Introduction: from critical theory to technical politics

Technical politics is the name for disputes over technology design involving social actors with different values, interests and ideas about the future shape of society. Such disputes are surely as old as technology itself but in the modern, industrial period they tended to involve quite narrow sections of society, and the resultant technology served very specific economic interests. In the digital era, this has changed as people everywhere are shaping and customising devices and networks to suit their own preferences. The new era of popular interventions in technical practice creates openings for progressive politics, in which values other than the narrow pursuit of profit might shape technical infrastructure. At the same time, the objective need for new technologies, to address climate change and other imminent catastrophes, has never been more obvious or urgent.

This book is a critical study of the work of Andrew Feenberg, philosopher of technology and exponent of a unique version of critical theory. Grounded in the tradition of Marx and the Frankfurt School, Feenberg's project is political and avowedly left-wing, even socialist in orientation. His work is distinguished from other versions of critical theory by its basically optimistic assessment of the role of technology in social change. Feenberg's concept of technical politics attempts to mediate between the democratisation of technical practices on one hand, and the need for civilisational change to move humanity onto a sustainable footing on the other.

In this version of critical theory, technology retains the progressive role assigned to it by Marx – one that had receded to the horizon, or even been reversed in the work of earlier generations of critical theorists, who associated it with instrumental reason and the disenchantment of the world. Strangely enough, Feenberg also retains some of these negative ideas but incorporates them into an understanding of technology that

grasps it in terms of its fundamental ambivalence. He presents a definition of technology that is both conceptually nuanced and at the same time sensitive to historical variation in a way that distinguishes his work and sets it above even the most sophisticated positions in contemporary philosophy of technology.[1]

This work of conceptualisation is inseparable from Feenberg's conviction that technology is profoundly political and, moreover, that the principal political challenge faced by humanity today concerns its technology. In trying to establish the truth about what technology is, Feenberg at the same time elaborates a thesis on the politics of its place in cultural modernity. This involves the claim that technological change is not merely a driver of modernisation, and neither is it a factor that impedes or delimits the scope of politics and the pursuit of enlightened or progressive social reforms. In disclosing the 'historical essence' of technology Feenberg reveals that it is the very medium of political transformation: that activity conducted in the technical sphere, informed by extra-technical discursive factors, is the locus of political potential in modern societies. In short, he identifies technology as the site of political praxis: *technical politics*.

The idea of technical politics, then, combines Marx's enthusiasm for technology as the driver of social change and political progress with critical theory's suspicion of technology as the locus of societal rationalisation. Feenberg achieves this by locating both sides of this contradiction, so to speak, as internal to his account of what technology is, so that it is itself a constitutively contradictory phenomenon, while at the same time demonstrating that technology is always socially contested. Indeed, Feenberg goes so far as to say that technology is the distinctive form taken by politics today. His work speaks directly to the concerns of those who advocate technological acceleration as the route out of our contemporary crisis. Nick Srnicek and Alex Williams (2017), for example, converge with Feenberg in seeking to reclaim the project of modernity and, like him, they take reflection on technology's potential as a kind of licence to 'think big' about the prospects for future civilisation. However, their analysis lacks any account of how the willed transformation of technology they seek is to be brought about, so they can only genuflect to the need for new networks of institutions, presumably brought into existence by the (not inconsiderable) force of their polemic. In contrast, Feenberg takes what they dismiss as 'folk' interventions in technology as a starting point but adds a strategic theorisation of the technical as political, and in so doing provides essential conceptual resources with which to move from wish fulfilment to tactical analysis.

Feenberg's project is a synthesis of many currents of thought, and it introduces several important concepts that arise from this. Like any theory of such scale and ambition, his runs the risk of eclecticism, in

which disparate concepts and sources are forced together despite not really being compatible. One of the tasks of a book like the present one, which is part exposition and exegesis but also part critique, is to pull apart what has been carefully sewn together in order to give the reader a vantage point from which to judge the success of the larger project for themselves. It behoves the author of such a work to acknowledge that the putting together was much more difficult than the pulling apart. The conscience of said author is partly allayed by the fact that pulling at threads of this quality is very enjoyable and that the activity is a kind of compliment to the intelligence that wove them together.

The first duty of a book like this, though, is to try and convey a sense of the value and importance of the work that is being discussed. Why does Feenberg write about technology, and what is he trying to tell us about it? Why does he tell us that Heidegger's insights are important and worth hanging onto, while at the same time demonstrating the depth and extent of error in the philosophy that gave rise to them? How can he draw on Foucault's critique of the human sciences and also defend an idea of progressive technological rationalisation? Why does he condemn the Frankfurt School as miserabilists who often fail to deliver on their own promises, while calling his own theory the 'critical theory of technology'? Is Feenberg some (any) kind of Marxist, or is he a utopian socialist? These questions, and others concerning the details of his system, are all addressed in this book, but first it is necessary to position his intervention in contemporary thought about technology and society.

My contention is that Feenberg's primary focus has been the development of a theory of technology as something that is always already political. What he calls 'technical politics' is the central concept around which the rest of his system falls into place and in light of which its various points of obscurity and difficulty may best be clarified and understood. In this introduction I will attempt to situate it historically and theoretically, as well as providing an overview of the current book and describing the basis of my own critical perspective.

1 Critical theory in context

Feenberg began publishing on technology in the early 1990s, prior to which he published a study of Georg Lukàcs and the young Marx (Feenberg 1981). His interest in technology, however, pre-dates the published work and must have been present in his relationship with Herbert Marcuse, who supervised Feenberg's doctoral studies in the 1960s and early 1970s. This relationship is surely the most important and influential one on the development of Feenberg's thought, and it is fair to

say that he has done more than any other thinker to update and extend Marcuse's theory, to give it contemporary relevance.

A key moment in Feenberg's intellectual formation was his involvement in the 1968 events in Paris. There is a photograph of him outside the gates of the Renault factory where students and workers famously came together in a bid to wrest social power from the capitalist class and their political representatives.[2] As documented in his co-authored book about those events (Feenberg and Freedman 2001), this bid was partly successful. For a few weeks the power of the government of Charles de Gaulle was undermined and the president fled the country. In Paris and elsewhere in France basic social functions like the distribution of food were taken over by informal networks of people motivated to create an alternative social system.

In common with others of his generation who participated in the May events, Feenberg has a special light in his eyes when they are discussed, and it would not be an exaggeration to say that *les événements* have the status of an article of faith for him. As is widely noted in the commentary on 1968, many of the people involved were profoundly affected by something they experienced then. The near religious character of the May events is evidenced by the way that disputes over their interpretation quickly involve accusations of betrayal. Among those, like Alain Badiou, Jacques Rancière and indeed Feenberg, who retain their conviction that willed, wholesale changes of social system in wealthy countries remain possible and desirable, 1968 stands as confirmation. As such, their collective memory is an ideological bulwark against cynicism and nihilism, both of which serve as gateway drugs to political apathy and capitulation.

This has a profound bearing on the mature thought of the philosophers of the class of '68. Feenberg's theory is informed by his enduring conviction that capitalist modernity is susceptible to radical, even revolutionary transformation. Like Rancière (2009), his understanding of this assigns a specific role to aesthetics and to the changing role of the human senses in history. For both these thinkers, as for the young Marx, the senses are shaped and reconfigured by social and cultural contexts that promote the need for sharpened perception in some circumstances while dulling it in others. Capitalism produces a sensory configuration attuned to a world based on equivalences and exchange, while socialist perception would be more diverse, offering access to a fuller, more sensuous kind of experience. Like Marcuse, Feenberg retrieves this idea from Marx's 1844 *Manuscripts* (Marx 1983), and deploys it as part of his account of the nature of technology under capitalism and the politics of technological transformation.

Marcuse famously visited Paris during the 1968 uprising and addressed meetings of the students and workers. For him, the upheavals of the time must have been a kind of vindication. In *Eros and Civilization* (1961)

and *One-Dimensional Man* (1964) he had speculated that the totally rationalised, sexually repressed societies of Western civilisation had a chink in their armour. Educated youth, especially those groomed for a role in the technical professions, might refuse to take the places assigned to them. Their possession of technical skills and knowledge could, paradoxically enough, lead them to develop the possibility not of a less rationalised social system but of one in which rationality was developed to a new level, restored to the role set for it by the Enlightenment of improving human life rather than merely engineering the superficial 'happiness' of the satisfied consumer.

Marcuse's positive response to the 1960s student uprisings was in marked contrast to the attitudes of other members of his generation of critical theorists. His contemporaries, the Frankfurt School theorists Max Horkheimer and Theodor Adorno, reacted to student demonstrations and occupations in Germany with fear and suspicion. Indeed, excessive caution seems to have marked their attitude to any direct political engagement.[3] Adorno is said to have been troubled to find that his ideas might have inspired any kind of spontaneous social movements and considered that this was based on a misunderstanding. That was not unreasonable, given his negative assessment of the redemptive powers of political discourse. Horkheimer's revulsion at the behaviour of the students was such that he ended up expressing support for the US war in Vietnam.[4] It is not difficult to see why, for Feenberg and other students of the 1960s, Marcuse was a more appealing figure.

At the heart of the difference between these two versions of critical theory is a disagreement over psychoanalysis and what it has to tell Marxist theory about the nature of capitalist societies and the prospects for revolution. According to Marcuse's reading of Freud, consumerism enabled capitalism to move from straightforward, nineteenth-century repression of sexual instincts to a managed process whereby desires that might be destabilising to social order were re-cathected to the commodity, effectively channelling the basic drives into forms of consumption. Gratification was achieved through the cultivation of false needs and the endless deferral of real satisfaction into the behaviour patterns of acquisitive individualism. The way out of this, led by a generation of progressive technocrats, lay in the recovery of natural embodied desires and demand for the satisfaction of real needs, which consumer capitalism could not provide. There is a direct connection between these theoretical views and the radical cultural politics of the students, which involved ideas like flower power, free love and sexual liberation (Neville 1971).

Adorno's view was more austere and based on a different kind of refusal. Perhaps reflecting the mark made on him by the catastrophic events of the mid-twentieth century, he feared any project that might unleash the darker forces of the id. Like Marcuse, he worked out of the problematic

that seeks reconciliation of subject and object, and for him too this involved a dimension that could only be adequately explored using the psychoanalytic concepts of desire and repression. He also described the culture industry in terms of false needs and misdirected desire. However, for him, the notion of real needs was more obscure, and identifying it with the liberation of desire in a kind of somatic condition of bliss was a false route, likely to lead nowhere or to somewhere even worse than consumerism.

As Espen Hamer (2005) points out, Adorno proposed a different understanding of the subjective dynamics of life under capitalism, in which liberation is modelled more closely on the struggle for a kind of Kantian autonomy, albeit one that is informed by a richer portrayal of psychic life than was available to eighteenth-century philosophy. The political implications of his approach are correspondingly less clear than those of Marcuse's and probably more conservative.

Critical theory in Europe has moved on since Adorno and Marcuse, and second- and third-generation Frankfurt theorists have repudiated their forebears on a number of important points. Of obvious importance here is the work of Jürgen Habermas,[5] who has penned important critiques of both Adorno and Marcuse, and who has developed a very different version of critical theory based on theoretical foundations that have more in common with pragmatism than with the Marxist dialectic. His work also draws more heavily on ideas from development psychology than on psychoanalysis. Habermas is a few years older than Feenberg, and his work has framed the contemporary understanding of what Frankfurt School-inspired critical theory is in the twenty-first century. It is therefore worth itemising, albeit quite schematically, the major points of difference between his work and that of earlier critical theory, in order to place Feenberg's contribution in this context.

First, Habermas (1990) claims that what he calls the philosophy of consciousness has been superseded by the philosophy of language. Assimilating insights from Wittgenstein and pragmatism, Habermas moves critical theory into a theoretical context dominated by the study of language. This has a bearing on all aspects of his work. Ethics, for example, is less a matter of seeking internal coherence for a subject whose actions should be in line with privately processed maxims of conduct, and becomes instead a matter of consistency with norms integral to structures embedded in speech and verbal communication. Habermas considers that interpersonal efforts of communication are premised on a founding orientation to consensus and that this imposes ethical constraints on social actors. This focus on communication leads him to distinguish analytically between contexts of action, depending on the kind and extent of communicative orientation they imply. The development of a cultural lifeworld based on meaning is then distinguishable from the evolution

of a systems sphere in which technical imperatives routinely determine what is done, without communicative deliberation. This pragmatic delineation of action domains gives a functional-evolutionary conception of the social formation, which supersedes historical materialism (1985). On this basis Habermas rejects the key critical notions of historicism and totality. His model of society is autonomous in its key features from any historical considerations, and its two dimensions interlock on the basis of a sociological functionalism that posits no overall direction for societal or historical development (1989).

Habermas's theory is 'critical' only in the fairly minimal sense that by clarifying the fundamental properties of the cultural lifeworld as ruled by norms implicit in communication, he succeeds in identifying the main threat to meaning in contemporary society through the idea of 'internal colonisation' (1985). The latter involves a corruption or distortion of communicative processes so that practices which ought to be mediated through speech and discussion aimed at reaching agreement are instead 'steered' by money or power. The latter are systems media that can 'reach through' communicative acts to impose an alien logic on events in the cultural lifeworld. The practical thrust of this theory lies in the direction of containment of the systems sphere, which, through colonisation, poses the permanent threat of becoming overweening and eliminating the positive role of shared meanings as a factor in the mediation of collective life.

Feenberg's theory incorporates ideas from Marcuse and first-generation Frankfurt theorists, but he combines them with an emphasis on communication that is, at times, quite Habermasian. He does not, however, completely repudiate the philosophy of consciousness, since, as we shall see, he retains an important role for both aesthetics and phenomenological analysis of ideas, specifically those operative at the scene of technology design, in his account of technology's alignment with social power and in his understanding of the politics of socio-technical change. Similarly, Feenberg retains an idea of the historical totality as a quasi-organic entity with its own dialectical developmental principles. His theory of technical politics is underpinned by the belief that more democracy in technology design will issue in a more humane society, culminating in what he calls 'civilizational change'. Moreover, while Habermas embraces pragmatism as a philosophy, with attendant limitations on what counts as real for social *science*, Feenberg retains from earlier critical theorists the notion of a wider reality that exceeds contemporary science and even plays an important role in social and historical change.

In all these ways, Feenberg is a traditional critical theorist who refuses the Habermasian update. At the same time, he introduces innovations of his own to Marcusean critical theory, also based on subsequent philosophical developments. In particular, Feenberg does not accept the consignment of technology to a separate, systems sphere beyond the scope

of theories of social and cultural meaning. Technology, he argues, can be more or less meaningful depending on its social and historical location. One of his key innovations is to insist that both communication and the drive to create efficient and effective connections that characterise Habermas's systems dimension are best understood as combined *inside* the technical sphere. This is a subtle introjection of the central opposition of Habermasian theory, and it has important consequences.

2 Digital technology and critique

Feenberg's thesis that technology is essentially historical and ambivalent was formulated under its own very specific historical and cultural conditions. The argument that technology – its design and use – are not merely political but actually constitutive of contemporary politics is plausible because it coincides with the rise of digital technology and culture. Since the 1990s in particular, much of what was formerly understood as social activity, involving embodied actors in real-world places, has moved online. In this sense, the principal forums of social activism and debate about political issues are more highly mediatised than ever before. The rise of mass internet use, followed by the ongoing absorption of much of society into social media, has its origins in the same counter-cultural context that gave rise to the 1968 revolts.

Personal or home computer technology was first propounded in the mid-1970s and swiftly found a place for itself in the liberal ethos of the US West Coast (Freiberger and Swain 1984). The first such computers were shaped by a counter-culture that identified them as tools for self-emancipation and for the revival of democracy and community, in opposition to consumer culture and 'the system'. This culture had a strong 'do-it-yourself', craft ethos and was motivated by the search for social connection and authenticity. To an extent it was anti-technological, yet it included sub-groups for whom specific kinds of technology were viewed positively as tools of liberation. In this cultural setting the notion of a small computer had appeal because it presented the opportunity to take computer power from the system and give it to the people. Computer clubs and hobbyist groups sprang up to embrace the new machines, with slogans like 'computer power to the people' (Levy 1984). In his study of the social currents that shaped home computing, Fred Turner (2006) describes how counter-cultural icon Richard Brand's 'Whole Earth' movement combined a 'back to nature' ethos with the idea of using computers to connect people who shared the same alternative values and facilitate their activities.

This social context informed the design culture of computing and, in the course of the 1980s and 1990s, affected the way that computers

were presented to the wider public. Within the emergent discipline of human–computer interface design the dominant trend was to create machines that did not seem or feel like machines and which interacted with humans through more or less 'natural' communicative processes. Austere command lines gave way to sumptuous graphical user interfaces, and computing culture became 'post-modern' (Turkle 1995) as it based human interaction with computers on simulation and play rather than the acquisition of technical knowledge. This tendency towards pleasurable computing developed in tandem with the popularisation of the Internet in the 1990s, itself made possible by the development of the world wide web and 'user-friendly', graphically enabled web browsing. A key value of the counter-culture had been play rather than work, and this was reflected in the emergence of online social spaces that included fantasy worlds and massive multi-player gaming environments. By the turn of the century the counter-culture may have passed away, but many of its values had been parsed into design principles of the digital revolution (Kirkpatrick 2013).

Key among those values was the notion of democratic participation. This was present in the aspirations of the early hobbyists and foregrounded again in the rhetorics of 'Web 2.0' in the first decade of this century. The meaning of technology has been transformed by this principle. In the industrial epoch technology consisted of machines that people were obliged to use as part of their work. Machines were progressive in the sense that they enhanced productive efficiency, but few people were keen to work with one. To be sure, there were gadgets for the home and some dedicated devices for leisure use, but in recent decades technology has become as strongly associated with leisure as it is with labour. Connection to the Internet via a smartphone is almost a necessary condition for social participation, and this is experienced not as an imposition of the system but as a portal to opportunities for play, social connection and enjoyment. Technology has crossed some kind of line, and it has been pushed by the actions of millions of individuals driving its design and its acquisition of functions.

This change is vital to Feenberg's project because the fact of popular involvement in technology design constitutes the definitive opening to technical politics. His point is not merely that technology design is political because it conditions all of this activity. It is also not simply that nearly all social interaction is now mediatised and so political activity requires some kind of technological knowledge. For Feenberg, the fact that people consciously shape technology is the form taken by contemporary politics. In much the same way that Badiou (2006) dismisses most of what passes for politics in contemporary society as an empty exchange of well-rehearsed platitudes that changes nothing, so Feenberg basically agrees with his Frankfurt forebears that politics in the traditional sense is well under the control of the system. The extent of conscious

activity in connection with technology, challenging designs and modifying practices of use, is real politics because it touches directly on the operation of structures of power in modern societies and presents an immanent challenge to the hold of that system. When Feenberg makes the case for technical politics, one of the things he is saying is that this is the only, or certainly the main, viable form of real politics today.

There is, then, a continuous thread that connects Feenberg's involvement with the student protests in the 1960s to his identification of technology as the principal locus of contemporary politics. Digital technology has opened up what seemed to be closed off, namely, the possibility of a political challenge to the system that, just a few decades ago, had been called 'technocracy'. It is perhaps ironic that that this opening appears in the very dimension of social life that had seemed to be most strongly associated with the dominance of the system.

Moreover, the changes to technology associated with the move to digital culture involve alterations not only to the productive or economic dimension of society. The rise of computers and of other digital techniques has changed the way that technology relates to culture and meaning. In effect, it raises the question of whether there is a single continuous meaning to the idea of technology, a definition that transcends such discrepancies and links all of its various instances. Is there something inherently or essentially technical that connects the Manchester–Liverpool railway of 1830 to 2019's iPhone XS? According to Feenberg, the answer is not straightforward. There is an essential thread running through all instances of technology, but it is only ever encountered in a distinctive, contemporary social construction.

When he writes that technology has a historical essence, Feenberg takes the important step of incorporating a sociological element into the philosophical definition of technology. It is this move that enables him to comprehend the changes just discussed as *part of the meaning* of technology, and on this basis to identify the possibility of technical politics, while at the same time retaining a perspective grounded in critical theory. The latter, as we have seen, involves suspicion of instrumental reason and often identifies this with the essence of technology. The fact that Feenberg continues to invoke ideas formulated in the pre-digital context sometimes creates the impression of a prevarication on this point, something that is discussed at greater length in what follows. A key contention of this book, however, is that this is a misreading of his work, which is in fact avowedly and consistently anti-essentialist, in the sense that it refuses to identify technology with instrumentalism. The critique Feenberg makes of technology is premised not on the notion that it is instrumental in essence, but on the empirical observation that when it serves the ends of social domination this tends to coincide with a pronounced instrumentalism in its design. This explains why earlier,

essentialist philosophies sometimes 'ring true' even though their fundamental premises are false.

This is not to deny that there are problems at this point in his theory, however. I will suggest that rather than prevarication there is a hesitation in Feenberg's approach, by which I mean that once he has identified technology's role in social domination with its instrumental aspects, he does not recognise that it can also be biased in other ways. The relationship between technology in which the instrumental dimension is more pronounced and the social employment of technology to exploit and dominate both people and nature may well be much as he describes, as a matter of contemporary social historical fact. But it is important to notice that, consistent with the anti-essentialist approach, this leaves open the twin possibilities of progressive yet nakedly instrumental technique and the use of aestheticised and ostensibly meaningful designs in strategies of exploitation and manipulation.

This raises the question of how regressive and positive features are to be discerned when discussing technologies in context. Since technology is political, indeed is co-extensive with the political in the sense described above, this is a vital question for the critical theory of technology. One hazard attendant on any theory that views technology as the singular locus of conscious struggles over social power is that of taking an aesthetic index as the obvious route to target problematic designs. Machines that clearly prioritise function over form, the efficient realisation of a purpose over qualitative questions concerning the character of use, will then seem to be obviously contentious, while those that get inserted more or less seamlessly into social situations and perhaps even serve overt communicative ends will tend to disappear from view. The ease with which technical politics might fall into this is one of the reasons why the critical theory of technology warrants examination and critique. It is perhaps especially important to clarify the aesthetic dimension of the theory, to make it into a primary means for addressing technologies as socially problematic, even before they become politically contentious.

The main point of critique pursued in this book concerns the Adornian principle of non-identity as the basic point of departure for critical theory. My suggestion is that Feenberg succeeds, in the theory of technical politics, in placing technology firmly within the problematics of identity and representation. It is when technology design stitches a new device, technique or machine into the web of currently accepted identifications and social meanings that it serves power most effectively. This may not coincide with it behaving instrumentally or with the proliferation of the kinds of 'symptom' associated with industrial-era technologies, like physical harm to workers or egregious resource depletion. Contemporary technical politics concerns the kind of 'doubling' that occurs when an app, for example, contributes to an ongoing process of subjectification,

condemning people to a narrowly specified course of action rather than promoting or accommodating reflection that might open up alternative personal trajectories. Such nodal points in the operation of specific technologies can be related to impositions of identity and conformity onto social subjects, and technical politics ought to focus on creating opportunities for alternative subjectivations, by urging design changes that reduce dependency and enhance informed technology use.

This question of how to diagnose entanglements of specific designs with webs of social power also has a bearing on the kind of technical-political action that ought to be considered 'progressive'. Feenberg tends to identify positive developments in technical politics with action that points towards reconciliation of subject and object in a changed civilisation, in which technology has been redesigned to serve the interests of culture and communication rather than the narrow, instrumental goal of enhanced productive efficiency. Feenberg's preference here is informed by his affinity with Marcuse, for whom society is an organic whole that has been split apart by capitalism and awaits re-unification. For Adorno, in contrast, any politics based directly on the search for reconciliation of subject and object risks imposing its own identitarian demands on both of them.

Feenberg takes from Marcuse the principle that critique should move beyond the retrospective exercise of judgement to explain what has happened in the past as a negative consequence of the totally administered life, in order to actively promote reflection aimed at illuminating a course to something better in the future. He alleges that Adorno and other critical theorists evade crucial questions when they fail to take this step, effectively regressing behind some kind of mealy-mouthed Kantian moralism – condemning everything while refusing to say what should be done instead. I argue that in his rush to identify and affirm positive, present potential, Feenberg makes a pre-emptive move towards politics that cannot but leave unanswered questions in its wake.

The critical purpose of this book, therefore, is to address some of those questions with the Adornian principle of non-identity in mind, not with the aim of knocking Feenberg's theory down but rather in an attempt to support his efforts to identify and draw out the political significance in much of what is going on in contemporary digital culture. The result is that, while we reach slightly different conclusions, I argue nonetheless that Feenberg's critical perspective serves as a much more productive approach than the available alternatives in contemporary thought about technology.

3 Technical politics

My account of Feenberg begins by identifying his central question with that of Marx. Their common problematic concerns the contradictions

of the capitalist social formation and how they result in the transition to a society that takes the maximum degree of individual human self-realisation as its organising principle. Chapter 1 introduces the idea of technical politics as, first and foremost, an attempt on Feenberg's part to solve a fundamental dilemma of Marxism which, despite its urgent and as yet unresolved character and the enormous quantity of Marx scholarship over the past two centuries, is rarely addressed head-on anywhere. Feenberg not only engages with it but, in the theory of technical politics, presents an ambitious solution.

In his theory of history, Marx (1970) locates technology in the material infrastructure of society, among its productive forces, which he considers more fundamental to the explanation of social change than superstructural features like ideas or legal rights. Living in society, 'men inevitably enter into definite relations, which are independent of their will, namely relations of production appropriate to a given stage in the development of their material forces of production' (1970: 20). The latter include technology and tend to expand in productive power over the course of the historical process. This development of the productive forces is a condition of possibility of the transition to a socialist society, because that society has to be able to produce great quantities of material wealth if it is to facilitate the multitude of projects entailed by its emphasis on individuals' self-development. Marxism therefore identifies technology development as the key to historical progress. Moreover, within this overarching historical process, capitalism is the social formation that most accelerates technology development. Overturning the constraints of tradition, the dynamism of the capitalist economy means that it is always innovating and producing new, more productive machines. The place of capitalism in Marx's historical eschatology, immediately prior to socialism, is no accident: capitalism creates the material conditions, including the technical foundations, that make socialism possible.

However, Marx also describes in detail how technology in capitalist society is shaped to serve the interests of the capitalist class in their struggle against the mass of the people, who have to operate the machines. He shows that the principal motivation for capitalists to introduce new techniques is not to improve efficiency, or even to enhance their competitiveness, but rather to act against their employees. From the perspective of the individual capitalist, machinery is primarily an opportunity to reduce reliance on workers and to thwart their efforts to take control of the production process. For this reason, capitalist machinery is designed to oppress workers and to contribute to their domination rather than their self-realisation.

The dilemma here is that capitalist technology is held to be both shaped to be unpleasant for workers *and* the foundation for a socialist society, in which arduous toil is replaced by freely associated productive activity.

Feenberg discusses how the Soviets failed to address this problem and instead pursued a strategy of copying capitalist technology, combined for many years with a militaristic social organisation of the workplace. In consequence, the experience of living and working in Soviet society was no less unpleasant than life in a capitalist one, with the changed relations of ownership and control over production becoming something of an abstraction from the standpoint of the ordinary worker. Marx's paradox, then, had a toxic practical legacy in the twentieth century.

Feenberg draws the lesson that technology is one of the things that has to change as a part of the transition to a superior, socialist society. What he calls 'civilizational change' involves not only a break with the capitalist economy but an equally, if not more, profound shift at the level of material culture, and technology is implicated on both levels. The working class, as conceived by Marx, are not the privileged agents of this work of transformation. Instead, the struggle to change technology is more diffuse and concerns everyone who is subject to the operations of power in modern society. Drawing on critical theory's synthesis of Marx and Weber, Feenberg argues that the authority of technology discussed by Marx and Engels is not limited to the industrial workplace but spreads throughout society and culture.

Technology, in this argument, is not only shaped by capitalist interests and antithetical to workers' well-being but is also a key agent of societal rationalisation. While the development of technology remains, as Marx maintained, ultimately progressive, it is also shaped by the tendency towards intensified use of instrumental reason to enhance efficiency and, as Weber (1974) had shown, a correspondingly diminished role for meaning in social processes. In this analysis, technology is reified so that it appears to be the 'best solution' in any given workplace scenario, and resisting it becomes near-synonymous with irrationality.

By following his critical theory forebears and making this synthesis of Marx with Weber, Feenberg only seems to have doubled his difficulty. Somehow, technology must be the vehicle to a better society, yet it is also shaped by the capitalist interest in domination *and* societal rationalisation. Feenberg's solution is the theory of ambivalence: technology is both biased in the ways just described and remains the locus of a set of capabilities that could set humanity free. Technical politics mediates the poles of this contradiction, with the actions of social agents competing over the meaning of technology in a struggle that is now invested with political significance.

Recognising the activity of a range of social groups whose actions subvert or even democratise technology design and use as political, Feenberg opens up a theoretical space that both bears upon the very meaning of technology and helps to address Marx's problem. The transition to socialism now includes a technical dimension in the sense that,

just as socialist culture and institutions need to be prefigured as part of counter-hegemonic struggle, so its technological foundations can also be presaged by struggles waged in the present. Where hackers produce software to support striking workers by automating denial-of-service attacks on company servers, or when patients' groups demand that drug testing regimes be liberalised to allow them access to experimental treatments, Feenberg identifies the seeds of a socialist technology. Where these struggles are successful they bend technology design and technical practices to human ends, and the result is 'democratic' or 'subversive rationalisation'.

Technical politics consists of interventions that affect technology in ways that counter its existing bias. Chapter 2 discusses Feenberg's account of the bias of technology under capitalism, which he calls 'formal' bias and rigorously distinguishes from the substantive version propounded by essentialist scholars. Feenberg's inclusion of social factors in the philosophical definition of technology is in evidence here. According to his argument, technology is formally biased only when it is placed in a determinate social context. Cases of substantive bias, when a design is inherently detrimental to the interests of a specific social group (or even straightforwardly inhuman), are outliers. Yet technology never really exists as such outside of social contexts, and so a definition of it that disregarded that context would itself be a mere abstraction. Feenberg rejects essentialist theories, like those of Jacques Ellul (1964) and Martin Heidegger (2013), on that basis.

At the same time, though, essentialist critics identify bias in technology with certain traits with which it has long been strongly associated – in particular, the instrumental reduction of sometimes complex and meaningful situations to 'problems' with a single solution. Efficiency is often associated with this kind of narrowing of focus onto the attainment of a clearly defined goal by the most expeditious means, and its pursuit is open to criticism when it leads to the neglect of important neighbouring features of the world. This leads Feenberg to acknowledge that substantive critique sometimes has purchase, but, for him, this is a consequence of technology's historically contingent role in modern rationalisation and its shaping by factors specific to that context, rather than of its substantive character as technology.

The chapter concludes by arguing that Feenberg fails to follow through on this argument, with the result that he rejects the substantivist baby with the essentialist bathwater. In fact, technology is always substantively biased, and this insight is made possible by Feenberg's own move of including a social element in the definition. The substantive properties of technology that make it biased are not always the ones operative in capitalist modernity, which means that the question of its bias needs to be uncoupled from its purported instrumentalising qualities.

In short, removing one kind of capitalist bias by making technology more meaningful or pleasurable to use may well lead to another kind; it will never make technology neutral. Feenberg knows this, of course, but does not, it seems to me, take full advantage of his own insight when reflecting on socialist technology, which will have to have its own kind of substantive bias.

The third chapter turns to Feenberg's concept of technical politics, which, as I have suggested above, is perhaps his central theoretical innovation. The idea of technical politics involves a further theoretical synthesis, this time of social constructivism with Ernesto Laclau and Chantal Mouffe's (1985) theory of hegemony and radical democracy. In a number of influential works published in the 1980s, scholars in the new discipline of science and technology studies (STS) established the notion that social groups shape technologies by competing to attach their own preferred meanings to them in the early phases of their development (e.g. Bijker and Hughes 1989). These labelling processes involve rival constituencies identifying capacities in new technologies that might be used to solve problems in a way that is relevant to their needs or interests. Perhaps the most important insight here, from Feenberg's perspective, is that this process is competitive, because this is a clue to its political character.

If constructivists generally overlooked wider questions, like the social consequences of a particular group's success in gaining control of a technology, Feenberg insists that disputes over what a technology is for commonly have far-reaching consequences that should not be bracketed out. More importantly still, the fact that such disputes can occur at all, and even seem to be happening more often, suggests that the totally administered, rationalised society described by Adorno and Horkheimer (1997) and Marcuse (1964) may have come unstuck. Dissent is surfacing close to the heart of that social formation, in connection with its most reified, authoritative element. This development is seized upon by Feenberg as the fulfilment of Marcuse's idea that technocracy might be transformed from within by the development of an alternative technology.

Another fertile aspect of STS exploited by Feenberg is its emphasis on language and descriptive operations that represent technologies in such a way as to affect how they are initially perceived, which has consequences for how they turn out and are presented to the wider public. Technology design then emerges as a contest played out in games of description and counter-description, which are described in detail by STS scholars, albeit in a way that nearly always neglects the issue of social power. Drawing on Laclau and Mouffe's (1985) highly discursive conception of politics, Feenberg reinterprets these processes as agonistic articulations occurring within the parameters set by capitalist hegemony. Technology, in this terminology, is 'coded' in its design process, and competing social

groups seek to make their own articulations of this code dominant, or hegemonic.

Technical politics, then, is played out through multiple local struggles to articulate technology in a dual sense: (1) to provide the dominant expression or representation of a technology, so that it comes to be associated with some purposes rather than others; and (2) in so doing, to connect a given design to the global meaning of technology itself, in a move that alters the prevailing conception of what technology is and, importantly, what it might be in the future. The latter is the hegemonic codification of technology, which Feenberg takes to be crystallised in the works of essentialist philosophers, even if they are wrong to believe that this is all that technology can be.

The idea of technical politics is the centrepiece of Feenberg's theory, providing his entire intervention with its rationale. The theoretical synthesis of STS and politicised post-structuralism is ingenious, and it restores politics and the necessity of radical social change, in particular radical democratic transformation, to the centre of critical theory's concerns. Chapter 3 describes why Feenberg identifies such political promise in contemporary popular interventions in a variety of technical fields of activity. However, the chapter also lodges a number of reservations.

First, the aggregation of multiple local struggles over technology need not ever amount to the kind of sweeping, wholesale system change implicit in Feenberg's reference to 'civilizational change'. Second, the theory seems to exaggerate the extent to which technical politics simply is politics, in which case technology and contests over the meaning of technology are the only available way for people to challenge the social system. This last impression is re-enforced by Feenberg's characterisation of the current technical hegemony in terms that are drawn from essentialist scholarship: if that is an accurate account then the technocratic system as a whole is largely intact and its technology is, paradoxically, the only chink in its armour. Third, Feenberg's move to view these social interventions as a progressive form of politics may be peremptory in the sense that it leaves out of account all those actors and social groups who, for various reasons, are not actively involved in changing technology but are excluded from its development and use. Why such exclusion happens is a sociological rather than a political question, and it could be argued that it is one that should be integral to any critical theory of technology.

Chapter 4 turns to the notion that technical politics has an important aesthetic dimension. As seen above, Feenberg takes from Marx (1983) the idea of an intrinsic connection between social power and the sensory configuration of the human creature. This relationship is, to a large extent, mediated through technology and technology design, since changes here tend to be determinate for historical variation in the texture and

feel of lived or sensed experience. Feenberg's analysis of aestheticisation starts from the observation that, historically, all technology has been attentive to the question of how it fits with the rest of human activity. This concerns questions of meaning – specifically, how individual technical objects symbolise their function to putative operators. Such public symbolisation processes serve to situate objects in wider webs of significance and meaning. The way that technology design addresses this issue in any given society will have a bearing on how technics and technique cohere with the wider cultural context and on what is meant by technology as a whole.

All technology has this symbolic dimension, but how it interacts with technical functionality is historically variable. According to Feenberg, what distinguishes the technology of capitalist modernity is that, unlike other cultures, it neglects this aspect of technology design, presenting its users with a peculiarly austere kind of technology. It is in this context that technology in modern societies is perceived (and theorised) as a narrowly instrumental, even brutal, dimension of society and often regarded as something that needs to be contained and limited to specific areas of activity. Feenberg emphasises that this is a contingent meaning, however, and points to other cultures in which technology represents other, positive values.

In traditional societies, for example, it was common for people to decorate tools and machines, a practice that demonstrated their incorporation into the weave of cultural life. Similarly, facility with a particular kind of tool would often be associated with a social role or identity, with the consequence that the user and the tool would be held in a certain kind of esteem by the rest of the community. Residual traces of this more organic relationship between individuals, technology and culture can be discerned in modern, even industrial settings, where workers continue to decorate factory tools and some technical professions maintain a collective sense of themselves as vocations. These things are harder to sustain under modern conditions because technology is designed in a way that is neglectful of its symbolic aspect, reflecting (and contributing to) the fact that it has become abstracted from society and often seems to sit outside of culture.

Feenberg comprehends this difference in terms of his theory of 'instrumentalisation', which is the focus of Chapter 5. Instrumentalisation has primary and secondary moments. Primary instrumentalisation refers to the historically continuous sub-stratum of human interaction with the physical and natural environment, which always involves a certain kind of violence associated with the displacement of items from their natural locations and their reduction to those aspects that are used to achieve a human purpose. There is a strong resonance between primary instrumentalisation and essentialist theories of technology, but Feenberg emphasises that no technology consists purely of its primary

instrumentalisations. Technology always also includes a second moment, in which it is articulated to meaning-making activities that constitute the society and culture of which it is a part. This is where Feenberg incorporates historical and social factors into the definition of technology. Just as when he includes instrumentality and communication and the opposition between them as factors internal to technology development, so here he performs a kind of introjection whereby essentialist and constructivist elements are made to co-mingle in a single conception of what technology is.

The elements in this definition, then, are in play whenever there are disputes over the meaning of any given technical artefact. Feenberg maintains that capitalist modernity is characterised by a uniquely stark, stripped-down version of secondary instrumentalisation, so that its technology is marked by a tendency to erode and undermine the compensatory aspect of secondary instrumentalisation, revealing what appears to some as the violent heart of technical endeavour. However, technical politics makes it clear that capitalist technology runs up against an internal limit, in the sense that no merely instrumental technology is actually possible, and other forces, internal to technology development itself, will necessarily counter this tendency and attempt to insert symbolic mediations that mollify primary instrumentalisation.

The notion that technology includes, as part of its internal rational structure, a meaningful aspect that might be expanded upon and developed is central to Feenberg's suggestion that, contrary to Adornian pessimism, it might be possible to construct utopia from here, the nerve centre of technocracy. Moreover, by identifying democratic technical politics as the means through which secondary instrumentalisation might be expanded and infused with alternative meanings beyond the narrow pursuit of ends, he presents a vision of such change as democratic, rather than carried through by a progressive technical elite, as in Marcuse's version.

Feenberg is particularly critical of Adorno for failing to include such a positive moment in his version of critical theory, calling the latter's refusal to countenance utopia an 'evasion' that renders his theory largely irrelevant. In the final chapter I suggest that the real problem here is one that Feenberg himself does not fully escape – namely, that there is an epistemological problem for critique as a way of identifying social problems, which can be brought into relief by using utopia as a method for thinking the future. The book concludes with the suggestion that, especially in his own refusal to theorise the substantively biasing aspects of progressive technology, Feenberg's technical politics also does not deliver on its utopian promise. Notwithstanding this, his theory offers crucial resources with which to move in that direction, and for that reason alone it demands our attention.

Notes

1 This view is confirmed by Feenberg's pre-eminent position in most anthologies and in discussions at all the relevant symposia on philosophy of technology, as well as the pride of place assigned to his pieces in prestigious collections like the one edited by Robert Scharff and Val Dusek (2003). He has secured a prominent place for Marxian thought within one of the most important sub-fields of contemporary philosophy, an accomplishment all the more remarkable at a time when left-leaning academics have been largely excluded from many disciplines, including philosophy and sociology. While two edited collections (Veak 2006; Arnold and Michel 2017) have been devoted to his work, I believe this is the first monograph study.
2 This photograph can be accessed at: www.sfu.ca/~andrewf/books/may68.pdf. Accessed 9 December 2019.
3 'Adorno was unsympathetic to any form of revolutionary action, interpreting it as blind to its own motives and naïve about its likely consequences' (O'Connor 2012: 13).
4 Lorenz Jäger reports that Horkheimer 'stuck demonstratively to the side of the United States, whose mission to save the world from the dangers of Eastern Communism he had made entirely his own' (2004: 197–198).
5 Adorno was Habermas's doctoral supervisor, as Marcuse was Feenberg's.