy quantity, the other on energy costs. The exergy community, pioneered by Bob Ayres, promotes exergy as energetic measure of useful work that considers the quantity and quality of embodied energy used in production. The EROI community, led by Cleveland and Hall (a student of H.T. Odum (Röpke, 2004, p. 299), emphasises energy return on investment as a measure of how much energy is available for use after deducting the energy needed to extract and ‘produce’ it. A declining EROI signals the end of cheap energy and growth for fossil-dependent industrial economies (Dale et al., 2012; Murphy and Hall, 2011). Exergy and EROI aim to highlight the essential role of energy in production and are promoted as variables explaining economic growth. I interpret both measures as variations of “economics as the classical school did it” (Judson, 1989, p. 262). The difference is that energy physicists focus on embodied energy or energy costs of production instead of embodied labour or costs, as Ricardo and Smith did.

Energy physicists emphasise the energy dependency of the economy, which is laudable. However, policy implications easily resemble those derived from marginal utility theory (Burkett, 2009; Söllner, 1997). If it were true that economic value reflects embodied energy or energy costs, perfectly functioning markets would arrive at prices proportional to energy and reflect ‘true’ costs of production.

“There is no inherent conflict between an embodied energy (or energy cost) theory of value and value theories based on utility... Embodied energy values are accurate indicators of market values where markets exist... this is one way of ‘internalising’ all factors external to the existing market system and solving the natural resource valuation problem... markets can be viewed as an efficient energy allocation device that humans have developed to solve the common problem facing all species – survival” (Costanza, 1980, p. 1224).

From this perspective, the problem becomes one of imperfect, incomplete or missing markets in which energy externalities have to be internalised. EROI analysis is *“much like economic cost-benefit analysis” (Murphy et al., 2011, p. 1889).*

Energy theories of value are problematic because they theorise exchange value in transhistorical terms too, as Smith, Ricardo and the marginalists did. The dominance of exchange value is specific to capitalism, i.e. the fact that goods and services are generally exchangeable for another; but the fact that goods and services embody energy is not. All societies, capitalist and non-capitalist, produce things which contain energy. A historical explanation of the dominance of exchange value matters for understanding why planetary boundaries are reached in the Capitalocene. Capitalism is not the first society incompatible with its surrounding ecosystem but in capitalism this incompatibility has reached global dimensions. Why? Energy theories of value fail to address this question.

3.4. Eco-Marxists: the adoption and rejection of Marxian value theory

Few theoretical contributions discuss Marxian value theory in ecological economics. The core issue of debate between those authors who defend it, reject it or argue for adaptations to the theory, centres on the question of whether nature is a source of value. In ecological economics, this debate is as old as the origins of the field. Georgescu-Roegen was critical of Marxian value theory for treating labour as the only source of value (Georgescu-Roegen, 1971). Martinez-Alier and Naredo highlighted the pioneering role of Sergei Podolynski, who attempted to ground Marxian value theory in thermodynamics. They argue that Marxian value theory is inconsistent with energy analysis, as a result of Marx and Engels having dismissed Podolynski's approach (Martinez-Alier, 1987; Martinez-Alier and Naredo, 1982). Burkett and Foster countered that Podolynski suggested a crude energy theory of value, which was not an improvement to Marx's theory (Burkett and Foster, 2008, 2006, Foster and Burkett, 2008, 2004). This rebuttal has not settled the issue. The debate continues, for instance, between Kallis and Swyngedouw (2017) on the question of whether bees produce value. The role of nature as source of value is not only debated between ecological economists and eco-Marxists but also amongst Marxists (see for example a special issue in *Capitalism Nature Socialism*: Kenney-Lazar and Kay, 2017).

Remarkably, however, a clear account of what Marxian value theory actually is remains missing. This surprises especially in the theoretical contributions that aim to defend it. Douai (2009) tries to convince social ecological economists that *“the concept of economic value is an empty space in SEE”* which *“is detrimental to the achievement of its main goals”* (Douai, 2009, p. 272). However, Douai's explanation of value is essentially limited to one paragraph (Douai, 2009, p. 264). He explains use value and exchange value in two sentences, mentions labour as common substance of value in one sentence, followed by a remark on social labour, and a statement that money is the concrete representation of economic value. He presents the commodity as most important part of Marx's work without explaining how important concepts interrelate and what abstract socially necessary labour time means.

Burkett proceeds similarly. In *‘The Value Problem in Ecological Economics’* he criticises ecological economists for adopting energy theories or value and mainstream approaches to environmental valuation, but the Marxian alternative is presented in a short section filled with

difficult Marxian terminology (Burkett, 2009). Presented this way, Marxian value theory remains difficult to appreciate for non-Marxists. Even progressive camps in ecological economics consider it a dead end and the general advice is to stay away from it.⁴ In the following section, I attempt to deepen and extend Burkett's and Douai's contributions.

4. Marxian value theory: the foundations of capitalism as monetary market economy

Marx was a realist and a systems thinker. His vision was to understand the workings of the capitalist system as a whole, rather than individual exchange or prices. What distinguishes capitalism from previous forms of societal organisation, such as feudalism or slave societies, is that commodity production becomes *generalised*. The commodity – a good or service exchanged for money – remains no longer at the fringes of societal functioning but becomes the dominant form of wealth. Under generalised commodity production, labour power (the capacity to work) becomes a commodity too, as well as means of production (Polanyi, 1944). This is why Marx starts to unfold his understanding of capitalism with the commodity (a choice that took him 30 years). He asks: what can we learn about the functioning of the system from understanding that commodities are the predominant form of wealth? What does it tell us about the nature of capitalism? What matters in such societies?

A preliminary remark: I proceed with a smoothed concept of ‘value’. There is an extensive, thorny and controversy-strewn literature about the meaning of the term. My understanding draws on seminal interpretations in the Anglo-Saxon Marxian political economy tradition (Brown, 2008; Elson, 1979; Fine and Saad-Filho, 2016; Harvey, 2010b; Saad-Filho, 2002) in conjunction with literature on the dialectical method (Murray, 1993; Ollman, 1993; Ollman and Smith, 2008; Reuten, 2018, 2000; Smith, 1998), because Marx's method – systematic dialectics – makes a big difference in understanding capitalist value.

4.1. Step 1. Use value and exchange value are fundamentally different things

The starting point is to recognise that the commodity has a two-fold character: it is a use value and an exchange value. The value theories discussed so far – the classical approach of Adam Smith and David Ricardo, marginal utility theory, energy theories of value and those eco-Marxists who emphasise nature as a source of value – explain exchange value in transhistorical terms, i.e. by something that is applicable to all societies, such as utility, concrete labour time, or energy. Marx's value theory, however, is an attempt to understand what explains the general exchangeability of commodities under capitalism. As such, Marx endeavours to investigate a historically-specific explanation of exchange value. Exchange value is seen as dependent on specific social conditions (Sommerville, 2020). This is a crucial difference to other value theories and I invite the reader to bear this in mind in the explanations that follow.

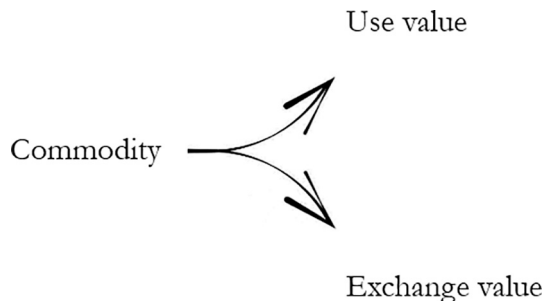
Marx argues that the fact that commodities are different as use values is what *motivates* their exchange.

“If the use values were not qualitatively different, hence not the products of qualitatively different forms of useful labour, they would be absolutely incapable of confronting each other as commodities. Coats cannot be exchanged for coats, one use-value cannot be exchanged for another of the same kind” (Marx, 1990, p. 132).

⁴When I started to study Marxian Political Economy, several ecological economists warned me of value theory and suggested to ‘stay away from it’. For a long time, this was indeed my intention. I changed my mind when I realised that I won't understand more complex economic categories and how they form a system that explains capitalist dynamics without understanding value.

Use value is a necessary condition for exchange value – without use, no exchange. But use values *cannot* bear a systematic relationship with exchange value. Why? Because exchange value is something that commodities have in common. As exchange values, they are characterised by a general ability to be exchangeable, which is historically-specific to capitalism. An explanation of this exchange value must therefore be historically-specific too. This implies a demarcation between use value, as a transhistorical category, and the predominance of exchange value under capitalism. As use value, a spoon can be used to eat soup. As exchange value, the spoon has a power to be exchanged for other commodities, which has nothing to do with the wood or metal contained in it. There is no use value category, be it energy, wood, height, weight or anything else that has the power to systematically explain exchange values for all commodities.

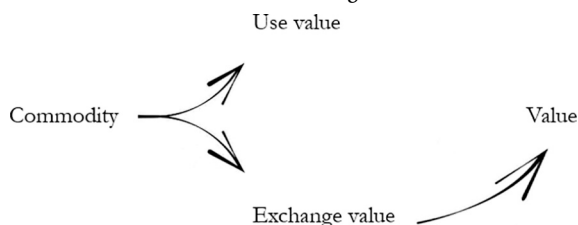
Step 1. The demarcation between use value and exchange value.



4.2. Step 2. The identification of a ‘third thing’ called value

If use values cannot explain capitalist exchange value, there needs to be something else that can. Marx calls this ‘third thing’ value. Value is a concept that aims to explain exchange value under capitalism. As a matter of fact, commodities are made commensurable in exchange. As exchange values they establish definite quantitative relations. What explains this commensurability? There needs to be some “*common element, of which they represent a greater or a lesser quantity*” (Marx, 1990, p. 127). “*There can be no exchange... without equality, and no equality without commensurability*”. This quote is not from Marx, but from Aristotle (Marx, 1990, p. 151). Marx admired Aristotle for showing that exchange relations are based on equality which entails that two things can only be compared as commensurable quantities. Aristotle identified the requirement of a common substance upon which commensurability is based but stated that such a thing cannot, in truth, exist. Marx’s response was “*But why not?*” (Marx, 1990, p. 151). If use values drop out to explain this equivalence and systematic relation, it needs to be something else.

Step 2. The identification of a ‘third thing’ called value.



4.3. Step 3. The identification of value as abstract socially necessary labour time

What are we looking for, if we aim to uncover the essence of value? The search is for properties that explain the power of exchangeability. This power has to be something material.⁵ It cannot be a pure thought

construct because this would violate Marx’s materialist and realist philosophy according to which appearances arise from material structures (Brown, 2008). A ‘god-like’ substance is excluded. Also, it has to be a quantity that bears a systematic relationship with exchange value. As exchange value describes a quantity only another quantity has the capacity to explain exchangeability. Furthermore, there has to be a systematic relation between the essence and its physical manifestation (Harre and Madden, 1975). As H₂O, for example, is an essence that necessarily manifests as water, steam or ice, the essence of value necessarily manifests and bears a systematic relation to money. Finally, it needs to be something distinct from use value, as argued above.

Marx argued that the property left to explain capitalist value is abstract socially necessary labour time (ASNLT). What does this mean? ‘Labour’ is broadly understood, as life activity or social practice. People work to reproduce themselves and society. They transform nature (and thereby themselves) to survive. Under capitalism, the dominant form this transformative power takes is wage-labour. Non-wage labour can be value producing too, such as a self-employed person or a working employer, but it is not the dominant form.

‘Socially necessary’ denotes the average amount of labour time required, under existing conditions of skills and technology, to produce commodities. “*If it takes one day to make a pair of shoes on average, then the abstract labour embodied in a pair of shoes is one day no matter whether it takes the individual labourer two or 50 hours to make*” (Harvey, 2006, p. 14/15). ‘Socially necessary’ is a static average that points to the systemic importance of technological advance in shaping value and price magnitudes (Reuten, 2018).

The innovation compared to other value theories is the concept of ‘abstract labour’. For Marx, abstract labour is not an idea, but a historical fact. The fact that people sell their labour – labour in general – is a social phenomenon specific to capitalism, which has not existed in previous societies. Ancient Greeks, for example, conceived every productive activity in terms of the product it was aimed at: sewing in terms of cloth; cobbling in terms of shoes (Höfig, 2019). The organic link between the product and the producer erodes in capitalist societies in which commodity producing labour in general becomes a means to create wealth in general.

Abstract labour is labour that produces products with ‘value’ in the sense of universal exchangeability (Smith, 2018). Whether concrete labour, energy and nature – The specific work of people and animals and matter-energy that go into the production of bread for my breakfast – Turns into abstract labour depends on whether this work gets socially validated in exchange, i.e. whether the bread produced is successfully sold for money (Smith, 2018). ‘Abstraction’ means that in the act of exchange, different kinds of individual labour become equalised and homogenised. There is an abstraction from determinate use value considerations, i.e. one use value is just as good as any other. Capitalist society is indifferent about it (Murray, 2017). Concrete labour and nature matter insofar as they provide the material basis for value creation, but in exchange, they are subordinated to impersonal market forces

Whereas abstract labour represents the qualitative substance of value, ‘labour time’ stresses its quantitative aspect. Labour time is the magnitude of value (Banaji, 1979), measured in weeks, days, hours, minutes. As exchange value is a quantitative relation it can only be explained by another quantity. How much time it takes to produce commodities is without doubt crucial to understanding real-world capitalist dynamics.

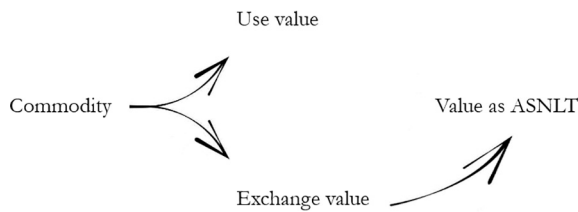
Step 3. The identification of value as abstract socially necessary labour

(footnote continued)

value material or is it not? Value is not natural material, i.e. it does not have a systematic determinate relationship to any natural property, such as energy or wood or broccoli. Value is however social material, i.e. it relates to objective social reality.

⁵Harvey defines value as immaterial but objective (Harvey, 2010a). So is

time (ASNLT).



4.4. Step 4. Money as measure of value

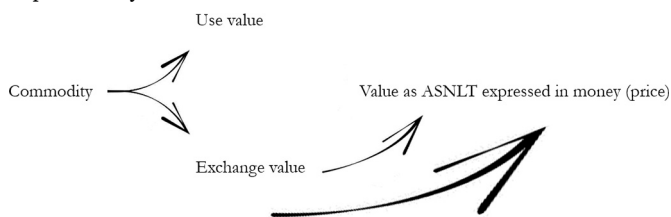
As value is an invisible relation it needs embodiments – forms in which it appears. Money is the necessary appearance of value (Smith, 1990). Money becomes the general equivalent – something in which the value of goods and services can be expressed – in societies where use values are generally produced as commodities. In brief, generalised commodity production and exchange is monetarised production and exchange. Capitalist exchange is not a sequence of barter transactions (...C-C-C-C-C...) but a sequence of purchases and sales (...C-M-C-M-C-M...) and money not just a means that facilitates barter – it is not just a ‘veil’. Capitalism is a thoroughly monetarised society unique in human history (Smith, 2018).

Marxian value theory explains how a society can reproduce despite the fact that the production and exchange of goods is organised privately, without ex ante coordination? The answer is: through the price system.

“Marx’ labor theory of value ... is chiefly an attempt to explain why all the products of human productive activity in capitalist society have a price, not why a particular product costs such and such, but why it costs anything at all. That everything humans produce has a price is an extraordinary phenomenon peculiar to the capitalist era, whose social implications are even more profound because most people view it ahistorically, simply taking it for granted” (Ollman, 1993, p. 61).

Price is related to value, but they are not the same. Price is the monetary expression of value, a form in which value appears, whereas value is the ‘hidden’ underlying essence. Price is the external relation between commodities, value their internal connection (Ilyenkov, 1960). This connection is not random or accidental but relatively stable. Brown (2008) describes it as a ‘patterned’ or ‘rough and ready’ relationship. The continuity and difference between price and value (Elson, 1979) can be illustrated by recalling how these magnitudes are measured. Value is measured by labour time, prices by money. The colloquial expression ‘time is money’ captures their obvious connection in capitalist praxis. At the same time, everybody agrees that time and money are not the same.

Step 4. Money as measure of value.



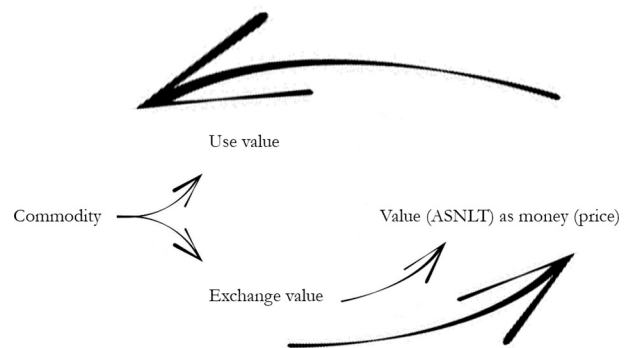
4.5. Step 5. From money back to the commodity – now as capital

The four-step approach to derive value, money and price is not linear but a ‘cycle of abstraction’ (Banaji, 1979). The first cycle moves from the commodity through its contradictory nature between exchange value and use value to an understanding of value and the necessity of money as expression of value. As the production of exchange value rather than use value is the stronger moment driving the

reproduction of capitalist society, and as exchange value gets expressed as money in practice, Marx derives an explanation, at the end of this first cycle, why commodities are produced in the first place: for the purpose of making money. In this function, money transforms into capital. Ultimately, this means that “commodity circulation is only the relatively cheery appearance of the endless accumulation of capital” (Murray and Schuler, 2017, p. 126). This is how Marx derives capital as dominant force driving capitalist reproduction.

Capital is a form of value; it is self-valorizing value or the self-expansion of value (Arthur, 2008; Brown, 2002). From a Marxian perspective, capital is not a factor of production, it is production. M-C-M’ conveys the essence of what capital means: value in motion in a way that creates more value. Money (M) is invested to produce commodities (C) to recover the initial investment (M) plus an extra amount of money, i.e. surplus value (dM = M’-M). In simple terms: capitalism is a mode of production for profit. Part of the surplus value is re-invested to maintain production over time. The result is the reproduction of capital on an expanded scale.

Step 5. From money back to the commodity – now as capital.



5. The relevance of Marxian value theory: A fundamental critique of capitalism

This section applies value theoretical insights to a debate of interest to ecological economists. There has been a long debate on whether capitalism is compatible with a sustainable and just society, for example in an exchange between Richard Smith, Herman Daly and Philip Lawn (Daly, 2010; Lawn, 2011, 2005; Smith, 2010). The authors agree on many issues, such as the need for a different macro-economic model, redistribute wealth, and discard consumerism; where they disagree on is what political economy regime would be conducive to a world with low throughput and high wellbeing. Lawn and Daly argue for, Smith against capitalist markets to underpin a steady-state economy. Here, I offer additional insights to this debate to support Smith’s view and critique Lawn’s and Daly’s.

How to transition from 21st century capitalism to a different economic model is far from clear. In my view, academics can support just transitions by debunking ideas and narratives that protect the status quo and by promoting those that unlock radical alternatives. I argued above that value theory shapes how economists think about the functioning of the economic system and that the mainstream value narrative does not offer a realistic account of capitalism, and hence radical departures from it. Here, I make the case that steady-state economics closely resembles the mainstream narrative, which leads steady-staters to defend, rather than challenge capitalist market supremacy. To illustrate this view, I leave the careful step-by-step explanation of value categories started in section 4 to make a few broader points on growth, profits and exploitation.

5.1. Understanding capitalist markets: efficiency vs. exploitation

Daly rejects interference with the market organisation of production

based on the belief that markets are efficient in allocating resources.

“Daly’s vision of steady-state capitalism embraces the efficiency-facilitating role of markets” (Lawn, 2011, p. 7). “Allocative efficiency is important in terms of minimizing resource wastage and facilitating beneficial forms of technological progress” (Lawn, 2005: 221).

Understanding markets as facilitating efficiency is a neoclassical idea, grounded in marginal utility theory. Lawn confirms that their vision is established *“given the well-known principles of diminishing marginal benefits and increasing marginal costs” (Lawn, 2011, p. 3).* According to marginal utility theory, value is a measure of wellbeing; reflecting people’s choices, striving for happiness, at the lowest cost of pain. In this view, the reason for exchange is the satisfaction of need, at the margin, money (price) is ‘only’ a representation thereof and markets are ‘neutral’ mechanisms that balance costs and benefits in the public interest.

These foundations lead Lawn and Daly to understand the economy as a cost-benefit system. If costs rise faster than benefits, economic activity becomes ‘uneconomic’ (Daly, 1991). The basic structure of the economy is not a problem in this narrative. The market is theorised as if it existed to serve people’s needs by providing use values. This misleads steady-staters to understand capital as *“all physical objects subject to ownership that are capable of directly or indirectly satisfying human needs and wants” (Lawn, 2005, p. 212).* They defend capital and ‘extensions’ such as natural capital as cornerstones of a rational society – a ‘use value’ economy (Kauder, 1965). Governments are expected to ‘macro control’ to protect the vulnerable from undesirable market outcomes, but ‘micro’ decisions should be left to the market (Daly, 2010). This understanding justifies profit-seeking, competition and technological advance as serving the general public.

What is called ‘efficiency’ in mainstream economics is called ‘exploitation’ in Marxian political economy. This is because, from a realistic and systemic perspective, capitalist markets are far from efficient in terms of saving energy and resources and capitalist competition is no innocent means to churn out technologies for the public good. *“Competition ... forces producers to reinvest much of their profit back into productivity-enhancing technologies” (Smith, 2010, p. 31).* Marxian value theory explains why. The importance of ‘labour’ that is ‘socially necessary’ and undertaken in a specific amount of ‘time’ points to the core dynamic of technologically-induced labour productivity increases for capitalist reproduction. Market-based exchange underpinned by competition puts pressures on firms and individuals to increase the efficiency of units of production by cutting costs of inputs, seeking cheaper raw materials and labour, or increasing the scale of production. As such, capitalist market provision is inherently related to growth dynamics and the exploitation of people and planet. The general tendency is for cheaper and more, rather than high quality, durable and less. With the best of will, this reality is difficult to square with Daly and Lawn’s vision of redesigning capitalist markets – still based on competition and profit-seeking – towards qualitative development.

The absurdity of capitalist value is empirically supported by the COVID-19 crisis. The pandemic reveals the gulf between social and market valuation. For example,

“childcare workers were estimated to generate between £7 and £9.50 benefits to society for every £1 they are paid, and waste recycling workers £12. On the other hand, tax accountants and investment bankers were estimated to destroy £47 and £7 respectively of social value for every £1 they were paid” (nef 2017 quoted in Gough, 2020).

From capital’s point of view, this valuation makes sense. Investment bankers certainly contribute more to the proliferation of capital than childcare workers. This is because capitalist value is based on labour productivity increases steered towards the production of monetary incomes, not towards direct social need. Marxian value theory reveals this injustice by explaining how use values are distinct from and systematically subordinated to market values. It thereby also exposes how

‘efficiency’ serves as the mainstream disguise for ‘exploitation’.

5.2. Profit and growth dynamics

Lawn acknowledges that profit making is central to capitalism and suggests it can continue in a steady-state economy, whereas economic growth is not and cannot.

“Capitalist systems do not need to grow” (Lawn, 2005, p. 3). “A capitalist system could just as easily expand until it reaches its optimal scale” (Lawn, 2011, p. 8).

This view matches the conception of the economy as a cost-benefit-system too. Profits are imagined to continue in industries that yield social benefits, whereas those could phase out that create social harm – and indeed would phase out, based on a heroic assumption of ‘natural decline’ (Lawn, 2011, p. 10). Lawn emphasises the need to encourage ‘good’ profits that don’t relate to growth. As such, a steady-state economy is presented as a *“pathway to sustained, healthy profits” (Lawn, 2011, p. 4).* Smith counters that growth is a structural imperative under capitalism, rather than subjective and optional (Smith, 2010). He does however not explain how profits arise, nor how profit-making is intimately linked with growth dynamics.

Marxian value theory sheds light on these issues. M-C-M’ is a powerful notion of the basic structure of the capitalist system. The dominant form of reproducing human life – via the production of commodities – operates on the basis of investments steered towards generating surplus value. Surplus value is rooted in surplus product which is the production of goods and services beyond subsistence needs. Many profit theories (based on Keynes, Kalecki, Sraffa or the neoclassical school) rely on the existence of a surplus product for profit (Shaikh, 2016, p. 232). Marx digs deeper and establishes that surplus product is rooted in surplus labour time, i.e. unpaid work (Marx, 1863). This is because labour power is the only commodity that has the capacity to increase its own exchange value. Why?

If the value of a commodity is its socially necessary labour time, then the value of the commodity labour power is the labour time socially necessary to produce the goods that workers need for the reproduction of themselves and their families. If workers only produced what was necessary for their own subsistence, there would be no surplus, no basis for profits and no good reason for capitalists to employ anyone. Even if ‘fair’ wages are paid, the value of labour power would be less than the value that capitalists received from the commodities that are produced. Marx’s theory is not one of unfairness, but of structural and systemic tendencies. It explains how capitalist reproduction is rooted in the exploitation of labour. And without production, nothing can be sold and exchanged. What happens in production is hence a precondition for different types of profits in circulation (Pirgmaier, 2018).

Clarifying how profits fundamentally arise out of exploitation – and hence out of dominance and deception – is crucial for understanding capitalist institutions. I agree with Lawn and Daly on the need for fundamental institutional changes and bold government action. But I believe that such changes are much better served by adopting realistic theory that illuminates about real-world dynamics and struggles. The largely unquestioned role of the capitalist markets in the steady-state narrative is deeply problematic. The market does not exist independent of power relations, but is more an expression of them. Rapid social change consonant with the challenges ahead requires ideas that dismantle and confront power, rather than justify and protect it.

6. Conclusions

Value theory raises questions about the foundations of our societies. What is and has value, in capitalist societies? How is the reproduction of life organised? This paper explains three approaches to understanding value in economics: the classical approach of Adam Smith and

David Ricardo, the neoclassical approach based on marginal utility theory of value, and Marxian value theory.

The classical and neoclassical tradition theorise exchange value as driven by transhistorical use values (subjective utility, objective embodied labour time or costs of production). This gives rise to a conception of capitalism as a ‘real economy’, i.e. an economic system that produces goods and services for the purpose of satisfying people’s needs and wants. This is essentially a conception of a barter economy.

Ecological economics implicitly adopts a mainstream conception of the economy, by drawing on classical or neoclassical value theory. This gives rise to a conception of the ‘real real’ economy, which emphasises the biophysical foundations of the economy and ultimate social outcomes such as health and wellbeing. Ecological economists dig deeper as to what *should* matter and be valued more in economy and society.

In reality, capitalism is a monetary market economy. This is the conclusion of Marxian value theory. Marx breaks with the classical and neoclassical tradition by insisting that use value and exchange value are related but distinct concepts that need to be kept dialectically separate to understand capitalism. This results in nothing less than opposing conceptions of the economic system as a whole. It means that capitalism is, at the core, not an economy that serves people by delivering wellbeing, but one in which people serve the economy.

As a result, Marxian value theory is the only value theory in economics that provides a fundamental critique of capitalism, and calls for a different logic of provisioning. By providing a step-by-step guide of how Marx identifies value and capital as destructive social forces that subordinate people and planet to capitalist market provision, this contribution aims to advance a radical social science understanding in ecological economics.

Declaration of Competing Interest

None.

Acknowledgements

This research was supported by the Leverhulme Trust Research Leadership Award ‘Living Well Within Limits’ (RL2016–048) and the Yorkshire Integrated Catchment Solutions Programme (iCASP) funded by the UK Natural Environment Research Council (NE/P011160/1). I thank Lukas Hardt, Will Lamb, Simon Mair, Pedro Mendez Loureiro, Geert Reuten and two anonymous reviewers for their excellent comments. A special thank you goes to Andrew Brown for inspiring me to understand value and for helping me, ceaselessly and patiently, to see through the thicket of value theory.

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