Artificial Intelligence: George Eliot, Ernst Kapp, and the Projections of Character

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Even in the context of George Eliot's last and strangest work, *Impressions of Theophrastus Such* (1879), 'Shadows of the Coming Race' is a very peculiar piece of writing. It takes the penultimate place in a volume that coheres loosely around the character of Theophrastus, taker and maker of impressions — of himself, his society, his culture, nation, world. Many aspects of his contemporary intellectual and print culture catch his caustic eye: its strains of pedantry, for example, of declinism, of contrarianism; the debasing effects of its popularism, the softening effects of its too scrupulous impartiality on moral judgement. But in 'Shadows' he turns his attention away from analysis of the present to consider the prospect ahead, 'the state of the universe hitherto', as he puts it with flamboyant gesturalism, or, with a little effort at circumscription, how things may be for humanity 'a thousand years or so' hence.[1]

The perspective offered on the future, like most of the impressions, barely fits the standard conception of an 'impression', the dominant manner of the book being argumentative, stylistically jagged, enamoured of strong opinions but averse to fixed positions. 'Shadows' takes the form of a dispute between Theophrastus, who imagines a dystopian future in which human activity has been made redundant by the development of perfectly efficient, self-maintaining machines, and his friend 'Trost' (*consolation*, in German) who takes a philosophical lead from Leibniz and looks forward to 'the best of all possible worlds' (p. 137). Menial and repetitive labour will be a thing of the past, Trost anticipates; human minds will be set free to contemplate higher, more refined things; a near-inexhaustible store of intellectual interest will be opened up to us, aided, rather than supplanted, by technology. Not easily placated, Theophrastus challenges Trost to assuage his fears:

> Show me why, since each new invention casts a new light
> along the pathway of discovery, and each new combination
> or structure brings into play more conditions than its inventor

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[1] George Eliot, *Impressions of Theophrastus Such*, ed. by Nancy Henry (Iowa City: University of Iowa Press, 1994), pp. 137, 139.

foresaw, there should not at length be a machine of such high mechanical and chemical powers that it would find and assimilate the material to supply its own waste, and then by a further evolution of internal molecular movements reproduce itself by some process of fission or budding. This last stage having been reached, [...] one sees that the process of natural selection must drive men altogether out of the field. (pp. 140–41)

The debt to Edward Bulwer Lytton's *The Coming Race* (1871) is evident from the title, and like him Eliot is making free play with evolutionary theory in defence, it would seem, of 'human' powers of imagination (Bulwer Lytton had specified the power of 'romance'). But the particular vision of the future given here is less a nightmare projection of the Darwinian imaginary, Ian Duncan explains, than a return to an older hypothesis, drawn from Herder and given new life by Richard Owen and John Tyndall, to the effect that 'biological life is continuous at a base molecular level with processes of mineral formation'.[2] 'Capsiz[ing]' Tyndall's attempt to make the organic and inorganic cohere (Duncan, p. 199), Theophrastus asks us to contemplate a world that will have evolved away from the organic altogether — physics, chemistry, biology all superseded in the triumph of the machine.

Science offers a potential analogy here for literary invention — one that is latent rather than clearly flagged or developed by Eliot. In the context of a book deeply preoccupied by how ideas, texts, readers evolve through time, the futurist scenario of technology that is self-maintaining and self-regenerating, functioning free of its first maker, may be thought of as akin to what happens, in the extreme case, when *any* creative innovation evolves away from its originator and takes on a life (or non-life?) of its own. In late career Eliot was keenly alert to questions of literary legacy and literary deformation. Tired of her role as moral 'sage', she was facing the future without her partner G. H. Lewes (in the terminal stages of enteritis while *Impressions* was taking shape, his 'last act' as her 'literary agent' was to send the text to Blackwood on 21 November 1878, and he died nine days later).[3] One important strain of *Impressions*, then, has to do with that aspect of writing that can be expected — *must* be expected — to outrun its originating 'intelligence' and enter into processes of cultural reception, transmission, and transformation that could not have been imagined. Hence Socrates, for example, in Chapter 10, dying a burlesque death, uttering 'cockney puns' on the London stage; 'Ophelia in fleshings and a voluminous brevity of grenadine' (pp. 85, 82). While Theophrastus goes into battle on behalf of maintaining standards of erudition, Eliot, behind him, is rather more

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[2] Ian Duncan, *Human Forms: The Novel in the Age of Evolution* (Princeton: Princeton University Press, 2019), p. 199.
[3] Nancy Henry, 'Introduction', in *Impressions*, ed. by Henry, pp. vii–xxxvii (p. xv).

accepting of the fact that texts, language, culture evolve over time in a process that adapts them to a variety of cultural interpretations and values.

In either the literal or the metaphorical analysis, it is to the point that Theophrastus's science is non-serious: his imaginings are not exactly absurd (intelligent philosophical and scientific minds have speculated along such lines), but they are, in context, much more rhetorical than rational. Only time and a deeper scientific education could tell what future technology may accomplish, and Theophrastus is, Trost scoffs, an 'incurable dilettant[e]' (p. 140). His exuberant sketching of possibilities — machines capable of detecting and making good their own 'waste'; machines self-replicating without aid from their makers — offers to distract from bad logic as he moves too quickly from unknowable processes of future machine development ('fission or budding'?) to emphatic pronouncement on consequences ('the process [...] must drive men [...] out').

Read in the context of twentieth and early twenty-first century developments in artificial intelligence and robotics, 'Shadows of the Coming Race' seems strikingly prescient, but its primary interest (I want to argue) consists less in any long-range pronouncement on where AI may be taking us than in its anticipation of the rhetorical cast of much subsequent writing about technological futures: that is, the predictive acuity of the sketch relates not to technology but to the cultural discussion around technology. Scoping out ground that was becoming familiar to readers, and has since become thoroughly so, Theophrastus sets his imagination loose on the implications of machine 'intelligence' for human reasoning.[4] 'I am told', he reports darkly,

> of micrometers and thermopiles and tasimeters which deal physically with the invisible, the impalpable, and the unimaginable; of cunning wires and wheels and pointing needles which will register your and my quickness so as to exclude flattering opinion; of a machine for drawing the right conclusion. (pp. 137–38)

In such a world judgement would no longer have a place. Even human ingenuity would be redundant: 'perfectly educated' machines will serve needs that they have themselves determined, and will do so efficiently, unencumbered by 'screeching' consciousness (p. 141). Psychology will be an encumbrance of the past, though it will presumably still afflict poor humanity. Implicitly, culture — as a symbolic expression of human interests, desires, fears — will no longer be a matter of intellectual concern.

Impressions seems especially percipient, in retrospect, and not out of line with other future-oriented writing of the period, in its preoccupation

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[4] See Peter Fitting, 'A Short History of Utopian Studies', *Science Fiction Studies*, 36 (2009), 121–31 (p. 123).

with the future of human labour. Like much 'automation discourse' today, as the historian Aaron Benanav has recently denominated it, 'Shadows' takes a special interest in what work may come to mean if technology delivers on the promise to free the world from many of the tasks currently requiring human agents.[5] Here Theophrastus broadens his attention from his earlier impressionistic attention to literary labour (and the literary 'work') to consider the *general* condition of work in the future.

Three of the four tenets Benanav associates with 'automation discourse' are already present in Theophrastus's fearful reflections on where technological change may be taking humanity. The first of these is that 'workers are already being displaced by ever-more advanced machines, resulting in rising levels of "technological unemployment"'.[6] Just so, Theophrastus worries that elimination of 'the humbler kinds of work' is depriving some people of a means of 'get[ting] their bread'. A marker of things to come, he suggests, is the automatic weighing of sovereigns at the Bank of England, where 'a shrewd implacable little steel Rhadamanthus' determines in a 'fraction of an instant' whether any coin is short weight (p. 137). As with his speculations about machine regeneration, the prompt to his thinking here is not new; the machines in question were introduced at the Bank in 1851 at the instigation of John Herschel, Master of the Mint — designed by Napier & Son after an invention by William Cotton, improving upon a prototype 'Automaton' that had been in development since 1842 (*Fig. 1*).[7]

Refined over the course of the next decade, the Napier 'Automaton' was in regular use from 1866, determining the true weight of all gold and silver coins passing through the Bank.[8] Theophrastus thus taps into images and ideas that have been in circulation for a while — after the fashion of coins indeed — some becoming worn and chipped in the process. Not for nothing is the chapter of *Impressions* dealing with the vulgarization of high culture entitled 'Debasing the Moral Currency' (Chapter 10). Having already revived, in that context, the ancient Cynic's challenge to accepted

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[5] Aaron Benanav, 'Automation and the Future of Work — I', *New Left Review*, September/October 2019, pp. 5–38 (p. 6).

[6] Benanav, p. 6. Benanav's fourth proposition is that 'universal basic income' is increasingly perceived as the only answer to 'mass-unemployment catastrophe' (p. 6).

[7] For a technical description of the design, see Thomas Oldham, 'Description of the Automaton Balance for Weighing Coins, Invented by William Cotton, Esq., Governor of the Bank of England', *Minutes of the Proceedings of the Institution of Civil Engineers*, 2 (1843), 121–23 <https://doi.org/10.1680/imotp.1843.24645>.

[8] Sir John Craig, *The Mint: A History of the London Mint from A.D. 287 to 1948* (Cambridge: Cambridge University Press, 1953), p. 322; 'James Murdoch Napier', *Grace's Guide to British Industrial History* <https://www.gracesguide.co.uk/James_Murdoch_Napier>; and (on the 'Automaton'), 'Pre-1900 Machinery — Under Construction', Napier Power Heritage Trust <http://www.npht.org/pre-1900-machinery/4577715856> [both accessed 9 February 2020].

Fig. 1: Napier & Son, 'Automaton' coin weighing machine for the Bank of England, 1842. Image taken from <http://www.enginehistory.org/members/Convention/2011/Presentations/NapierHx1178-1930.pdf.> [accessed 10 February 2020].

moral values and standards (παραχαράτειν το νόμισμα/*paracharattein to nomisma*), Theophrastus now gives Cynicism a futuristic twist as he imagines relegating judgement, even on matters crucial to the good ordering of human society, to the machine.[9]

The second feature of twentieth and twenty-first century 'automation discourse', Benanav tells us, is its assumption that we can extrapolate directly from observations of current technological capacities, which are limited, to future capacities, imagined as unlimited. As he explains,

[9] The most famous of the ancient Cynics, Diogenes of Sinope is said to have been the son of a banker and compelled to flee his city of origin after adulterating the local coinage. The Greek phrase 'παραχαράτειν το νόμισμα/paracharattein to nomisma', usually rendered as 'debase the currency', then extends to the Cynic's activities in the sphere of morality, where he offers to debase the moral currency. See Diogenes Laertius, *Lives of Eminent Philosophers*, trans. by R. D. Hicks, Loeb Classical Library, 2 vols (Cambridge, MA: Harvard University Press, 1972), II: *Books 6–10*, 22–23 (6.2.20).

technological developments in the present become 'a sign that we are on the verge of achieving a largely automated society, in which nearly all work will be performed by self-moving machines and intelligent computers' (p. 6). Demonstrating just such readiness to take present improvements as indications of sweeping change on the horizon, Theophrastus treats machine capacity in one, confined arena of automation as a warrant for predicting that technology will in the future command far more complex operations of logic. We will one day have not just 'a machine for drawing the right conclusion', but 'an automaton for finding true premises' (p. 138). He is, clearly, waxing satiric but his satire takes some authority from being able to point to a striking change already achieved.

Underpinning his proposed extension of the automaton's remit, we may recognize a reflection on the long dream of Enlightenment, the ambition of Diderot and his collaborators to liberate all that 'valuable knowledge [...] locked up in the operations of [human] mechanical workers', 'free[ing]' knowledge, 'reform[ing]' it, 'render[ing] [it] efficient'.[10] Theophrastus himself does *not* participate, though the essay as a whole surely does, in the deepest sophistication of that dream, which emerges, Simon Schaffer and others have argued, at the point where philosophical intelligence turns back upon itself, directing scepticism at its own rationalizing: 'enlighten[ing] itself about itself', as Habermas puts it, 'and about the harm that it does' (quoted in Schaffer, pp. 127–28). 'Dogmas and formulae', in Kant's influential articulation of the internal critique of Reason, become legible as 'mechanical instruments for rational use (or rather misuse)', 'the ball and chain of [a] permanent immaturity' (quoted in Schaffer, p. 151). Theophrastus's concern is not that too much human thought is already reductively mechanistic; he fears rather a mechanical *takeover* of human reason — efficient machines eliminating inefficient human performances. Trost is closer to Kant when he protests that machines 'are the slaves of our race, need our tendance and regulation, obey the mandates of our consciousness, and are only deaf and dumb bringers of reports which we decipher and make use of', but he too dodges the philosophical opportunity for explicit scepticism towards reason itself (p. 138). For him, our liberation from the more humdrum operations of intelligence will create the space for higher mental operations. The example he gives of the good uses to be made of a new freedom to pursue the life of the mind is, tellingly, absurd:

> Say, for example, that all the scavengers' work of London were done, so far as human attention is concerned, by the occasional pressure of a brass button (as in the ringing of an electric bell),

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[10] Simon Schaffer, 'Enlightened Automata', in *The Sciences in Enlightened Europe*, ed. by William Clark, Jan Golinski, and Simon Schaffer (Chicago: University of Chicago Press, 1999), pp. 126–65 (p. 127).

> you will then have a multitude of brains set free for the exqui-
> site enjoyment of dealing with the exact sequences and high
> speculations supplied and prompted by the delicate machines
> which yield a response to the fixed stars, and give readings of
> the spiral vortices fundamentally concerned in the production
> of epic poems or great judicial harangues. (pp. 139–40)

That is, take away all the Mayhew-style scavenging and recycling of waste, to support everyday life, and capable minds will be free to ponder the stars and fathom what is 'in the ether' at the point when epic poetry or 'great judicial harangues' are formed.[11] The hyperbolic afflatus reads as satire, but there may be some uncertainty about how far, if at all, Trost owns it. I take 'great judicial harangues' to be a dig at Theophrastus's pontifications. Certainly, Trost, as a Leibnizian character, seems required to hold the optimistic position, but then he is himself just as guilty of overstatement. The deeper satiric digging, surely, undermines both speakers, eager as they are to take intellectual precedence: each likes to think of himself as commanding the power of satire; neither commands authority.

In both respects — the fear of human redundancy; the too quick extrapolation from what technology can do now to what it may do in the future — 'Shadows of the Coming Race' is remarkably accurate in sketching out the terrain of later future-writing.[12] With respect to Benanav's third feature of 'automation discourse', however, its contribution is not just anticipatory but more distinctively critical. This is where the conflict between Theophrastus and Trost starts to become more than merely entertaining. Benanav is far from the first to observe that the human consequences of technological development attract rival predictions: 'automation should entail humanity's collective liberation from toil, but because we live in a society where most people must work in order to live, this dream may well turn out to be a nightmare' (p. 6). Like many others before him, he detects marked cultural *ambivalence*: 'the "jobless future" [...] is both a nightmare and a "promesse de bonheur" all at once', as Fredric Jameson has put it.[13] Many commentators on Victorian cultural responses to technology have remarked that there was, already, a lot of ambivalence about by

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[11] See Helge Kragh, 'The Vortex Atom: A Victorian Theory of Everything', *Centaurus*, 44 (2002), 32–114, on Helmholtz's theory of vortex motion in fluids and its uptake by physicists between the 1850s and 1880s as a perceived solution to 'the age old problem of the constitution of matter'. Kragh describes the application of the theory in areas well beyond electromagnetics, including 'spectra, gas theory, gravitation, and the constitution of the ether' (p. 34).

[12] For a helpful overview of the development of 'future studies', see 'Introduction', in *Futures*, ed. by Jenny Andersson and Sandra Kemp (Oxford: Oxford University Press, forthcoming).

[13] Fredric Jameson, *Archaeologies of the Future: The Desire Called Utopia and Other Science Fictions* (London: Verso, 2005), p. 150.

the 1870s.[14] But holding contrary emotions in balance is not *Impressions*'s preferred mode. 'Shadows' persists, instead, in a dramatic polarization of views: Theophrastus's alarmism contrasting starkly with Trost's confidence, no resolution being found. With hyperbole the order of the day, both men relish the drama of their antagonism:

> 'Am I already in the shadow of the Coming Race? and will the creatures who are to transcend and finally supersede us be steely organisms, giving out the effluvia of the laboratory, and performing with infallible exactness more than everything that we have performed with a slovenly approximativeness and self-defeating inaccuracy?'
> 'But,' says Trost, treating me with cautious mildness on hearing me vent this raving notion, 'you forget that these wonder-workers are the slaves of our race, need our tendance and regulation [...]. When we cease, they cease.'
> 'I am not so sure of that,' said I. (p. 138)

The debate continues to the end, with Theophrastus's friend regularly protesting against his poor reasoning: the 'peculiar nasal note of scorn' starts to be heard; '"Pooh!" says Trost. (We are on very intimate terms.)'; '"Absurd", [he] grumble[s]' (pp. 140, 142). In context the reference to 'effluvia' is especially striking. As the speakers imagine the eradication of organic inefficiency with the self-maintaining functionality of the machine, their own bodies comically demonstrate their own 'slovenliness': to speak, here, is to exhale, snort, 'vent', 'grumble' — not merely to perform. Yet the imaginary machines seem less than perfect replacements. They too will leak 'effluvia of the laboratory'. They too seem destined to carry traces of the untidily performative human in their infallible and exact 'performing'.

Theophrastus knows his own histrionic excess. It matters greatly for any assessment of the significance of 'Shadows' as a form of future-writing that the reader recognizes the sheer absurdity of this cut and thrust in a debate where neither party is reasoning well. When Theophrastus insists that the mechanical 'demons' of the future will be 'tremendously potent for not carrying the futile cargo of a consciousness screeching irrelevantly, like a fowl tied head downmost to the saddle of a swift horseman' (p. 141), he is, James Buzard rightly observes, no longer in the domain of irony. But Buzard need not worry, as he does, that 'Theophrastus, and perhaps Eliot too, [may be] wishing that horseman rode faster still, en route to the

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[14] See, for example, Herbert Sussman's influential account, *Victorians and the Machine: The Literary Response to Technology* (Cambridge, MA: Harvard University Press, 1968); also Christopher Keep, 'Technology and Information: Accelerating Developments', in *A Companion to the Victorian Novel*, ed. by Patrick Brantlinger and William B. Thesing (Malden, MA: Blackwell, 2002), pp. 137–54.

obsolescence of self-important humanity'.[15] This is, for sure, the rhetorical posture Theophrastus adopts, but to align his view with Eliot's, even tentatively, is to lose sight of the dialogue form and the comic extremity of his and Trost's positions. What we are hearing is an emphatically hyperbolic performance of the dystopian mode, scripted by a writer who knows the apocalyptic extremity of his own rhetoric, and opposed throughout by a voice of equally stretched philosophical optimism.

In providing a vehicle for such performances, *Impressions* as a whole (and this impression superlatively) develops the ground of opposition to what Eliot calls, famously, in *Middlemarch* (1871–72), 'the wisdom of balancing claims'.[16] Drawing attention to the drama, the grist, the supererogatory emotional *investment* in opposition, *Impressions* might help us to recognize what, even in that earlier and much more emolliently persuasive text, was *not* emollient or 'balanced'. Very often extracted as a keynote of Eliot's liberal moralism at its most self-reflexive and carefully self-regulating (knowingly imperfect), the elegant phrase about wisdom in fact emerges in the course of an interchange not unlike that between Theophrastus and Trost.[17] In conversation with his friend Lydgate — who is 'radical' only in his attention to medical reform; in all else somewhat conservative and 'unreflecting[ly]' egoistic (p. 340 (Chap. 36)) — the young and more ardently reformist (but politically as yet somewhat unformed) Will Ladislaw gets drawn into argument over whether the electoral reform measures that have enthused so many potential voters may not be a palliative and a distraction from the specific measures Ladislaw would like to see introduced against poverty and disease. It is an argument in which Will does quite well, but more by quick instinct than judicious consideration of the issues, we are told: Lydgate soon finds himself 'checkmated by a move which he had often used himself' (the appeal to pragmatism over concern for good motive) (p. 458 (Chap. 46)). 'The wisdom of balancing claims' is a fine phrase Will pulls out of the air to assert the need to rectify wrongs where we find an entire class of society inequitably treated and aggrieved. This is not moderation from Will; it is, at the time, a knee-jerk response, as he seeks to get the upper hand in debate with his friend. What matters, in context, is that the two young men are finding their way in a conversation that undoubtedly matters, and in which at least one of them (Will) will eventually find a clearer sense of his own position, but in which reconciliation of oppos-

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[15] James Buzard, '*Impressions of Theophrastus Such*: "*Not* a Story"', in *A Companion to George Eliot*, ed. by Amanda Anderson and Harry E. Shaw (Chichester: Wiley-Blackwell, 2015), pp. 204–16 (p. 215).
[16] George Eliot, *Middlemarch*, ed. by David Carroll (Oxford: Clarendon Press, 1986), p. 457 (Chap. 46).
[17] See, especially, D. A. Miller, 'George Eliot: "The Wisdom of Balancing Claims"', in his *Narrative and its Discontents: Problems of Closure in the Traditional Novel* (Princeton: Princeton University Press, 1981), pp. 107–94.

ing views is rightly perceived by both to be an impossible future outcome, given the reality of human nature and the divided interests at work in society. Even supposing 'balance' to be desirable.

Impressions takes that insight and gives it stronger, sharper articulation through the form of the impression. Its concern, in doing so, is not with the *content* of writing about the future so much as the mode. I take 'Shadows' to be a parodic exercise, aimed critically at contemporary cultural speculation about the future, and eschewing 'cultural ambivalence' in favour of a sharply articulated *argument* between the dystopian and utopian perspectives ('nightmare' v. 'promesse de bonheur'). The principal questions it raises on that basis are, I want now to suggest, not questions of mechanics in the sense understood when we are asked to contemplate the 'Automaton' or other machines, but (in keeping with the rest of *Impressions*) questions of the technology of literary authority, returning us to the old meaning of 'technology' — its first recorded meaning in *OED* — 'A discourse or treatise on an art or arts'.[18] In raising those questions, Eliot keeps our attention closer to the form and style of the literary text than do many recent descriptions of how Victorian technological innovations in communications and transportation fostered innovation in publishing and commercial entrepreneurialism by writers (telegraphy, for example, assisting the development of a global periodical press).[19] But she also offers a way of thinking about 'technology' in literary terms that is more abstract and generalizable than accounts of new machines driving specific formal and stylistic changes in, say, narrative technique or poetic metre.[20]

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[18] *OED online*, n. 1: [in full] 'A discourse or treatise on an art or arts; *esp.* (in later use) a treatise on a practical art or craft. *Obsolete.*' (*OED* 3rd edn, 2009) <https://www.oed.com>.

[19] See, especially, Jay Clayton's influential *Charles Dickens in Cyberspace: The Afterlife of the Nineteenth Century in Postmodern Culture* (New York: Oxford University Press, 2003); also, Daniel A. Novak, 'A Literature of its Own: Time, Space, and Narrative Mediations in Victorian Photography', in *Media, Technology, and Literature in the Nineteenth Century: Image, Sound, Touch*, ed. by Colette Colligan and Margaret Linley (Farnham: Ashgate, 2011), pp. 65–90; and (distinctive in its attention to concerns about how the experience of technological innovation affected thinking about ownership of literary innovation) Clare Pettitt, *Patent Inventions: Intellectual Property and the Victorian Novel* (Oxford: Oxford University Press, 2004).

[20] As, for example, in Nicholas Daly's exploration of the impact of new technologies on sensation fiction and melodrama: *Literature, Technology and Modernity, 1860–2000* (Cambridge: Cambridge University Press, 2004); Jason R. Rudy's study linking Victorian telegraphy to developments in poetics: *Electric Meters: Victorian Physiological Poetics* (Athens: Ohio University Press, 2009); Novak's account of how photography assisted new modes of narrative experimentation that manipulated the 'indexical quality' of the image to release it from the constraints of its time and space: 'A Literature of its Own', in *Media, Technology, and Literature*, ed. by Colligan and Linley; and Kate Flint's exploration of how literature developed, and anticipated, the 'lightning flash of revelation' in flash photography: *Flash!:*

To develop this line of thought I turn to a philosophical work almost exactly contemporary with *Impressions of Theophrastus Such*, exploring culture itself as an 'evolved' technology — a work potentially though not certainly known to Eliot.

Ernst Kapp and the projections of language

Ernst Kapp's *Grundlinien einer Philosophie der Technik: Zur Entstehungsgeschichte der Cultur aus neuen Gesichtspunkten* (1877), long recognized as a key text in the history of technology and media studies, has only recently been translated into English as *Elements of a Philosophy of Technology: On the Evolutionary History of Culture*.[21] In part as a result of the delay in finding its way into English, the book has the curious status of being (its editors note) at once 'familiar' and 'neglected' in 'the history of media technology' (p. xv). Within media and technology studies Kapp's name is closely associated with the concept of 'organ projection', according to which the tool is the means by which the human being acts upon the world both 'material-mechanical[ly]' and 'organic-spiritual[ly]' (p. 246). 'Man is the measure of all things', he writes, recalling a famous line of Protagoras (p. 8). The apparent anthropocentrism risks simplifying a deeply Hegelian, dialectical view of how thought operates in relation to things:

> External things enter into the human being as objects of his consciousness. To the extent that he discovers himself elucidated in them, they become his interiority. [...]
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> *Self-consciousness* proves to be the result of a process in which knowledge of an exterior is transformed into knowledge of an interior.
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> This knowledge, turning back toward the exterior and expanding our understanding of it, in turn provides new information about our interior, ultimately producing, in this endless complication of our orientation in the world and of our self-orientation generally, the content of all knowledge. (p. 22)

Photography, Writing, and Surprising Illumination (Oxford: Oxford University Press, 2017), pp. 36–44, and 'Victorian Flash', *Journal of Victorian Culture*, 23 (2018), 481–89 (pp. 487–89).

[21] Ernst Kapp, *Elements of a Philosophy of Technology: On the Evolutionary History of Culture*, ed. by Jeffrey West Kirkwood and Leif Weatherby, trans. by Lauren K. Wolfe (Minneapolis: University of Minnesota Press, 2018). The translator understandably omits '*from New Points of View*' from the title. The original German text is available at <http://vlp.mpiwg-berlin.mpg.de/library/data/lit39532/index_html?pn=1> [accessed 9 February 2020].

Though there is no record of Eliot having owned or commented on *Elements*, there is a close, and sympathetic, connection between her own early work in post-Hegelian German idealism and Kapp's thinking, arising from Kapp's direct debt to Feuerbach.[22] Eliot's translation of *The Essence of Christianity* in the early 1850s immersed her in Feuerbach's view of religion as a 'projection' of human nature — an approach to the expression of belief that strongly influenced Kapp's conception of the broader expression of culture. 'God', as Eliot translates Feuerbach, 'is the mirror of man'; this is 'feeling [...] exalted to that stage in which it can mirror and reflect itself, in which it can project its own image as God'.[23] It is to Eliot, in this and similar passages, that we owe the term 'projection' as the standard English rendition of the range of German terms associated with *Projektion* theory.[24]

Kapp was offering something more than a conceptual apparatus for technology. His was a narrative endeavour, aimed at explaining how 'culture', in its broadest sense, evolved. The story told is one of increasing refinement of ideas over time: gradual technical refinement and sophistication runs in parallel with, and to an extent drives, refinement in the realm of concepts. The similarity to ideas that Nietzsche would soon put forward in relation to morality is striking.[25] As in the genealogy of morality, evolution from a 'state of nature' is a 'helpful' fiction with only a provisional relation to anthropological facts:[26] from the 'primitive' scenario of the

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[22] The book is not listed in William Baker, *The George Eliot/George Henry Lewes Library: An Annotated Catalogue of Their Books at Dr. Williams's Library* (New York: Garland Publishing, 1977). I am grateful to Angela Wootton, currently working on further cataloguing of the collection, for confirming that the text is also not listed in the card catalogue (which is not definitive proof that it never formed part of the collection). Hegelian idealism was more Lewes's terrain of interest than Eliot's, on the evidence of their published writing — and it is worth recalling here that he found Hegel vexatious (the four editions of the *Biographical History of Philosophy* show him becoming, over thirty or so years, an ever more stringent critic of 'a system in which Thought is the same as the Thing, and the Thing is the same as the Thought'). See his *Biographical History of Philosophy*, 4 vols (London: Knight, 1845–46), IV: *Series II: From Bacon to the Present Day* (1846), p. 213. The entry on Hegel was serially and (Isobel Armstrong observes in her article in this issue of *19*) substantially revised and enlarged over the course of several later editions, with Lewes's exasperation at Hegel's idealist overriding of the distinction between Thing and Idea, Being and Non-Being, only intensifying.

[23] Ludwig Feuerbach, *The Essence of Christianity*, trans. by Marian Evans (London: Chapman, 1854), p. 62. For the verb 'to project', see also p. 62 and *passim*.

[24] See Van A. Harvey, *Feuerbach and the Interpretation of Religion*, Cambridge Studies in Religion and Critical Thought, 1 (Cambridge: Cambridge University Press, 1995), p. 32. Harvey notes Feuerbach's preference for *vergegenständlichen* ('to objectify').

[25] Nietzsche was reading Paul Rée's *Der Ursprung der moralischen Empfindungen* (*The Origin of the Moral Sensations*) in 1877 and developing his ideas for a more critical handling of the subject.

[26] Bernard Williams, *Truth and Truthfulness: An Essay in Genealogy* (Princeton: Princeton University Press, 2002), pp. 21, 19.

hunter-gatherer, as Kapp treats it, is derived an explanation of 'the whole civilized world' — its languages, arts, sciences, history, politics, national consciousness (p. 246).

The crucial difference from Nietzsche is that Kapp's account of culture is not 'critical' in either the sense, or the profound degree, that attaches to Nietzsche's account of morality. In the *Elements*' closing reflections on man's relation to the 'state' there *is* an offer to liberate human beings into a higher civilization, freed from the 'social grievances' of the present day (among which he counts a tendency to pessimism about 'infernal machines' and '[too] bold inferences as to the future of civilization'), but the offer depends upon a conviction of freedom's 'consciously willed, disciplined and cultivated harmony with organic necessity' (pp. 247, 249). This can make Kapp — admirable though his own political commitments were — sound too little troubled by the possibility of legitimate disagreement about what we might agree to value in the domains of culture, politics, and ethics.[27] 'A higher self-consciousness will come to permeate society, which will have a curative effect', he promises: 'With the amelioration of conflict, of individuals among themselves and of states with one another, the pessimistic worldview will be reduced to the degree necessary for a healthy optimism to thrive' (pp. 248–49). It all sounds rather homogenizingly confident of what counts as 'high', 'healthy', and grounds for 'optimism'. That said, recent critical reading of Kapp has been keen to recognize the potential for the *Elements* to speak beyond the limits of its own political vision. 'Kapp is a bracing thinker', Siegfried Zielinski writes invitingly, because he does not think 'apocalyptically' but 'operational[ly] and forward-facing': his theorizing was 'unabashedly ahead of its time for the last third of the nineteenth century, and it is not too late to radically reactivate it'.[28]

Reading Kapp's *Elements* in tandem with 'Shadows' suggests tantalizing points of overlap in their concerns and their influences. A more determinedly intellectual-historical approach than my own here might, indeed, press more strongly the connections between this strange offshoot of German idealism, strongly coloured by Kapp's émigré years in America, and Eliot's late and singular exercise in future-writing. Such an approach might well find evidential traction. Yet 'Shadows' is a stubbornly slight piece of writing — manifestly unlike Kapp's 360-page systematic treatment

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[27] As an expatriate German in Texas from 1849 to 1865, Kapp was president of *Die Freie Veiren* (The Free Society), pursuing a broad set of forward-thinking democratic principles including abolition, equal pay for equal work, and separation of church and state. See Terry G. Jordan, 'Kapp, Ernst', *Handbook of Texas Online* (Texas State Historical Association) <https://tshaonline.org/handbook/online/articles/fka01>; also 'Ernst Kapp', Wikipedia, <https://en.wikipedia.org/wiki/Ernst_Kapp> [both accessed 9 February 2020].

[28] Siegfried Zielinski, 'Afterword', in *Elements of a Philosophy of Technology*, ed. by Kirkwood and Weatherby, pp. 251–66 (pp. 265–66).

of the 'evolution of culture'. Pursuit of deep connections runs an obvious risk of overwhelming that slightness with excess baggage; and there may be further deterrence in Theophrastus's recurrent spikiness on the subject of imported 'influences' ('it is always interesting to bring forward eminent names' (p. 91)).

With that caution, a theoretical conversation between the two may help to flush out quite what logic lies behind the placement of this oddly extravagant impression of the future at the end of a set of impressions primarily concerned until this point with the past. Of particular relevance, in this respect, are Kapp's ruminations on the ease with which we lose sight of language's technical aspect. When he remarks that with language we see the tool (that is, the abstract *idea* of the tool) in its 'highest conception', he is identifying a feature of language use that sets the terms for his thinking about all higher cultural advancements. Unlike all other forms of organ projection, language, he declares, is 'free of' the material resistance that otherwise meets the human effort to impose form on things: 'Moving in the most pliable and, in a sense, spiritual element, language allows both the tool and the organic activity that shapes it to appear as uniformly cooperative.' Thus, thinking comes to seem 'just as much the tool of language as language is the tool of thought'; on that basis all the refinements of culture are erected and continually advanced (p. 208). We are so used to the congenial appearance of unity between 'speech and writing', 'the written sign and the utterance, the graphic character and the speech sound', he observes, that we lose sight of the technological projection at work in language, literature, the arts, and, indeed, the nation state as the political framing of culture (pp. 211, 210).

To train our attention on language as technology, then, is to put some resistance back into the picture, recalling us to humble origins of culture that we may be in danger of forgetting. In other words, by attending to language and to its workings as a technological field of human 'projection' into the world, we place ourselves in a better position to understand what culture is, what the human impulses behind it are, how it 'evolved', and even how it may be expected to go on evolving — without committing ourselves to any too particular anticipation of what the future will look like. By way of enhancing the resistance to a too naturalizing apprehension of language, he reminds his reader that the term 'character' comes from the Greek, 'originally [...] the figure or text etched in or imprinted on stone, metal or wood', and that attending to etymology may (among other things) permit the ethnographer to detect the forms of 'clan organization' at work in the differences between written languages (p. 211). Similarly, he invites the reader to dwell on those secondary extensions of handwriting into the technologies of the book, the printing press, telegraphy, stenography, code that may (he is optimistic) one day yield the possibility of a 'universal written language' (he rests his hopes on the last three). When he claims, wittily, to be writing

'under the sign of the hammer', he is making a case for a kind of strategic crudity in the service of the ongoing 'advance of culture' (pp. 219, 217).

The most perplexing feature of *Impressions of Theophrastus Such*, inevitably disorienting to readers, is Eliot's choice to retreat from the sophistication of realist fiction into something that looks so much formally cruder — going back to the broad parameters of the Greek rhetorical 'character' sketch, as practised by the original Theophrastus (pupil of Aristotle) and developed by later (chiefly French) imitators, preferring its angular, satiric, often immoderate gambits to the moderated, ethical, and psychological subtleties of the novel as she had practised it. The character-based impression is, I want to suggest, an equivalent manoeuvre to Kapp's choice to operate 'under the sign of the hammer' in laying out the technical basis of culture. 'Shadows', too, puts technicality to the fore. Operating in a field where pessimism is comfortably conventional, prompting resistance from an equally 'congenial' optimism, Eliot shows the projection at work in both stances. Through the polarized dialogue of Theophrastus and Trost, she draws out the key features of a discourse starting to clarify its terms in these years: the announcement of a fear that human culture will end with the elimination of humanity; the leap from the 'now' to the imagined 'then'. She puts the linguistic operations and drivers to the fore in a cut and thrust of verbal sallies, mouthy expostulations from strongly pre-scripted characters who project emotion as much as words. Not least, the textuality of the encounter is insistently present, through constant allusions to writing already in circulation. Like Kapp, in short, she puts resistance back into the picture, the revelation of technology at work yielding a perspective on culture and the grounds from which it advances into the future.

On this basis *Impressions* can then proceed to the much more famous essay with which it ends, 'The Modern Hep! Hep! Hep!'. There, Eliot will argue against those who would embrace the idea that humanity is headed towards a universal culture. Nancy Henry tells us that the ordering of these last two essays was initially reversed: reading 'Shadows' next to Kapp's *Elements*, it may be easier to see why the change was made ('Introduction', p. xxviii). By making future-writing a question of technical projection *before* she conducts future-writing as ethics and politics, Eliot sets out terms of engagement for the more morally assertive essay. 'The Modern Hep!' issues, in effect, a check on progressive idealism. We are not yet ready, it argues, for the subsumption of cultures (plural) in one universal 'culture' and *may never be ready*. Our attachments to the cultures we have formed across our lives (our languages, our creeds, our social practices) have a value, Eliot urges, that cannot and should not be overridden in the drive for a commonality that has no such basis in our past experience, personal and collective. We cannot but hold the particular culture into which we are born close to us, however partial and imperfect its terms. No 'theory of

human wellbeing can be constructed', she will conclude, 'in disregard of the influences which have made us human' (p. 165).[29]

Kapp would not necessarily have disagreed. It is the purpose of *Elements*, however, to hold out the *possibility* that the dialectical feedback loop between technology and the human will at length shift the ground of culture itself, freeing us into a shared future in which the ills that divide us will have been mended. Unlike Kapp, Eliot is not committed to a dialectical view. In its final two chapters *Impressions* offers no such optimistic idea that, in the long playing out of history, we stand to leave behind our social grievances (including those we bear towards technology) and achieve a higher freedom. Like Lewes, she was, in this last work, a realist, though of a quite different sort to the kind we have learned to identify: anti-idealist, rather than sympathetically 'moral'. The realism remains, however, a form of humanism, and in that important respect she and Kapp may be thought of as allies, projecting the technology of human culture against the idea of a future hostile to the human.

In between 'Shadows of the Coming Race' and 'The Modern Hep! Hep! Hep!' Theophrastus disappears. To all intents and purposes, the last essay reads, in his absence, as a meditation on the specificity of our attachment to culture coming from Eliot, rather than from any intermediary. Yet it earns its authority to assert so contrarian a perspective on the progressivist aspirations of her contemporary liberal-intellectual culture by prior engagement with the theoretical effort at thinking through what it means to 'project' ourselves imaginatively into the future. She could, of course, have gone about it the other way around: the argument against a 'universal' conception of culture could have been made first, the theory following. But by putting the question of technology to the fore, Eliot gives the reader of *Impressions* the conceptual tools, as it were, to step back from the current shape of debate about the future as she saw that debate emerging in the 1870s and (correctly) predicted that it would continue. Discerning the key features of a discourse of prediction that was, already at that point, very quick to foresee the displacement of the human, eager to leap from recognition of technological achievements made thus far to assume a complete triumph of machine over man, inevitably ambivalent about what that triumph might mean for the human need of meaningful work in the world, 'Shadows of the Coming Race' asks us to pause. The very features that make this so strangely cumbersome a text to read now are the features that effect that resistance. They ask us to think harder about the status of words, texts, images, forms, characters, arguments — the most refined technological projections the human race has developed.

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[29] For a full development of this reading of 'The Modern Hep! Hep! Hep!', see Helen Small, *The Function of Cynicism at the Present Time* (Oxford: Oxford University Press, forthcoming).