Culture and Technology

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Introduction

Once again, technology is threatening to destroy culture. This time around, the specter of artificial intelligence (AI) seems to rattle at the foundations of humanity itself. Yet, where some see a threat, others see a promise: of freedom from time-consuming activities like reading and writing; of democratized access to cultural production; or simply of quick and easy assistance for mundane tasks at work or at home. While the development of AI technologies has made notable progress in recent years, predictions of it heralding 'the end of the world as we know it' remain speculative. As the economic historian Aaron Benanav has argued, the current discourse on AI might be usefully compared to the automation hype and scare that dominated news cycles throughout the 2010s.[1] While studies predicting the looming replacement of almost half of all jobs turned out to be vastly overstated, it is likely that "the nature of work"[2] – as well as life in general – will be affected by technological transformations.

Cultural Studies can help to make sense of this situation. It offers a perspective that rejects technological determinism and, instead, contextualizes processes of technological change as well as the way humans interact with existing technologies in wider socio-economic conjunctures. Rather than seeing specific developments as the inherent result of some innovation, it asks us to take a closer look at the power relations that inform how technologies are created and popularized as well as the different practices with which users integrate them into their everyday lives. By considering cultural history, it shows that the dreams and anxieties articulated by contemporary observers are hardly novel. The fantasy of self-moving instruments of production is as old as that of a self-playing lyre in Aristotle's *Politics*, expressed more than 2,000 years before humans invented industrial robots and drum computers.[3]

Based on this, Cultural Studies invites us to scrutinize the common interpretation of culture and technology as separate – even opposing –

entities. Consequently, Cultural Studies analyzes not just how technologies inform the production, distribution and consumption of cultural artifacts, but also in how far technologies themselves are formed by the cultural conditions from which they emerge. As Raymond Williams argued, technologies are "always socially and materially produced"[4] – they explicitly do not "emerge exclusively from a process of research and development independently of all social conditions and political interests".[5] Instead, they are produced within a specific cultural environment: "virtually all technical study and experiment are undertaken within already existing social relations and cultural forms, typically for purposes that are already in general foreseen".[6] In this sense, technologies are "reifications of deliberate activity".[7] This does not mean that, once specific technologies exist, it is possible to use them in the intended way only. However, they are also not "open to infinite flexibility as a result of users' interpretations of them".[8] Technologies "make some things possible, others not."[9]

If technologies cannot be divorced from the cultural contexts in which they are formed, and if culture is fundamentally shaped by the technologies it employs, it might be more useful to examine how their interdependency is realized under different conditions. Doing so might also allow us to develop new perspectives on the conflicts and tensions that regularly arise around this topic, as "public anxieties around new technologies [...] are often more about pre-existing tensions within the culture than they are about the technologies themselves".[10] Thus, to talk about steam machines we also need to address the wage relation, capitalist crisis, and working-class revolt; to talk about washing machines, we also need to examine the gendered relations of reproduction; to talk about Auto-Tune, we need to analyze questions of (cultural) value.

The Culture/Technology Conundrum

The modern notion of culture, Williams notes, emerged "in the period which we commonly describe as that of the Industrial Revolution".[11] While the introduction of new productive technologies was transforming workshops and factories as well as cities and landscapes, the meaning of the term culture shifted, too. Before, culture had been the "culture *of* something", be it the cultivation of nature in agriculture or the cultivation of minds in learning; now it became "a thing in itself", a separate entity or sphere: on the one hand, this included "the general body of the arts", on the other, "a whole way of life".[12] Cultural Studies, as always, is interested

in their conjunction.

One particularly influential response to the transformations of the Industrial Revolution can be found in Thomas Carlyle's 1829 essay "Signs of the Times". Here, the Scottish writer announces the advent of a new era, a "Mechanical Age" or "Age of Machinery", though he crucially distinguishes between its "outward" and "inward" manifestations.[13] The former refers to the introduction of new technologies such as machines, steam engines, or railroads which transformed the ways in which Carlyle's contemporaries were living, working and traveling. What strikes him as more significant, and more dangerous, however, are the effects that mechanization has on the intellectual, moral, and spiritual dimensions of life. Thus, Carlyle uses a metaphor that will often be repeated: what is at stake is humanity's "whole manner of existence," for humans "are grown mechanical in head and in heart, as well as in hand".[14]

Only two years later, the American lawyer Timothy Walker ridiculed Carlyle's alleged "mysticism" in the pages of the *North American Review*. Walker, instead, celebrates the emancipatory potential of the novel technologies. He argues that if the manual labor necessary to produce the means of subsistence were to be reduced or even eliminated, humans would obtain the "leisure" to devote themselves to improving their "higher and nobler nature". Consequently, he writes, "there would be nothing to hinder all mankind from becoming philosophers, poets, and votaries of art".[15] The abolition of physical labor would allow for an unprecedented flourishing of intellectual and artistic activities. As much as Carlyle's essay seems to prefigure a nostalgic cultural conservatism that is anxious in the face of progress, the "Automated Utopia"[16] of Walker's retort reads a lot like calls for a fully automated post-capitalism in a series of books published at the height of the automation hype in the 2010s.[17]

What makes Carlyle's contribution specifically relevant from a Cultural Studies perspective is the fact that he recognizes culture "as an integrated whole": "Like a modern anthropologist, Carlyle is attempting to make statements about an entire way of life [...]. In using the machine as a symbol of the age, he is saying that neither the causes nor the consequences of mechanization can be confined to the 'outer' or physical world."[18] This allows for an understanding of technology as not "autonomous," but as being located within culture understood as a "complex web [...] made up of connections".[19] Technology, thus, affects the production of cultural artefacts, but also of society itself, our "whole way of life".

In fact, the very word 'technology' – which is now so easy at hand to describe the changes that Carlyle was concerned with – did not yet exist at the time. However, as the nineteenth century advanced, the idea of an "Age of Machinery" seemed insufficient to describe the increasingly complex systems that were emerging. Instead, commentators were looking for a "concept that did not merely signify [...] a *means* of achieving progress, but rather one that signified a discrete entity that, in itself, virtually *constituted* progress".[20] 'Technology' not only articulated an idea of progress but at the same time seemed to become the subject of that progress. Rather than simply clarifying what was happening, however, the new concept also carried the "hazard" of simplifying, "especially when the singular noun (*technology*) is the subject of an active verb, and thus by implication an autonomous agent capable of determining the course of events".[21]

One of the ways in which we might navigate this messy terrain of culture and technology – who is influencing whom, and are they even separate things? – is by focusing on specific case studies. If culture is a web of connections, then "[t]echnologies arise within these connections as part of them and as effective within them".[22] Instead of identifying a simple relation of cause and effect between the two seemingly separate spheres of culture and technology, Cultural Studies scholarship sets out to analyze historically specific articulations of the meanings, materialities, and practices, both inscribed in and informed by concrete technologies.

Technology, Labor, and Power Relations

Industrialization shaped new ways of thinking about processes of mechanical (or technological) development and their relationship to human beings, from humans turning into quasi-machines to fears of mass unemployment or dreams of full automation. All of these appear in the work of the first great critic of capitalist civilization, Karl Marx, who condemns the incorporation of workers into the "lifeless mechanism" of the factory system "as its living appendages" in the first volume of *Capital*.[23] However, he also envisions a future in which the near-total reduction of "direct labour time" creates the conditions of possibility for the "artistic, scientific etc. development of the individuals in the time set free" in the *Grundrisse*.[24] Generations of scholars have tended to read Marx as a technological determinist, who held that the progressive development of the productive forces – which were, on top of that, reductively identified with productive technologies – would determine

the course of history.[25] However, in his mature works Marx suggests that he was very much aware that technologies are located in webs of social relationships in complicated ways. They can create affordances for proletarian political practice, when the development of industry concentrates more and more workers in factories where they can become unified "into a class"[26] based on their shared experiences. At the same time, Marx writes that one could view all "inventions made since 1830" as having been made "for the sole purpose of providing capital with weapons against working-class revolt".[27]

In this context, the role of power – the power to make or break articulations – becomes crucial. Andreas Malm's historical materialist account of the introduction of the steam engine, which was established not because it was more efficient or cheaper than the water wheel, but "because it offered superior power over labour",[28] is a case in point: the steam engine relied on and mobilized the properties of coal that constituted a significant advantage in a socio-historical context defined by class antagonism and the profit imperative, because it enabled capitalists to build factories in cities where wage-dependent proletarians were concentrated, instead of having to move to remote regions where water was abundant but labor scarce. Accordingly, steam was fetishised as "the materialised power of the bourgeoisie" in contemporary poems and pamphlets.[29]

Household Technologies

To understand the role of culture in these processes of change, it is particularly instructive to take into account the articulation of gender and technology. While activities performed in the domestic sphere often have not been recognized as labor, let alone socially necessary labor, Marxist feminist activists and scholars have long insisted that these activities performed typically by women constitute "social services inasmuch as they serve the reproduction of labor power".[30] Without the care work of women, without shopping, cooking and washing, no men could return to the factory in the morning. The liberation of women from their "slavery to a kitchen sink",[31] then, seemed to require that housework be "fully automated," as Shulamith Firestone put it,[32] or "incorporated into the industrial economy," by, for instance, "engineering technologically advanced cleaning machinery," in Angela Davis's words.[33] Other writers, like Mariarosa Dalla Costa, remained wary, however, suggesting that "the automation of domestic work [...] will never happen", because "the

maintenance of the nuclear family is incompatible with 'the automation of these services'".[34] Services, in fact, are often precisely those tasks which cannot (easily) be automated in the first place, which means that there might be material limits to the industrialization of the household.[35] Moreover, when activities performed in the domestic sphere (say, doing the laundry) are automated (by the washing machine), it need not result in less work. In her appositely titled book *More Work for Mother* (1983), the historian Ruth Schwartz Cowan has shown that in many cases the opposite has been the case. Her argument – sometimes called the "Cowan Paradox"[36] – is that the introduction of labor-saving technologies into the household has often saved no labor at all or, more precisely, has not reduced the amount of labor typically performed by women in the domestic sphere. While cooking on a wood-burning stove, for instance, used to require preparatory activities such as gathering and chopping firewood as well as the actual preparation of a meal and the cleaning of the appliance, the introduction of gas or electric ranges "eliminated only one of those steps, the first; and *that* was the step, which [...] was most likely to be assigned to the men and boys in the family".[37] In the end, only some tasks were eliminated, while others were reorganized in such a way that the work became less physically taxing, but increased in volume.
In this context, changing cultural values have played an important role: a transformation of standards of cleanliness meant that a woman in a household possessing an electric washing machine "would have found it *easier* to do her laundry but, simultaneously, would have done *more* laundry".[38] Helen Hester and Nick Srnicek, whose 2019 book *After Work* confirms many of the tendencies observed by Cowan, note that "while technology may provide opportunities, it does not determine changes. The possibility of more frequent washing also required the *demand* for more frequent washing". Hence, they argue, one needs "to look at the influence of both advertising and broader social norms",[39] a task for which Cultural Studies offers a rich theoretical and methodological toolbox. In short, it is crucial to consider cultural values – such as changing standards of cleanliness – as well as the distribution of power in social relationships – such as the gendered division of labor – when thinking about the uneven impact of automation. The introduction of new technologies, then, does not merely replace workers, but can also lead to the creation of new tasks and practices which, however, can be devalued by drawing on existing cultural representations (of gender, but also, for example, race, ethnicity, nationality, age or dis/ability).

Hopes and concerns about technological change are not just directed at the (industrial) workplace or household labor, they also manifest in the 'arts' – often taken as some kind of early alarm system for threats to a 'whole way of life'. In the case of music, discussions ranging from short-form video and streaming to sampling and recorded sound to copyright and musical notation present a long history of negotiations around how we engage with culture through technology. As in the examples addressed above, this dynamic seems to have gained momentum during the nineteenth century. Industrialization also transformed people's relationship to music-making: it made possible the mass production of instruments like the piano, but likewise introduced devices that could (re-)produce sound without immediate human action. As early as 1906, the American composer and conductor John Philip Sousa warned against the possible effects of new technologies like the (self-playing) player piano and the phonograph.[40] Himself a pioneer of sound recording, Sousa was ambivalent about the impact of what he called "canned music", which might range from educating the general public to incapacitating their musical abilities. First and foremost, Sousa saw music as something to be done, rather than to be consumed.

Indeed, the possible replacement or devaluation of human activity has persistently accompanied the evolution of popular music. This has frequently taken the form of critics bemoaning the decline of 'real' music – music that is seen as a somehow unmediated (emotional or artistic) expression of the people producing it – which is contrasted with the use of newer devices, be this player pianos, electric guitars or synthesizers and drum machines. According to Simon Frith, what "is at stake in all these arguments is the authenticity or truth of music; the implication is that technology is somehow false of falsifying".[41] More fundamentally, "technology is seen to undermine the pleasures of music-making (and watching music-making)".[42] In recent years, one of the most obvious manifestations of this discourse has been around Auto-Tune.

Auto-Tune was developed as a software tool to easily correct off-key singing – a practice that, in more laborious forms, had been possible for numerous decades – but eventually attracted attention through its unconventional use on Cher's 1998 hit "Believe". Instead of merely adjusting the singing in a discreet way, "Believe" featured Auto-Tune as a vocal-procession effect, similar to older devices like the talk box or the vocoder. Since the 1960s, these had regularly been employed to stylize

robotic, posthuman voices. What made Auto-Tune so appealing to artists like T-Pain was the way it interacted with their vocals. This indissoluble mesh of human and machine was also what irritated its critics: not only did these voices not sound like they were supposed to, it also seemed that Auto-Tune was actively undermining the importance of musical skill. Thus, its users were slammed for apparently not being able to sing.[43] What some found to be a new avenue for – or even rejection of – expressiveness, others perceived as an unnatural intervention into the artistic process. Cultural Studies invites us to think about the underlying factors informing why and how such value judgments are made. These range from genre ideologies – as Frith points out, (male-dominated) rock music cultures have long fostered a sense of authenticity to distinguish it from the alleged artificiality of (feminized) pop – to questions of identity or a concern with manipulation and power.

Conclusion

Socialists may have dreamed of a moment when the unified industrial working class would expropriate the expropriators and redirect the factories liberated from the regime of private property to produce use-values rather than commodities – but this turned out to be more difficult than imagined. This was not exclusively due to the fact that the party of private property put up a strong fight. Rather, the question arises whether all technologies can actually be freely repurposed. If all technologies exist in the web(s) of connections that make up a culture, the question is whether old articulations, say, between technological artifacts, gendered identities and notions of economic value, can be dissolved and new articulations forged. With some technologies this might seem feasible. There is, arguably, nothing about the electric oven that connects it inextricably to the nuclear family and its traditional gendered division of labor. Communal cook-shops of the future could, theoretically, afford the chance to produce food collectively without condemning individual mothers to more work. The electric oven, then, is a technological artifact that is not "inherently" compatible with only one form of politico-cultural arrangements.[44]

But what about the globe-spanning logistical infrastructure of just-in-time capitalism? According to the communist writer Jasper Bernes, logistics is "capital's art of war" and "one of the key weapons in a decades-long global offensive against labour".[45] As such, he argues, this specific logistical infrastructure is of little use outside a capitalist economy; it

cannot be repurposed and rearticulated, because certain meanings, based on the systemic imperative to accumulate capital, are deeply inscribed into its very materiality. Consequently, we cannot merely assume that any technology can be rearticulated at will. Instead, as Bernes writes elsewhere, capitalist technologies "fit together into technical ensembles that exhibit a strong degree of *path-dependency*",[46] making some things possible, others not. This need not lead to a resurrection of the old technological determinism, but compels us to acknowledge the inertia of historically implemented technical systems – even though the prospect of catastrophic climate change makes a radical transformation of the "technical infrastructure of the planetary factory"[47] more necessary than ever.

1. Aaron Benanav, "The Revolution Will Not Be Brought to You by ChatGPT", *The New Statesman*, April 11, 2023 (accessed 26 May 2026).
2. Ibid.
3. Aristotle, *Politics*, transl. C. D. C. Reeve, Indianapolis/Cambridge: 2017, p. 6.
4. Raymond Williams, "Means of Communication as Means of Production" (1978), in: *Culture and Materialism: Selected Essays*, London: 2020, 56-70, here p. 56.
5. Georgiana Banita, "Raymond Williams and Online Video: The Tragedy of Technology", in: *About Raymond Williams*, eds. Monika Seidl, Roman Horak and Lawrence Grossberg, London: 2010, 94-105, here p. 96.
6. Raymond Williams, *A Short Counter-Revolution – Towards 2000 Revisited*, ed. Jim McGuigan, London: 2015, p. 90.
7. Endnotes, "Error", *Endnotes* 5 (2019), 114-160, here p. 115.
8. Nick Prior, *Popular Music, Digital Technology and Society*, London: 2018, p. 17.
9. Jennifer Daryl Slack and J. Macgregor Wise, *Culture and Technology: A Primer*, 2nd ed., New York: 2015, p. 132.
10. Gilbert B. Rodman, "Waiting for the Great Leap Forward: Mixing Pop, Politics and Cultural Studies", in: *The SAGE Handbook of Popular Music*, eds. Andy Bennett and Steve Waksman, London: 2015, 48-63, here p. 59.
11. Raymond Williams, *Culture and Society 1780-1950*, London: 2017 (1958), p. xiii.
12. Ibid., p. xiv.
13. Thomas Carlyle, "Signs of the Times" (1829), in: *Selected Writings*, London: 1980 (1971), 29-55, here p. 34.
14. Ibid., p. 37.
15. Timothy Walker, "Defense of Mechanical Philosophy (1831)", *Bulletin of Science, Technology & Society* 9 (1989), 91-97, here p. 92.
16. Leo Marx, *The Machine in the Garden: Technology and the Pastoral Ideal in America*, Oxford: 2000 (1964), p. 185.
17. See Alex Williams and Nick Srnicek, *Inventing the Future: Postcapitalism and the a World Without Work*, London: 2015; Paul Mason, *Postcapitalism: A Guide to Our Future*, London: 2016; Aaron Bastani, *Fully Automated Luxury Communism*, London: 2019. For a survey of anticapitalist discussions of automation, see Johannes Fehrle, Marlon Lieber and J. Jesse Ramírez, "Marxism and the Technology Debate", in: *(De)Automating the Future: Marxist Perspectives on Capitalism*, eds. Johannes Fehrle, Marlon Lieber and J. Jesse Ramírez, Leiden: 2024, 1-53.
18. Marx, *The Machine in the Garden*, p. 173. See also Williams, *Culture and Society*, p. 116.
19. Slack and Wise, *Culture and Technology*, p. 126.
20. Leo Marx, "Technology: The Emergence of a Hazardous Concept", *Social Research* 64:3 (Fall 1997), 965-988, here p. 977-978, emphases added.
21. Ibid., p. 968.
22. Slack and Wise, *Culture and Technology*, p. 112.
23. Karl Marx, *Capital: A Critique of Political Economy*, vol. 1, transl. Ben Brewster, London: 1990 (1872), p. 548.
24. Karl Marx, *Grundrisse: Foundations of the Critique of Political Economy* (*Rough Draft*), transl. Martin Nicolaus, London: 1993, p. 706. On the development of Marx's thought, see Fehrle, Lieber, and Ramírez, "Marxism and the Technology Debate," p. 3-15.
25. See for instance G. A. Cohen, *Karl Marx's Theory of History: A Defence*, Princeton: 2000 (1978).

26. Karl Marx and Frederick Engels, "Manifesto of the Communist Party," in: *Collected Works*, vol. 6, New York: 1976, 477-519, here p. 493.

27. Marx, *Capital*, vol. 1, p. 563.

28. Andreas Malm, "The Origins of Fossil Capital: From Water to Steam in the British Cotton Industry", *Historical Materialism* 21:1 (2013), 15-68, here p. 44, emphasis removed.

29. Andreas Malm, *Fossil Capital:The Rise of Steam Power and the Roots of Global Warming*, London: 2016, p. 218, emphasis removed.

30. Mariarosa Dalla Costa, "Women and the Subversion of Community (1972)", in: *Women and the Subversion of Community: A Mariarosa Dalla Costa Reader*, ed. Camille Barbagallo, Oakland: 2019, 17-49, here p. 28.

31. Ibid., p. 29.

32. Shulamith Firestone, *The Dialectic of Sex: The Case for Feminist Revolution*, New York: 1970, p. 201.

33. Angela Davis, *Women, Race and Class*, London: 2019 (1981), p. 201.

34. Dalla Costa, "Women and the Subversion of Community", p. 31.

35. Aaron Benanav, *Automation and the Future of Work*, London: 2020, p. 59.

36. Helen Hester and Nick Srnicek, *After Work: A History of the Home and the Fight for Free Time*, London: 2023, p. 22-28.

37. Ruth Schwartz Cowan, *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave*, New York: 1983, p. 98, original emphasis.

38. Ibid, original emphases.

39. Hester and Srnicek, *After Work*, p. 55, original emphasis.

40. Cf. John Philip Sousa, "Machine Songs IV: The Menace of Mechanical Music", *Computer Music Journal* 17:1 (1993), p. 14-18.

41. Simon Frith, "Art Versus Technology: The Strange Case of Popular Music", *Media, Culture & Society* 8:3, 263-79, here p. 265.

42. Frith, "Art Versus Technology", p. 266-268.

43. These criticisms are also heavily gendered, as are the production contexts in which such overt – as well as more subtle – uses of pitch-correction take place. Cf. Catherine Provenzano, "Making Voices: The Gendering of Pitch Correction and The Auto-Tune Effect in Contemporary Pop Music", *Journal of Popular Music Studies* 31:2 (2019), 63-84.

44. Langdon Winner, "Do Artifacts Have Politics?" *Daedalus* 109:1 (1980), p. 121-36.

45. Jasper Bernes, "Logistics, Counterlogistics and the Communist Prospect", *Endnotes* 3 (2013), p. 185-186.

46. Jasper Bernes, "The Belly of the Revolution: Agriculture, Energy, and the Future of Communism", in: *Materialism and the Critique of Energy*, eds. Brent Ryan Bellamy and Jeff Diamanti, Chicago/Alberta: 2018, 331-375, here p. 334, original emphasis.

47. Phil Neel, *Hellworld: The Human Species and the Planetary Factory*, Leiden: 2025, p. 219.

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