POLITICS
&POETICS
A Journal for Humane Philosophy

Politics & Poetics, III: The Human Difference
www.politicsandpoetics.co.uk
ISSN: 2543-666X
G. Pappin, 'Automation, AI, and the Politics of Human Distinction'
Article publication date: April 2017
Article Id: 939541
Version 1

Automation, AI and the Politics of Human Distinction

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ABSTRACT:
Contemporary technological developments are challenging the distinctiveness of human nature in two key ways. First, efforts at developing advanced forms of artificial intelligence challenge the distinctiveness of the human assertion, formulated by Aristotle, to be rational animals. Though the meaning and definition of 'artificial intelligence' is hotly debated both inside and outside specialist groups, the effectual truth of artificially intelligent machines is the replacement of human labour, either freeing current labourers for other employment or simply making them redundant. Second and related to the consequences of the first, advanced machines are shifting the balance between routine and creativity, gradually replacing routine jobs typically performed by human beings. Yet political philosophy and political life present two obstacles for the aspirations of those who hope for a dramatic expansion of machine learning in human society. Disagreement over how to frame moral and political questions and explain them in human language poses a difficulty for artificially intelligent machines seeking to learn the terms necessary for natural language. And second, the expectation that machine performance of rote tasks will liberate human beings for creative tasks underestimates the importance of routine in human activity, a routine found in the classical sense of duty or *officium* as well as participation in politics through citizenship. These elements of 'resistance' to the most dramatic changes aimed at by technological advance, however, will complicate rather than arrest the coming situation.

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Automation, AI and the Politics of Human Distinction

Gladden Pappin

Contemporary technological developments are challenging the distinctiveness of human nature in two key ways. First, efforts at developing advanced forms of artificial intelligence challenge the distinctiveness of the human assertion, formulated by Aristotle, to be rational animals. Though the meaning and definition of 'artificial intelligence' is hotly debated both inside and outside specialist groups, the effectual truth of artificially intelligent machines is the replacement of human labour, either freeing current labourers for other employment or simply making them redundant. Second and related to the consequences of the first, advanced machines are shifting the balance between routine and creativity, gradually replacing routine jobs typically performed by human beings. In what follows, I will present two contrary tendencies that political life and political philosophy present for the aspirations of those who hope for a dramatic expansion of machine learning in human society. Disagreement over how to frame moral and political questions and explain them in human language poses a difficulty for artificially intelligent machines seeking to learn the terms necessary for natural language. And second, the expectation that machine performance of rote tasks will liberate human beings for creative tasks underestimates the importance of routine in human activity, a routine found in the classical sense of duty or *officium* as well as participation in politics through citizenship. These elements of 'resistance' to the most dramatic changes aimed at by technological advance, however, will complicate rather than arrest the coming situation.

I. Artificial Intelligence's Classification Problem

The years 1997 and 2016 both marked milestones in the advance of artificially intelligent computers able to beat human champions at games that they themselves designed. IBM's Deep Blue famously bested Gary Kasparov in a 1997 match in New York City, though Kasparov disputed certain elements of the match and (as many forget) had beaten Deep Blue the prior year in Philadelphia. [1] Most recently, a computer program called AlphaGo, designed by Google's DeepMind venture, defeated Lee Sedol, a South Korean champion of the traditional game Go, in four of five matches in Seoul in March 2016. In January 2017 AlphaGo then defeated Ke Jie, the Chinese Go champion. Because the flexibility of Go's rules allow for a much larger number of possible board positions, defeating a human being required Google's project to create a program mimicking human neural networks rather than attempting to win through sheer superiority of calculation. In the cases of both Deep Blue and AlphaGo, however, the computer programs also exhibited the ingenuity of their human creators, who had to design programs capable of measuring and responding to a wide range of factors. While no one would hail AlphaGo or Deep Blue as the sign of imminent and rapid advances in artificial intelligence technology, their victories still give the sense that the area of properly human accomplishment has slightly diminished.

[1] For an analytical history of the match, see Monroe Newborn, *Kasparov versus Deep Blue: Computer Chess Comes of Age* (New York: Springer, 1997).

What computer programs' triumph over their human opponents means, however, is unclear. Chess and Go are both mental games with well-defined rules and discrete motions registered on a playing board simply represented in mathematical terms. No robot can yet play football. Indeed, even 'deep learning' algorithms of the sort developed by DeepMind depend on mastering games with clearly defined rules, turn-taking, easily measurable moves and grid-like playing areas. For the same reason, baseball (still a decidedly human sport) has proved much easier to analyse with 'sabermetrics' than sports such as American football, which depend on the players' sense of an opposing team's 'look', and involve difficult-to-measure variables such as the strength with which a running back stiff-arms a linebacker. Yet proponents of the development of machine intelligence frequently assume that the unlikely will become likely through the sheer power of computational advance. The neural networks of today's 'deep learning' machines have an expanding capacity to teach themselves rather than simply being taught by their human designers. A computer program could, for example, trawl data sets of geo-located pictures and 'learn' how to guess the location of new pictures it has not previously seen. A Google program has recently made strides at performing just this feat.[2] Nick Bostrom, the Oxford philosopher who has devised scenarios to manage the development of machine intelligence, argues that the trend toward more powerful computing will eventually take a dramatic, irreversible turn toward feats of understanding, organization and creation that stretch the limits of the imagination.[3] But because the leap from mastery of rote tasks or computation to 'learning' is one of quality as well as quantity, that leap may in fact be impossible.

The computer scientists attempting to spirit machine learning toward the level and forms of human intelligence (including, for example, the grasping of humour) speak about developing the 'natural language understanding of machines'. Since programming is not a humorous activity, one may be forgiven for doubting whether the humourful can be programmed by the humourless. The purpose of natural language understanding lies well beyond the merely interim goals of improving interaction of search engines or the digital assistants like Siri or Cortana who sit largely unused within mobile computing platforms. Instead the goal of equipping machines with natural language capacities is to enable them to think like human beings and, if speaking and reasoning truly go together, to develop a human-like intelligence buttressed by computational powers far beyond what the human mind can accomplish. Yet at the same time a steady drumbeat of sceptics has suggested that Moore's Law, the generations-long 'two-year plan' of the semiconductor industry, is gradually slowing. Some suggest, as well, that its slowing will ease the current burden on small businesses to keep up with ever-quickening technology, and lead to greater agreement on technology standards.[4]

What stands in the way of a human-like artificial intelligence, however, is not merely the potential decline of Moore's Law or the difficulty in discovering more advanced forms of computing than the current microchip. Instead the problem may be grasped by considering the conditions for the forms of mastery computers now exhibit. While the triumph of AlphaGo and Deep Blue is only one form that intelligent

[2] 'Google Unveils Neural Network with "Superhuman" Ability to Determine the Location of Almost Any Image.' *MIT Technology Review* (2016), https://www.technologyreview.com/s/600889/google-unveils-neural-network-with-superhuman-ability-to-determine-the-location-of-almost/, accessed 10 March 2016.

[3] Nick Bostrom, *Superintelligence: Paths, Dangers, Strategies* (Oxford: Oxford University Press, 2014).

[4] See, recently, Andrew Huang, 'Moore's Law Is Dying (and That Could Be Good)', *IEEE Spectrum*, 52/4 (April 2015), 43–47; Tim Cross, 'Double, Double, Toil and Trouble', *The Economist*, 418,/8980 (2016), 3–4.

computing can take, the algorithms designed to interpret data perform at their peak when data are easily interpreted. Recently Gary King, the social scientist, has emphasized that analytical prowess frequently leads to leaps of computing ability far greater than the relatively slow and plodding Moore's Law: as he put it, 'Big Data Is Not about the Data!'[5] Figuring out the key categories or associations to drive analysis (e.g. of voting patterns) is of greater importance. The mere existence of large data sets is of little use if the data are not well categorized. But it is precisely in the classification and interpretation of data that social scientific analysis struggles.

That social science always involves classification is not itself a new observation. But when we speak of artificially intelligent machines smoothly interacting with the human world, the questions that arise involve all the subtlety of judgment that language can convey. We can appreciate the difficulties involved in value-laden description by briefly considering one of the many different accounts of political science — for example, that articulated by Aristotle in his *Nicomachean Ethics* and *Politics*. Here the particular accuracy or excellence of Aristotle's approach is not at issue, as one can find similar complexity in the classifications of Cicero, Aquinas, Hobbes or Spinoza. Rather, I wish to draw attention to the basic elements of any such classifications – elements, which are at risk of being overlooked by those who expect advanced computing technology to grasp or understand the human world with which they will necessarily interact. (The need for a 'human-like' artificial intelligence stems from the interaction between computers and the human world around them, and does not depend on a 'human' construction of what intelligence is.)

Consider then, beginning again with the simplest necessary aspect, Aristotle's description of the virtue of courage in the *Ethics*. When Aristotle describes the virtues, he names each as the mean, or proper degree, with respect to a certain type of action. A courageous action shows the proper willingness to take risk on behalf of a noble cause, and avoids the defective state of pusillanimity as well as the excessive degree of foolhardiness. In making his classification, Aristotle began with the common praise of a virtue as courageous, and blame of other sorts of action as vicious. His description of virtue as a mean and his opposing of two vices was his own contribution, which proposed a structure or way of thinking about the virtues and vices that were praised and blamed in ordinary speech. In order to follow out his classification, he also notes that many states of excess or defect with respect to a particular virtue lack a name. Aristotle's classification thus in a sense gave greater purchase over the phenomena he wished to describe than even the 'natural language' around him, and in turn later shaped the way that people thought about the ethical criteria of human actions.

An algorithm for calculating and predicting human behaviour runs up against the difficulty of classifying human behaviour without embracing the categories provided by a particular analytical tool. In a much more limited way, this problem was witnessed in mid-century debates over whether social science could be 'scientific' in the sense of being morally neutral.[6] Social scientists insisted on the moral neutrality of the terms used to describe political regimes. Calling a regime 'tyranny' was unscientific since the term contained a moral or political judgment on a regime's quality. Instead, terms like 'authoritarian' or 'charismatic' described political phenomena without judging them. Political actions, Leo Strauss and others countered,

[5] Gary King, 'Big Data Is Not about the Data!' preface to *Computational Social Science: Discovery and Prediction*, ed. R. M. Alvarez (Cambridge: Cambridge University Press, 2016).

[6] For an overview of the mid-century conflict, which will direct readers to the primary sources, see Nasser Behnegar, *Leo Strauss, Max Weber, and the Scientific Study of Politics* (Chicago: University of Chicago Press, 2003).

could not properly be described without their moral note. A risky action to rescue someone in distress was necessarily 'courageous'. Some philosophers accepted Aristotle's classification of virtues and corresponding vices, while others modified or wholly rejected his classification. Machiavelli, for example, simply opposed the 'effeminate and pusillanimous' to the 'fierce and spirited' – two extremes with the latter more preferable than the former, and without a virtuous mean.[7]

The problem facing artificially intelligent machines is a much larger form of that faced by researchers pursuing highly specialized questions. Not only do human beings disagree about whether a certain action is courageous (as opposed to pusillanimous or foolhardy), but they even disagree about the proper ways to classify human actions. While Aristotle offers a list of twelve virtues and their corresponding vices, the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* offers more than 900 pages of detailed classification of human behaviour patterns as different sorts of mental illness.[8] In a similar vein, in October 2015 the tenth revision of the International Classification of Diseases expanded its classification to 70,000 diagnostic codes from 14,000 in its previous edition.[9] The point of noting these facts is not to endorse or oppose more or fewer ways of classification, but rather to note that the description of the human condition, whether medical, moral or political, is not based on a settled classification.

Some researchers in artificial intelligence are well aware of the problem presented by having to 'seed' burgeoning machine super-intelligence with appropriate values. But as Nick Bostrom puts it in his recent book on these matters, 'Solving the value-loading problem is a research challenge worthy of some of the next generation's best mathematical talent.'[10] Programmers, he says, will face an extremely difficult problem structuring an artificial intelligence so that it learns proper values correctly, without rejecting them or rebelling against being guided to learn them. He and other researchers acknowledge that machine intelligence must be given *some* values. Eliezer Yudkowsky, a theorist whose suggestion appeals to Bostrom, proposes that we program machine intelligence to adopt the views that human beings *would* adopt if they were a more fully advanced and mature species – what he calls our 'coherent extrapolated volition.'[11] As I have suggested, however, the difficulty facing machine intelligence involves another element. Before we seed artificial intelligence with a value to pursue and a (hopefully) reliable means to pursue it, we first must supply it with the categories necessary to understand human behaviour and thus interact with human beings. Even that, however, requires a value-laden framework that the programmers of artificial intelligence claim to wish to avoid.

The computing programs that have defeated human beings in games are indeed 'artificially' intelligent in the sense that human artifice has programmed the basic terms, classifications and rules necessary for them to function within a gaming environment. The expanded use of artificially intelligent computers capable of

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[7] Niccolò Machiavelli, *The Prince*, trans. H. C. Mansfield Jr., (2nd edn, Chicago: University of Chicago Press, 1996), chap. 15, 62.
[8] *Diagnostic and Statistical Manual of Mental Disorders*, 5th edn (Arlington: American Psychiatric Association, 2013).
[9] *International Statistical Classification of Diseases and Related Health Problems*, 3 vols. (10th rev., Geneva: World Health Organization, 2011).
[10] Bostrom, *Superintelligence*, 229.
[11] *Ibid.*, 259.

'natural language' engagement with human beings thus depends on their being provided with a set of classifications necessary to understand human activity in the areas in which they interact with human beings. Since evaluative language expresses opinions and judgments about what is good, artificial intelligence based on natural language can only succeed in understanding straightforward human dictation. Opinion is not only found in particular judgments, but (as in Aristotle, Machiavelli or modern psychology) in the framework that produces a certain judgment in a certain case. Artificially intelligent machines by definition have no 'natural opinion' of the praiseworthy and blameworthy on which to build a language of virtue or vice. For that reason, artificially intelligent machines will not be capable of teaching themselves whether an action is courageous or whether a regime is tyrannical, unless they have been provided those categories by a human programmer. They will have no reason to use an evaluative or a merely descriptive framework. Yet the expectation that artificially intelligent machines will, through extraordinary powers of computation, be able to act or think in human terms overlooks the different evaluative frameworks, which layer human speech.

II. Teaching Human Beings to Speak Machine

Now, however, human designers are attempting to set the terms of human–machine interaction in a way favourable to machines' ability to understand human beings simply. In other words, the need for computers to analyse human beings through a few simple modes of human expression is in turn simplifying human expression. Natural language processing has made major strides in understanding text written by human beings in order to learn about facts and events, and interpret material such as company press releases as a part of stock-trading algorithms. The computational analysis of opinions and other aspects of the interior states of human speakers currently sits at a primitive level, with algorithms able to analyse probabilistically whether a text expresses a positive or negative sentiment regarding something. The direction that current researchers envision for natural language processing indicates further how limited these attempts are. As Julia Hirschberg and Christopher D. Manning have recently explained, 'more work is currently being done to identify particular emotions, such as Ekman's classic six basic emotions (anger, disgust, fear, happiness, sadness, surprise), which may be reactions to events, propositions, or objects.'[12] Other efforts to teach 'human values' to artificially intelligent computer programs depend on a similar simplification. Mark O. Riedl and Brent Harrison of the Georgia Institute of Technology suggest using simple, artificially constructed stories to train programs in the practice of culturally dominant values. But their method depends on training computers in reward-response and is limited to simple situations in which 'values' are clear.[13]

Leaving aside the clear limitations of such a framework, the effort to teach computers to identify emotions is strikingly similar to the set of six expressive emojis used on the world's largest social network, Facebook. After twelve years of allowing users the option only to 'Like' a post and then comment on it with written text, Facebook in 2016 expanded the set of possible reactions to six: Like, Love, Haha, Wow, Sad, and Angry. Beyond allowing users to express their reactions more precisely than the old Like button,

[12] Julia Hirschberg and Christopher D. Manning, 'Advances in Natural Language Processing' *Science*, 349/6245 (2015), 265.
[13] Mark O. Riedl and Brent Harrison, 'Using Stories to Teach Human Values to Artificial Agents' (paper presented at the Second International Workshop on AI, Ethics and Society, Phoenix, AR, February 2016).

Facebook's new tools also give more information to advertisers and others with a stake in gauging user reaction. A user-categorized or self-categorized reaction takes the difficulty out of a computer's understanding of human reactions, but also simplifies those reactions. The role of smartphone applications across the many different domains of human life causes human actions in each domain to be funnelled into the limited categories needed for those domains to be computed. Machine intelligence could, then, begin to interact directly with human beings as human actions are simplified into simple categories such as 'left-swipe' and 'right-swipe'. Hirschberg and Manning imagine a machine intelligence 'aimed at human-computer interface[s] capab[le] of giving effective suggestions and reacting productively to human input, rather than wholly replacing the skills and knowledge of a human translator.'[14] Such interaction would depend on the simplification already beginning to be put in place.

Those involved in the development of artificial intelligence have been remarkably open in describing the model of rationality on which such computing systems will be built. David C. Parkes of Harvard University and Michael P. Wellman of the University of Michigan have explained the similarity of the model of artificial intelligence to that of the mainstream economic modelling of human behaviour. 'If we represent goals in terms of preference over outcomes', they wrote in 2015, 'and conceive perception and action within the framework of decision-making under uncertainty, then the AI agent's situation aligns squarely with the standard economic paradigm of rational choice.' They conclude, 'In other words, AI strives to construct – out of silicon (or whatever) and information – a synthetic *homo economicus*, perhaps more accurately termed *machina economic[a]*.'[15] When understood in this way, efforts to develop artificial intelligence stem from a particular account of human beings as needy and thus goal-oriented, driven by the need for optimal decision-making rather than the exercise of virtue. By taking opinions rather than wants as the starting-point of analysis, classical political science began to refine human opinions into knowledge of the good, and never sought to optimize the satisfaction of human wants. The drive for artificial intelligence simply proceeds on the basis of a different science. But if human beings still are made of opinion and philosophy as well as desire, then machine intelligence will find it difficult and indeed impossible to integrate seamlessly with human beings.

III. Creativity: The Last Remaining Human Distinction?

The advance of machine intelligence has raised new questions about the sort of interaction that will occur between human beings and machines, whether in the form of advanced software applications or physical robots with whom they interact. Several different models of that relationship have been advanced in recent years, all motivated by the concern that machine intelligence should not displace that, which is uniquely human. John Markoff, a long-time reporter on the technology industry, frames the interaction between human beings and machines as a choice between artificial intelligence and intelligence augmentation, AI vs. IA.[16] When artificial intelligence cooperates with or enhances human action as well as decision-making, it augments human intelligence rather than replacing it. Markoff notes that many young people desire the guidance in decision-making that cloud-based algorithms can offer in suggesting what to do, purchase, eat,

[14] Hirschberg and Manning, 'Advances', 262.
[15] David C. Parkes and Michael P. Wellman, 'Economic Reasoning and Artificial Intelligence', *Science*, 349/6245 (2015), 267.
[16] John Markoff, *Machines of Loving Grace: The Quest for Common Ground between Humans and Robots* (New York: Ecco, 2015).

where to go, what to wear and the like. Contemporary algorithms are more specific than broad-market television commercials, and yet less threatening or imperious than dictates from a religious or political source. Another model for human–machine interaction, favourably advanced by Walter Isaacson in his profile of the scientists and engineers who invented the Internet, proposes that machine intelligence perform rote tasks and manual labour so that human beings can be free to pursue creative activity.[17] While intelligence augmentation describes the ways that artificial intelligence could enhance human activity, such as through providing critical information or decision-making capacity, advanced computing's replacement of human labour appears inevitable.

Current efforts toward automation aim at an end-state remarkably close to the utopian vision laid out by Marx in *The German Ideology* (1846). Marx describes a state in which 'society regulates the general production and thus makes it possible for me to do one thing today and another tomorrow, to hunt in the morning, fish in the afternoon, rear cattle in the evening, criticise after dinner, just as I have a mind, without ever becoming hunter, fisherman, shepherd or critic.'[18] On a first contemporary impression Marx's quotation might seem rather strange: fishing in the afternoon and rearing cattle in the evening hardly sounds to modern ears like the definition of a utopia. Marx's hypothesis, though, was that industry or technology would become sufficiently far advanced so that the basic materials of society eventually would be provided almost automatically by machines. Members of an advanced communist society would, for the good of society as a whole, voluntarily show up an hour or two at a time to help operate the machinery, after which they could then return to the idyllic life Marx had described, doing whatever they had a mind to do, without ever 'committing' or having to select one particular career or profession over another. Indeed, to the extent that mining or textile production happened mechanistically, most people would be freed entirely of the need for professions, and would be able to take up whatever activity they wished. Since they would understand themselves as members of society as a whole, they would naturally contribute what labour it remained necessary for them to contribute, and their off-hours activities would redound to the good of the whole.

One element of Marx's thought now frequently forgotten is his view that a communist society would only be possible once capitalist means of industrial production had become sufficiently advanced that a communist society could, so to speak, piggy-back on capitalism's successful mechanical production and turn it toward the human good.[19] Indeed, the liberation of human beings from work (but without communism of property) is now part of the pitch made by both Left and Right for advanced applications of artificial intelligence. On the left, Nick Srnicek and Alex Williams have called for 'a fully automated economy', 'reducing the length of the working week with no cut in pay', a universal basic income, and 'a project that would overturn existing ideas about the necessity and desirability of work.'[20] They place little

[17] Walter Isaacson, *The Innovators: How a Group of Inventors, Hackers, Geniuses, and Geeks Created the Digital Revolution* (New York: Simon and Schuster, 2014), 486–88.

[18] Karl Marx and Friedrich Engels, *The German Ideology*, in *The Marx-Engels Reader*, ed. Robert C. Tucker (2nd edn, New York: Norton, 1978), 160. (Tucker notes that part I was likely written by Marx.) Tyler Cowen is one of few who make the connection to Marx, e.g. in *Average Is Over: Powering America beyond the Age of the Great Stagnation* (New York: Dutton, 2013), 258.

[19] See *Manifesto of the Communist Party*, part I.

[20] Nick Srnicek and Alex Williams, *Inventing the Future: Postcapitalism and a World without Work* (Brooklyn: Verso Books, 2015), chap. 6. On resistance to work, see also David Frayne, *The Refusal of Work: Rethinking Post-Work Theory and Practice* (London: Zed Books, 2015).

limit on what sorts of work their 'utopian demand' would seek to automate. Even apparently distinctive human tasks such as creative work and 'affective work' (e.g. caring for the sick) should still be oriented by the goal of automation. Profits made by the machine-owners would then be distributed throughout society in the form of a universal basic income, enabling human beings to be free from all but the most minimal labour.

Jerry Kaplan, a lecturer on the history and philosophy of artificial intelligence at Stanford, anticipates a similarly automated world, prosperous but in need of new political structures to shepherd those displaced by advancing technology. 'In principle', he writes, 'all these developments will not only free you from drudgery but make you more efficient and effective, if you're lucky enough to be able to afford them.'[21] 'Forged laborers', as Kaplan calls robots of any size, 'will displace the need for most skilled labor'; 'synthetic intellects', as he calls artificially intelligent agents, 'will largely supplant the skilled trades of the educated.'[22] Like Srnicek and Williams but in apparent unawareness of Marx, Kaplan also heralds a future in which people will 'play piano, paint, write poetry, grow prize orchids, sell handmade arts and crafts' and do many other things in the fields that remain the niche of human beings.[23] Though Kaplan would certainly not describe himself as a member of the Right, he adheres to broadly neoliberal expectations of improving prosperity that are functionally conservative within the Silicon Valley environment where he operates. Those aiming at an enhanced version of contemporary society (like Kaplan) and those with more radical hopes both expect technological advances to succeed in making vast numbers of blue collar and white collar human workers redundant.[24]

Every hopeful vision of future interaction between human beings and computers returns to the suggestion expounded by Walter Isaacson: 'to find ways to optimize the collaboration between human and machine capabilities – to forge a partnership in which we let the machines do what they do best, and they let us do what we do best.'[25] Isaacson's suggestion, building on that of the famed computer scientist J. C. R. Licklider, seems initially reasonable. As Derek Thompson notes in a 2015 article for *The Atlantic* titled 'A World without Work', the success of machine automation in industrial tasks could, among other possible outcomes, allow (or force) human beings to return to the artisanal crafts that they practised before the Industrial Revolution. Drawing on the work of Lawrence Katz, a professor of economics at Harvard, Thompson adds that ours 'would be a future not of consumption but of creativity, as technology returns the tools of the assembly line to individuals, democratizing the means of mass production.'[26] The artistic, expressive and creative aspects of human intelligence appear robust against the attempts by machine inventors to capitalize on the replacement of human labour in other tasks. As Thompson admits, a technologically-enabled future of plenty could alternatively lead to a world of widespread consumption, or to a world in which jobs were only episodic but paid tasks frequent.

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[21] Jerry Kaplan, *Humans Need Not Apply: A Guide to Wealth and Work in the Age of Artificial Intelligence* (New Haven: Yale University Press, 2015), 6.
[22] *Ibid.*, 134.
[23] *Ibid.*, 185.
[24] For an earlier attempt to link Marx's historical analysis to libertarian capitalist expectations of the future withering away of the state, see Hans-Hermann Hoppe, 'Marxist and Austrian Class Analysis', in *The Economics and Ethics of Private Property: Studies in Political Economy and Philosophy* (2nd edn, Auburn: Ludwig von Mises Institute, 2006).
[25] Isaacson, *The Innovators*, 479, discussing J. C. R. Licklider, 'Man-Computer Symbiosis', *IRE Transactions on Human Factors in Electronics* vol. HFE-1/1 (March 1960), 4–11.
[26] Derek Thompson, 'A World without Work', *Atlantic Monthly*, 316/1 (2015), 56.

But human creativity seems distinctively or resiliently human only because the routine, rote and mechanical aspects of human being have been partly replaced and are under continued threat. Identifying creativity as the unique human expression only reflects a retreat from what we previously understood as the full scope of the human being. When Aristotle identified man as a rational animal, for example, he did not mean that rationality alone was the characteristic of human beings, but rather that rationality distinguished human beings from other animals with shared characteristics other than that of reason. The larger point holds even without the need to accept Aristotle's definition or his understanding of nature. Identifying human beings as the creative animal, for example, would be misunderstood if creativity were the only domain in which human beings were allowed to operate. The development of neural networks in artificially intelligent computers may likewise lead to their performing actions, which appear to stem from a native creativity. In 2015, for example, a computer program at Tufts University generated its own scientific theory in biology.[27] Just as Aristotle thought that political life aimed at living well because it had already established the common ground of mere living, so, too, do human creativity and rationality operate in a human context of the routine and even the animal.

IV. The New Duty of Creativity

Hostility to the ordinary, non-creative activities of human life has appeared from a variety of quarters. In the United States and other liberal democracies, the rituals, which give meaning to human life, are more than in pre-modern regimes, subject to popular and individual choice. Religious practice, for example, is not simply an obligation that one must fulfil or perform but a social function open to redesign in countries with liberal laws concerning free exercise. Instead one may find ritual and meaning in almost any practice – the coffee ritual, for example. As Hubert Dreyfus and Sean Dorrance Kelly put it in *All Things Shining* (where they laud the late capitalist coffee ritual in particular), 'There are a wide variety of domains worth caring about [i.e. and ritualizing] and there are no objective, context-independent principles for determining which domains these are.'[28] Likewise, from at least the time of John Dewey, American education gave priority to the goal of creativity and innovation over knowledge of a set of facts (for example, the facts of European and American history). One unusual effect on the priority given to creativity is the tendency to devalue excellent accomplishment in the arts and sciences in favour of the creative genius. A recent article on 'How to Raise a Creative Child' registered this lament: 'Child prodigies rarely become adult geniuses who change the world. [...] They strive to earn the approval of their parents and the admiration of their teachers. But as they perform in Carnegie Hall and become chess champions, something unexpected happens: Practice makes perfect, but it doesn't make new.'[29] In a democratic context that has eliminated the traditional or aristocratic forms of social distinction, newness offers a path to distinction putatively based on original social contribution rather than inheritance, religion or dubious

[27] Daniel Lobo and Michael Levin, 'Inferring Regulatory Networks from Experimental Morphological Phenotypes: A Computation Method Reverse-Engineers Planarian Regeneration', *PLOS Computational Biology* 11/6 (June 2015): e1004295. For a popular summary, see Katie Collins, 'Computer Independently Solves 120-Year-Old Biological Mystery', *Wired*, June 5, 2015, http://www.wired.co.uk/news/archive/2015-06/05/computer-develops-scientific-theory-independently.

[28] Hubert Dreyfus and Sean Dorrance Kelly, *All Things Shining: Reading the Western Classics to Find Meaning in a Secular Age* (New York: Free Press, 2011), 219.

[29] Adam Grant, 'How to Raise a Creative Child', *The New York Times* (31 January 2016).

assertions of virtue. Yet at the same time, the exclusive praise of newness devalues even prodigious skills or beautiful traditions that are not expressly innovative.

The attempt to ease concerns about machine intelligence depends on this functional view of human activity, in which society offers no clear definition of what functions it considers valuable, still less right or just. Imagining a world in which machines perform even more of the functions typically reserved to human beings is easier in light of the functionalist view: what matters is *that* a function is performed, not how or by whom. To be sure, machines have long performed tasks too dangerous or even impossible for human beings to perform. But they now serve also in areas where many would prefer human interaction, such as in customer service, financial services or even store checkout lines. If the 'creativity' standard means that we must view even a prodigious performance of Bach as derivative, how much more is the bagging of groceries undignified and worthy instead of replacement by machines?

The functionalist account of human labour overlooks, and has difficulty incorporating, the many different functions that human labour serves, including the satisfaction of those who perform it. While it is true that the modern division of labour often creates unsatisfying jobs, even manual or routine labour can provide intangible benefits to a labourer who takes satisfaction or pride in doing his job well. In this respect, Aristotle's call to order one's passions and actions 'when one ought and at the things one ought, in relation to those people whom one ought, for the sake of what and as one ought', suggests that the many different aspects of human activity cannot be reduced to the goods or services produced.[30] Machine intelligence cannot perform activities with the right motive nor, by definition, in a human way. While human beings are often indifferent about whether some actions are performed by computers or human beings, (for example, call connection by computers instead of operators), many rote tasks that could be replaced by machines are currently performed by people who take pride even in routine labour. Though it should not be necessary to say so, ordinary life is filled with routine as well as repetitive tasks that are frequently satisfying even if frequently frustrating, as well.

Supposing that a society depended entirely on machines for manufacturing, the human creativity heralded as our remaining distinction would become obligatory for anyone wishing to find a niche in the technological economy. When products and services are viewed as functions indifferently performed by machines or human beings, the number of human professions dwindles to only a few: the sale of sex, and the sale of handcrafted goods. The hope that artisanal craftsmanship will see a revival after the replacement of most human labour by machines, however, misunderstands the role that craftsmanship traditionally played in human society. The specific arts and crafts were needed in order to produce particular goods that could not be produced on their own or (in most cases) through mechanical automation. Each artisan, as Plato's Socrates discovered, saw the world in a slightly different way due to the practice of his art, which gave him a window on the world even if the window was partially obstructed.[31] In his *Atlantic* essay on life without work, Derek Thompson observed 'the beauty of an economy where tens of millions of people make things they enjoy making – whether physical or digital, in buildings or in online communities – and receive feedback and appreciation for their work.'[32] But respect and admiration are a far cry from the steady

[30] Aristotle, *Nichomachean Ethics*, trans. R. C. Bartlett and S. D. Collins (Chicago: University of Chicago Press, 2011), Book 2 chap. 6.
[31] Plato, *Apology*, 21e–22e.
[32] Thompson, 'World', 57.

income reserved only for the most successful digitally connected creators. A plumber made redundant through the creation of artificially intelligent 'forged labourers' may not wish or be able to shift his skill to the probably unsuccessful marketing of bric-à-brac. But every person has a unique body not replicable by machines, bodies to which viewing and access will be sold in ever increasing quantities, at ever lower prices. The final niche will not be a product you make. It will be you.

V. Unavoidably Normal

That the human difference once belonged even in professions that are now fully mechanized is evident in the use of names surrounding particular professions. While today's most successful companies are not named after their founders (e.g., Apple, Google), many tradesmen and professionals include their name in their business ventures: Jim's Plumbing, for example, or law firms named after their principals. Though machine shops might eventually be replaced by automated machining facilities, the fact that they traditionally have personal names attached to them suggests that the people operating the shop add something distinctive to the art. Likewise, the practice of including trades in people's names both identifies people with their trades and calls to mind their always distinctive practice of that trade: James the Cartmaker eventually becomes James Cartwright. An artisan was not merely performing a 'function' that could be performed equivalently by someone else, but gained the knowledge of a craft, which he performed in a distinctive way. Since human beings are creatures of habit, the continual practice of a certain art gave an artisan his identification with that art. An artisan not only practised his art, but fulfilled a kind of office in practising something socially necessary.

More broadly, the concept of office is the earlier tradition's` alternative to the functional account of human production. Cicero, to take the progenitor of that tradition, viewed office or *officium* as a fundamental aspect of human life: 'For no part of life, neither public affairs nor private, neither in the forum nor at home, neither when acting on your own nor in dealings with another, can be free from duty.'[33] The framework of office allowed Cicero to provide a social context for the creative activity today's theorists consider the human distinction. 'The search for truth and its investigation are, above all', he said, 'peculiar to man.' But he limited their practice to 'whenever we are free from necessary business and other concerns.'[34] Those other concerns, which built up to the distinctiveness of reason, aimed at 'necessities': 'they are to procure and to conserve whatever is required for the activities of life, in order both to preserve the fellowship and bonding between men, and to allow excellence and greatness of spirit to shine out.'[35] An honourable person would not devote excessive attention to investigation without first attending to the matters helpful to life in common with other human beings. The activities helpful to human society, though, have intrinsic as well as productive benefits. They require the virtues of justice, liberality, greatness of spirit and seemliness. So, too, Cicero remarks that human beings appear to have been created not 'for jesting and play, but rather for earnestness', such that jesting and playing take their place within the larger context of a serious life.[36] He adds

[33] Cicero, *On Duties* [*De officiis*], ed. M. T. Griffin and E. M. Atkins (Cambridge: Cambridge University Press, 1991), Book I chap. 4.
[34] *Ibid.*, I.13.
[35] *Ibid.*, I.18.
[36] *Ibid.*, I.103.

> Furthermore, one must understand that we have been dressed, as it were, by nature for two roles: one is common, arising from the fact that we all have a share in reason and in the superiority by which we surpass the brute creatures. [...] The other, however, is that assigned specifically to individuals."[37]

Seemliness, then, is the virtue which preserves the features and characteristics which make one an individual, while ordering them toward the promotion of the common good. The different paths through which an individual can contribute to society are the 'offices' suited to particular temperaments, whose performance is understood to be a duty. The ways of life or paths that can be followed are largely set out, and Cicero advises that one first consider following the profession of one's father unless, of course, one's nature is not suited to it.[38]

I bring up Cicero's account of human life in terms of offices not to make an apology for his account of human nature (or that of the Stoics), but instead to bring out the characteristics of a non-'functionalist' view of the arrangement of human society. The approach of *De officiis* highlights both the individual and community-oriented aspects of human nature, attempts to balance the virtues necessary for social life and the philosophical quest for wisdom, and views the relatively fixed social necessities and their corresponding virtues as important together. That manner of viewing the world of which human beings were a part never could have led to the imperative of providing goods and services through the most automatic and least labour-intensive methods. For that reason, the pre-modern world was more acutely subject to natural disasters, blighted crops, disease and the other chancy features of nature than the modern society, which aims to bring nature under rational control. But by the same token, it is not too simple a fact to note that the terms through which human society could be understood were, though often extremely complex, more fixed in their particular meanings. The social signalling of clothes, for example, may well have changed frequently, but at particular times certain clothes signified certain things. As many modern social theorists from Tocqueville onwards have noted, democratic life liberates human beings from the fixed political and social signalling that was part of pre-democratic life.[39] An artificial intelligence could more easily master heraldry and the various titles of English nobility, for example, than it could determine whether wearing jeans in modern society happened to signal blue-collar labour on the one hand or 'tech casual' on the other. In that sense, free choice has undermined predictability. Though no artificial intelligence could decide the 'right' categories through which to analyse and predict human behaviour, it is in part the unpredictability of modern life and our own difficulty in mastering changing social signs that drive us to want the assistance of artificial intelligence and social science. The external strictures of form imposed by the *ancien régime* have finally been replaced by the internal demand, required for algorithms to understand us, of funnelling ourselves into rigidly formed sets of possible emotions. As in every other social form, the new master is still there but harder to identify.

VI. The Return of Politics

Considered on its own, the effort to justify artificially intelligent manufacturing and management processes

[37] Cicero, *On Duties.*, 1.107.
[38] *Ibid.*, 1.120–21.
[39] For example, Pierre Bourdieu, *Distinction: A Social Critique of the Judgment of Taste*, trans. R. Nice (London: Routledge, 1986).

in terms of their liberation of human beings for creative activity seems perfectly reasonable. On that argument, the human difference lies in creativity and innovation, at the intersection of *homo faber* and *homo ludens*. But a primary goal of innovation in computing is to bring human life in contact with data collection and analysis at an ever-increasing number of points. Connecting devices to cloud-based computing through the 'Internet of Things' mediates more aspects of human life through platforms designed for their intelligibility to the underlying algorithms that make them run.[40] In other words, the analytic social science used to sift through the data collected by social networks and Internet-connected devices seeks to predict human behaviour with increasing accuracy. Each application, service, and device uses its own code to funnel into a reasonable range the vast set of possible human responses. Left-swiping and right-swiping our way through the social world is not simply a plan of convenience for facilitating human desire: it makes our reactions more intelligible to the company which mediates human relationships through swiping. In place of executing our *officium* in a well-defined political order, we separate the domains of human life and act freely within each. As each domain of human life becomes mediated through some means of computer application, however, that liberty becomes analysed in terms designed to make it predictable.

The justification of automation in manufacturing thus contradicts the aims of artificial intelligence in the world of social interaction. Both aim at rational control over the natural and social worlds. In truth the goal and hence (in our Machiavellian world) the justification of computer innovation is to preserve human beings and the activities of ordinary human life at precisely that level which produces the most 'value'. In spite of automation's professed interest in expanding the scope for human creativity more broadly, Silicon Valley holds itself up as the standard of innovation. Yet its most noted efforts at computer innovation involve bringing human activity into electronically mediated platforms. The blueprint for today's innovation is always the same: 'optimize' an un-optimized area of human life by bringing it under electronic monitoring and management. Since technological innovation is the standard of innovation among those working to automate every other area of human activity, today's innovators will not likely be able to preserve a very broad scope for the creativity they profess to prize. The creativity, which they argue is the hallmark of human nature, has long depended on an interaction with the 'ordinary' features of human life that entrepreneurs aspire to replace. Musical compositions salute the four seasons, great works of literature remember famous and dangerous love affairs, and liturgical life builds itself atop the ordinary cycle of human life. With work done by machines so that human beings can be at their leisure, literary creativity will have no remaining task but to imagine what being ordinary was once like. Everyone in democratic societies wants to be special. But everyone wants to be normal, too.

The improvement of government has been remarkably absent from the story told by contemporary entrepreneurs about their successes. Advances in statistical calculation have, without doubt, made for more rational administration within elements of welfare bureaucracies as well as health systems. No citizen, however, would report a more favourable judgment of his government thanks to advances in computing power or social networking. Administering things better and managing people more effectively has not inspired the citizens of Western democracies toward giving their governments ever higher approval ratings. Indeed, the managerial class of Western democracies has faced repeated crises of confidence in its ability to

[40] See, for example, Pedro Domingo, *The Master Algorithm: How the Quest for the Ultimate Learning Machine Will Remake Our World* (New York: Basic Books, 2015).

structure continued economic growth or to make sense of 'political' situations – for example, to decide the status or meaning of national boundaries within international agreements. Even in a society filled with superintelligent machines, human beings must govern themselves well, and the human demand for good government has never shown signs of going away. As long as we have representative and democratic governments, the citizens of Western nations will need to see themselves in the activity of their governments. They still want at least the appearance of governing themselves and not being administered.

From the standpoint of human beings, the core point of rationally administering all things is that everyone and everything is where it is supposed to be at the proper time. Rational administration replaces fundamental matters of political disagreement with the question of logistics. At its best, rational administration makes a world in which people are a little bit less annoyed than they would otherwise be. Grocery stores are filled at just the right moment, packages are delivered on schedule, medical supplies are available in quantity, and one has planned for one's retirement and the education of one's children. For every concern dissipated, however, another annoyance seems to come in its place, whether through expanded requirements for data tracking and reporting, or through 'rational' schemes that often seem forced or even ridiculous. Rational administration is at best minimally satisfactory, but never uses or satisfies the human desire to rule. The world proposed by entrepreneurs seeking super-intelligent machines, however, is nothing other than a world of perfect rational administration.

In spite of the quest to automate all 'ordinary' activities so as to leave the 'creative' activities to human beings, political life is both ordinary and resistant to automation. It has shown itself resistant to most attempts at radically revising the conditions and goals of political life. Further, the organization of political life takes many forms, each of which implies a different framework for making political judgments and analyzing political activity. A value-neutral computer program would be no more effective than value-neutral political science in explaining (for example) the concept of justice, which is understood differently in different regimes. Still less could an algorithm have determined, in advance, whether the precedent-based system of common law or the jurisprudential and code-based system of civil law were preferable ways for structuring human affairs. In the absence of a single, 'rational' ordering of political things, technological innovation has difficulty contributing to the improvement of human self-government. Efforts to make human life more purely creative and innovative, freed from the drudgery (or dignity) of ordinary work, will likewise leave human beings at a greater disadvantage in practising the virtues necessary for political life.

With some exceptions, as modern technology has advanced, citizens of Western democracies have been able to transfer their skills to new industries, to leave behind blue collar for white collar work, or to shift from manufacturing to the service economy. As entrepreneurs attempt to automate further sectors of blue and white collar labour, the need to explain that which distinguishes human beings will grow more acute – that is, if a distinctive human life is to be maintained. Like the discipline of bioethics, which awaits imminent advances in the biomedical sciences before mildly pronouncing its critique, an explanation of the human difference will be too late if that attempt is purely reactive. The resistance of human moral and political judgments to prediction or rational standardization will not in itself prevent an advance of machine intelligence or further automation. Only by practising the political virtues of care for the common good and mindful defence of human (not machine) liberty will we be able to make a political choice about the world we want to inhabit. But in granting pride of place to innovation unburdened by political limitation we have, for now, foreclosed that possibility.