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No escape from the technosystem?

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Abstract

The main purpose of this article is to provide an in-depth review of Andrew Feenberg's *Technosystem: The Social Life of Reason* (Cambridge, MA: Harvard University Press, 2017). To this end, the analysis is divided into two parts. The first part gives an overview of its thematic structure and elucidates its key arguments. The second part discusses its most controversial aspects and grapples with its principal weaknesses and limitations. By way of conclusion, the article argues that Feenberg's book demonstrates the pivotal role that the technosystem plays in shaping contemporary society.

Keywords

Andrew Feenberg, critical constructivism, critical theory, function, progress, rationality, reason, social life, technology, technosystem

Introduction

The main purpose of this article is to provide an in-depth review of Andrew Feenberg's *Technosystem: The Social Life of Reason*¹ (2017). To this end, the analysis is divided into two parts. The first part gives an overview of its thematic structure and elucidates its key arguments. The second part discusses its most controversial aspects and grapples with its principal weaknesses and limitations. By way of conclusion, the article argues that Feenberg's book demonstrates the pivotal role that the technosystem plays in shaping contemporary society.

I. Thematic structure and key arguments

Feenberg's book is divided into a *Preface*,² an *Introduction*,³ three *Parts*,⁴ and a *Conclusion*.⁵ Furthermore, it contains an extensive *Notes*⁶ section as well as both a *Name Index*⁷ and a *Subject Index*.⁸

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Part I

Part I is entitled 'Method'.⁹ It comprises three chapters (Chapters 1–3). These provide an introduction to 'critical constructivism' (CC), making a case for its relevance to the analysis of what Feenberg calls 'the technosystem'. Feenberg considers the intellectual contributions of a large pool of prominent scholars: Karl Marx and Michel Foucault; Theodor W. Adorno, Max Horkheimer, and Herbert Marcuse; Gilbert Simondon and various thinkers associated with two currents of science and technology studies (STS), namely social constructivism and actor–network theory (ANT).

These thinkers and approaches share the following assumption: while 'modern societies are organized around rational institutions and artefacts',¹⁰ rationality is never 'singular and pure'¹¹ but always shaped by socio-historically variable conditions. Given the 'context-bound realization of rationality',¹² technological design – far from being reducible to a mere product of scientific principles – is influenced by social forces, which play a central 'role in the definition, selection, and application of those principles'.¹³ For instance, social movements – although they have been excluded from participating in traditional types of the technosystem – are increasingly pushing for inclusion, as illustrated in the rise of environmentalism. Just as critical theorists highlight the importance of social struggles, Simondon's concept of 'concretization'¹⁴ offers an empirically substantiated framework for exploring the multiple factors allowing for 'technical progress',¹⁵ notably in terms of its profound impact on the development of human life forms. Combining contextualist and constructivist understandings of rationality, Feenberg proposes a *critical* philosophy of technology, insisting on the historically situated constitution of social arrangements and, thus, on 'the *limits* of the rational organization of modern society'.¹⁶ Feenberg's account exposes not only the opportunities arising from technology, but also its contradictions and perils, especially those that manifest themselves in social pathologies.

Chapter 1 – entitled 'Marx after Foucault'¹⁷ – suggests that the latter's critical studies of 'technical disciplines such as criminology and psychiatry',¹⁸ permit us to cast new light on the former's understanding of capitalism. Such a perspective, according to Feenberg, enables us to reinterpret Marx's approach and, crucially, to transcend the rather narrow economic focus of his later writings, thereby overcoming some of its major shortcomings. Feenberg develops this argument around five themes¹⁹: (1) Marx's critique of the irrationality of capitalism is complemented by a sustained critique of capitalist rationality. (2) Marx's conception of the 'concrete' object, defined as a combination of manifold determinations, can be integrated into a genealogy of technosystem design. (3) Marx's discussion of the relation between meaning and economic function is applied to contexts in which objects serve a particular role. (4) Marx's dialectic of 'real subsumption' and proletarian resistance is generalized in a theory of co-production and participant interests. (5) Marx's understanding of working-class consciousness and socialism acquires new significance when compared to Foucault's notions of 'subjectification' and 'governmentality'. To be clear, Feenberg does not contend that Foucault was a 'Marxist' or that Marx was a 'pre-Foucauldian'. Rather, he asserts that by cross-fertilizing Marxian and Foucauldian thought it becomes possible to grasp the intricacies of the capitalist technosystem.

Chapter 2 – entitled ‘Critical Constructivism’²⁰ – examines the relation of CC to its two intellectual cornerstones – the critical theory (CT) of the Frankfurt School and early work in STS. Drawing on social constructivism and ANT, STS takes issue with ‘positivist and determinist ideologies’²¹ that appear to leave little, if any, ‘place for democratic control of technology’²² in advanced societies. CC, CT, and STS reject the idea of a ‘pure’, ‘value-free’, and ‘universal’ technology, while maintaining that it is both possible and desirable to develop ‘an explicit theory of democratic interventions into the technosystem’.²³ CC is not intended to serve as a rival or radical alternative to STS. Rather, it is meant to be ‘an invitation to open the field to a wider range of philosophical and social theories of modernity’.²⁴ Before the rise of STS, the social study of technology was linked – almost exclusively – to ‘Marxism, pragmatism, Heideggerian phenomenology, and various sociological theories of modernity’.²⁵ These approaches emphasize the intimate relationship between technology and society, underscoring that the development of the latter is profoundly shaped by the evolution of the former, and vice versa. In this respect, the study of technology is marked by several paradigmatic oppositions: optimism versus pessimism, voluntarism versus determinism, processualism versus structuralism, interpretivism versus positivism, constructivism versus realism – to mention only a few. Feenberg’s CC is an attempt to bring together key insights from seemingly disconnected, if not irreconcilable, intellectual traditions – such as CT, STS, and Foucauldian genealogy.²⁶ Such a multiperspectival endeavour permits us to comprehend that complex types of domination, which are embedded in technologically advanced forms of action coordination, can be regarded ‘as a contingent social achievement, rather than as an essential consequence of rationality as such’.²⁷ Based on this premise, CC highlights the dynamic involvement of everyday actors in conflicts over the place of technology in contemporary society.²⁸

Chapter 3 – entitled ‘Concretizing Simondon and Constructivism’²⁹ – discusses the main contributions of STS to CC. This chapter is ‘something of a manifesto for a more politically informed approach within STS’,³⁰ making a number of methodological suggestions. It builds on Simondon’s classic writings on the philosophy of technology,³¹ which – although, admittedly, they are less well known in Anglophone academia – are a crucial reference point in the works of other prominent scholars,³² such as Bruno Latour,³³ Gilles Deleuze,³⁴ and Bernard Stiegler.³⁵ Inspired by Simondon’s studies, Feenberg reminds us of the deep ambivalence of technology, as illustrated in the ‘familiar dilemma of uncritical celebration and purely negative critique’,³⁶ unconditional endorsement and categorical condemnation, techno-fanaticism and techno-fatalism. Conservative philosophers à la Martin Heidegger – since they are deeply suspicious of technology, especially of its unrestrained developments – advocate some kind of ‘spiritual redemption in opposition to a technology-based lifestyle’.³⁷ By contrast, progressive thinkers à la Marcuse – rather than reducing technology to a merely systemic force of alienation and domination – insist on its empowering, if not emancipatory, potential.³⁸ Discarding both fatalistic and idealistic notions of technology, Feenberg makes a case for Simondon’s view that ‘the way forward is to better integrate technology with human beings and nature’.³⁹ On this account, technological and civilizational developments are inextricably linked and ultimately driven by the purposive, cooperative, and creative capacities of human actors. In this regard, Simondon’s ‘theory of

concretization' draws an important distinction between 'technicity' and 'utility': the former defines 'what makes technology technical'⁴⁰ and is present in all technical devices and systems; the latter designates technology's 'relation to human needs'.⁴¹ Convinced that '[c]ontemporary struggles over technology are profoundly political',⁴² Feenberg identifies two interrelated, but distinct, types of progress: technical and normative.⁴³ Just as it would be a mistake to reduce one to the other, it would be erroneous to pretend they can be understood in isolation from each other. An important difference between these two forms of progress, however, is the following: whereas normative progress is reversible, technical progress is irreversible.

Part II

Part II is entitled 'Application'.⁴⁴ It comprises only one chapter, entitled 'The Internet in Question'⁴⁵ (Chapter 4). It provides an empirical application of socio-constructivist methodology to contemporary debates on recent and possible future developments of the Internet. A central question explored in this chapter is whether or not 'market rationality' and 'communicative rationality' can harmoniously coexist on the Internet.⁴⁶ At the core of global digital communication technologies, there is a tension between these two forms of rationality – a source of concern to which one may add the antinomy between 'instrumental rationality' and 'substantive rationality'.⁴⁷ Its internal contradictions notwithstanding, the Internet remains an important public space, in which debates and controversies shaping society take place.⁴⁸ The Internet, however, has several problematic aspects:

- It fragments and polarizes public life to the degree that it promotes the emergence of '*echo chambers*' in which individuals never contact anyone with dissenting views'.⁴⁹
- It is 'defined by narcissistic *self-advertisement and business*',⁵⁰ serving the self-promotion of both individual and collective actors motivated by a variety of vested interests.
- It is a crucial medium for the exercise of *systemic power*. At the economic level, it is permeated by capitalist market forces, epitomized in 'the dispiriting commercialism of Facebook and Google'.⁵¹ At the political level, it can be used for influencing, if not controlling, public opinion – both in liberal and in authoritarian societies.
- It is a tool of *mass surveillance*. The powerful role of 'corporate and government surveillance'⁵² can hardly be overestimated, reminding us that the 'progressive uses of the Internet',⁵³ including its general contribution to democracy, cannot be dissociated from its retrograde tendencies.

Feenberg, in contrast to orthodox Marxist interpretations of the digital age, affirms that public engagement with pressing contemporary issues on the Internet is 'not motivated by struggle over the distribution of surplus value as are workers' struggles'.⁵⁴ This is not to deny that Marx had a subtle understanding of technology, including its vital role in mobilizing industrial workers across the globe. In the early twenty-first century,

however, we have been witnessing the rise of an era in which, arguably, the quasi-ubiquity of technology is more evident than ever before in human history:

Today technical mediation touches every aspect of society, not just the factory. The entire population of advanced capitalist societies is enrolled in many overlapping technical networks, each of which is organized by a hierarchical administration modelled on capitalist management.⁵⁵

While recognizing the powerful role of technology in influencing societal developments, Feenberg – wary of technological determinism and civilizational fatalism – stresses the importance of *human agency* in shaping the course of history. On his account, '[h]uman action, not technology, will decide the future of the Internet'.⁵⁶ Feenberg warns his readers not to overstate the case for the alleged novelty of the Internet, since some of its defining characteristics – such as multifunctionality and multiconnectedness – are not unprecedented. Indeed, '[a]ll technologies establish networks in the sense that they bring people and things together',⁵⁷ and all technologies accomplish this 'in combinations determined by a mix of symbolic and causal relations'.⁵⁸ Drawing on Jürgen Habermas's work, one may wonder what place the Internet occupies in 'the system' and 'the lifeworld'.⁵⁹ Largely controlled by both corporate and governmental forces, it constitutes an essential element of people's (digitally mediated) experience of, and interaction with, reality. In this chapter, Feenberg offers an in-depth analysis of key sociological issues arising from the tension-laden constitution of the Internet, illustrating that its very existence hinges on both subjects and objects, symbolic and causal relations, normative and objective forces, experiential and systemic resources, communicative and instrumental powers, counterhegemonic and prohegemonic struggles.

Part III

Part III is entitled 'Theory'.⁶⁰ In this part, which contains three chapters, Feenberg aims to outline the relation of his own approach to the works produced by major scholars in his field of inquiry, permitting him to reformulate his *instrumentalization theory*.⁶¹ Questioning the preponderance of instrumental reason in modern society, Feenberg notes that '[p]hilosophers have long criticized a form of life based on the pursuit of ever more powerful means without regard for any higher purpose'.⁶² In the 'disenchanted' world of modernity, the concern with *means* appears to override the concern with *ends* – that is, formal rationality (*Zweckrationalität*) seems to trump value rationality (*Wertrationalität*). In premodern times, the search for 'higher purposes' used to be justified by 'worldviews based on myths effectively refuted by the Enlightenment'.⁶³ The rise of modernity is inextricably linked to the emancipation from ideological dogmas that lack epistemic validity, social authority, and political legitimacy when assessed against rigorous standards of discursive rationality, critical inquiry, and scientific discovery. Yet, 'the belief in progress that inspired the Enlightenment'⁶⁴ cannot be dissociated from the repressive and retrograde tendencies that appear to be built into modernity. Instrumentalization theory seeks to unearth the 'progressive possibilities'⁶⁵

inherent in modernity without underestimating its regressive potential and without drawing ‘dystopian conclusions’.⁶⁶ Part of this journey is to demonstrate that human rationality, in the sense of *Vernunft*, is an emancipatory capacity. Thus, ‘instead of showing the *social dimension of rationality*’,⁶⁷ as in the previous chapters, the aim of these chapters is ‘to show the *rationality of the social*’.⁶⁸ Such an undertaking, which urges us to renew CT’s dialogical engagement with the social sciences, may provide us with solid grounds on which to make a case for ‘a revised idea of progress’.⁶⁹

Chapter 5 – entitled ‘Reason and Experience in the Age of the Technosystem’⁷⁰ – considers different theories of modernity, notably the intellectual contributions made by prominent members of the Frankfurt School, but also those by György Lukács and Hannah Arendt. According to Feenberg, a striking feature that these scholars have in common is that they ‘all resist the reduction of the social world to functionality’.⁷¹ Hence, they are all critical of the preponderance of instrumental rationality over emancipatory forms of rationality – such as communicative, discursive, substantive, and critical modes of rationality. For Feenberg, a central problem with contemporary (particularly Habermasian and post-Habermasian) CT is not only that it tends to be reformist, rather than radical or revolutionary, but also that its understanding of the political (and, one may add, of the social, the cultural, and the economic) ‘excludes the technosystem’.⁷² Feenberg complains that, within these reductive accounts, ‘[s]ocial struggle over the technosystem is undertheorized, if not completely ignored’,⁷³ since it is attributed, at best, a peripheral status within their conceptual architectures of society. Effectively, this leads to ‘a renewed version of the split between (political) values and (technical) facts’,⁷⁴ which is both theoretically misleading and practically counterproductive.

Value and fact are rigorously distinguished only in theory. In everyday life they mix as in the good old days of Aristotle.⁷⁵

In sum: at the *conceptual* level, facts and values may be differentiated as ideal types; at the *ontological* level, they overlap. In the social world, *all ‘facts’ are value-laden*, since they are interpreted, and acted upon, in a contextually contingent and culturally variable fashion. At the same time, *all ‘values’ are fact-laden*, since they impact upon the ways in which humans engage in both the material and the symbolic construction of the objective, normative, and subjective dimensions pervading their existence. This ‘double hermeneutic’ regarding the relationship between *facts* and *values* is reflected in the ‘double existence’ of functional objects, which are ‘both what they are and what they are for’⁷⁶ – that is, they have both an objective and a purposive character. Functionality ‘crosses the line between value and fact’.⁷⁷ It bridges the alleged gap between the two, since the functions attributed to things have both physical and cultural components. Indeed, ‘[t]he double aspects – factual and normative – apply to the technical sphere as to every other aspect of life’.⁷⁸ For they are integral to the human world, whose incessant construction depends on the combination of what *is* and what *ought to be*. In the age of the technosystem, reason permits us to make sense of, and experience allows us to engage with, the technological mediation of the world.

Chapter 6 – entitled ‘The Concept of Function in Critical Constructivism’⁷⁹ – is arguably the intellectually most challenging and theoretically richest section of

Feenberg's book. It traces the philosophical background to his instrumentalization theory in the works of Heidegger and Lukács, demonstrating 'its relevance to the concept of functionality in an analytic philosophy of technology'.⁸⁰ In terms of breadth and depth, this chapter is both impressive and inspiring. Owing to its complexity, it is difficult to provide an accurate summary of its main arguments in one paragraph. The key purpose of this chapter is to explore 'the nature and limits of functionality'.⁸¹ Undoubtedly, '[f]unctions and functional objects have a place in social life'.⁸² Indeed, one may add that the whole point of sociological functionalism is to grasp the constitution of social phenomena, forces, and constellations in terms of their functions. Given the centrality of this task, functionalist approaches can be found in intellectual traditions as diverse as institutionalism, Marxism, feminism, and constructivism. The problem, however, is that 'modern societies treat everything as a function',⁸³ illustrating the preponderance of instrumental rationality (that is, ultimately, functionalist rationality⁸⁴) in the context of modernity. Feenberg rightly poses the question of why it appears to be the case that functionality 'gives rise to the crises and pathologies of modernity'.⁸⁵ Part of the answer he gives to this question is what may be described as *the universalization of functionality in modernity*:

Functional understanding has become a universal perspective, an a priori principle for the constitution of objects generally with disastrous consequences.⁸⁶

Functionality is so central to the human condition that even its compulsive celebration may be normalized, if not naturalized, to such an extent that those immersed in, if not controlled by, it are more likely to reinforce than to undermine its ubiquitous dominance. Grappling with the multifaceted implications of this issue, Feenberg goes on to argue that an 'implicit theory of function'⁸⁷ informs the writings of Heidegger, Lukács, and Marcuse.

Considering different *theories of function*,⁸⁸ Feenberg starts from the assumption that '[t]echnical objects have a foot in two worlds'⁸⁹: on the one hand, in 'a world of *human intentions*',⁹⁰ which is both *subjective* in that these are projected upon reality by meaning-generating actors and *normative* in that these are embedded in culturally variable horizons of interpretation; on the other hand, in 'a world of *objective properties*',⁹¹ which is *factual* in that these are inherent in the ontological constitution of the entities in question. Arguably, the most convincing 'analytic theories of technical function'⁹² are those that offer a balanced account of both sides of this relation. Furthermore, it is essential to grasp both the 'everyday' and the 'scientific' uses of the term 'function'. This can be achieved by developing a 'double hermeneutic', capable of understanding the interaction of epistemic layers produced by both laypersons and experts.⁹³

As emphasized by Wybo Houkes and Pieter E. Vermaas in their 'dual natures' project,⁹⁴ both sides of functionality need to be studied: its *subjective* side 'consists in beliefs and purposes together constituting a user-plan',⁹⁵ which is derived from presuppositions about properties 'based on direct experience or on information obtained from experts'⁹⁶ (or a combination of these two epistemic levels); its *objective* side 'consists in specific physical properties',⁹⁷ whose ontological significance can be comprehended by

laypersons and/or experts on the basis of everyday experience and/or evidence-based research.

Feenberg rejects (or at least claims to reject) ‘technological determinism’⁹⁸ – that is, the supposition that both the constitution and the development of the social world are largely, if not entirely, determined by technological forces. In this respect, he proposes to distinguish between *technique* and *technologies*⁹⁹: the former refers to ‘specific technical elements [...] which are in themselves *neutral* applications of *objective* knowledge of nature’¹⁰⁰; the latter designate ‘developed *ensembles of technical elements*’¹⁰¹ and, as such, ‘are *greater than the sums of their parts*’.¹⁰² Technologies are defined by socially contingent ‘criteria of purpose’¹⁰³ realized through ‘the very selection and arrangement of the intrinsically neutral units from which they are built up’.¹⁰⁴ These criteria are ‘embodied’ in the technology and, hence, irreducible to ‘an extrinsic use to which a neutral tool might be put’.¹⁰⁵ In short, technologies are culturally codified, purposively signified, and functionally organized sets of techniques. Feenberg’s ‘critical constructivism’ is a plea for a ‘double-aspect theory of technology with the implied reference to double-aspect theories of the mind/body relation’.¹⁰⁶ Such an approach discards both purely *mechanical* and merely *contextual* explanations of technology: the former lead to ‘naïve instrumentalism or technological determinism’,¹⁰⁷ whereas the latter result in short-sighted perspectivism or technological relativism. The aim, then, is to demonstrate the extent to which, far from excluding one another, ‘[c]ausality and culture intersect in functionality’.¹⁰⁸

In this regard, Feenberg’s distinction between *functionalism* and *CC* is important:¹⁰⁹

- The former, which is epitomized in *analytic theories of function*, stresses ‘cognitive aspects of the interaction between causality and culture’.¹¹⁰ On this account, the projective attribution of function to a particular object hinges on an actor’s assumption that ‘the materials possess natural properties suitable for use’.¹¹¹ The preoccupation with physical qualities in the ascription of function is essential to the scientific discovery of ‘the naturalistically conceived objective properties of things’.¹¹²
- The latter, which is reflected in a *phenomenology of functionality*,¹¹³ explores ‘social aspects of the phenomena’¹¹⁴ under consideration. This framework is action-theoretic – not only in that it takes ‘the beliefs and intentions of actors’¹¹⁵ seriously, but also in that it examines ‘the subjective and objective conditions of functionalization as a social process’.¹¹⁶ Such a constructivist-phenomenological venture permits us to understand that not only the physical properties of objects but also the interpretations performed by subjects are integral to ‘the problems to which technical solutions are addressed’¹¹⁷ – by both laypersons and experts. If ‘user experiences’¹¹⁸ made by actors in their lifeworlds are crucial to both the development and the application of technology, then ‘function must be situated in relation to the culture and way of life it serves’.¹¹⁹ In short, a technical object is *both* ‘a sum of physical properties’¹²⁰ *and* an ensemble of normatively and subjectively variable presuppositions and intentions. It is worth remembering that CT, long before the rise of

constructivism, urged us to take issue with crude versions of positivism by recognizing that ‘facts are *made*, mediated by Subjectivity’.¹²¹

In the remaining sections of this chapter, Feenberg provides a thorough overview of the philosophies of technology in the writings of Heidegger and Lukács, culminating in a passionate defence of his own approach: *instrumentalization theory*, which – as he notes – he has been developing in his previous works.¹²² In essence, it represents Feenberg’s systematic attempt ‘to account for functionality as a social phenomenon’.¹²³ More specifically, it aims to demonstrate that several aspects of what he terms ‘technique’ manifest themselves in ‘the structure of the technical subject and object’.¹²⁴ Pursuing this endeavour, he insists on ‘the double aspects of technical functionality. *There is no purely technical; the technical is always already cultural*’.¹²⁵ Instrumentalization theory, then, draws on the following insights:

1. ‘[C]ausal and cultural functionalizations complement each other’,¹²⁶ making the allocation of specific functions in the design of artefacts and systems possible in the first place.
2. Like other elements of social life, ‘design is never fixed once and for all’¹²⁷ but adjustable and replaceable, illustrating the reconstructability and renormalizability of all spatiotemporally contingent facets of the human world. Actors can ‘resignify the object in terms of new demands’¹²⁸ and, in accordance with potentially changing circumstances, ascribe ‘new technical characteristics’¹²⁹ to it.

In other words, the analysis of functionalization processes ‘splits along two axes, causal and cultural aspects, and objective and subjective aspects’,¹³⁰ which, while being conceptually separable, are ontologically interrelated. Traditional dichotomies – such as structure/agency, object/subject, material/symbolic, and macro/micro – collapse when recognizing the interdependence and interpenetration of structural and agential, objective and subjective, material and symbolic, as well as macro- and micro-level forces in the creation, application, and circulation of technology.¹³¹

For Feenberg, the *technosystem* contains three key components: (1) *markets*, (2) *administrations*, and (3) *technologies*.¹³² Each of these is sustained by a particular form of ‘social rationality’¹³³:

Markets exhibit mathematical equivalence, *administrations* relate rules to cases on the model of the relation of scientific law to particular facts, and *technology* seeks optimization and efficiency through measurement and calculation. The instrumentalization theory applies with some modifications to markets and administrations. In all three spheres, *possibilities of technical control* are designed into objects or institutions in conformity with a *combination of causal and cultural principles*.¹³⁴

Markets involve processes of *commodification*, administrations require processes of *bureaucratization*, and technologies entail processes of *control optimization*. The central aim of Feenberg’s instrumentalization theory is to uncover the interdependence and interpenetration of these three components. The technosystem represents ‘a field of technical practices aimed at control of the environment, whether natural, economic, or

administrative'.¹³⁵ It is crucial, however, *not* to isolate rationalities (irrespective of their typological specificity) from the social contexts in which they are embedded and employed.¹³⁶ From Feenberg's perspective, the environment can be regarded 'as an ensemble of sociotechnically rational functions'¹³⁷ – in short, as a functionally organized ecosystem constructed, and constantly reconstructed, by purposive, cooperative, and creative creatures capable of providing reasons for their actions. Functionality, far from being reducible to 'a subjective idea'¹³⁸ or 'a material fact'¹³⁹ (or indeed a combination of the two), constitutes 'a *social process*'¹⁴⁰ in and through which technical concerns are cross-fertilized with 'cultural or political desiderata'¹⁴¹ and tested against objective 'constraints in the design of concrete artifacts or systems'.¹⁴²

The principal problem with the technosystem is that it 'strives to be all-encompassing',¹⁴³ since it is oriented towards the 'total functionalization'¹⁴⁴ of society. This process has highly detrimental consequences, three of which are particularly noteworthy:

1. the dehumanization, depersonalization, and instrumentalization of social relations;
2. the systematic destruction of the environment on a global scale; and
3. the technical manipulation of culturally specific meanings, contributing to the rise of nihilistic scepticism.¹⁴⁵

These serious consequences cannot be alleviated, let alone undone, by redefining or 'pushing back the boundaries of technical mediation'.¹⁴⁶ '[U]niversal functionalization'¹⁴⁷ is so essential to late-modern life that 'a return to "nature" is inconceivable'.¹⁴⁸ In a world of total functionalization, 'the richness and complexity of both lived experience and the human subject'¹⁴⁹ are undermined by processes of abstraction and alienation. Crucially, for Feenberg, decisive 'democratic interventions into the technical domain'¹⁵⁰ are required to bring about a 'gestalt switch',¹⁵¹ capable of overcoming the pathologies of modernity by building a society in which the fulfilment of human needs, rather than the pursuit of instrumental imperatives, takes priority.

Chapter 7 – entitled 'The Logic of Protest'¹⁵² – examines 'the rationality of public interventions into the technosystem'.¹⁵³ It does so by affirming that the theory of judgement, derived from Arendt's interpretation of Immanuel Kant's aesthetics, can serve as a tool to make sense of the tension-laden relationship between laypersons and experts. Such an undertaking obliges us to reflect on the nature of the public sphere. In this respect, Feenberg suggests that rhetorical analysis of public debate may provide a viable alternative to Habermas's discourse ethics, including his 'rationalistic theory of deliberative democracy'.¹⁵⁴ Similar to Habermas, other prominent critical theorists – such as Horkheimer, Adorno, and Marcuse – have articulated powerful critiques of instrumental rationality, while arguing for 'the possibility of another form of rationality that would fulfill the dream of enlightenment without its destructive consequences'.¹⁵⁵

Feenberg explores the role of judgement in shaping societal developments.¹⁵⁶ In his opinion, Kant's distinction between 'determinant' (or 'determinative') and 'reflective' types of judgement may be useful in this respect. Moreover, Feenberg offers a pertinent account of Alena Azmanova's theory of public debate, which – he maintains – can be applied to the study of the politics of the technosystem. Particularly important in this

regard is her proposal to distinguish four levels in the normative structure of society: (1) institutional rules and procedures, (2) a multiplicity of values and interests, (3) principles of justice, and (4) a 'phronetic' coding with paradigms of articulation and significance.¹⁵⁷ Finally, Feenberg reflects on 'the rhetoric of the technosystem'.¹⁵⁸ Here, he builds on two key distinctions: first, Michel Foucault's distinction between (informal, experience-based, and explicitly normative) 'subjugated knowledges' and (formal, abstract, and canonized) 'scientific knowledge'; second, Michel de Certeau's distinction between (official and institutional) 'strategies' and (unofficial and grassroots) 'tactics' employed by actors occupying subordinate positions within institutions. In this conflict between prohegemonic and counterhegemonic forces, instrumentalization theory aims to open up a space of imagination in which '[t]he struggle over the technosystem'¹⁵⁹ lies at the core of the quest for human emancipation.

The concluding chapter deals with '*the question of progress*'.¹⁶⁰ Feenberg starts from the assumption that CT 'has always been based on utopian hopes'.¹⁶¹ In his eyes, this – broadly optimistic – outlook presupposes a conception of history that is (at least potentially) 'progressive'.¹⁶² Given this (implicit or explicit) belief in 'progress', postmodern and postcolonial approaches pose a serious challenge to CT, insofar as its advocates seek to escape the charges of relativism and (Eurocentric) universalism.¹⁶³ Feenberg urges his readers to conceive of progress 'not as a *tendency* of history but as an achievement of *struggle* against injustice'.¹⁶⁴ To qualify as truly progressive, however, the normative grounds underlying these struggles cannot be confined to the typical versions of Western principles and ideals but must be nourished by 'the progressive desires of peoples everywhere'¹⁶⁵ across the globe.

Over the past decades, there has been a shift from the (somewhat ambitious) pursuit of 'grand narratives' to the (comparatively modest) defence of 'local narratives'.¹⁶⁶ Just as postmodernists à la Jean-François Lyotard reject the idea of 'progress' as an illusion embedded in modernity's *Zeitgeist*,¹⁶⁷ critical theorists à la Walter Benjamin have been warning for some time that 'faith in progress has gilded the horrors of history in a false glory'.¹⁶⁸ Amy Allen's *The End of Progress*¹⁶⁹ is a bold attempt to take postcolonial sensitivities seriously, notably the accusation that European intellectuals – among them, critical theorists – tend to ignore, if not to deny, 'the entanglement of their normative ideals with the horrific facts of colonial domination and genocide'.¹⁷⁰ Allen insists on exposing the intertwinement of modernity (including the Enlightenment) and imperialism (including colonialism). Faced with this challenge, she advocates a 'metanormative contextualism',¹⁷¹ which is based on two assumptions:

1. 'moral principles or normative ideals are always justified relative to a set of contextually salient values, conceptions of the good life, normative horizons – roughly speaking, forms of life or lifeworlds'¹⁷²;
2. 'there is no über-context, no context-free or transcendent point of view from which we can adjudicate which contexts are ultimately correct'.¹⁷³

On this account, 'progress' is possible, but the very idea of 'civilizational leaning'¹⁷⁴ is to be rejected, insofar as it reinforces the myth of 'the transcendent superiority of the West'.¹⁷⁵ It appears, then, that CT needs to overcome both epistemic extremes – that is, universalism and particularism, foundationalism and relativism, transcendentalism and

contextualism – if it seeks to propose a credible ‘third position’.¹⁷⁶ To Feenberg’s mind, however, it is vital to recognize that *social, political, and moral* forms of progress cannot be properly understood without considering the issue of *scientific-technical* progress.¹⁷⁷ In his assessment, ‘the clean separation of normative and technical rationality’¹⁷⁸ is a highly questionable epistemological and methodological move that brings CT dangerously close to the realm of mainstream – including conservative – political theory.¹⁷⁹ One of the dangers of such a short-sighted approach is that it fails to acknowledge that ‘obstacles to progress are often not political in the usual sense but are embedded in the design of the technosystem’.¹⁸⁰ Progress – far from being reducible to legal, judicial, political, or institutional changes, which are of primary concern in procedural theories of democracy¹⁸¹ – is ‘realized *essentially* through technosystem change’.¹⁸² If we fall into the positivist trap of portraying ‘the technical conditions of progress as external “facts”’,¹⁸³ then we run the risk of obscuring the pivotal role that democratic struggles play in shaping – and, if required, transforming – ‘the technical base itself’.¹⁸⁴

A key problem inherent in the technosystem, of course, is that it promotes, and indeed depends upon, ‘the peculiar hegemony of technical reason in modern societies’.¹⁸⁵ Feenberg’s CC faces up to ‘the failure of technical reason to deliver the moral advance promised since the Enlightenment’,¹⁸⁶ thereby discarding a naïvely optimistic, and essentially evolutionist, account of modernity. Whereas normative progress is reversible, technical progress is irreversible. The crucial point in this respect, however, is this: ‘Progress is not technical *or* moral but technical *and* moral’.¹⁸⁷ In other words, progress is driven by both *Verstand* and *Vernunft* (not to mention *Urteilskraft*).

Given the intertwinement of technical and normative aspects of social development, it is crucial to abandon the ‘naïve confidence in progress’¹⁸⁸ present in positivist and evolutionist thought. For this to be achieved, we need to urge both laypersons and experts ‘to appreciate instances of progress where they occur’.¹⁸⁹ While the metanarratives of modernity have arguably undergone a major crisis of legitimacy, as illustrated in the ‘postmodern turn’ in the social sciences,¹⁹⁰ local forms of progress – epitomized in the celebration of micronarratives – have had, and continue to have, a significant impact on the development of highly advanced societies in the early twenty-first century. The paradigm shift from grand (‘global’) narratives to small (‘local’) narratives may ‘free the imagination to explore alternatives to both the existing society and the failed revolutions of the past’.¹⁹¹ Rather than announcing ‘the end of progress’, however, we need to concede that we are only just witnessing its beginning.¹⁹² In a normative sense, then, it is imperative to remind ourselves that believing in some kind of progress is crucial to public interventions. From a genuinely forward-looking perspective, there is no point in fighting for change unless those endorsing it consider it progressive.¹⁹³

II. Weaknesses and limitations

Let us reflect on the weaknesses and limitations of Feenberg’s *Technosystem* in the following sections.

Imbalance

It is to Feenberg's credit that he has sought to demonstrate the relevance of his theoretical framework to the empirical study of social reality. Despite this laudable intention, there is a noticeable imbalance between the theoretical and the empirical parts of his argument. In fact, Part II – which is entitled 'Application'¹⁹⁴ – is the only section of the book that has a genuinely substantive focus. This part consists of just one chapter. This means that, out of eight chapters (if we include the Introduction and the Conclusion), only one chapter has an empirical outlook. Unsympathetic critics may object that this one-chapter section seems 'tagged on', since the book is, for the most part, a theoretical treatise, rather than an empirical investigation.

Editing

The book could have been edited more carefully. For instance, the use of punctuation (especially commas and hyphens) is somewhat sloppy and inconsistent. This may be partly due to the fact that the manuscript is based on articles previously published in different outlets, such as academic journals and edited books, with different house styles. Yet, this shortcoming adds to the impression that the book, because it is essentially a collection of already published material, does not hang together in a way that would allow its author to tell a coherent story.

A collection of essays?

The book contains only two 'new' chapters (Chapters 5 and 7). As spelled out in the Preface, various chapters 'have been published in earlier versions'.¹⁹⁵ In fact, this applies to almost the entire manuscript – notably the Introduction and Chapters 1, 2, 3, 4, and 6. In his Preface, Feenberg thanks several people for helping him 'to write this book'.¹⁹⁶ It may have been more accurate if Feenberg had expressed his gratitude to them for having helped him to write several articles, which he subsequently put together and converted into a book. In one of the three endorsements that appear on the book cover, Wiebe E. Bijker states that 'Feenberg has written his magnum opus'. Without wanting to question Feenberg's considerable intellectual achievements (of which there are plenty, both in this book and in other works), Bijker's commendation seems to be an overstatement, given that a collection of previously published articles – which, after some revisions, are simply put together – hardly qualifies as a 'masterpiece'. This is not a merely formal matter but a serious content-related issue, in the sense that one major weakness of the book is that it is not always clear how the various chapters are logically interconnected, let alone how they make an overarching argument.

Granted, each 'Part' is introduced by means of a valuable overview of what lies ahead, and the chapters share a concern with what Feenberg describes as 'the techno-system'. The chapters, however, are uneven in terms of their quality (with Chapter 6 standing out as by far the strongest contribution). Moreover, as a reader, one gets the impression that they were written for different audiences and that, although each chapter makes interesting points, together they do not result in a compelling argument that is

based on a clear and coherent structure. Perhaps the most obvious example of this problem is the 'Conclusion'.¹⁹⁷ Feenberg states that it 'sums up the argument of the book in relation to the question of progress as elaborated there and in the debates among critical theorists'.¹⁹⁸ This chapter, however, is essentially a separate discussion of Amy Allen's *The End of Progress*.¹⁹⁹ Despite some thematic overlap with the previous chapters, it certainly does *not* 'sum up the argument of the book'. Considering the above, it would have been useful if the book's subtitle had included the words *Philosophical Essays*, indicating that, except for two chapters, this volume is a set of previously published papers.

Questionable claims

The quality of Feenberg's argument suffers from several questionable claims. For the sake of brevity, let us consider only some of them.

- 'Truth is always subtly eccentric with respect to the real'.²⁰⁰ Admittedly, this quote is taken out of context. Even when read in the context of the surrounding text, however, it is far from clear what exactly Feenberg is trying to convey here. The trouble is that Feenberg's book contains plenty of aphorisms of this sort, which may sound elegant and insightful, but which lack rigorous conceptual, let alone empirical, substantiation.
- 'For analytic purposes, Habermas and Honneth relate normativity to the first-person perspective of the participant and the empirical facts of power to the third-person perspective of the observer'.²⁰¹ This is a bold claim, for which Feenberg fails to provide any textual evidence. This may not come as a surprise, given that it caricatures the intellectual positions taken by these two prominent scholars. For both Habermas and Honneth, the construction of normativity and factuality is inextricably linked to physical, cultural, and personal dimensions of human reality. These are expressed, and interpreted, through the confluence of first-person, second-person, and third-person perspectives. Lifeworlds are sustained by communicative (Habermas) and recognitive (Honneth) processes, allowing for the emergence of spheres of action and interaction, which, in the human universe, are generated and experienced as realms of objectivity, normativity, and subjectivity. Normativity and subjectivity are as much part of science as objectivity is part of people's lifeworlds, and vice versa. The simplistic opposition between 'normativity' (first-person perspective) and 'empirical facts' (third-person perspective) does not do justice to CT's attempt to account for the multifaceted constitution of 'reality' as it is constructed and 'the world' as it is experienced.
- 'As a member of my society I respond to rules of proper behavior as norms, while as an observer I perceive the power relations through which the rules have achieved normative status'.²⁰² One need not be a Boltanskian to recognize that power relations are perceived (and, indeed, understood, discussed, problematized, and challenged) not *only* by 'outside' observers (such as social scientists) but *also* by 'inside' ordinary actors immersed in everyday interactions. One need not be a

Bourdieuian to acknowledge that behavioural rules and conventions are responded to (and, indeed, understood, discussed, problematized, and challenged) not *only* by ‘inside’ ordinary actors (that is, members of society) but *also* by ‘outside’ observers embedded in competing, and yet interpenetrating, social fields.²⁰³ Once again, the simplistic opposition between ‘the following of behavioural rules’ (participant) and ‘the critique of behavioural rules’ (observer) fails to explore the extent to which these two levels of existential immersion and epistemic apprehension feed into each other.

- In the opening paragraph of the book, Feenberg – drawing on Aristotle – affirms that ‘philosophy begins in wonder’.²⁰⁴ He goes on to contend that ‘familiarity is the enemy of reflection’,²⁰⁵ before spelling out that one of the main aims of his book is ‘to defamiliarize one commonplace phenomenon: the social function of rationality’.²⁰⁶ It is true that wonder, disruption, and crisis are precious sources of reflection. Familiarity, however, is not necessarily ‘the enemy of reflection’. One need not be a hermeneutic philosopher à la Gadamer to accept that without familiarity and prejudice (*Vorurteilsstruktur*) there would be no reflection at all.²⁰⁷ Moreover, it is not clear why we should consider ‘the social function of rationality’ as a ‘commonplace phenomenon’. Quite the opposite is the case: ‘continental’ scholars (including critical theorists) have long criticized ‘analytic’ and ‘transcendental’ philosophers for failing to acknowledge the social constitution (including the social functions) of rationality, precisely because it is *not* a commonplace. These are only a few basic examples from the opening paragraph that illustrate a general weakness of the book: it makes too many sweeping statements and unsubstantiated, if not erroneous, assertions. There is nothing wrong with using aphorisms or making ‘big claims’ as long as their validity is properly argued and corroborated.

Lack of originality

A considerable weakness of this book is that it makes various points that, far from being particularly original, will appear self-evident to most readers. Let us consider three examples:

- ‘We must learn to live with the ambiguity’.²⁰⁸ Feenberg’s remarks regarding the ‘ambiguity’ or ‘ambivalence’ of the human condition are hardly original. Declarations of this sort have been made by numerous scholars from different angles in the humanities and social sciences.²⁰⁹
- ‘Most social critics, including the pessimists among them, believe implicitly in the idea of progress’.²¹⁰ Unsurprisingly, most readers will agree with this contention. More importantly, Feenberg needs to specify what kind of social critics he has in mind – presumably, left-wing and progressive, rather than right-wing and retrograde, ones. It would have been appropriate to explain why even those social critics who claim to be ‘progressive’ *without* endorsing a particular notion of ‘progress’ (especially postcolonialists and poststructuralists) actually, in one way or another, *do* believe in progress.

- The emphasis on the centrality of human practices ('you are what you do'²¹¹) has been on the agenda of different (notably philosophical and sociological) forms of pragmatism for some time. The same applies to the critique of consumer capitalism ('[t]oday, not only are you what you do but even more emphatically you are what you buy'²¹²), which social scientists have been articulating for several decades. It is hard to see what Feenberg has added to these age-old debates when summarizing them in aphoristic statements, of which there are plenty in his study.

'Non-human' versus 'human'?

Throughout the book, Feenberg appears to take the distinction between 'the non-human' and 'the human' for granted. A significant development in recent debates in the humanities and social sciences is widespread recognition of the fact that this distinction is increasingly blurred, both conceptually and empirically. Obvious examples include the environment, the body, cognition, culture, and – unsurprisingly – technology. These appear to indicate that classical dichotomies – such as 'non-human' versus 'human', 'nature' versus 'culture', 'objectivity' versus 'normativity' – are more and more difficult to defend. Feenberg broadly shares the 'modern' view that, as humans, we are equipped with the species-constitutive ability to (re)construct the conditions of our existence, by drawing on our purposive, cooperative, and creative capacities. To be clear, Feenberg provides numerous astute reflections on the human condition, stressing the power exercised by the constraints of our sociobiological immanence:

As humans we can only act on a system to which we ourselves belong. Any change we make in the system affects us, too. This is the practical significance of our corporeal and social being. We exist in a world of causal powers and meanings we do not fully control. Our body exposes us to the laws of nature. And we are born into a cultural world we largely take for granted. In short, we are finite beings. Our finitude shows up in the reciprocity of action and reaction.²¹³

Feenberg notes that '[o]ur body exposes us to the laws of nature',²¹⁴ but also to the contingencies of society, because 'we are born into a cultural world'.²¹⁵ Still, he rightly warns that '[t]he extraordinary power of human beings to modify their niche supports the illusion of independence from the natural world'.²¹⁶ It would have been useful, however, if he had elaborated on why the distinction between 'nature' and 'society' is not only controversial, but also possibly obsolete, if not misleading.

Furthermore, one may wonder how broad (or narrow) the definition of 'a system to which we ourselves belong'²¹⁷ should be. Owing to technology, we are able to *act on* the moon. While it is part of our universe, it would be hard to argue that we *belong to* the moon, let alone that we should consider it as a serious candidate for human habitation. The same applies to various additional elements of our solar system – notably other planets. In short, Feenberg needs to revise bold assertions such as '[a]s humans we can only act on a system to which we ourselves belong'.²¹⁸ One can find several examples that suggest otherwise.

Technology and experience

Feenberg's analysis of the relationship between technology and society is based on a somewhat narrow conception of experience. He associates *experience* with the *lifeworld*, rather than with *science*. This is reductive, however, given that experience constitutes an integral part of the scientific endeavour, notably of its empirical variants. Thus, 'technical knowledge and experience'²¹⁹ are not only 'complementary'²²⁰ but also co-constitutive. The former is not simply 'incomplete'²²¹ but, more fundamentally, inconceivable 'without input from'²²² the latter. We may add that, within the philosophy of science, experience serves as a foundational category in two diametrically opposed conceptions of social research: for positivists and realists, experience is a crucial source of *objective* knowledge; for constructivists and interpretivists, experience is a vital source of *normative* and/or *subjective* knowledge. For all of them, however, experience is a – if not, *the* – key source of knowledge, not only (as emphasized by Feenberg) in the lifeworld but also (as largely ignored by Feenberg) in science.

Hence, the opposition between *science* (as 'an absolute spectator on existence'²²³) and *everyday experience* (involving 'active persons in the contingent movement of events and ideas'²²⁴) is problematic, unless we recognize that the former and the latter are *co-constitutive*. Just as science relies on experience as a major point of reference in the search for epistemic validity, experience is permeated by science in both the material and the symbolic construction of social reality. Consider, however, Feenberg's following passage:

The nature discovered by science seems indifferent to humanity, while the nature we experience is saturated with anthropomorphic qualities. We moderns believe in science. By contrast we think our ordinary understandings of nature are subjective.²²⁵

This statement (similar to several other sets of assertions in Feenberg's book) is flawed for a number of reasons. (1) Given that '*nature*' has been profoundly influenced and shaped (and, on many levels, both dominated and exploited) by '*humanity*', the former and the latter are deeply *intertwined*, not least since the emergence of the Anthropocene. (2) Not all 'moderns believe in science' – or there is at least a *large spectrum of opinions on the role and power of science*, ranging from highly optimistic to highly pessimistic accounts of what it can achieve. (3) Most modern epistemologists would agree that 'our ordinary understandings of nature' are not only subjective but also objective and normative – that is, our everyday ways of making sense of the world are shaped by varying degrees of *objectivity*, *normativity*, and *subjectivity*, since human survival is inconceivable without the socio-epistemic confluence of *realism*, *tribalism*, and *perspectivism*.

Feenberg is right to insist that '[s]cience is supposed to inform and guide experience',²²⁶ but he fails to stress that the latter is also supposed to inform and guide the former (in fact, he denies this when adding 'not the other way around'). In short, his phenomenological (that is, lifeworld-focused) conception of experience is deeply problematic in that it overlooks the fact that the whole point of science (notably its empirical and empiricist versions) is to rely on experience – not only as its epistemic starting point, but also as its principal source of inquiry and discovery.

Science criticizes and transcends lived experience. It separates itself from our experience through rigorous critique. [...] The scientific idea of nature involves a systematic negation of experience; appearance and reality stand opposed.²²⁷

To conceptualize ‘science’ and ‘experience’ (by the way, there is no such thing as a ‘non-lived experience’) in terms of a categorical opposition of this sort is misleading. In a society that is profoundly shaped by advanced forms of technology, the boundaries between ‘science’ and ‘experience’ are increasingly blurred. Feenberg, therefore, is right to insist that ‘[i]t is *no longer* possible to decide in principle between our two relations to nature’²²⁸ – that is, an ordinary and a scientific one. He could have gone a step further, however, by conceding that it has *never* been possible to decide between these two relations – that is, *ever since* scientific knowledge has shaped ‘our entire material existence through its technological applications’.²²⁹

‘Science and technology influence our understanding of our experience, but the reverse is also true’.²³⁰ If our interpretation of the relationship between science and experience is ‘dialectical rather than hierarchical’,²³¹ then neither everyday experience nor science will have ‘the last word’.²³² We, as members of the human species, are not able to choose between ‘science’ and ‘experience’, since both of them – as ‘two ontological principles’²³³ and cornerstones of technologically advanced life forms – ‘operate in our civilization and culture’.²³⁴ The point, therefore, is to conceive of the relationship between science and experience not as a ‘persistent dualism’,²³⁵ but, rather, as a historical constellation of interdependence and interpenetration.

Technology and protest

Feenberg makes several pertinent observations on the role of collective protests in bringing about social change. A problematic aspect of his analysis, however, is that he tends to assume that most – if not all – protests are ultimately about technology. He contends that ‘values are the facts of the future’.²³⁶ Given their ontological intertwinement, ‘[v]alues are not the opposite of fact’.²³⁷ In the social world, the former and the latter permeate, if not presuppose, one another. While it is true that the world in which we live has been, and continues to be, shaped by values, it is reductive to affirm that ‘[t]echnologies are the crystallized expression of those values’.²³⁸ Technologies are partly (and, in many cases, profoundly) influenced by *values*, but their development is also contingent on *facts* – that is, not only on *normative* arrangements and *subjective* perceptions, but also on *objective* constellations.

Feenberg’s ‘technologicistic’ conception of political contestation leads him to suggest that ‘[p]rotests formulated in the language of values express aspects of reality that have not yet been incorporated into the technical environment’.²³⁹ Contrary to this assertion, however, social protests *may* express aspects of reality that have *already* been incorporated into the technical environment – not to mention the fact that there are numerous forms of political contestation in which the technical environment plays at best a secondary (if any serious) role. The confluence of *the normative force of the factual* and *the factual force of the normative* is vital to the construction of human realities. This insight does not permit us, however, to conclude that technological issues lie at the core of *all*

social and political struggles. All conflicts over values, articulated in protests of different forms, are permeated by technology. This does not mean that the former are always primarily concerned with, let alone driven by, the latter.

Technological determinism

A major irony of Feenberg's book is the following contradiction: on several occasions, he criticizes, and distances himself from, technological determinism; key parts of his argument suggest, however, that he himself flirts with, if not subscribes to, technological determinism. He rightly maintains, and convincingly demonstrates, that 'society and technology are inextricably imbricated'.²⁴⁰ This insight justifies the underlying assumption that there is no comprehensive study of society without a critical sociology of technology. Yet, to contend that '[s]ocial groups exist through the technologies that bind their members together'²⁴¹ is misleading. For not *all* social groups are *primarily* defined by the technologies that enable their members to relate to, and to bond with, one another. Indeed, not all social relations, or social bonds, are based on, let alone determined by, technology.

Of course, Feenberg is right to argue that 'technologically mediated groups influence technical design through their choices and protests'.²⁴² Ultimately, though, the previous assertion is tautological. This becomes clear if, in the above sentence, we replace the word 'technological(ly)' with terms such as 'cultural(ly)', 'linguistical(ly)', 'political(ly)', 'economic(ally)', or indeed another sociological qualifier commonly used to characterize the specificity of a social relation. Hence, we may declare that 'culturally, linguistically, politically, and economically mediated groups influence cultural, linguistic, political, and economic conventions through their choices and protests'. In saying so, we are stating the obvious. If, however, we aim to make a case for cultural, linguistic, political, or economic determinism, then this is problematic to the extent that we end up reducing the constitution of social arrangements to the product of one overriding causal set of forces (whether these be cultural, linguistic, political, economic, technological, or otherwise).

While declaring that he is a critic of technological determinism, Feenberg – in central passages of his book – gives the impression that he is one of its fiercest advocates. Feenberg's techno-Marxist evolutionism is based on the premise that 'progress is realized *essentially* through technosystem change'²⁴³ – that is, on the assumption that, effectively, human progress is reducible to technological development. Feenberg is right to stress that '[t]echnical progress is joined indissolubly to the democratic enlargement of access to its benefits and protection from its harms'.²⁴⁴ 'Concretization',²⁴⁵ understood in this way, conceives of progress as a 'local, context-bound phenomenon uniting technical and normative dimensions'.²⁴⁶ We may add, however, that progress has not only technical (or technological) but also economic, cultural, and political dimensions, which contain objective, normative, and subjective facets. At times, the differentiation between these aspects is blurred, if not lost, in Feenberg's account, given his tendency to overstate the power of technology at the expense of other crucial social forces. In other words, progress is not only 'inextricably entangled with the technosystem',²⁴⁷ but it is also indissolubly entwined with the *economic*, *cultural*, and *political* systems in which it

unfolds and for (or against) which it exerts its *objective*, *normative*, and *subjective* power.

The preceding reflection takes us back to the problem of techno-reductionism:

The struggle over the technosystem began with the labor movement. Workers' demands for health and safety on the job were public interventions into production technology.²⁴⁸

All struggles over social (sub)systems have *not only* a technological *but also* various other (notably economic, cultural, and political) dimensions. Demands made by particular subjects (defined by class, ethnicity, gender, age, or ability – or a combination of these sociological variables) are commonly expressed in public interventions *not only* into production technology, *but also* into economic, cultural, and political systems. In all social struggles (including class struggle), technology can be an important means to an end, but it is rarely an end in itself. Put differently, social struggles are partly – but seldom essentially, let alone exclusively – about technology.

Techno-socialism

Feenberg seems to harbour the hope of building a future in which socialism prevails – and, with it, a 'socialist technology',²⁴⁹ which serves the goal of human fulfilment, empowerment, and emancipation. 'The dream of socialist technology designed and controlled by those who build and use it has never been fully realized'.²⁵⁰ On this account, the project of constructing a socialist society is inextricably linked to the challenge of 'broadening democracy to include the whole social terrain covered by the technosystem'.²⁵¹ While Feenberg is right to underscore the extent to which ideological ('socialism'), political ('democracy'), demographic ('social terrain'), technological ('technosystem'), as well as – by implication – economic ('productive forces') and administrative ('the state') facets of social reality are intimately interrelated, his belief in 'the dream of socialist technology' seems, at best, naïve and idealistic or, at worst, cynical and ahistorical.

One need not be a right-wing libertarian to acknowledge that the multiple experiences with 'the dream of socialist technology' in the twentieth century have been largely disappointing and, in some cases, a major catastrophe. During the Cold War, marked by the 'systemic competition' (*Systemkonkurrenz*) between capitalism and socialism, the former greatly outperformed the latter in almost every aspect of advanced technologies. Feenberg's romanticization of 'socialist technology' is at odds with the historical lessons that humanity was taught in the twentieth century.

This is not to suggest that, under capitalism, technology is free of the major contradictions and pathological aspects that Feenberg describes and examines in his book (and, indeed, in many other of his works). Still, the romanticization of 'socialist technology' is no less problematic than the idealization of 'capitalist technology'. We need to recognize that, in addition to the fact that the latter largely outperformed the former, many – albeit not all – of the civilizational challenges posed by contemporary technologies have emerged, and will continue to emerge, regardless of whether these are embedded in capitalist or socialist systems.

Both industrial and postindustrial formations have faced (and continue to face) serious social and environmental issues that are inextricably linked to technological developments (and captured in debates on alienation, reification, exploitation, and domination). As critical sociologists, we need to distinguish between those challenges, contradictions, and pathologies that are widespread in (if not unique or intrinsic to) *capitalist* societies and those that are widespread in (if not unique or intrinsic to) *socialist* societies. Granted, to provide an accurate and fine-grained picture, such an ambitious explanatory endeavour would have to differentiate between ‘varieties of capitalism’²⁵² and ‘varieties of socialism’.²⁵³ Systemic idiosyncrasies notwithstanding, most likely there are significant commonalities and differences between *capitalist* and *socialist technosystems*, the empowering and disempowering aspects of which should be neither overstated nor understated. For Feenberg, the concept of ‘capitalist technosystem’ is a pleonasm, whereas the concept of ‘socialist technosystem’ is an oxymoron. Under both capitalism and socialism, however, technology has been shaped by the systemic forces of the economy and the state, including their instrumental imperatives and functionalist rationality. Arguably, both ‘the dream of capitalist technology’ and ‘the dream of socialist technology’, for all their considerable accomplishments, have included episodes of real nightmares.

Of course, Feenberg may assert that the world has not yet experienced ‘real’ socialism. On this interpretation, the ‘actually existing socialism’ of the twentieth century was a state-controlled system, devoid of genuine democratic structures and processes.

Democracy is a recognition of finitude. Citizens give up the claim to know and control everything. They accept the limits of their knowledge in submitting to a process of discussion.²⁵⁴

Arguably, it was precisely this lack of democracy that significantly contributed to the collapse of ‘actually existing socialism’ in general and to the lagging-behind of socialist technologies in particular. The ‘problem of technological hubris’,²⁵⁵ to be tackled effectively, needs more, rather than less, democracy.

Romanticizing the premodern

Feenberg’s analysis of technology is based on a latent romanticization of premodern life forms. This tendency is synthesized in the contention that, ‘[u]ntil the emergence of total functionalization in late modernity, non-functional relations prevailed in most domains of social life’.²⁵⁶ This assumption is problematic on several counts. (1) How can one prove that ‘total functionalization’ did not prevail in premodern life forms? (2) One can make the case that ‘total functionalization’ has always prevailed – and will always prevail – in human societies, because functionality is an anthropological invariant and, as such, an integral part of our species-distinctive condition. (3) The romanticization of premodern life forms, along with the demonization of their modern counterparts, may be interpreted as a hidden version of conservatism à la Heidegger, which lies at the heart of Feenberg’s critique of technology under capitalism. Admittedly, Feenberg – unlike Heidegger – is not only fascinated by technology but also keen to draw attention to its empowering

aspects. At the same time, his analysis suffers from a tendency to portray ‘total functionalization’ as a specifically modern, rather than an anthropological, problem.

Nature versus society?

Throughout the book, Feenberg grapples with the notion that technology permits the human species to ‘conquer’ nature. As he stresses, this ambition is paradoxical in the following sense: since ‘human beings are natural beings’,²⁵⁷ ‘the project of conquest is self-contradictory’.²⁵⁸ By dominating, exploiting, and destroying nature, human beings effectively contribute to, if not orchestrate, their own domination, exploitation, and destruction. More specifically, this paradox has two implications:

- As humanity seeks to conquer nature, it does so by equipping some sectors of the population with more powerful means to engage in domination, exploitation, and destruction than others. The domination of nature goes hand in hand with social domination (which may be based on key sociological variables such as class, ethnicity, gender, age, ability, etc. – or, indeed, on the intersectionally constituted combination of these variables).
- As humanity harms its natural environment, its eco-conquering actions ‘come back to haunt the perpetrators in the form of feedback from the system to which both conqueror and conquered belong’.²⁵⁹ Ultimately, the assault on nature is an assault on humanity. For the latter is firmly embedded in, and forms an integral part of, the former. To recognize, then, that ‘the things we do to nature we also do to ourselves’²⁶⁰ requires acknowledging that, far from being placed outside the ecosystem, we are situated within, and dependent upon, it.

A central aspect that is missing from Feenberg’s account of this tension-laden constellation, however, is the following: by virtue of our species-constitutive capacities, we rise above nature, even if – paradoxically – we remain part of it. Admittedly, there is no consensus on the once-and-for-all identification of our main species-constitutive capacities or distinctively human features. In this respect, typical candidates are ‘reason’ (notably the cognitive trinity of *Verstand*, *Vernunft*, and *Urteilkraft*²⁶¹), ‘consciousness’, ‘self-awareness’, ‘language’, ‘culture’, and ‘morality’ – to mention only a few. Yet, we need to put our finger on the attributes that make us distinctively ‘human’ and raise us above nature – even if only metaphorically, given that we *are* natural beings.

Another important issue that needs to be addressed in this context is the concept of *interest*. What interests do human actors pursue? The following types of interest appear to be crucial:

1. personal interests (‘the individual’);
2. communitarian interests (‘the group’);
3. institutional interests (‘the organization’);
4. societal interests (‘the imagined community’);
5. species-constitutive interests (‘humanity’);
6. planetary interests (‘the world’); and
7. universal interests (‘the universe’).

Since *all* human actions are interest-laden and *some* human actions are also interest-driven, it is hard to see how it is possible to develop a CT of society without proposing a CT of interests.

Fallibilism and science

Consider the following statement:

Modern scientific knowledge claims to be universal, and, indeed, it can be substituted for traditional knowledge everywhere, the success of technology confirming its validity. But scientists are all fallibilists; they do not believe in absolute truth. Understood epistemologically, scientific method organizes the discovery of ‘truths’, or at least what scientists use for truths while they last.²⁶²

The above passage is symptomatic of several issues arising from Feenberg’s conception of science:

- Not all modern scientific knowledge purports to be ‘universal’ (let alone ‘universalist’). The whole point of scientific research is to test (and thereby to confirm or to repudiate) the validity of truth claims. Different subject matters and different academic disciplines may allow for different degrees of certainty regarding the defensibility of claims to epistemic validity. Both in the natural sciences and in the social sciences, however, the positivist pursuit of value-free universality has been called into question for centuries, not least by critical theorists.
- It is misleading to suggest that modern scientific knowledge ‘can be substituted for traditional knowledge *everywhere*’.²⁶³ Of course, Feenberg is right to insist that the achievements of technology confirm its profound impact on nature and society. Contrary to Feenberg’s techno-optimism, however, they do not necessarily ‘confirm its validity’.²⁶⁴ More importantly, numerous forms of ‘traditional knowledge’ – including, for example, religious belief systems – cannot be replaced by ‘scientific knowledge’. The point is not to deny that, on various levels, the latter may be epistemically superior to the former. Rather, the point is to recognize that ‘traditional’ ways of relating to, engaging with, and attributing meaning to the world are essential to human society, including scientifically advanced and largely secularized life forms.
- Not all scientists are fallibilists. Some of them – however naïve and objectionable this may seem – believe in the possibility of discovering absolute truths and, thus, in the need to raise universal (that is, unconditional and non-relativizable) truth claims. Feenberg contradicts himself at this point: on the one hand, he asserts that ‘[m]odern scientific knowledge claims to be universal’²⁶⁵; on the other hand, he affirms that ‘scientists are all fallibilists’.²⁶⁶ We cannot have it both ways. The age-old controversies between diametrically opposed epistemological positions – reflected in antinomies such as positivism versus interpretivism, realism versus constructivism, universalism versus particularism, foundationalism versus relativism, transcendentalism versus contextualism – will not go away. The merits and

limitations of these debates notwithstanding, it would be erroneous to assume that the gap between diametrically opposed epistemological perspectives can be overcome by cross-fertilizing them, let alone by suggesting that they are *all* correct, even if they fundamentally contradict each other.

Validity and legitimacy

Feenberg rightly points out that ‘not all norms depend on power’²⁶⁷ and that, in fact, ‘some respond to a rational advance in reflexivity and autonomy’.²⁶⁸ More specifically, he makes the evolutionist claim – which may have been inspired by Habermas’s early work²⁶⁹ – that ‘[a]t the collective level the learning process that disentangles reason from power is a universally valid progressive advance’.²⁷⁰ Referring to Allen’s disagreement with critical theorists such as Habermas,²⁷¹ Honneth,²⁷² and Forst,²⁷³ Feenberg discusses the (Foucauldian) view that ‘reason and power cannot be separated’²⁷⁴ and that, crucially, ‘reason is simply a supplement of power that power gives itself’.²⁷⁵ He eloquently summarizes this interpretation as follows:

Subjects become the subjects they are through the practices determined by the power relations in which they participate. [...] [R]eflexivity and autonomy depend to some extent on power rather than transcending it.²⁷⁶

Although, broadly speaking, Feenberg offers a balanced critique of Allen’s position on this matter, he could have provided a more fine-grained account of the relationship between reason and power in terms of *validity* and *legitimacy*.²⁷⁷ The justifiability of an action, or a set of actions, depends not only on *what* is being done, but also on *who* does it, *when*, *where*, and *to whom*. ‘For *objectivity* (“What?”) is – inevitably – a matter of *social authority* (“Who?”), *spatiotemporal contextuality* (“Where and when?”), and *interactional relationality* (“To whom?”)’.²⁷⁸ Social arrangements, therefore, are not only the product of *rational* considerations, based on reason-giving practices oriented towards providing defensible justifications, but also the result of *relational* constellations, generated by interest- and power-laden practices motivated by dynamics of competition and positioning. Contrary to Feenberg’s assertion that ‘[t]he technosystem is the sum of [...] *rational* arrangements’,²⁷⁹ it is the ensemble of socio-historical constellations, which are shaped *both* by reason-giving practices testing different levels of validity *and* by power-laden practices establishing spatiotemporally variable codes of legitimacy.

Progress and Eurocentrism

Feenberg provides several astute reflections on the link between Eurocentrism and technology. The detrimental consequences of the former cannot be dissociated from the global impact of the latter. ‘The whole world has accepted Europe’s scientific-technical superiority in the last two centuries’.²⁸⁰ Feenberg insists that technology, along with the notion of progress (with which it is rightly or wrongly associated), is ‘far more pervasive and influential now than older forms of sovereignty’.²⁸¹ To put it

bluntly, technology speaks louder than words. This does not mean, however, that he is willing to equate *technical progress* with *normative progress*:

The West, as the originator of modernity, can claim to be more ‘advanced’ in some respects than nations that have only begun to emulate it recently. But that is no reason for arrogant self-congratulation given the many serious problems confronting Western modernity. A non-Western nation that sought original solutions to these problems would have lessons to teach the West.²⁸²

Building on Feenberg’s argument, it may be useful to distinguish between *ontological Eurocentrism* and *epistemic Eurocentrism*: the former designates a *social reality*, whereas the latter refers to an *ideological perspective*. Both forms of Eurocentrism are deeply problematic, but Feenberg urges us to concede that there is no point in denying their existence. An ‘effective critique of Eurocentrism’²⁸³ must account for the global spread of technology as a means to consolidating hegemonic – notably ‘Western’ – modes of power across the world.

The above statement is problematic, however, in the following respects: (1) Strictly speaking, it may be misleading to portray ‘the West’ as ‘the originator of modernity’,²⁸⁴ since ‘the West’ is the product of both endogenous *and* exogenous sources of influence. Historically, it has been shaped by both ‘Western’ and ‘non-Western’ forces. (2) Its genealogy notwithstanding, ‘the West’, far from representing a homogenous entity, is internally fragmented. (3) If we characterize ‘the West’ as ‘more “advanced”’,²⁸⁵ we risk falling into the trap of social evolutionism, whose advocates – in the context of (neo)-colonialism and (neo)imperialism – employ the language of ‘progress’ to defend assumptions regarding ‘civilizational superiority’.

Feenberg draws attention to the fact that ‘Eurocentrism intrudes on the lifeworld of non-European societies primarily through capitalism and technology’.²⁸⁶ He concedes, however, that not only economic and technological but also political and ideological forces have played a major role in ‘transforming life throughout the world’,²⁸⁷ in many cases without much – if any – respect for the needs, demands, and rights of those at the receiving end. ‘Western’ ideals – including democracy – are still being ‘metabolized’²⁸⁸ by non-European actors. These ideals have been, and continue to be, mobilized to legitimize different versions of capitalist development. As such, they effectively serve as instruments for the imposition of imperial power. It is far from clear, however, to what extent the history of these ideals can (or cannot) be dissociated from their normative (and potentially emancipatory) value.

Feenberg convincingly argues that there is no ‘progressive’ politics without a belief in ‘progress’. Challenging both postcolonial and postmodern approaches, he is right to suggest that there is no point in throwing the baby out with the bathwater. In other words, despite its legitimizing role in colonialist and imperialist projects, the concept of ‘progress’ is an indispensable normative tool for distinguishing between progressive and retrograde political agendas. What is missing from Feenberg’s account is a systematic outline of the normative criteria that permit us to differentiate between ‘progressive’ and ‘non-progressive’ (including pseudo-progressive) conceptions and forms of progress.

Reform versus revolution?

A key issue with which Feenberg grapples throughout the book is what may be described as *capitalism's integrationist power* – that is, its systemic capacity to adjust to behavioural, ideological, and institutional demands, allowing it to reinforce its own legitimacy. Given its systemic elasticity, adaptability, and absorbability,²⁸⁹ capitalism has a remarkable capacity to overcome its internal crises and, crucially, to adjust to changing historical circumstances. Broadly speaking, Feenberg is right to suggest that, insofar as they have *any* transformative impact, social and political struggles tend to lead to reforms, rather than revolutions.²⁹⁰ This illustrates that social systems, including those based on simple or complex forms of domination, are 'able to adjust to new constraints'.²⁹¹ A central issue that Feenberg could, or perhaps should, have explored in more detail, however, is why it appears to be the case that capitalism is not only largely successful at adapting to altering social conditions but also fairly efficient at incorporating demands for social and political change, albeit in a reformist fashion.

Consider key sociological variables (such as class, ethnicity, gender, age, and ability) as well as their corresponding systems of discrimination and domination (such as classism, racism, sexism, ageism, and ableism). Capitalism has proved capable of accommodating reformist, if not radical, demands related to these areas of struggle – not least by commodifying them and thereby converting them into sources of profit under the 'do-well-by-doing-good' umbrella of (pseudo-) 'progressive' philanthrocapitalism. Neo-Marxists and post-Marxists will find it difficult to hold on to the orthodox Marxist distinction between the 'main contradiction' (*Hauptwiderspruch*) and 'subordinate contradictions' (*Nebenwidersprüche*), according to which the latter (e.g. classism, racism, sexism, ageism, and ableism) represent epiphenomenalist expressions of the former (capitalism).²⁹² The advantages and disadvantages of this conceptual architecture notwithstanding, a key question that remains is why capitalism has been, and continues to be, relatively successful in coping with the challenges posed by several coexisting (that is, interdependent, and yet relatively independent) systems of domination within the boundaries of its mode of production.

Straw-man arguments

On several occasions, it appears that Feenberg creates a straw man to make his argument work. For instance, he points out that advocates of CT and ANT tend to agree that 'individuality cannot be conceived independently of other people and things',²⁹³ recognizing that human actors are always embedded in different social networks and historically specific configurations. It is hard to think of any classical or contemporary social scientist, let alone sociologist, who would seriously deny this. In fact, a vital objective of social science is to account for the degree to which the seemingly most autonomous forms of individuality cannot be dissociated from structures and practices of sociality. The same applies to the corresponding assumption that the human subject should be conceived of 'not as a spiritual entity, a substantialized thought, a cogito, but as a living being, hence a being essentially connected to its surroundings'.²⁹⁴ Again, this is hardly

news to anyone, since one of the main aims of social-scientific research is to scrutinize the multiple ways in which actors are shaped by their environment.

In a similar vein, Feenberg reminds his readers of CT's insistence that 'the rational system of domination of advanced industrial society'²⁹⁵ can be regarded 'as a contingent social achievement, rather than as an essential consequence of rationality as such'.²⁹⁶ Who would seriously question the socio-historical constitution permeating *any* system of domination? The same applies to Feenberg's contention that rationality, similar to other key components of human culture, 'is not universal but [...] context-bound'.²⁹⁷ Again, even 'quasi-transcendental' approaches, such as Habermas's 'universal pragmatics',²⁹⁸ highlight the extent to which all species-constitutive features of humanity – such as language, communicative reason, and consciousness – are embedded in historical contexts and derived from people's lifeworlds. Unsympathetic critics may rightly object that Feenberg is, once again, stating the obvious when affirming that 'function must be situated in relation to the culture and way of life it serves'.²⁹⁹ Unfortunately, one finds an abundant amount of statements of this sort in Feenberg's book. In the twenty-first century, we should dare to replace 'the sociology of the obvious' with 'the sociology of the not so obvious'.

Function(alism)

Feenberg provides an intellectually rigorous and thought-provoking overview of the concept of *function* in CC.³⁰⁰ His astute and insightful reflections on the concept of function are one of the strongest aspects of his book. It is striking, however, that he does not touch upon, let alone examine or discuss, *sociological* versions of functionalism – for instance, functionalism à la Émile Durkheim, Herbert Spencer, Talcott Parsons, Robert Merton, or Niklas Luhmann. Granted, Feenberg's approach is primarily philosophical, rather than sociological. Still, given his emphasis on the socio-historical constitution of function (notably in the realm of technology), it is surprising that sociological versions of functionalism are largely ignored in his – otherwise comprehensive and, in many ways, impressive – account of function.

In this context, it is worth having a closer look at some of Feenberg's assertions regarding 'function' and 'the critical study of function'. With and beyond Feenberg, one may argue that 'modern societies treat everything as a function'³⁰¹ *no more or less than* premodern, or indeed postmodern, societies – precisely because function constitutes a core ingredient of the human condition.

Thus, we may have to qualify Feenberg's claim that '[f]unctional understanding has become a universal perspective'³⁰²:

- At the experiential level of *everyday existence*, this may be true insofar as the role of *functions* is crucial to the constitution and evolution of the human species, irrespective of the spatiotemporal specificities of different life forms.
- At the epistemic level of *scientific inquiry*, this may be true insofar as the explanation of *functions* is integral to the study of both the natural world and the social world. Causality and functionality are intimately intertwined. It is hard to

dissociate the question of *why* something happens, develops, or works in a particular way from the question of *for what purpose* it does so.

Functionalists – notably in academic disciplines such as sociology, anthropology, criminology, and political science – insist on the aforementioned link between causality and functionality. Scholars opposed to functionalism, by contrast, regard it as ultimately conservative, if not reactionary, due to its alleged emphasis on ‘reproduction’ and ‘structural determinacy’, along with its arguably reductive tendency to draw analogies between the natural world and the social world when examining striking similarities in terms of their respective functional organization. For critics of functionalism, a functional – let alone functionalist – understanding of reality is not as ‘universal’ as Feenberg appears to suggest.

Feenberg’s contention that ‘[t]echnical objects have a foot in two worlds’³⁰³ may be further differentiated by recognizing that they have a foot in *three* worlds – that is, in ‘the’ objective world, ‘our’ normative world, and ‘my’ subjective world. Such a triadic understanding of the ways in which humans engage in the construction of reality by virtue of technology accounts for the fact that they are *simultaneously* immersed in the *physical* world of facts and properties, the *social* world of norms and conventions, and the *personal* world of intentions and projections. To be clear, while it may be possible to distinguish these three spheres of engagement with the world at a conceptual level, they overlap with and depend on one another at the ontological level:

1. Our *objective* situatedness in the world is impregnated with a multiplicity of *normative* codes and *subjective* perceptions, upon which we rely to define our place in the universe.
2. Our *normative* construction of the world is inconceivable without our ability to draw on a sense of realism, when presupposing the existence of *objective* constellations, and a sense of perspectivism, when interpreting and engaging with these constellations from a *subjective* standpoint.
3. Our *subjective* experience of the world hinges on our embeddedness in both *objective* and *normative* realms of existence.

A comprehensive theory of function needs to take these three levels of existential immersion in the world into consideration.³⁰⁴

Causality and culture

One may have doubts as to whether Feenberg’s distinction between *technique* and *technologies*³⁰⁵ is useful (and tenable), especially in light of the fact that he characterizes the former as *neutral/objective* (‘applications of knowledge of nature’) and the latter as *combinational/relational* (‘greater than the sums of their parts’).³⁰⁶ An obvious objection would be that there is no such thing as a ‘neutral’ or ‘objective’ technique. For all applications of (seemingly objective) knowledge of nature are embedded in both normatively and subjectively mediated criteria underlying our purposive engagement with the world. Of course, Feenberg is aware of this, warning that a ‘purely mechanical explanation of technology leads to naïve instrumentalism or technological determinism’.³⁰⁷

What is problematic in this respect, however, is his distinction between *causality* and *culture*:

Causality and culture intersect in functionality. I am aware that in one common definition culture would encompass knowledge of causal relations [. . .]. Rather than pausing to clarify this terminology issue, I will assume a more or less common sense understanding of the terms.³⁰⁸

In his ‘double-aspect theory of technology’,³⁰⁹ which seeks to overcome the Cartesian mind–body dualism, body and mind are conceived of as intrinsically entangled. Yet, his distinction between ‘causality’ and ‘culture’ is questionable to the extent that it reflects a false dichotomy – that is, a dichotomy that reinforces the kind of dualistic thinking that Feenberg sets out to overcome. In the realm of human interactions, causality is as permeated by culture as objectivity is pervaded by normativity and subjectivity; at the same time, culture is as permeated by causality as normativity and subjectivity are pervaded by objectivity.

In a dualist manner, Feenberg affirms that ‘[t]he understanding of functionalization splits along two axes, *causal* and *cultural* aspects, and *objective* and *subjective* aspects’.³¹⁰ Thus, not only does he construct a false dichotomy between ‘causal’ and ‘cultural’, but he also erroneously conflates the former with ‘objective’ and the latter with ‘subjective’ dimensions. In the human world, however, both causality and culture have *objective*, *normative*, and *subjective* components. What critical theorists need to shed light on when examining the role of technology in society is not the interaction of ‘causal and cultural principles’³¹¹ but, rather, the confluence of objective, normative, and subjective factors, without which there would be no such thing as human life forms.

Commodification

Feenberg maintains that commodification processes involve four key principles: alienability, excludability, rivalry, and standardization.³¹² This account is problematic, however, in that the last principle – that is, standardization – does *not* always form part of commodification processes. Consider, for instance, Boltanski and Esquerre’s recent proposal of a ‘distinctive *pragmatics of value-setting*’,³¹³ which is based on *four forms of valorization*,³¹⁴ whose ‘relationships can be articulated as a set of *transformations*’³¹⁵:

1. the ‘*standard form*’,³¹⁶ which is vital to *industrial economies* and which allows for the possibility of mass production;
2. the ‘*collection form*’,³¹⁷ which prevails in *enrichment economies* and which is based on a narrative attached to an object’s past;
3. the ‘*trend form*’,³¹⁸ which is crucial to *fashion economies* and whose principal reference points are contemporary high-profile individuals, such as present-day celebrities; and
4. the ‘*asset form*’,³¹⁹ which is preponderant in *financial economies* and which is driven by the incentive to resell objects for a profit at some point in the future.

Crucially, the ‘collection form’ is a commodity, but it does *not* necessarily involve ‘standardization’ as a principle. On the contrary, collection items (such as paintings, drawings, etc.) often derive their commodity value from escaping the homogenizing logic of the ‘standard form’. This is just one obvious example that illustrates that Feenberg would be well advised to revise his four-dimensional account of commodification, which, in its current form, applies to industrial economies, but not necessarily to enrichment economies.³²⁰

Emancipation

It is surprising that Feenberg states that early critical theorists – such as Horkheimer, Adorno, and Marcuse – have argued for ‘the possibility of another form of rationality that would fulfill the dream of enlightenment without its destructive consequences’.³²¹ The whole point of Adorno and Horkheimer’s famous analysis of ‘the dialectic of Enlightenment’³²² is to uncover the ‘ambivalence of modernity’.³²³ On this view, modernity’s emancipatory potential, although it *does* exist, can never be fully realized. One need not be a postmodernist to concede that the pursuit of various metanarratives underlying ‘the dream of enlightenment’ is an ambivalent affair reflected in both progressive and regressive developments experienced in the era of modernity. Adorno’s notion of ‘negative dialectics’³²⁴ is an attempt to transcend mechanical notions of human emancipation, based on the naïve belief in the allegedly evolutionary force of the interplay between ‘thesis’ and ‘antithesis’ resulting in a ‘synthesis’ as the guarantee of civilizational progress. In short, from an Adornian perspective, there is no such thing as the ultimate fulfilment of the dream of Enlightenment by virtue of an emancipatory form of rationality.

What remains is the certainty that emancipation remains forever uncertain – and potentially non-emancipatory. Feenberg is right to remind us that ‘a world and a subjectivity narrowed down to the measure of technique cannot fulfill human potentials’.³²⁵ Indeed, he captures this idea very eloquently when stating that, within the boundaries of the technosystem, a process is unleashed which ‘both generates a potential and represses it’.³²⁶ In a Lukácsian spirit, Feenberg provides a powerful account of the tension-laden fact that ‘[w]hat human beings can become is laid out in their relations within the reified system, but only as potentiality, not as actuality’.³²⁷ Thus, the other certainty with which we are confronted is that, under conditions of quasi-permanent reification, the potentiality of human fulfilment can hardly become an actuality.

Just as CT ‘has always been based on utopian hopes’,³²⁸ it has always been wary of utopian projects. Its understanding of history is indeed ‘progressive, or at least potentially so’.³²⁹ At the same time, however, it is suspicious of overly confident, and monolithically defined, agendas claiming to bring about universal emancipation. Paradoxically, then, CT’s utopianism is anti-utopian. Its commitment to exploring ‘alternatives to both the existing society and the failed revolutions of the past’³³⁰ can be met only by accepting that ‘the many local narratives’³³¹ of people’s lifeworlds are irreducible to ‘the grand narrative’³³² of world history. The transcendental scope of the latter is nothing without the immanent power of the former. Technology is a universal (that is, species-constitutive) force applied in particular (that is, spatiotemporally contingent)

contexts. Its normative ambivalence derives from the fact that technology can be used in both empowering and disempowering, progressive and regressive, liberating and repressive, emancipatory and retrograde ways.

Summary

Feenberg's book demonstrates the pivotal role that the technosystem plays in shaping contemporary society. His study, regardless of its weaknesses and limitations, is a powerful reminder of the fact that a truly critical theory of society needs to grapple with the ubiquitous presence of technology – not only in the context of modernity but, more generally, throughout the course of human history. Whatever the future may hold in store, the technosystem is here to stay. Feenberg has provided us with a comprehensive, balanced, and inspiring account of both its perils and its opportunities.

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Notes

1. Feenberg (2017a). Cf. Ihde (2018), Pilsch (2019), and Ritzer (2019).
2. Feenberg (2017a, ix–xiii).
3. Feenberg (2017a, 1–14).
4. Feenberg (2017a, 15–85 (Part I), 87–111 (Part II), and 113–86 (Part III)).
5. Feenberg (2017a, 187–204).
6. Feenberg (2017a, 207–29).
7. Feenberg (2017a, 231–32).
8. Feenberg (2017a, 233–35).
9. Feenberg (2017a, 15–85 (Part I)).
10. Feenberg (2017a, 15).
11. Feenberg (2017a, 15).
12. Feenberg (2017a, 15).
13. Feenberg (2017a, 15).
14. Feenberg (2017a, 16). See also Feenberg (2017a, 72–73, 82–84, 105, 181, and 200). In addition, see Simondon (1989 [1958]).
15. Feenberg (2017a, 16).
16. Feenberg (2017a, 16 (*italics added*)).
17. Feenberg (2017a, 17–37).
18. Feenberg (2017a, xi).
19. See Feenberg (2017a, 18).
20. Feenberg (2017a, 38–65).
21. Feenberg (2017a, 38).
22. Feenberg (2017a, 38).
23. Feenberg (2017a, 38).
24. Feenberg (2017a, 38).
25. Feenberg (2017a, 38).
26. See Feenberg (2017a, 40).

27. Feenberg (2017a, 40 (quotation modified)).
28. See Feenberg (2017a, 53).
29. Feenberg (2017a, 66–85).
30. Feenberg (2017a, xi).
31. See esp. Simondon (1989 [1958], 2005, 2014).
32. See Feenberg (2017a, 66).
33. Latour (1987, 1993 [1991], 2005). Cf. Høstaker (2014).
34. Deleuze (2001, 2013 [1968]). Cf. Sauvagnargues (2016), Høstaker (2014), and Vaysse (2006).
35. Stiegler (1994, 1996, 2001). Cf. Vaysse (2006).
36. Feenberg (2017a, 67).
37. Feenberg (2017a, 67).
38. See Feenberg (2017a, 67).
39. Feenberg (2017a, 67).
40. Feenberg (2017a, 71).
41. Feenberg (2017a, 71).
42. Feenberg (2017a, 81).
43. On this distinction, see, for example, Feenberg (2017a, 35, 57, 67, 73, 83, 85, 115, 170, 182, 187–90, 194, 197, 199–200, and 203).
44. Feenberg (2017a, 87–111 (Part II)).
45. Feenberg (2017a, 89–111).
46. See Feenberg (2017a, 87).
47. Cf. Susen (2015c, 15, 54, 62, 104, 120, 121, 196, and 227).
48. See Feenberg (2017a, esp. 107–111). Cf. Susen (2011a).
49. Feenberg (2017a, 107 (*italics added*)).
50. Feenberg (2017a, 108 (*italics added*)).
51. Feenberg (2017a, 108).
52. Feenberg (2017a, 108 and 111).
53. Feenberg (2017a, 108).
54. Feenberg (2017a, 109).
55. Feenberg (2017a, 109).
56. Feenberg (2017a, 110).
57. Feenberg (2017a, 110–11).
58. Feenberg (2017a, 111).
59. Cf. Habermas (1987b [1981]) and Habermas (1987c [1981]).
60. Feenberg (2017a, 113–86) (Part III).
61. See Feenberg (2017a, xi).
62. Feenberg (2017a, 113).
63. Feenberg (2017a, 113).
64. Feenberg (2017a, 113).
65. Feenberg (2017a, 114).
66. Feenberg (2017a, 114).
67. Feenberg (2017a, 114 (*italics added*)).
68. Feenberg (2017a, 114 (*italics added*)).
69. Feenberg (2017a, 114).

70. Feenberg (2017a, 115–34).
71. Feenberg (2017a, xi).
72. Feenberg (2017a, 115).
73. Feenberg (2017a, 115 (quotation modified)).
74. Feenberg (2017a, 115).
75. Feenberg (2017a, 132).
76. Feenberg (2017a, 132).
77. Feenberg (2017a, 132).
78. Feenberg (2017a, 132).
79. Feenberg (2017a, 135–60).
80. Feenberg (2017a, xi).
81. Feenberg (2017a, 135).
82. Feenberg (2017a, 135).
83. Feenberg (2017a, 135).
84. Cf. Habermas (1987b [1981]) and Habermas (1987c [1981]).
85. Feenberg (2017a, 135).
86. Feenberg (2017a, 135).
87. Feenberg (2017a, 135).
88. Feenberg (2017a, 135–40).
89. Feenberg (2017a, 136).
90. Feenberg (2017a, 136 (*italics added*)).
91. Feenberg (2017a, 136 (*italics added*)).
92. Feenberg (2017a, 136).
93. Feenberg (2017a, 136). On this point, see, for example, Giddens (1977a, esp. 12 and 28) and Giddens (1977b, esp. 151). See also, for instance, Celikates (2009), Habermas (1987a [1981], esp. 110), Susen (2007, esp. 56–57 and 59n28), and Susen (2011b).
94. See Houkes and Vermaas (2010). Cf. Franssen et al. (2016) and Preston (1998). See also Feenberg (2017a, 136).
95. Feenberg (2017a, 136).
96. Feenberg (2017a, 136).
97. Feenberg (2017a, 136).
98. Feenberg (2017a, 137). See also Feenberg (2017a, 43, 48, 69, and 77).
99. See Feenberg (1977, esp. 114). See also Feenberg (2017a, 137).
100. Feenberg (2017a, 137 (*italics added*)).
101. Feenberg (2017a, 137 (*italics added*)).
102. Feenberg (2017a, 137 (*italics added*)).
103. Feenberg (2017a, 137).
104. Feenberg (2017a, 137).
105. Feenberg (2017a, 137).
106. Feenberg (2017a, 137 (quotation modified)).
107. Feenberg (2017a, 137–38).
108. Feenberg (2017a, 138).
109. See Feenberg (2017a, 138–39).
110. Feenberg (2017a, 138).
111. Feenberg (2017a, 138).

112. Feenberg (2017a, 139).
113. See Feenberg (2017a, 138).
114. Feenberg (2017a, 138).
115. Feenberg (2017a, 138).
116. Feenberg (2017a, 138).
117. Feenberg (2017a, 139).
118. Feenberg (2017a, 139).
119. Feenberg (2017a, 139).
120. Feenberg (2017a, 139).
121. Marcuse (2001, 55 (*italics in original*)). See also Feenberg (2017a, 202). (Feenberg misquotes Marcuse here; the article 'the', which Feenberg put before the noun 'facts', does not appear in Marcuse's original text.)
122. On this point, see Feenberg (2017a, 153). See, for example, Feenberg (1991, 2001 [1991]) and Grimes and Feenberg (2013). See also, for instance, Feenberg (1986 [1981], 1995, 1999, 2005, 2010, 2017b, 2017c), Feenberg and Barney (2004), Feenberg and Hannay (1995), and Misa et al. (2003).
123. Feenberg (2017a, 153).
124. Feenberg (2017a, 153).
125. Feenberg (2017a, 153 (*italics in original*)).
126. Feenberg (2017a, 153).
127. Feenberg (2017a, 153).
128. Feenberg (2017a, 153).
129. Feenberg (2017a, 153).
130. Feenberg (2017a, 153).
131. See Feenberg (2017a, 197).
132. See Feenberg (2017a, 157–59).
133. See Feenberg (2017a, 158).
134. Feenberg (2017a, 158 (*italics added*)).
135. Feenberg (2017a, 159).
136. See Feenberg (2017a, 159).
137. Feenberg (2017a, 159).
138. Feenberg (2017a, 159).
139. Feenberg (2017a, 159).
140. Feenberg (2017a, 160 (*italics added*)).
141. Feenberg (2017a, 160).
142. Feenberg (2017a, 160).
143. Feenberg (2017a, 160).
144. Feenberg (2017a, 160).
145. See Feenberg (2017a, 160).
146. Feenberg (2017a, 160).
147. Feenberg (2017a, 160).
148. Feenberg (2017a, 160).
149. Feenberg (2017a, 160).
150. Feenberg (2017a, 160).
151. Feenberg (2017a, 160).

152. Feenberg (2017a, 161–86).
153. Feenberg (2017a, xii).
154. Feenberg (2017a, 161). See, for instance, Cooke (2000), Eriksen and Weigård (2003), Festeinstein (2004), Habermas (1996a [1992], 1998, 2005), Pellizzoni (2001), Power (1998), Susen (2009a), Susen (2010b, esp. 110–11 and 116–17), Susen (2018a), and Young (1997).
155. Feenberg (2017a, 161).
156. See Feenberg (2017a, 163–67).
157. See Feenberg (2017a, 174–76). See also Azmanova (2012).
158. See Feenberg (2017a, 184–86).
159. Feenberg (2017a, 186).
160. See Feenberg (2017a, 187–204 (*italics added*)).
161. Feenberg (2017a, 187).
162. See Feenberg (2017a, 187).
163. See Feenberg (2017a, 187). See, for example, Bhabha (1994), Bhambra (2007a, 2007b, 2014), Chakrabarty (2000), Connell (2007), Gandhi (1998), Go (2013, 2016), Grosfoguel (2007), Rodríguez et al. (2010), Kerner (2018), McLennan (2003a, 2013b), Mignolo (2011), Quijano (2007), Santos (2010), Savransky (2017), Seidman (2013), Spivak (1988), and Young (2001).
164. Feenberg (2017a, 187 (*italics added*)).
165. Feenberg (2017a, 187).
166. See Feenberg (2017a, 188–90).
167. Cf. Lyotard (1984 [1979]) and Lyotard (1986).
168. Feenberg (2017a, 188). See, for example, Benjamin (1961, 1972–1989, 1992 [1968], 1999 [1982], 2008). See also, for instance, Benjamin (1989), Dodd (2008), and Wolin (1994).
169. Allen (2016).
170. Feenberg (2017a, 188).
171. Allen (2016, 131). See also Feenberg (2017a, 188).
172. Allen (2016, 131). See also Feenberg (2017a, 189).
173. Allen (2016, 131). See also Feenberg (2017a, 189).
174. Feenberg (2017a, 189).
175. Feenberg (2017a, 189).
176. See Feenberg (2017a, 189).
177. See Feenberg (2017a, 189). See also Feenberg (2017a, 35, 57, 67, 73, 83, 85, 115, 170, 182, 187–90, 194, 197, 199–200, and 203).
178. Feenberg (2017a, 189).
179. See Feenberg (2017a, 189).
180. Feenberg (2017a, 190).
181. On *the relationship between democracy and constitutional law*, see, for example, Alexy (1998), Black (2000, 2001), Deflem (1994a, 1994b), Ferrara (2001), Guibentif (1994), Günther (1998), Habermas (1996b [1992], 1998a, 1998b, 2001), Hall (1986), Poggi (1978), Power (1998), Preuss (1998), Rasmussen (1994), Rosenfeld and Arato (1998), Susen (2018a, 52–53), and Thornhill (2013).
182. Feenberg (2017a, 190 (*italics in original*)).
183. Feenberg (2017a, 190).
184. Feenberg (2017a, 190).

185. Feenberg (2017a, 197).
186. Feenberg (2017a, 197).
187. Feenberg (2017a, 203 (*italics in original*)).
188. Feenberg (2017a, 203).
189. Feenberg (2017a, 203).
190. Cf. Susen (2015c), Susen (2016a), and Susen (2017a).
191. Feenberg (2017a, 204).
192. See Feenberg (2017a, 203). See, for example, d'Entrèves and Benhabib (1996), Frank (1992), Habermas (1996 [1981]), Honneth et al. (1992a, 1992b), Ingram (2005), and Susen (2015c, esp. Chapter 4 as well as 233–41 and 279).
193. See Feenberg (2017a, 200).
194. Feenberg (2017a, 87–111 (Part II)).
195. Feenberg (2017a, xii).
196. Feenberg (2017a, xiii).
197. Feenberg (2017a, 187–204).
198. Feenberg (2017a, xii).
199. Allen (2016).
200. Feenberg (2017a, 14).
201. Feenberg (2017a, 190).
202. Feenberg (2017a, 190).
203. On this point, see, for example, Bénatouïl (1999), Boltanski et al. (2014 [2009], 2010), Celikates (2009), and Susen (2011b, 2012b, 2015b).
204. Feenberg (2017a, ix).
205. Feenberg (2017a, ix).
206. Feenberg (2017a, ix).
207. See Gadamer (1965).
208. Feenberg (2017a, 14).
209. On this point, see Susen (2015c, 16–18). See also Susen (2015c, 1, 16–22, 44, 75, 113, 119, 143, 174, 178, 179, 180, 190, 191, 204, 205, 219, 223, 235, 236, 269, 273, 276, 279, and 285n86). *On the social and political challenges arising from the experience of ambivalence under modern and/or postmodern conditions*, see, for instance, Bauman (1991), Bauman and Tester (2007, esp. 23–25 and 29), Hammond (2011, esp. 305, 310, 312, and 315), Iggers (2005 [1997], 146–47), Hviid Jacobsen and Marshman (2008, esp. 804–7), Kellner (2007, esp. 117), Mulinari and Sandell (2009, esp. 495), Quicke (1999, esp. 281), Susen (2010a, esp. 62–78), Susen (2018c, esp. 7), and van Raaij (1993, esp. 543–46, 551–55, and 559–61).
210. Feenberg (2017a, 115).
211. Feenberg (2017a, 4).
212. Feenberg (2017a, 4).
213. Feenberg (2017a, 2).
214. Feenberg (2017a, 2).
215. Feenberg (2017a, 2).
216. Feenberg (2017a, 2).
217. Feenberg (2017a, 2).
218. Feenberg (2017a, 2).
219. Feenberg (2017a, 7).

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220. Feenberg (2017a, 7).
 221. Feenberg (2017a, 7).
 222. Feenberg (2017a, 7).
 223. Feenberg (2017a, 12).
 224. Feenberg (2017a, 12).
 225. Feenberg (2017a, 13).
 226. Feenberg (2017a, 13).
 227. Feenberg (2017a, 13).
 228. Feenberg (2017a, 13 (*italics added*)).
 229. Feenberg (2017a, 13).
 230. Feenberg (2017a, 14).
 231. Feenberg (2017a, 14).
 232. Feenberg (2017a, 14).
 233. Feenberg (2017a, 14).
 234. Feenberg (2017a, 14).
 235. Feenberg (2017a, 14).
 236. Feenberg (2017a, 8).
 237. Feenberg (2017a, 8).
 238. Feenberg (2017a, 8).
 239. Feenberg (2017a, 8).
 240. Feenberg (2017a, 9).
 241. Feenberg (2017a, 9).
 242. Feenberg (2017a, 9).
 243. Feenberg (2017a, 190 (*italics in original*)).
 244. Feenberg (2017a, 200).
 245. Feenberg (2017a, 200).
 246. Feenberg (2017a, 200).
 247. Feenberg (2017a, 190).
 248. Feenberg (2017a, 9).
 249. Feenberg (2017a, 11). Cf. Feenberg (1977) and Fleron (1977).
 250. Feenberg (2017a, 11).
 251. Feenberg (2017a, 11).
 252. On *varieties of capitalism*, see, for instance, Bluhm et al. (2014), Hall and Soskice (2001), Hancké (2009), Hancké et al. (2007), Lane and Myant (2007), Miller (2005), Soederberg et al. (2005), Susen (2012b, 306), Susen (2015c, 134 and 310n380), and Susen (2018b, esp. 7–8).
 253. On *varieties of socialism (and communism/Marxism)*, see, for instance, Avineri (1977), Bernhard and Kubik (2014), Fagan and Kopecky (2018), Lane (2014), Lane and Myant (2007), Myant and Drahokoupil (2011), Offe (1997 [1996]), Patsouras and Thomas (1981), and Satterwhite (1992).
 254. Feenberg (2017a, 11).
 255. Feenberg (2017a, 11).
 256. Feenberg (2017a, 160 (*italics added*)).
 257. Feenberg (2017a, 11).
 258. Feenberg (2017a, 11). Cf. Feenberg's reference to Fitzgerald (2010 [1922]).

259. Feenberg (2017a, 11).
260. Feenberg (2017a, 11).
261. On this point, see, for instance, Kant (1979 [1798], 2003 [1785], 2009 [1784]). See also, for example, Susen (2009b, esp. 104–05), Susen (2010b, esp. 112–13), Susen (2013a, esp. 325–26 and 330–31), Susen (2015a, esp. 1027–28), Susen (2015c, 13, 57, 58, 105, 162, 197, 198, 210, 215, 216, 219, 234, 235, 236, 259, 260, 275, and 333n15), Susen (2016a, 432–33), Susen (2017b, esp. 18 and 43), and Susen (2018c, 28).
262. Feenberg (2017a, 13).
263. Feenberg (2017a, 13 (*italics added*)).
264. See Feenberg (2017a, 13).
265. Feenberg (2017a, 13).
266. Feenberg (2017a, 13).
267. Feenberg (2017a, 191).
268. Feenberg (2017a, 191).
269. See, for example, Habermas (1979, 1984b [1976], 1987 [1968], 2000). See also, for instance, Antonio (1989), Honneth (1991a [1986]), Kirkpatrick (2003), McCarthy (1981), Müller-Doohm (2000), Susen (2010b, 109, 114, and 116), and Whitton (1992).
270. Feenberg (2017a, 191).
271. Habermas (1987b [1981], 1987c [1981]).
272. Honneth (1991b [1986], 1995 [1992]).
273. Forst (2012 [2007], 2013 [2011]).
274. Feenberg (2017a, 193).
275. Feenberg (2017a, 193).
276. Feenberg (2017a, 191).
277. *On the relationship between ‘validity claims’ and ‘legitimacy claims’*, see, for example, Susen (2007, 257), Susen (2013a, esp. 330, 331, 334, 335, 337, 339, 341, 342, 343, 344, 349, 363, 365, and 369), Susen (2013b, esp. 200, 207–15, 217–18, 219, 222, and 225–30), Susen (2015c, 10, 55, and 200), Susen (2018c, 22–23), and Susen and Baert (2018).
278. Susen (2015c, 10 (*italics in original*)).
279. Feenberg (2017a, 193 (*italics added*)).
280. Feenberg (2017a, 194).
281. Feenberg (2017a, 195).
282. Feenberg (2017a, 195).
283. Feenberg (2017a, 194).
284. Feenberg (2017a, 195).
285. Feenberg (2017a, 195).
286. Feenberg (2017a, 195).
287. Feenberg (2017a, 195).
288. Feenberg (2017a, 195).
289. On this point, see Susen (2012a, esp. 287). See also Holloway (2010, 6–7, 17, 51, 65, and 180).
290. See Feenberg (2017a, 36).
291. Feenberg (2017a, 36).
292. Susen (2012a, 299).
293. Feenberg (2017a, 52).

294. Feenberg (2017a, 140).
295. Feenberg (2017a, 40).
296. Feenberg (2017a, 40).
297. Feenberg (2017a, 163).
298. See Habermas (1984a [1976], 2001 [1984]). See also, for example, Susen (2007, Chapter 3, esp. 74–90), Thompson (1982), and Whitton (1992).
299. Feenberg (2017a, 139).
300. See Feenberg (2017a, 135–60 (Chapter 6)).
301. Feenberg (2017a, 135).
302. Feenberg (2017a, 135).
303. Feenberg (2017a, 136 (*italics added*)).
304. Cf. Susen (2016b).
305. See Feenberg (1977, 114). See also Feenberg (2017a, 137).
306. See Feenberg (2017a, 137).
307. Feenberg (2017a, 137).
308. Feenberg (2017a, 138).
309. Feenberg (2017a, 137 (*quotation modified*)).
310. Feenberg (2017a, 153 (*italics added*)).
311. Feenberg (2017a, 158).
312. See Feenberg (2017a, 158).
313. Fraser (2017, 59 (*italics in original*)).
314. For *a useful summary of these four 'forms of valorization'*, see Boltanski and Esquerre (2017b, 69–70). See also Boltanski and Esquerre (2017b, 72–76). On *the notion of 'forms of valorization'* [*les formes de mise en valeur*], see Boltanski and Esquerre (2017a, Chapter IV).
315. Boltanski and Esquerre (2017b, 68 (*italics in original*)). Boltanski and Esquerre spell out that they conceive of this 'set of transformations' in Claude Lévi-Strauss's sense of the term. On this point, see Boltanski and Esquerre (2017a, 164–65 and 196). See, in particular, Lévi-Strauss (1962). See also Boltanski and Esquerre (2017a, 586n12) and Maniglier (2002, 55–56). On *the relevance of Lévi-Strauss's work to Boltanski and Esquerre's argument*, see, for example, Boltanski and Esquerre (2017a, 68–69, 120, 164–65, 196, 242, 282, 494, 582, 586, 594, 598, and 609) and Boltanski and Esquerre (2017b, 68–69). Cf. Lévi-Strauss (1962); cf. also Lévi-Strauss (1949) and Lévi-Strauss (1971).
316. On *the 'standard form'* [*'forme standard'*], see Boltanski and Esquerre (2017a, esp. Chapter V). More specifically, see Boltanski and Esquerre (2017a, 21, 129, 157, 159, 165, 166, 173, 178, 179, 181, 182–83, 187, 201–42, 234, 295, 357, 394, 395, 429, and 524–26).
317. On *the 'collection form'* [*'forme collection'*], see Boltanski and Esquerre (2017a, esp. Chapter VII). More specifically, see Boltanski and Esquerre (2017a, 68, 129, 165, 166, 178, 179, 181–82, 188, 243–325, 349, 352, 401, 403, 404, 417–19, 429, and 527–29).
318. On *the 'trend form'* [*'forme tendance'*], see Boltanski and Esquerre (2017a, esp. Chapter IX). More specifically, see Boltanski and Esquerre (2017a, 175, 179, 181, 184, 188, 226, 327–53, 394, 404, and 526–27).
319. On *the 'asset form'* [*'forme actif'*], see Boltanski and Esquerre (2017a, esp. Chapter X). More specifically, see Boltanski and Esquerre (2017a, 159, 165, 174, 178, 181, 184, 188, 224, 226, 288, 293, 327, 355–72, 394, 395, 399, 401, 442, 484, 493, and 529–30).

320. See Susen (2018b).
321. Feenberg (2017a, 161).
322. Adorno and Horkheimer (1997 [1944/1969]).
323. On *the ambivalence of modernity*, see, for example, Bauman (1991), Bauman and Tester (2007, esp. 23–25 and 29), Hammond (2011, 305, 310, 312, and 315), Iggers (2005 [1997], 146–47), Jacobsen and Marshman (2008, 804–07), Kellner (2007, 117), Mulinari and Sandell (2009, 495), Quicke (1999, 281), Smart (1998), Susen (2010a, esp. 62–78), Susen (2015c, 1, 16–18, 190, and 236), Susen (2016a, esp. 430 and 432–33), Susen (2017a, esp. 104–05), Susen (2018b, 36 and 66), and van Raaij (1993, 543–46, 551–55, and 559–61).
324. See Adorno (1973 [1966]).
325. Feenberg (2017a, 150).
326. Feenberg (2017a, 151).
327. Feenberg (2017a, 151).
328. Feenberg (2017a, 187).
329. Feenberg (2017a, 187).
330. Feenberg (2017a, 204).
331. Feenberg (2017a, 204).
332. Feenberg (2017a, 204).

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