

Coherence, instrumen-  
talism, technocracy,  
Rule of Law

roger.brownsword@kcl.ac.uk

This article describes the technological disruption of law and legal reasoning, suggests how law might be re-imagined, and proposes four key elements in its re-invention. Two waves of disruption are identified: one impacting on the content of legal rules and perceptions of their deficiency; a second impacting on our appreciation of technological instruments as tools to be used for regulatory purposes to support or replace legal rules. The suggested re-imagination of law centres on the idea of the regulatory environment. The proposed re-invention of law starts with (i) a fresh understanding of the range of regulatory responsibilities, which shapes (ii) the articulation of the Rule of Law and informs both (iii) a renewal of traditional coherentist thinking and (iv) a reshaping of legal and regulatory institutions.

### 1. Introduction

This article is about the disruption of law and legal reasoning by new technologies as a result of which, I suggest, there is a need to re-Imagine and then to re-invent law. It is about the disruptive impact of new technologies on the traditional content of legal rules, about the way that those associated with the legal and regulatory enterprise reason, about the increasing availability of technological instruments to support, or even supplant, legal rules and, concomitantly, it is about the displacement of human agents from traditional regulatory roles.

The argument is that, in the wake of this disruption, there is a need to re-imagine the field (the regulatory environment) of which legal rules are a part.<sup>1</sup> Instead of thinking exclusively in terms of a certain set of rules and norms (representing 'the law'), it is suggested that we should think of a set of tools that can be employed for regulatory purposes. While some of these tools (such as legal rules) are normative, others (employing, for example, the design of products or processes) are non-normative. While normative instruments always speak to what 'ought' to be done, non-normative instruments at any rate, at

the hard end of the spectrum speak only to what 'can' and 'cannot' be done.<sup>2</sup> Finally, it is argued that, if law is to be re-invented, the renewal should be anchored to a new foundational understanding of regulatory responsibilities on which we can draw in order to shape our articulation of the Rule of Law, to revitalise 'coherentist'<sup>3</sup> thinking, and to refashion legal and regulatory institutions.

The article is in four parts. In Part 2, two principal disruptive waves are sketched: while one wave of technological disruption impacts on both the substance of legal rules and the prevailing legal mind-set, the other impacts on our appreciation of rules as just one kind of regulatory instrument. While the first wave has been felt since the early days of industrialisation, it is the second wave that will be critical this century.

There are three elements in Part 3: first, three mind-sets ('coherentist', 'regulatory-instrumentalist', and 'technocratic') generated by these technological disruptions are sketched; secondly, relative to these mind-sets, a short retrospective reflection is offered on Judge Frank Easterbrook's provocative argument that to regroup legal rules relating to modern ICTs as 'the law of cyberspace' would be as unilluminating as the regrouping of legal rules to represent 'the law of the horse';<sup>4</sup> and, thirdly, some initial remarks are made in relation to the question of which mind-set should be engaged and when.

\* King's College London and Bournemouth University. This article is largely based on a lecture that was given at the University of Warsaw on November 7, 2018 and, in part, on a lecture that was given in Tilburg (at an event celebrating 25 years of TILT) on January 18, 2019. I am grateful for the comments made and questions asked following both lectures, as well as for feedback from the journal's reviewers. Needless to say, the usual disclaimers apply.

<sup>1</sup> See, Roger Brownsword, 'In the Year 2061: From Law to Technological Management' (2015) 7 *Law, Innovation and Technology* 1; 'Field, Frame and Focus: Methodological Issues in the New Legal World' in Rob van Gestel, Hans Micklitz, and Ed Rubin (eds), *Rethinking Legal Scholarship* (Cambridge: Cambridge University Press, 2016) 112; and *Law, Technology and Society Re-imagining the Regulatory Environment* (Abingdon: Routledge, 2019).

<sup>2</sup> See, e.g., Roger Brownsword, 'Lost in Translation: Legality, Regulatory Margins, and Technological Management' (2011) 26 *Berkeley Technology Law Journal* 132.

<sup>3</sup> By 'coherentist' I mean, roughly speaking, a mind-set that is not only focused on the internal consistency and integrity of a body of doctrine but also that engages with new technologies by asking how that body of doctrine applies to new technological (or other) phenomena. I will elaborate this more fully in Part 3.

<sup>4</sup> Frank H. Easterbrook, 'Cyberspace and the Law of the Horse' [1996] *University of Chicago Legal Forum* 207. Although Easterbrook's article is frequently recalled for its provocative claim, most of the paper actually argues, in the

Faced with these disruptions, in Part 4, it is suggested that the required act of re-imagination is to view law and legal rules as one element of a more heterogeneous and more inclusive conception of the regulatory environment – specifically, a regulatory environment in which new technologies figure as instruments with regulatory effects. As a first step in this act of re-imagination, it is suggested that we might map the field by reference to (i) the types of measure or instrument employed (rules or non-rule technologies) and (ii) the source of the measure (public or private regulator). Then, with the focus on non-rule technological measures, we can develop the map by reference to (iii) the nature of the technological measure (soft or hard) and (iv) the locus of the intervention (external to agents or internal to agents).

Finally, in Part 5, four main elements of the re-invention of law are proposed. These are (i) a new foundationalist and hierarchical understanding of the range of regulatory responsibilities, where the responsibility to maintain the essential conditions for human social existence (the commons) is prioritised, (ii) a new appreciation of the Rule of Law, (iii) a renewed form of coherentist thinking, and (iv) a refashioning of legal and regulatory institutions.

My conclusion is not that, with law so re-invented, all will go well. In a world of dynamic technological change, maintaining the commons will always be a challenge and discharging our regulatory responsibilities will inevitably be work in progress. Nevertheless, I suggest that the chances of things going well are somewhat better if we do so re-imagine and then re-invent law than if we take no steps in this direction.

## 2. Law Disrupted

Shortly before Christmas 2018, an unauthorised drone was sighted in the vicinity of the airfield at London Gatwick airport. As a precautionary measure, all flights were suspended and, for two days, the airport was closed.<sup>5</sup> Following this incident, some exhorted the government to change the rules, particularly by providing for an extended drone no-fly zone around airports – in response to which, the government announced that the police would be given new powers to tackle illegal drone use,<sup>6</sup> and that the drone no-fly zone would be extended to 3 miles around airports.<sup>7</sup> Others, however, focused, not on the fitness of the rules, but on the possibility of finding a technological solution, ideally one that rendered it impossible in practice for a drone to be flown near an airport (or, failing that, a technology for disabling and bringing down unauthorised drones).<sup>8</sup>

Similarly, in its recent White Paper on the regulation of harmful online content – ranging broadly across content that is harmful to national security, to politicians, to children, and so on – the UK government has outlined a two-pronged strategy.<sup>9</sup> While one prong of the proposed response focuses on rendering the rules fit for purpose in the digital

age (notably by establishing a new statutory duty of care on Internet companies ‘to take reasonable steps to keep their users safe and tackle illegal and harmful activity on their services’<sup>10</sup>), the other prong aspires to make ‘technology itself [a]...part of the solution’.<sup>11</sup>

In these two responses, focusing on both rule changes and technological solutions, we see the disruption of law represented in two ways. First, there is the thought that the rules are not fit for (regulatory) purpose, this reflecting a sense of the inadequacy of existing legal rules. Secondly, there is the thought that the most effective regulatory response might be to rely on technological instruments rather than rules, this being at odds with the assumption that social order is to be maintained by the use of rules (and, concomitantly, heightening our appreciation of the potential use of both technological instruments other than legal rules and of smart machines rather than human agents). If the former views technology as a disruptive problem, the latter sees technology as part of the solution. If the former is characteristic of disruption that goes back to the early years of industrialisation, the latter is more characteristic of the Millennium.

Law is, thus, disrupted in two waves, one wave impacting on the substance of the rules on which we rely and the other on whether we should rely on rules at all. However, as we will elaborate in the next Part of the article, these disruptions also impact on the way in which we think as lawyers, provoking new framings, new conversations, and new legal and regulatory mind-sets.<sup>12</sup>

### 2.1 The first disruptive wave

The first wave of disruption causes us to question the adequacy of existing rules of law. In some cases, it is deficiencies in the substance of prevailing legal rules that are highlighted; the rules at issue need to be changed or qualified. In other cases, it is gaps or omissions in the prevailing legal rules that are exposed; new rules need to be introduced. However, in both cases, the essential disruption is that we wonder, as we would now put it, whether the legal rules and principles are fit for purpose.

The disruptive effects of industrialisation on the traditional rules of the criminal law are highlighted by Francis Sayre when, in a seminal article, he remarks on the ‘steadily growing stream of offenses punishable without any criminal intent whatsoever.’<sup>13</sup> While this development jars with the traditional idea that there can be no criminal offence without *mens rea*, the world was changing. As Sayre recognised, the ‘invention and extensive use of high-powered automobiles require new forms of traffic regulation;...the growth of modern factories requires new forms of labor regulation; the development of modern building construction and the growth of skyscrapers require new forms of building regulation.’<sup>14</sup> So it was that, in both England and the United States, from the middle of the Nineteenth Century, the courts accepted that, so far as ‘public welfare’ offences were concerned, it

spirit of Coasean law and economics, for clear rules, for creating property rights where they are needed, and for facilitating the formation of bargaining institutions.

<sup>5</sup> See, e.g., BBC News, ‘Gatwick airport: How countries counter the drone threat’, December 21, 2018, <https://www.bbc.co.uk/news/technology-46639099> (last accessed 21 December 2018).

<sup>6</sup> See BBC News, ‘Police to get new powers to tackle illegal drone use’ January 7, 2019. Available at <https://www.bbc.co.uk/news/uk-46787730> (last accessed February 20, 2019).

<sup>7</sup> See BBC News (Business), ‘Drone no-fly zone to be widened after Gatwick chaos’ February 20, 2019. Available at <https://www.bbc.co.uk/news/business-47299805> (last accessed February 20, 2019).

<sup>8</sup> It has also been reported that the Home Office is testing new counter-drone technologies (see n 7).

<sup>9</sup> HM Government, Online Harms White Paper (CP 57, April 2019).

<sup>10</sup> ‘Online Harms White Paper’ at p. 42 (para 3.1).

<sup>11</sup> ‘Online Harms White Paper’ at p. 6 (para 10) – so, for example, at p. 13, para 1.12, we read that it is ‘vital to ensure that there is the technology in place to automatically detect and remove terrorist content within an hour of upload, secure the prevention of re-upload and prevent, where possible, new content being made available to users at all.’ For the various ways in which the government proposes to encourage the search for technological solutions, see Part 4 of the White Paper.

<sup>12</sup> See, Roger Brownsword, ‘Law and Technology: Two Modes of Disruption, Three Legal Mind-Sets, and the Big Picture of Regulatory Responsibilities’ (2018) 14 *Indian Journal of Law and Technology* 1; and Law, Technology and Society Re-imagining the Regulatory Environment (Abingdon: Routledge, 2019) Chs 8-12.

<sup>13</sup> F.B Sayre, ‘Public Welfare Offences’ (1933) 33 *Columbia Law Review* 55, at 55.

<sup>14</sup> Sayre (n 13) at 68-69.

was acceptable to dispense with proof of intent or negligence.<sup>15</sup> If the food sold was adulterated, if vehicles did not have lights that worked, if waterways were polluted, and so on, sellers and employers were simply held to account. For the most part, this was no more than a tax on business; it relieved the prosecutors of having to invest time and resource in proving intent or negligence; and, as Sayre reads the development, it reflected ‘the trend of the day away from nineteenth century individualism towards a new sense of the importance of collective interests.’<sup>16</sup>

A somewhat similar story of disruption can be told in relation to the rules of tort law. There, the key developments involve adjustments to the cornerstone idea of fault-based liability.<sup>17</sup> As Geneviève Viney and Anne Guégan-Lécuyer put it, a tort regime ‘which seemed entirely normal in an agrarian, small-scale society, revealed itself rather quickly at the end of the nineteenth century to be unsuitable.’<sup>18</sup> Accordingly, stricter forms of liability were needed to assist claimants who had been exposed to unacceptable forms of risk. However, at the same time, it was necessary to introduce immunities in order to shield nascent enterprises and to maintain an environment that does not discourage innovation.<sup>19</sup>

In the case of contract law, the key moments of disruption start with a shift from a ‘subjective’ consensual model of agreement to an ‘objective’ approach. The idea that contractors have to be subjectively *ad idem*, actually to have agreed on the terms and conditions of the transaction, hampered enterprises that needed to limit their liabilities associated with new transportation technologies. In the common law jurisprudence, this shift is epitomised by Mellish LJ’s direction to the jury in *Parker v South Eastern Railway Co*,<sup>20</sup> where the legal test is said to be not so much whether a customer actually was aware of the terms and had agreed to them but whether the railway company had given reasonable notice.<sup>21</sup> About a hundred years later, we come to a second moment of disruption when, with the development of a mass consumer market for new technological products (cars, televisions, kitchen appliances, and so on), it was necessary to make a fundamental correction to the traditional value of ‘freedom of contract’ in order to protect consumers against the small print of suppliers’ standard terms and conditions. Finally, although the potentially disruptive effects of online environments for commerce and contracting were resisted, it remains an open question whether the law can continue to treat contracts that are made using new transactional technologies

as if they were traditional offline, non-automated, non-self-enforcing transactions.<sup>22</sup>

What we see across these developments is a pattern of disruption to legal doctrines that were organically expressed in smaller-scale non-industrialised communities – communities where horses, not machines, did the heavy work. Here, the legal rules presuppose very straightforward ideas about holding to account (moreover, holding *personally* to account) those who engage intentionally in injurious or dishonest acts, about expecting others to act with reasonable care, and about holding others to their word. Once new technologies disrupt these ideas, we see the move to strict or absolute criminal liability without proof of intent, to tortious liability without proof of fault, to vicarious liability, and to contractual liability (or limitation of liability) without proof of actual intent, agreement or consent. Moreover, these developments signal a doctrinal bifurcation,<sup>23</sup> with some parts of criminal law, tort law and contract law resting on traditional principles (and representing, so to speak, ‘real’ crime, tort and contract) while others deviate from these principles as necessary adjustments or corrections are made.

More recently, we find a number of landmark cases in which the development or application of a new technology has exposed gaps or omissions in the law. For example, in the 1970s, Patrick Steptoe and Robert Edwards pioneered the development of the technique of in vitro fertilisation (IVF), famously leading to the birth of Louise Brown in 1978. Although the collaboration between Steptoe and Edwards did not involve any unlawful activity as such, the use of IVF was not explicitly legally authorised and, following the successful use of IVF, the Warnock Committee was set up to make recommendations concerning both assisted conception and the use of human embryos for research. In due course, the Human Fertilisation and Embryology Act, 1990, was put in place. This new legal framework set out the groundrules for the provision of, and access to, IVF services as well as for licensing research using human embryos. Similarly, various technological developments have provoked the creation of new offences to deal with a range of matters from human reproductive cloning to cybercrime. The development of computers necessitated setting out a legal framework for the processing of personal data; and there has been *sui generis* gap-filling and stretching of IP law to cover such matters as databases, software, and integrated circuits. What is distinctive about this kind of disruption is not so much that there are additions to the legal rule-book but that these responses are typically bespoke, tailored and in a legislative form; and, critically, the regulatory mind-set that directs these responses is quite different to traditional coherentist patterns of thought. Because this is a matter to which we will return in Part 3 of the article, we can leave it at that for the moment.

## 2.2 The second disruptive wave

The focus of the second disruptive wave is not on the deficient content of prevailing legal rules, or on gaps, but on the availability of new technological instruments that can be applied for regulatory purposes. The response to such disruption is not that some rule changes or new rules are required but that the use of rules is not necessarily the most effective way of achieving the desired regulatory objective.

<sup>15</sup> So far as the development in English law is concerned, illustrative cases include *R v Stephens* LR 1 QB 702 (1866); *Hobbs v Winchester* [1910] 2 KB 471; and *Provincial Motor Cab Co v Dunning* [1909] 2 KB 599.

<sup>16</sup> Sayre (n 13) at 67.

<sup>17</sup> See Miquel Martin-Casals (ed), *The Development of Liability in Relation to Technological Change* (Cambridge: Cambridge University Press, 2010).

<sup>18</sup> Geneviève Viney and Anne Guégan-Lécuyer, ‘The Development of Traffic Liability in France’ in Martin-Casals (n 17) 50.

<sup>19</sup> For example, in the United States, the interests of the farming community were subordinated to the greater good promised by the development of the railroad network: see Morton J. Horwitz, *The Transformation of American Law 1780-1860* (Cambridge, Mass.: Harvard University Press, 1977).

<sup>20</sup> (1877) 2 C.P.D. 416.

<sup>21</sup> Nb, too, Stephen Waddams, *Principle and Policy in Contract Law* (Cambridge: Cambridge University Press, 2011) at 39, pointing out that the emphasis of Bramwell LJ’s judgment in *Parker* is ‘entirely on the reasonableness of the railway’s conduct of its business and on the unreasonableness of the customers’ claims; there is no concession whatever to the notion that they could only be bound by their actual consent.’ For a fine example of principled contractual thinking coming into tension with regulatory reasoning, see Catharine MacMillan, ‘The Mystery of Privacy: Grand Trunk Railway Company of Canada v Robinson (1915)’ (2015) 65 *University of Toronto Law Journal* 1.

<sup>22</sup> See, e.g., Roger Brownsword, ‘The E-Commerce Directive, Consumer Transactions, and the Digital Single Market: Questions of Regulatory Fitness, Regulatory Disconnection and Rule Redirection’ in Stefan Grundmann (ed), *European Contract Law in the Digital Age* (Cambridge: Intersentia, 2017) 165.

<sup>23</sup> As recognised, for example, in the Canadian Supreme Court case of *R. v Sault Ste. Marie* [1978] 2 S.C.R. 1299, at 1302-1303.

Already, this presupposes a disruption to traditional patterns of legal thinking that is to say, it presupposes a regulatory-instrumentalist and purposive mind-set and a willingness to think about turning to architecture, design, coding, AI, and the like as a regulatory tool. Arguably, we can find such a willingness as soon as people fit locks on their doors. However, the variety and sophistication of the technological instruments that are available to regulators today is strikingly different to the position in both pre-industrial and early industrial societies. In particular, there is much more to technological management than traditional target-hardening: the management involved might—by designing products and places, or by coding products and people—disable or exclude potential wrongdoers as much as harden targets or immunise potential victims; and, there is now the prospect of widespread automation that takes humans altogether out of the regulatory equation. Crucially, with a risk management approach well-established, regulators now find that they have the option of responding by employing various technological instruments rather than rules. This is the moment when, so to speak, we see a very clear contrast between the legal and regulatory style of the rule-governed East coast (whether traditional or progressive) and the technologically-managed style of the West coast.<sup>24</sup>

In the wake of this second disruptive wave, the take-up of technological tools can be charted on a spectrum running from soft to hard.<sup>25</sup> At the soft end of the spectrum, the technologies are employed in support of the legal rules. For example, the use of surveillance technologies and/or identification technologies signals that rule-breaking is more likely to be detected; other things being equal, compliance with the rules is assisted and encouraged; but the strategy is still rule-based and the practical option of non-compliance remains. By contrast, at the hard end of the spectrum, the focus and the ambition are different. Here, measures of ‘technological management’ focus on limiting the practical (not the paper) options of regulatees;<sup>26</sup> and, whereas legal rules back their prescriptions with *ex post* penal, compensatory, or restorative measures, the focus of technological management is entirely *ex ante*, aiming to anticipate and prevent wrongdoing rather than punish or compensate after the event. Albeit a measure for road safety rather than crime control, this is how we should interpret the recent EU proposal to require that all new cars should be fitted with devices that ensure that vehicles comply with speed limits.<sup>27</sup>

Elsewhere, we see the search for technological solutions in relation to the protection of both intellectual property rights (qua digital rights management) and privacy.<sup>28</sup> Granted, a good deal of the effort to find such solutions comes from private corporations who deploy technological measures that have the desired regulatory and risk-managing

effects. To this extent, these parties act as regulators, albeit not as public regulatory bodies. It is also true that public regulators for example, in relation to the regulation of online content may direct or encourage private parties to develop technological solutions rather than invest in and impose their own technological measures. During the second wave of disruption, all parties who are in a position to ‘regulate’ begin to appreciate the possibilities given by new technological tools.

To elaborate on these latter examples, with the development of computers and then the Internet and World Wide Web, supporting a myriad of applications, it is clear that, when individuals operate in online environments, they are at risk in relation to both their ‘privacy’ and the fair processing of their personal data. Initially, regulators assumed that ‘transactionalism’ would suffice to protect individuals: in other words, it was assumed that, unless the relevant individuals agreed to, or consented to, the processing of their details, it would not be lawful. However, once it was evident that consumers in online environments routinely signalled their agreement or consent in a mechanical way, without doing so on a free and informed basis, a more robust risk-management approach invited consideration. Such an approach might still be rule-based (probably with the reasonableness of online business practice setting the standard), but the management might also be technological. In other words, once we are thinking about the protection of the autonomy of internet-users or about the protection of their privacy, why not also consider the use of technological instruments in service of the regulatory objectives?

Indeed, in Europe, this kind of thinking resonates with what we find in the General Data Protection Regulation (GDPR)<sup>29</sup> and, similarly, in Article 13 (now renumbered 17) of the EU Copyright Directive (where content recognition technologies and further development of such technologies are treated as central to cooperative arrangements between copyright holders and information society service providers).<sup>30</sup> While talk of ‘privacy enhancing technologies’ and ‘privacy by design’ has been around for some time,<sup>31</sup> in the GDPR we see that this is more than talk; it is not just that the regulatory discourse is more technocratic, there are signs that the second disruption is beginning to impact on regulatory practice—although how far this particular impact will penetrate remains to be seen.<sup>32</sup>

<sup>24</sup> Seminally, see Lawrence Lessig, *Code and Other Laws of Cyberspace* (New York: Basic Books, 1999). See, too, Roger Brownsword, ‘Code, Control, and Choice: Why East is East and West is West’ (2005) 25 *Legal Studies* 1.

<sup>25</sup> See, e.g., Pat O’Malley, ‘The Politics of Mass Preventive Justice’ in Andrew Ashworth, Lucia Zedner, and Patrick Tomlin (eds), *Prevention and the Limits of the Criminal Law* (Oxford University Press, 2013) 273.

<sup>26</sup> See, e.g., Roger Brownsword, ‘Law, Liberty and Technology’ in Roger Brownsword, Eloise Scotford, and Karen Yeung (eds), *The Oxford Handbook of Law, Regulation and Technology* (Oxford: Oxford University Press, 2017) 41.

<sup>27</sup> See, Graeme Paton, ‘Automatic speed limits planned for all new cars’ *The Times*, March 27, p 1.

<sup>28</sup> Compare, Lee A. Bygrave, ‘Hardwiring Privacy’ in Roger Brownsword, Eloise Scotford, and Karen Yeung (n 26), 754, 755. Here, Bygrave says that, in the context of the design of information systems, the assumption is that, by embedding norms in the architecture, there is ‘the promise of a significantly increased *ex ante* application of the norms and a corresponding reduction in relying on their application *ex post facto*.’

<sup>29</sup> Regulation (EU) 2016/679. See, e.g., Recital 78 which enjoins data controllers to take ‘appropriate technical and organisational measures’ to ensure that the requirements of the Regulation are met; and similarly, in the body of the GDPR, see Article 25 (concerning data protection by design and by default).

<sup>30</sup> European Commission, Proposal for a Directive of the European Parliament and of the Council on copyright in the Digital Single Market, COM(2016) 593 final, 2016/0280(COD) (Brussels, 14.9.2016).

<sup>31</sup> See, Bygrave (n 28); Ann Cavoukian, *Privacy by Design: The Seven Foundational Principles* (Information and Privacy Commissioner of Ontario, 2009, rev ed 2011) (available at <https://www.ipc.on.ca/images/Resources/7foundationalprinciples.pdf>) (last accessed February 5, 2018). For a recent review of the use, development and limits of a range of PETs, see The Royal Society, *Protecting privacy in practice* (London, March 2019). One of the recommendations made in this report is that government and regulators should ‘support organisations to become intelligent users of PETs’. So, for example, ‘the Information Commissioner’s Office (ICO) should provide guidance about the use of suitably mature PETs to help organisations minimise risks to data protection, and this should be part of the ICO’s Data Protection Impact Assessment guidelines. Such guidance would need to cover how PETs fit within an organisation’s overall data governance infrastructure, since the use of PETs in isolation is unlikely to be sufficient’ (at 7).

<sup>32</sup> Bygrave (n 28) argues, at 756, that, despite explicit legal backing, ‘the privacy-hardwiring enterprise will continue to struggle to gain broad traction.’ Most importantly, this is because this enterprise ‘is at odds with powerful

This evolution in regulatory thinking is not surprising. Having recognised the limited fitness of traditional legal rules, and having taken a more regulatory approach, the next step is to think not just in terms of risk assessment and risk management but also to be mindful of the technological instruments that increasingly become available for use by regulators. In this way, the regulatory mind-set is focused not only on the risks to be managed but also how best to manage those risks (including making use of technological tools).<sup>33</sup>

### 3. The Legal Mind-Set Disrupted

It will be recalled that one of the impacts of the first wave of disruption is to destabilise the traditional coherentist mind-set the challenge comes from a mind-set the logic of which is altogether more purposive and regulatory-instrumentalist. This disruptive effect is compounded by the second wave of disruption when regulatory-instrumentalism is taken in a more technocratic direction. With each mind-set, there are different questions that are focal, different framings, and different conversations that ensue.

Elaborating these disruptive impacts, there are three elements in this part of the article. First, there is a sketch of the three legal and regulatory mind-sets that are central to the narrative: namely, the coherentist, the regulatory-instrumentalist, and the technocratic. Secondly, relative to these mind-sets, I offer a retrospective comment on Judge Frank Easterbrook's famous assertion that creating a dedicated 'law of cyberspace' would be as mindless and inappropriate as recognising a 'law of the horse'.<sup>34</sup> Although we might quickly dismiss Easterbrook's intervention as seriously misreading the runes or as underestimating the significance of the regulatory activity at the technological nodes of interest, I suggest that his view is best regarded as a textbook expression of traditional coherentist thinking. Thirdly I will present some initial reflections on the question of which mind-set should be engaged and when. This is an important question and one to which we will return in Part 5.

#### 3.1 The three mind-sets

In what follows, we present three thumbnail sketches of the legal and regulatory mind-sets to which we have referred: the coherentist, the regulatory-instrumentalist, and the technocratic.

##### *Coherentism*

Coherentism is defined by four characteristics. First, what matters above all is the integrity and internal consistency of legal doctrine. This is viewed as desirable in and of itself. Secondly, coherentists are not concerned with the fitness of the law for its regulatory purpose. Thirdly, coherentists approach new technologies by asking how they fit within existing legal categories (and then try hard to fit them in). Fourthly, coherentists believe that legal reasoning should be anchored to guiding general principles. Coherentism is, thus, the natural language of litigators and judges, who seek to apply the law in a principled way.<sup>35</sup>

business and state interests, and simultaneously remains peripheral to the concerns of most consumers and engineers' (ibid).

<sup>33</sup> Compare Colin Gavaghan, 'Lex Machina: Techno-regulatory Mechanisms and "Rules by Design"' (2017) 15 *Otago Law Review* 123, 145 concluding that techno-regulatory mechanisms 'are already widespread and, likely to become more so as our lives become more urbanized and technologized.'

<sup>34</sup> Easterbrook (n 4).

<sup>35</sup> For a somewhat similar view, presented as a 'legalistic approach' to emerging technologies, see Nicolas Petit, 'Law and Regulation of Artificial Intelligence and Robots: Conceptual Framework and Normative Implications': available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2931339](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2931339) (last accessed February 17, 2018).

In the context of rapidly emerging technologies, it is worth lingering over the coherentist tendency to ask not whether the prevailing (and disrupted) rules are fit for purpose but how new phenomena can be fitted into traditional classification schemes or how they comport with general principles of law.

For coherentists, the focus is on the recognised legal concepts, categories and classifications;<sup>36</sup> and this is accompanied by a certain reluctance to abandon these concepts, categories and classifications with a view to contemplating a bespoke response. For example, rather than recognise new types of intellectual property, coherentists will prefer to tweak existing laws of patents and copyright.<sup>37</sup> Similarly, in transactions, coherentists will want to classify e-mails as either instantaneous or non-instantaneous forms of communication (or transmission),<sup>38</sup> they will want to apply the standard formation template to online shopping sites, they will want to draw on traditional notions of agency in order to engage electronic agents and smart machines,<sup>39</sup> and they will want to classify individual 'prosumers' and 'hobbyists' who buy and sell on new platforms (such as platforms that support trade in 3D printed goods) as either business sellers or consumers.<sup>40</sup> As the infrastructure for transactions becomes ever more technological the tension between this strand of coherentism and regulatory-instrumentalism becomes all the more apparent.<sup>41</sup> In sum, coherentism presupposes a world of, at most, leisurely change. It belongs to the age of the horse, not to the age of the autonomous vehicle.

##### *Regulatory-Instrumentalism*

In contrast with coherentism, regulatory-instrumentalism is defined by the following three features. First, it is not concerned with the internal consistency of legal doctrine. Secondly, it is entirely focused on whether the law is instrumentally effective in serving specified regulatory purposes and policies. Thirdly, regulatory instrumentalism has no reservation about enacting new bespoke laws if this is an effective and efficient response to a question raised by new technologies. Regulatory-instrumentalism is, thus, the natural language of legislators and policy-makers.

<sup>36</sup> See, e.g., the excellent analysis in Shawn Bayern, Thomas Burri, Thomas D. Grant, Daniel M. Häusermann, Florian Möslin, and Richard Williams, 'Company Law and Autonomous Systems: A Blueprint for Lawyers, Entrepreneurs, and Regulators' (2017) 9 *Hastings Science and Technology Law Journal* 135, where company structures that are provided for in US, German, Swiss, and UK law are reviewed to see whether they might plausibly act as a host for autonomous systems that provide a service (such as file storage, file retrieval and metadata management).

<sup>37</sup> Compare the analysis of multi-media devices in Tanya Aplin, *Copyright Law in the Digital Society: the Challenges of Multimedia* (Oxford: Hart, 2005).

<sup>38</sup> See, e.g., Andrew Murray, 'Entering into Contracts Electronically: the Real WWW' in Lillian Edwards and Charlotte Waelde (eds), *Law and the Internet: A Framework for Electronic Commerce* (Oxford: Hart, 2000) 17; and Eliza Mik, 'The Effectiveness of Acceptances Communicated by Electronic Means, Or – Does the Postal Acceptance Rule Apply to Email?' (2009) 26 *Journal of Contract Law* 68 (concluding that such classificatory attempts should be abandoned).

<sup>39</sup> Compare, e.g., Emily Weitzenboeck, 'Electronic Agents and the Formation of Contracts' (2001) 9 *International Journal of Law and Information Technology* 204.

<sup>40</sup> Compare e.g., Christian Twigg-Flesner, 'Conformity of 3D Prints—Can Current Sales Law Cope?' in R. Schulze and D. Staudenmayer (eds), *Digital Revolution: Challenges for Contract Law in Practice* (Baden-Baden: Nomos, 2016) 35.

<sup>41</sup> For insightful discussion of the proposed B2B platform Regulation, see Christian Twigg-Flesner, 'The EU's Proposals for Regulating B2B Relationships on online platforms: Transparency, Fairness and Beyond' (2018) 7 *Journal of European Consumer and Market Law* 222.

The regulatory mind-set is, at all stages, instrumental and instrumentally rational. The question is: what works, what will serve certain specified purposes? When a regulatory intervention does not work, it is not enough to restore the status quo; rather, further regulatory measures should be taken, learning from previous experience, with a view to realising the regulatory purposes more effectively. Hence, the purpose of the criminal law is not simply to respond to wrongdoing (as corrective justice demands) but to reduce crime by adopting whatever measures of deterrence promise to work.<sup>42</sup> Similarly, in a safety-conscious community, the purpose of tort law is not simply to respond to wrongdoing but to deter practices and acts where agents could easily avoid creating risks of injury and damage. For regulatory-instrumentalists, the path of the law should be progressive: we should be getting better at regulating crime and improving levels of safety.<sup>43</sup>

According to Edward Rubin, regulatory-instrumentalism is displacing a coherentist approach.<sup>44</sup> Thus, in the modern administrative state, the 'standard for judging the value of law is not whether it is coherent but rather whether it is effective, that is, effective in establishing and implementing the policy goals of the modern state.'<sup>45</sup> Certainly, one of the striking features of the European Union has been the single market project, a project that the Commission has pursued in a spirit of conspicuous regulatory-instrumentalism. Here, the regulatory objectives are: (i) to remove obstacles to consumers shopping across historic borders; (ii) to remove obstacles to businesses (especially small businesses) trading across historic borders; and (iii) to achieve a high level of consumer protection. In order to realise this project, it has been essential to channel the increasing number of member states towards convergent legal positions.

As the single market project has evolved into the digital Europe project, the Commission's regulatory-instrumentalist mind-set remains perfectly clear. As the Commission puts it:

The pace of commercial and technological change due to digitalisation is very fast, not only in the EU, but worldwide. The EU needs to act now to ensure that business standards and consumer rights will be set according to common EU rules respecting a high-level of consumer protection and providing for a modern business friendly environment. It is of utmost necessity to create the framework allowing the benefits of digitalisation to materialise, so that EU businesses can become more competitive and consumers can have trust in high-level EU consumer protection standards. By acting now, the EU will set the policy trend and the standards according to which this important part of digitalisation will happen.<sup>46</sup>

<sup>42</sup> Compare David Garland, *The Culture of Control: Crime and Social Order in Contemporary Society* (Oxford: Oxford University Press, 2001); and Amber Marks, Benjamin Bowling, and Colman Keenan, 'Automatic Justice? Technology, Crime, and Social Control' in Brownsword, Scotford, and Yeung (n 26) 705.

<sup>43</sup> The parallel development of a risk-management ideology in both criminal law and tort is noted by Malcolm Feeley and Jonathan Simon, 'Actuarial Justice: The Emerging New Criminal Law' in David Nelken (ed), *The Futures of Criminology* (London: Sage, 1994) 173.

<sup>44</sup> Edward L. Rubin, 'From Coherence to Effectiveness' in Rob van Gestel, Hans-W Micklitz, and Edward L. Rubin (eds), *Rethinking Legal Scholarship* (New York: Cambridge University Press, 2017) 310, 311.

<sup>45</sup> Rubin (n 44) 328.

<sup>46</sup> European Commission, Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee, 'Digital contracts for Europe—Unleashing the potential of e-commerce' COM(2015) 633 final (Brussels, 9.12.2015), 7.

In this context, coherentist thoughts about tidying up and standardising the lexicon of the consumer acquis, or pushing ahead with a proposed Common European Sales Law,<sup>47</sup> or codifying European contract law drop down the list of priorities. For regulatory-instrumentalists, when we question the fitness of the law, we are not asking whether legal doctrine is consistent, we are asking whether it is fit for delivering the regulatory purposes.

Last but not least, I take it to be characteristic of the regulatory-instrumentalist mind-set that the thinking becomes much more risk-focused. In the criminal law and in torts, the risks that need to be assessed and managed relate primarily to physical and psychological injury and to damage to property and reputation; in contract law, it is economic risks that are relevant. So, for example, we see in the development of product liability a scheme of acceptable risk management that responds to the circulation of products (such as cars or new drugs) that are beneficial but also potentially dangerous. However, this response is still in the form of a revised *rule* (it is not yet technocratic); and it is still in the nature of an *ex post* correction (it is not yet *ex ante* preventive). Nevertheless, it is only a short step from here to a greater investment in *ex ante* regulatory checks (for food and drugs, chemicals, and so on) and to the use of new technologies as preventive regulatory instruments. In other words, it is only a short step from risk-managing regulatory-instrumentalist thinking to a more technocratic mind-set.

#### Technocratic

The third mind-set, evolving from a regulatory-instrumentalist view, is one that is technocratic. In response to the demand that 'there needs to be a law against this', the technocratic mind-set, rather than drafting new rules, looks for technological solutions. Such a mind-set is nicely captured by Joshua Fairfield when, writing in the context of non-negotiable terms and conditions in online consumer contracts, he remarks that 'if courts [or, we might say, the rules of contract law] will not protect consumers, robots will.'<sup>48</sup>

We should not assume, however, that technocratic solutions will be accepted without resistance. For example, in the USA, a proposal to design vehicles so that cars were simply immobilised if seat belts were not worn was eventually rejected.<sup>49</sup> Although the (US) Department of Transportation estimated that the so-called interlock system would save 7,000 lives per annum and prevent 340,000 injuries, 'the rhetoric of prudent paternalism was no match for visions of technology and "big brotherism" gone mad'.<sup>50</sup> Taking stock of the legislative debates of the time, Jerry Mashaw and David Harfst remark:

Safety was important, but it did not always trump liberty. [In the safety lobby's appeal to vaccines and guards on machines] the freedom fighters saw precisely the dangerous, progressive logic of regulation that they abhorred. The private passenger car was not a disease or a workplace, nor was it a common carrier. For Congress in 1974, it was a private space.<sup>51</sup>

<sup>47</sup> Despite a considerable investment of legislative time, the proposal was quietly dropped at the end of 2014. This also, seemingly, signalled the end of the project on the Common Frame of Reference in which, for about a decade, there had been a huge investment of time and resource.

<sup>48</sup> Joshua Fairfield, 'Smart Contracts, Bitcoin Bots, and Consumer Protection' (2014) 71 *Washington and Lee Law Review Online* 36, 39.

<sup>49</sup> See, Jerry L. Mashaw and David L. Harfst, *The Struggle for Auto Safety* (Cambridge, Mass.: Harvard University Press, 1990) Chapter 7.

<sup>50</sup> Mashaw and Harfst (n 49) 135.

<sup>51</sup> Mashaw and Harfst (n 49) 140.

Today, similar debates might be had about the use of mobile phones by motorists. There are clear and dramatic safety implications but many drivers persist in using their phones while they are in their cars. If we are to be technocratic in our approach, perhaps we might seek a design solution that disables phones within cars, or while the user is driving. However, once automated vehicles relieve 'drivers' of their safety responsibilities, it seems that the problem will drop away—rules that penalise humans who use their mobile phones while driving will become redundant; humans will simply be transported in vehicles and the one-time problem of driving while phoning will no longer be an issue.

While the contrast between a technocratic approach and coherentism is sharp the former not being concerned with doctrinal integrity and not being entirely focused on restoring the status quo prior to wrongdoing the contrast with regulatory-instrumentalism is more subtle. For both regulatory-instrumentalists and technocrats the law is to be viewed in a purposive and policy-orientated way; and, indeed, as we have said, the latter can be regarded as a natural evolution from the former. In both mind-sets, it is a matter of selecting the tools that will best serve desired purposes and policies; and, so long as technologies are being employed as tools that are designed to assist with a rule-based regulatory enterprise as is the case with the examples of drones at Gatwick airport and harmful online content that we mentioned earlier in the article the technocratic approach might be viewed as merely an offshoot from the stem of regulatory-instrumentalism. However, once technocrats contemplate interventions at the hard end of the spectrum, their thinking departs from order based on rules to one based on technological management, from correcting and penalising wrongdoing to preventing and precluding wrongdoing, and from reliance on rules and standards to employing technological solutions. At this point, the technocratic mind-set reflects a new paradigm.

### 3.2 Disruption denied and the horse that bolted: was Easterbrook wrong?

Famously, Judge Frank Easterbrook, speaking at an early conference on the 'Law of Cyberspace', argued that 'the best way to learn the law applicable to specialized endeavors is to study general rules'.<sup>52</sup> Hence, Easterbrook claimed, to present a course on the 'Law of Cyberspace' would be as misconceived and unilluminating as to present a course on 'The Law of the Horse'. It would be 'shallow' and it would 'miss unifying principles'.<sup>53</sup> Rather, the better approach is 'to take courses in property, torts, commercial transactions, and the like....[For only] by putting the law of the horse in the context of broader rules about commercial endeavors could one really understand the *law* about horses'.<sup>54</sup> Nevertheless, the law of cyberspace was a horse that was destined to bolt. Easterbrook's doubts notwithstanding, courses and texts on 'cyberlaw', or 'Internet law', or 'e commerce', or the like, abound and few would deny that they have intellectual integrity and make pedagogic sense. Similarly, research centres that are dedicated to the study of cyberlaw (or law and technology more generally) have mushroomed and are seen as being in the vanguard of legal scholarship.

That said, was Easterbrook wrong?<sup>55</sup> As we have said, history has proved that Easterbrook was wrong insofar as he was predicting that

cyberlaw (or other law/technology projects) would have no future. However, there are also reasons for thinking that Easterbrook was wrong in supposing that the general principles of property, contract, and tort, and the like would represent the key legal material at the new technological nodes of interest. While some of the early case-law on disputes concerning the Internet and on questions provoked by developments in human genetics might have encouraged this view, it is now clear especially so in Europe that bespoke legislation is being put in place to regulate the relevant technologies and their applications.

Nevertheless, to the extent that Easterbrook was expressing a preference for a pedagogic strategy that brings general rules to bear on a range of facts and phenomena (including cyber phenomena), rather than a strategy that isolates cyber phenomena and then assembles the relevant law (both general and particular), his view should not be lightly dismissed. So viewed, the merits of his position hinge on the criteria that we take to be critical for determining the credentials of these rival pedagogic strategies. For example, if we take the criteria to be pedagogic economy, efficiency, and effectiveness, we might think that it is not so clear that Easterbrook was categorically wrong. Indeed, we might think that one of the strengths of Easterbrook's position is that it stands firm in insisting that students should be taught to think in the way that lawyers traditionally think: namely, figuring out how new fact-situations and phenomena fit with general legal rules and principles. Moreover, even if the cyberlaw horse has bolted, many lawyers persist in engaging with new technologies by approaching them in just the way that Easterbrook recommends for example, a common conversation, after blockchain, is whether smart contract applications will be recognised by judges as equivalent to fiat contracts.<sup>56</sup> In other words, coherentist conversations persist. Nevertheless, this supposed strength of Easterbrook's view holds good only so long as what is involved in 'thinking like a lawyer' and what it is to 'really understand the *law*' are unproblematic. Once these desiderata are problematised, Easterbrook's position is open to the objection that it directs the attention of students away from what now really matters, namely the systematically disruptive effects of technology on the law. To fail to foreground such disruption is to fail to understand the relevance and role of the law in a community where processes are increasingly automated and where relations between humans are increasingly mediated and managed by emerging technologies.

Elsewhere, I have suggested that, in our technological time, there are three key questions to be included in the curriculum.<sup>57</sup> These questions are expressed in relation to the teaching of, and curriculum for, the law of contract. However, suitably redrafted, they could be expressed for any of the traditional courses of law that Easterbrook

*Review* 501, and *Code and Other Laws of Cyberspace* (New York: Basic Books, 1999); Andrew Murray, *The Regulation of Cyberspace* (Abingdon: Routledge-Cavendish, 2007) Ch 1, and 'Looking back at the law of the horse: why cyberlaw and the rule of law are important' (2013) 10 *SCRIPTed* 310; and, implicitly, Chris Reed, 'Why judges need jurisprudence in cyberspace' (2018) 38 *Legal Studies* 263.

<sup>56</sup> See, e.g., Roger Brownsword, 'Regulatory Fitness: Fintech, Funny Money, and Smart Contracts' (2019) *European Business Organization Law Review* 1-23 DOI 10.1007/s40804-019-00134-2, and 'Smart Contracts: Coding the Transaction, Decoding the Legal Debates' in Philipp Hacker, Ioannis Lianos, Georgios Dimitropoulos, and Stefan Eich (eds) *Regulating Blockchain: Techno-Social and Legal Challenges* (Oxford: Oxford University Press, 2019) 311.

<sup>57</sup> See Roger Brownsword, 'Teaching the Law of Contract in a World of New Transactional Technologies' in Warren Swain and David Campbell (eds), *Reimagining Contract Law Pedagogy: A New Agenda for Teaching* (Legal Pedagogy) (Abingdon: Routledge, 2019) 112.

<sup>52</sup> Easterbrook (n 4) 207.

<sup>53</sup> Easterbrook (n 4) 207.

<sup>54</sup> Easterbrook (n 4) 208.

<sup>55</sup> For some responses to Easterbrook, see, e.g., See Lawrence Lessig, 'The Law of the Horse: What Cyberlaw Might Teach' (1999) 113 *Harvard Law*

has in mind. The three questions are as follows: First, how does the law of contract fit in to the wider regulatory environment for transactions? Secondly, as new transactional technologies become available and are taken up, should we try, like ‘coherentists’, to fit these developments into the existing body of doctrine or should we think about such matters in a more ‘regulatory-instrumental’ way? Thirdly, what should we make of the possibility of regulatory restrictions or requirements being, so to speak, ‘designed into’ the emerging technological platforms or infrastructures for contracts? In other words, what should we make of the ‘technological management’ of transactions?<sup>58</sup>

To ask these questions, we have to understand that law has been disrupted by new technologies. We have to understand that the context in which law operates is one in which legal rules co-exist with technological instruments that support those rules but that also might supplant and supersede such rules. We also have to understand that the traditional coherentist mind-set that is characteristic of court-centred legal thinking has been disrupted by technological developments that reach back into the Nineteenth Century and that it continues to be disrupted by the development, inter alia, of modern information and communication technologies.

Accordingly, in retrospect, what is wrong with Easterbrook’s approach is not so much that he defaults to a coherentist mind-set but that he seems to be either unaware of the disruptive effects of technology on the law or thinks that such disruption is unimportant. However, to put law and legal thinking in its modern context, to ‘really understand the law’, it is essential to step outside such a mind-set. Only then is it possible to recognise the extent of the disruption wrought by new technologies and, concomitantly, the significance of legal order. Only then do we begin to understand the uneasy co-existence that might be found in the relationship between law and various tech communities<sup>59</sup> but also *within* different factions of the legal and regulatory community. In sum, the problem with Easterbrook’s approach is that it is a denial of (or, in denial about) disruption. While this might be appropriate in the age of the horse, it is not at all appropriate in an age of disruptive cybertechnologies.

### 3.3 Which mind-set to engage

Given that regulators might frame their thinking in very different ways, does it matter which mind-set they adopt; and, if so, which mind-set should they adopt? When and why should we think like coherentists, when like regulatory-instrumentalists, and when like technocrats?

To illustrate the significance of the regulatory framing, consider the following hypothetical posed by John Frank Weaver:

[S]uppose the Aeon babysitting robot at Fukuoka Luclé mall in Japan is responsibly watching a child, but the child still manages to run out of the child-care area and trip an elderly woman. Should the parent[s] be liable for that kid’s intentional tort?<sup>60</sup>

If we respond to this question (of the parents’ liability) with the mind-set of a coherentist, we are likely to be guided by traditional notions of fault, responsibility, causation, and corrective justice. On this view,

<sup>58</sup> This possibility (of regulatory effects being coded into software and hardware) is central to Lawrence Lessig’s response to Easterbrook, see Lessig (n 55).

<sup>59</sup> Compare Karen Yeung, ‘Regulation by Blockchain: The Emerging Battle for Supremacy between the Code of Law and Code as Law’ (2019) 82 *Modern Law Review* 207.

<sup>60</sup> John Frank Weaver, *Robots Are People Too* (Santa Barbara, Ca: Praeger, 2014) 89.

liability would be assessed by reference to what communities judge to be fair, just and reasonable—and different communities might have different ideas about whether it would be fair, just and reasonable to hold the parents liable in the hypothetical circumstances. By contrast, if we respond like a regulatory-instrumentalist, the thinking is likely to be that before retailers, such as the shop at the mall, are to be licensed to introduce robot babysitters, and before parents are permitted to make use of robocarers, there needs to be a collectively agreed scheme of compensation should something ‘go wrong’. On this view, the responsibilities and liabilities of the parents would be determined by the agreed terms of the risk management package. However, we might also imagine a third response, a response of a technocratic nature, seeking to design out the possibility of such an accident. Quite what measures of technological management might be suggested is anyone’s guess—perhaps an invisible ‘fence’ at the edge of the care zone so that children (like supermarket trolleys or golf carts) simply could not stray beyond the limits. However, thinking about the puzzle in this way, the question would be entirely about designing the machines and the space in such a way that (harmful) collisions between children and mall-goers simply could not happen.

Which of these responses is appropriate? On the face of it, coherentism belongs to relatively static and stable communities, not to the dynamic and turbulent technological times of the Twenty-First Century not as a response to unauthorised drones at airports, or to dangerous or distressing online content, or to accidents involving robot carers. Pace Easterbrook, to assume that traditional legal frameworks enable regulators to ask the right questions and answer them in a rational way seems over-optimistic. If we reject coherentism, we will see regulatory-instrumentalism as a plausible default with the option of a technocratic resolution always to be considered.<sup>61</sup> However, there is a concern that regulatory-instrumentalism might tend to ‘flatten’ decision-making, reducing all conflicts to a balance of interests and replacing respect for fundamental values such as respect for human rights and human dignity with an all-purpose utilitarianism.<sup>62</sup> Moreover, concerns of this kind are amplified by the prospect of the use of technological management. If law is to be re-invented, regulatory-instrumentalism and technological management cannot be the complete answer. Before re-invention, though, we must speak to re-imagination.

## 4. Law Re-imagined

If technological tools and technologically managed environments are to be a significant part of our regulatory future, then there is a need to re-imagine law: first, setting law in a context that takes full account of the variety of norms that impact on, and influence, human behaviour; and, secondly, placing law in a context that recognises the channelling and constraining effect of technological management. In order to do this, it is suggested that we should broaden the field for juristic inquiry by operating with a notion of the regulatory environment that

<sup>61</sup> For a discussion in point, see David S. Wall, *Cybercrime* (Cambridge: Polity Press, 2007) where a number of strategies for dealing with ‘spamming’ are considered. As Wall says, if the choice is between ineffective legal rules and a technological fix (filters and the like), then most would go for the latter (at 201).

<sup>62</sup> Compare Christophe Geiger, ‘“Fair Use” through Fundamental Rights: When Freedom of Artistic Expression allows Creative Appropriations and Opens up Statutory Copyright Limitations’, Centre for International Intellectual Property Studies, University of Strasbourg, Research Paper No. 2018-09: see, [https://www.researchgate.net/publication/328061041\\_‘Fair\\_Use’\\_through\\_Fundamental\\_Rights\\_When\\_Freedom\\_of\\_Artistic\\_Expression\\_allows\\_Creative\\_Appropriations\\_and\\_Opens\\_up\\_Statutory\\_Copyright\\_Limitations](https://www.researchgate.net/publication/328061041_‘Fair_Use’_through_Fundamental_Rights_When_Freedom_of_Artistic_Expression_allows_Creative_Appropriations_and_Opens_up_Statutory_Copyright_Limitations).



accommodates both normative rule-based and non-normative technologically-managed approaches. Admittedly, this does not involve the reconceiving of 'law' as such—we might continue to conceive of law as a rule-based or norm-based enterprise; and we might continue to conceive of modern legal systems in terms of a conjunction of primary and secondary rules, or as multi-level normative orders, or whatever. In other words, we do not have to concede that 'code' is law, simply that 'code' together with law is part of the regulatory environment. So conceding, the critical correction is to re-imagine law within a regulatory environment that is no longer limited to guidance given by rules or norms.

What would such a regulatory environment look like? Famously, Clifford Shearing and Phillip Stenning highlighted the way in which, at Disney World, the vehicles that carry visitors between locations act as barriers (restricting access).<sup>63</sup> However, theme parks are no longer a special case. We find similar regulatory environments in many everyday settings, where along with familiar laws, rules, and regulations, there are the signs of technological management—for example, we find mixed environments of this kind in homes and offices where air-conditioning and lighting operate automatically, in hotels where the accommodation levels can only be reached by using an elevator (and where the elevators cannot be used and the rooms cannot be accessed without the use of security key cards), and perhaps par excellence in the 'code/space' that we find at airports.<sup>64</sup> On arrival at a modern terminal building, while there are many airport rules to be observed—for example, regulations concerning parking vehicles, smoking in the building, or leaving bags unattended, and so on—there is also a distinctive architecture that creates a physical track leading from check-in to boarding. Along this track, there is nowadays an 'immigration and security zone', dense with identifying and surveillance technologies, through which passengers have little choice other than to pass. In this conjunction of architecture together with surveillance and identification<sup>65</sup> technologies, we have the non-normative dimensions of the airport's regulatory environment—the fact of the matter is that, if we wish to board our plane, we have no practical option other than to follow the technologically managed track. Similarly, if we want to shop at an Amazon Go store, we have no choice other than to subject ourselves to the technologically managed environment of such stores; and, of course, if we visit Amazon or any other platform online, we will probably do so subject to both the specified terms and conditions for access and whatever technological features are embedded in the site.<sup>66</sup>

<sup>63</sup> Clifford D. Shearing and Phillip C. Stenning, 'From the Panopticon to Disney World: the Development of Discipline' in Anthony N. Doob and Edward L. Greenspan (eds), *Perspectives in Criminal Law: Essays in Honour of John LL.J. Edwards* (Toronto: Canada Law Book, 1985) 335.

<sup>64</sup> Compare James Bridle, *New Dark Age: Technology and the End of the Future* (London: Verso, 2018) 37: An airport is a canonical example of what geographers call 'code/space'. Code/spaces describe the interweaving of computation with the built environment and daily experience to a very specific extent: rather than merely overlaying and augmenting them, computation becomes a crucial component of them, such that the environment and the experience of it actually ceases to function in the absence of code.

<sup>65</sup> At London Heathrow airport, there is a £50 million project to install facial recognition technology said to be 'the biggest single deployment of biometric technology in the world' that will dispense with the need to show passports and boarding passes along the track. This project is presented as being for the convenience of passengers but it is also designed to increase security. See, Mark Bridge, Graeme Paton, and Daphne Bugler, 'No need for passports as Heathrow goes hi-tech' *The Times*, April 27, 2019, p 1.

<sup>66</sup> For an insightful and detailed analysis of the technological management of Facebook's site, see Tomer Shadmy, 'The New Social Contract: Facebook's Community and Our Rights' (2019) 37 *Boston University International Law Journal* (forthcoming).

If we treat the regulatory environment as essentially a signalling and steering environment, then each such environment operates with a distinctive set of regulatory signals that are designed to channel the conduct of regulatees within, so to speak, a regulated sphere of possibility. Of course, one of the benefits of technologies is that they can expand our possibilities; without aircraft, we could not fly. Characteristically, though, the kind of technological management that we are contemplating is one that restricts or reduces existing human possibilities (albeit, in some cases, by way of a trade-off for new possibilities). In other words, while normative regulation is directed at actions that are possible—and that remain possible—technological management engages with spheres of possibility but in ways that restructure those regulatory spaces and redefine what is and is not possible. In technologically managed environments, it is not so much a matter of what we ought or ought not to do but of what we can and cannot do.

This brief introduction to a re-imagined regulatory environment of which law is just one part needs more detail.<sup>67</sup> First, we need to make a few schematic remarks about technological management as a regulatory option before, secondly, offering some initial remarks about the mapping of the field that is to be re-imagined. Here, we propose a general map of the field in which we take our bearings from (i) the types of measure or instrument employed (rules or non-rule technologies) and (ii) the source of the measure (public or private regulator); and, then, we propose a more detailed mapping of the technological part of the field in which we take our bearings from (iii) the nature of the technological measure (soft or hard) and (iv) the locus of the intervention (external to or internal to regulatees). If we were to visualise this map, it would comprise a pair of two-by-two square grids. The first (general) grid would map: (i) rules issued by a public regulator; (ii) rules issued by a private (regulatory) body; (iii) technological measures employed by a public regulator; and (iv) technological measures employed by a private (regulatory) body. The second (technology-specific) grid would map: (i) soft technological measures that are external to regulatees; (ii) soft technological measures that are internal to regulatees; (iii) hard technological measures that are external to regulatees; and, (iv) hard technological measures that are internal to regulatees. In conjunction with the mapping in the first grid, the mapping in the second grid would supply further and better particulars about the types of technological measures employed by public and by private regulators.

#### 4.1 Technological management as a regulatory option

Technological management might employ a variety of measures, including the design of products (such as golf carts or computer hardware and software) and processes (such as the automated production and driving of vehicles, or the provision of consumer goods and services), the design of places (such as the Metro, or theme parks and airports) and spaces (particularly online spaces), and (in future) the design of people. Typically, such measures are employed with a view to managing certain kinds of risks by excluding (i) the possibility of certain actions which, in the absence of this strategy, might be subject only to rule regulation or (ii) human agents who otherwise might be implicated (whether as rule-breakers or as the innocent victims of rule-breaking) in the regulated activities. More-

<sup>67</sup> For extended discussion, see Brownsword, 'In the Year 2061: From Law to Technological Management' (2015) 7 *Law, Innovation and Technology* 1; and Law, *Technology and Society: Re-imagining the Regulatory Environment* (Abingdon: Routledge, 2019) Ch 2.

over, technological management might be employed by both public regulators and by private self-regulating agents (such as corporations protecting their IP rights or supermarkets protecting their merchandise and their trolleys).

Schematically, where the use of technological management is available as a regulatory option, the process can be presented in the following terms:

- Let us suppose that a regulator, R, has a view about whether regulatees should be required to, permitted to, or prohibited from doing x (the underlying normative view)
- R's view could be expressed in the form of a rule that requires, permits, or prohibits the doing of x (the underlying rule)
- but, R uses (or directs, or encourages, others to use) technological management rather than a rule
- and R's intention in doing so is to translate the underlying normative view into a practical design that ensures that regulatees do or do not do x (according to the underlying rule)
- the ensuing outcome being that regulatees find themselves in environments where the immediate signals relate to what can and cannot be done, to possibilities and impossibilities, rather than to the underlying normative pattern of what ought or ought not to be done.

This description, however, is highly schematic and what such a process actually amounts to in practice in particular, how transparent the process is, how much debate there is about the underlying normative view and then about the use of technological measures<sup>68</sup> will vary from one context to another, from public to private regulators, between one public regulator and another, and between one private regulator and another.

It also should be emphasised that the ambition of technological management is to replace the rules by controlling the practical options that are open to regulatees. In other words, technological management goes beyond technological assistance in support of the rules. Of course, regulators might first turn to technological instruments that operate in support of the rules. For example, in an attempt to discourage shoplifting, regulators might require or encourage retailers to install surveillance and identification technologies, or technologies that sound an alarm should a person carry goods that have not been paid for through the exit gates. However, this is not yet full-scale technological management. Once such hard technological management is in operation shoppers will find that it is simply not possible to take away goods without having paid for them.

## 4.2 Mapping the (re-imagined) field

Even if technological disruption is all around them, why should jurists re-imagine law? If their interests are purely doctrinal, if their mindset is purely coherentist, jurists can continue to engage with their traditional puzzles and lines of inquiry. However, to the extent that technological management displaces rules as the regulatory instrument of choice, traditional legal scholarship loses its relevance; rather like those who are experts in a language that is no longer spoken, coherentist lawyers (following Easterbrook) will be experts in a form of social ordering that is no longer practised. Moreover, if jurists hope to be able to contribute to debates about the legitimacy of particular forms of social ordering or particular exercises of power, they need to think beyond coherentism and they need to re-imagine law as one element in a larger configuration of power.

<sup>68</sup> Compare Shadmy (n 66).

### A general map

We can concede that jurists will have different cognitive interests and priorities. Nevertheless, assuming a common concern with the who and the how of the exercise of regulatory power, we can propose two sets of features that would give shape to a very general map of the re-imagined field. First, the map should indicate which type of measures or instruments are being used; and, secondly, it should indicate whether the source of the measure or instrument is public (and, typically, top down) or private (and, often, bottom-up).

Employing the first indicator, the map should tell us whether a particular regulatory environment, or a particular regulatory space, is constituted by rules or by non-rule technologies (or, indeed, by some combination of rules and non-rule technologies). Where we are in zones that are regulated by rules, we are in familiar territory; we have centuries of jurisprudential reflection to help us. However, where non-rule technologies are in play, it is a very different story. As Sheila Jasanoff has remarked, even though 'technological systems rival legal constitutions in their power to order and govern society...there is no systematic body of thought, comparable to centuries of legal and political theory, to articulate the principles by which technologies are empowered to rule us.'<sup>69</sup> Accordingly, once we have our most general map in place, we can begin work on a map that will aid our re-imagination of law specifically where non-rule technologies are in play.

Our general map should also tell us whether the source of the measure is public (and, typically, top down) or private (and, often, bottom-up) in other words, whether the regulator is public or private. In much traditional legal scholarship, the focus is on rules that have been promulgated by public law-making bodies. As critics of this approach have objected, this focus neglects the rule-making activities of private bodies. However, even with an expanded focus, we are still presupposing that we are operating in rule-governed zones. Once we move into regulatory spaces where non-rule technologies apply then we are in largely uncharted territory. Even so, it would be surprising if we did not think it important to know whether these technologies have been initiated and are being controlled by public or by private regulators or pursuant to some form of public/private partnership.<sup>70</sup>

That said, it must be admitted that the distinction between public and private is notoriously contestable and that the distinction between top-down and bottom-up regulation is both crude and far from exhaustive. For example, top-down government regulators might enlist the aid of non-governmental intermediaries (such as Internet service providers or platform providers) or they might adopt a co-regulatory approach setting general targets or objectives for regulatees but leaving them to determine how best to comply.<sup>71</sup> With new technologies occupying and disrupting regulatory spaces, regulators need to re-imagine how best to regulate. As Albert Lin says, in his analysis of new distributed innovative technologies (such as DIYbio, 3D printing, and the platforms of the share economy) these new forms of dynamic activity 'confound conventional regulation.'<sup>72</sup> In response, Lin argues, it turns out that '[g]overnance of distributed innovation...

<sup>69</sup> Sheila Jasanoff, *The Ethics of Invention* (New York: W.W. Norton, 2016) 9-10.

<sup>70</sup> For a perceptive commentary on the regulation of smart cities (as an example of technology-reliant public/private partnerships), see Lilian Edwards, 'Privacy, Security and Data Protection in Smart Cities: A Critical EU Law Perspective' (2016) 2 *European Data Protection Law Review* 28.

<sup>71</sup> Compare Julia Black, 'De-centring Regulation: Understanding the Role of Regulation and Self-Regulation in a "Post-Regulatory" World' (2001) 54 *Current Legal Problems* 103.

<sup>72</sup> Albert C. Lin, 'Herding Cats: Governing Distributed Innovation' (2018) 96 *North Carolina Law Review* 945, 965.

must be both distributed and innovative.<sup>73</sup> There is no one size fits all; and the regulatory environment that is most acceptable and effective is likely to have elements of both top-down and bottom-up approaches together with elements that fit neither of these types.

Nevertheless, as a first cut at re-imagining regulatory spaces, we can work along two axes. On one axis, it is the balance between reliance on rules and reliance on technologies that is measured; and, on the other axis, it is the extent to which regulatory interventions are public and/or top-down or private and/or bottom-up that is measured.

#### *A specific mapping of technological measures*

Once we are in areas that are regulated by non-rule technological measures, how should we get our bearings? I suggest again, somewhat tentatively that our map should indicate, first, what the nature of the particular measure is (specifically where it lies on a spectrum between soft and hard intervention) and, secondly, the locus of the intervention (specifically where it lies on a spectrum between external (to regulatees) and internal (to regulatees)).

With regard to the first indicator, we can differentiate between, on the one hand, those technological measures that are merely supportive of existing rules or assistive or advisory in relation to decision-making, and, on the other, measures of technological management proper that aim to eliminate or redefine some part of an agent's practical options. For example, the use of surveillance and identification technologies in the criminal justice system may simply support the rules of the criminal law; and the use of AI in police practice and in criminal justice decision-making may be simply assistive and advisory. By contrast, if vehicles cannot be driven unless seat belts are engaged, we have full-scale technological management.

Some years ago, Mireille Hildebrandt drew a distinction between 'regulative' and 'constitutive' technological features.<sup>74</sup> Whereas the former are in the nature of assistive or advisory technological applications, the latter represent full-scale technological management. By way of an illustrative example, Hildebrandt invites readers to imagine a home that is enabled with a smart energy meter:

One could imagine a smart home that automatically reduces the consumption of energy after a certain threshold has been reached, switching off lights in empty rooms and/or blocking the use of the washing machine for the rest of the day. This intervention [which is a case of a 'constitutive' technological intervention] may have been designed by the national or municipal legislator or by government agencies involved in environmental protection and implemented by the company that supplies the electricity. Alternatively [this being a case of a 'regulative' technological intervention], the user may be empowered to program her smart house in such a way. Another possibility [again, a case of a 'regulative' technological intervention] would be to have a smart home that is infested with real-time displays that inform the occupants about the amount of energy they are consuming while cooking, reading, having a shower, heating the house, keeping the fridge in function or mowing the lawn. This will allow the inhabitants to become aware of their energy consumption in a very practical way, giving them a chance to change their habits while having real-time access to the increasing eco-efficiency of their behaviour.<sup>75</sup>

Similarly, Pat O'Malley charts the different degrees of technological control on a spectrum running from 'soft' to 'hard' by reference to the regulation of the speed of motor vehicles:

In the 'soft' versions of such technologies, a warning device advises drivers they are exceeding the speed limit or are approaching changed traffic regulatory conditions, but there are progressively more aggressive versions. If the driver ignores warnings, data—which include calculations of the excess speed at any moment, and the distance over which such speeding occurred (which may be considered an additional risk factor and *thus* an aggravation of the offence)—can be transmitted directly to a central registry. Finally, in a move that makes the leap from perfect detection to perfect prevention, the vehicle can be disabled or speed limits can be imposed by remote modulation of the braking system or accelerator.<sup>76</sup>

Accordingly, whether we are considering smart cars, smart homes, or smart regulatory styles, we need to be sensitive to the way in which the regulatory environment engages with regulatees, whether it directs signals at regulatees enjoining them to act in particular ways, or whether the technology of regulation simply imposes a pattern of conduct upon regulatees irrespective of whether they would otherwise choose to act in the way that the technology now dictates.

At all points on this spectrum, whether the technological instrument is simply advisory and assistive, or becomes a 'nudge' (again running from soft to hard), or becomes a full-blown measure of technological management, we need to be sensitised to the significance of the particular nature of the technological measure.

This takes us to the second specific indicator, the locus of the intervention. For the most part, our assumption is that technological instruments are being embedded in places and spaces in which regulatees find themselves or with which they interact. Hence, we can talk about technologically managed zones or zones that are rule-governed. However, the proliferation of smart portable or wearable devices, together with many other smart products (such as autonomous vehicles) suggests that the relevant regulatory technological features are not so much zones into which human agents enter but extensions of the human agent. Nevertheless, we might persist with the idea that such technological instruments are still external to the agent (*qua* regulatee). However, with the development of various kinds of augmented reality and implants, the line between external and internal locations becomes more difficult to maintain. As Franklin Foer has suggested, the development of wearables such as 'Google Glass and the Apple Watch [might] prefigure the day when these companies implant their artificial intelligence within our bodies'.<sup>77</sup> In due course, if, in addition to coded spaces and coded products, we have coded human agents (analogous to coded robots), the line between external and internal signalling would have been crossed.

Taking stock, our general map will enable us to identify the type of regulatory measure (rule or non-rule technological) employed together with the source of that measure (public or private); and, where the measure is non-rule technological, our specific map will enable us to identify whether it is a soft or hard intervention and whether the locus is external or internal to regulatees. Even if we are not quite sure how to respond to a particular measure, this initial

<sup>73</sup> Lin (n 72) 1011.

<sup>74</sup> Mireille Hildebrandt, 'Legal and Technological Normativity: More (and Less) than Twin Sisters' (2008) 12.3 *TECHNE* 169.

<sup>75</sup> Hildebrandt (n 74) 174.

<sup>76</sup> Pat O'Malley, 'The Politics of Mass Preventive Justice' in Andrew Ashworth, Lucia Zedner, and Patrick Tomlin (eds), *Prevention and the Limits of the Criminal Law* (Oxford University Press 2013) 273, 280.

<sup>77</sup> Franklin Foer, *World Without Mind* (London: Jonathan Cape, 2017) 2.

mapping at least helps us to reconstruct our sense of the landscape of law and to grasp how regulatory power is articulated and by whom.

## 5. Law Re-invented

In this final part of the article, I outline four respects in which law needs to be re-invented. These concern the range of regulatory responsibilities, the Rule of Law, the renewal of coherentist thinking, and the re-designing of legal and regulatory institutions.

### 5.1 Regulatory responsibilities

We can start by noting two salient features (and striking problems) in relation to current thinking about regulatory responsibilities. The first is the assumption that whatever particular principles or purposes are taken to be guiding, they are in the final analysis reasonably and rationally contestable; and, the second is the ubiquitous engagement in all manner of balancing exercises (between rights, interests, public policy and so on) without any clear sense of there being a hierarchy that guides deciding between conflicting considerations. In short, there is a lack of foundations; and, there is a lack of hierarchy. Accordingly, a priority for the re-invention of law is to restore some order to our understanding of regulatory responsibilities.

In that spirit, I suggest that we frame our thinking by articulating three tiers of regulatory responsibility, the first tier being foundational, and the responsibilities being ranked in three tiers of importance. At the first and most important tier, regulators have a ‘stewardship’ responsibility for maintaining the pre-conditions for human social existence, for any kind of human social community. I will call these conditions ‘the commons’.<sup>78</sup> At the second tier, regulators have a responsibility to respect the fundamental values of a particular human social community, that is to say, the values that give that community its particular identity. At the third tier, regulators have a responsibility to seek out an acceptable balance of legitimate interests. The responsibilities at the first tier are cosmopolitan and non-negotiable (the red lines here are hard); the responsibilities at the second and third tiers are contingent, depending on the fundamental values and the interests recognised in each particular community. Any conflicts between these responsibilities are to be resolved by reference to the tiers of importance: responsibilities in a higher tier always outrank those in a lower tier.

In what follows, I speak briefly to each of these three tiers before returning to the question of which regulatory mind-set should be engaged.

#### *The regulatory responsibility for the commons*

It is an article of faith in the medical profession that doctors should, first, do no harm (to their patients). For regulators, the equivalent injunction should be, first, to ensure that no harm is done to the generic conditions that underpin the lives and prospects of their regulatees.

This injunction rests on two simple but fundamental ideas. First, there is the undeniable fact that members of the human species have certain biologically-dictated needs. Most planets will not support *human* life. The conditions on planet Earth are special for *humans*. Secondly, in the current state of the evolution of the species, humans have the capacity for agency understood in a thin sense akin to that presupposed by the criminal law.<sup>79</sup> That is to say, humans have the

capacity to pursue various projects and plans whether as individuals, in partnerships, in groups, or in whole communities. Sometimes, the various projects and plans that they pursue will be harmonious; but, often, human agents will find themselves in conflict or competition with one another as their preferences, projects and plans clash. However, before we get to particular projects or plans, before we get to conflict or competition, there needs to be a context in which the exercise of agency is possible. This context is not one that privileges a particular articulation of agency; it is prior to, and entirely neutral between, the particular plans and projects that agents individually favour; the conditions that make up this context are generic to agency itself. In other words, there is a deep and fundamental critical infrastructure, a commons, for any community of agents. It follows that any agent, reflecting on the antecedent and essential nature of the commons must regard the critical infrastructural conditions as special. Indeed, from any practical viewpoint, prudential or moral, that of regulator or regulatee, the protection of the commons must be the highest priority.

Accordingly, we expect regulators to be mindful that we, as humans, have certain biological needs and that there should be no encouragement for technologies that are dangerous in that they compromise the conditions for our very existence; secondly, given that we have a (self-interested) sense of which technological developments we would regard as beneficial, we will press regulators to support and prioritise such developments and, conversely, to reject developments that we judge to be contrary to our self-interest; and, thirdly, even where proposed technological developments are neither dangerous nor lacking utility, some will argue that they should be prohibited (or, at least, not encouraged)<sup>80</sup> because their development would be immoral.<sup>81</sup>

If we build on this analysis, we will argue that the paramount responsibility for regulators (whether they otherwise think like coherentists, regulatory-instrumentalists, or technocrats) is to protect, preserve, and promote:

- the essential conditions for human existence (given human biological needs);
- the generic conditions for human agency and self-development; and,
- the essential conditions for the development and practice of moral agency.

These, it bears repeating, are imperatives for regulators in all regulatory spaces, whether international or national, public or private. Of course, determining the nature of these conditions will not be a mechanical process and I do not assume that it will be without its points of controversy.<sup>82</sup> Nevertheless, let me give an indication of how I would understand the distinctive contribution of each segment of the commons.

<sup>78</sup> Compare Roger Brownsword, ‘Responsible Regulation: Prudence, Precaution and Stewardship’ (2011) 62 *Northern Ireland Legal Quarterly* 573.

<sup>79</sup> Compare, Stephen J. Morse, ‘Uncontrollable Urges and Irrational People’ (2002) 88 *Virginia Law Review* 1025, 1065-66.

<sup>80</sup> Compare Roger Brownsword, ‘Regulatory Coherence—A European Challenge’ in Kai Purnhagen and Peter Rott (eds), *Varieties of European Economic Law and Regulation: Essays in Honour of Hans Micklitz* (Springer, 2014) 235, for discussion of the CJEU’s decision and reasoning in Case C-34/10, *Oliver Brüstle v Greenpeace e.V.* (Grand Chamber, 18 October 2011).

<sup>81</sup> Recall, e.g., Francis Fukuyama, *Our Posthuman Future* (London: Profile Books, 2002) for the argument that the development and application of modern biotechnologies, especially concerning human genetics, should not be permitted to compromise human dignity.

<sup>82</sup> Moreover, even if it is agreed where the bottom lines are to be drawn, a community still has to decide how to handle proposals for uses of technologies that do not present a threat to any of the bottom line conditions.

In the first instance, regulators should take steps to protect, preserve and promote the natural ecosystem for human life.<sup>83</sup> At minimum, this entails that the physical well-being of humans must be secured; humans need oxygen, they need food and water, they need shelter, they need protection against contagious diseases, if they are sick they need whatever medical treatment is available, and they need to be protected against assaults by other humans or non-human beings. It follows that the intentional violation of such conditions is a crime against, not just the individual humans who are directly affected, but humanity itself.<sup>84</sup>

Secondly, the conditions for meaningful self-development and agency need to be constructed: there needs to be a sufficient sense of self and of self-esteem, as well as sufficient trust and confidence in one's fellow agents, together with sufficient predictability to plan, so as to operate in a way that is interactive and purposeful rather than merely defensive. Let me suggest that the distinctive capacities of prospective agents include being able:

- to freely choose one's own ends, goals, purposes and so on ('to do one's own thing')
- to understand instrumental reason
- to prescribe rules (for oneself and for others) and to be guided by rules (set by oneself or by others)
- to form a sense of one's own identity ('to be one's own person').

Accordingly, the essential conditions are those that support the exercise of these capacities.<sup>85</sup> With existence secured, and under the right conditions, human life becomes an opportunity for agents to be who they want to be, to have the projects that they want to have, to form the relationships that they want, to pursue the interests that they choose to have and so on. In the twenty-first century, no other view of human potential and aspiration is plausible; in the twenty-first century, it is axiomatic that humans are prospective agents and that agents need to be free.

The gist of these agency conditions is nicely expressed in a paper from the Royal Society and British Academy where, in a discussion of data governance and privacy, we read that:

Future concerns will likely relate to the freedom and capacity to create conditions in which we can flourish as individuals; governance will determine the social, political, legal and moral infrastructure that gives each person a sphere of protection through which they can explore who they are, with whom they want to relate and how they

want to understand themselves, free from intrusion or limitation of choice.<sup>86</sup>

In this light, we can readily appreciate that unlike, say, Margaret Atwood's post-apocalyptic dystopia, *Oryx and Crake*<sup>87</sup> what is dystopian about George Orwell's 1984<sup>88</sup> and Aldous Huxley's *Brave New World*<sup>89</sup> is not that human *existence* is compromised but that human *agency* is compromised.<sup>90</sup> We can appreciate, too, that today's dataveillance practices, as much as 1984's surveillance, 'may be doing less to deter destructive acts than [slowly to narrow] the range of tolerable thought and behaviour.'<sup>91</sup>

Thirdly, the commons must secure the conditions for an aspirant moral community, whether the particular community is guided by teleological or deontological standards, by rights or by duties, by communitarian or liberal or libertarian values, by virtue ethics, and so on. The generic context for moral community is impartial between competing moral visions, values, and ideals; but it must be conducive to 'moral' development and 'moral' agency in a formal sense. So, for example, in her discussion of techno-moral virtues, (sous) surveillance, and moral nudges, Shannon Vallor is rightly concerned that any employment of digital technologies to foster prosocial behaviour should respect the importance of conduct remaining 'our own conscious activity and achievement' rather than passive, unthinking submission.<sup>92</sup> She then invites readers to join her in imagining that Aristotle's Athens had been ruled by laws that 'operated in such an unobtrusive and frictionless manner that the citizens largely remained unaware of their content, their aims, or even their specific behavioral effects.'<sup>93</sup> In this regulatory environment, we are asked to imagine that Athenians 'almost never erred in moral life, either in individual or collective action.'<sup>94</sup> However, while these fictional Athenians are reliably prosocial, 'they cannot begin to explain *why* they act in good ways, why the ways they act *are* good, or *what* the good life for a human being or community might be.'<sup>95</sup> Without answers to these questions, we cannot treat these model citizens as moral beings. Quite simply, their moral agency is compromised by technologies (in this instance, legal rules) that do too much regulatory work.

Agents who reason impartially will understand that each human agent is a stakeholder in the commons where this represents the essential conditions for human existence together with the generic conditions of both self-regarding and other-regarding agency; and, it will be understood that these conditions must, therefore, be respected. While respect for the commons' conditions is binding on all human agents, it should be emphasised that these conditions do not rule out the possibility of prudential or moral pluralism. Rather, the commons represents the pre-conditions for both individual self-development and community debate, giving each agent the opportunity to develop his or her own view of what is prudent as well as what should be

<sup>83</sup> Compare, J. Rockström et al, 'Planetary Boundaries: Exploring the Safe Operating Space for Humanity' (2009) 14 *Ecology and Society* 32 (<http://www.ecologyandsociety.org/vol14/iss2/art32/>) (last accessed November 14, 2016); and, Kate Raworth, *Doughnut Economics* (London: Random House Business Books, 2017) 43-53.

<sup>84</sup> Compare Roger Brownsword, 'Crimes Against Humanity, Simple Crime, and Human Dignity' in Britta van Beers, Luigi Corrias, and Wouter Werner (eds), *Humanity across International Law and Biolaw* (Cambridge: Cambridge University Press, 2014) 87; and the Nuffield Council on Bioethics, *Genome editing and human reproduction: social and ethical issues* (London, July 2018), paras 3.72-3.78, for discussion of the interests of humanity (reaching beyond individual and social interests) and, in particular, of 'transgenerationalism'.

<sup>85</sup> Compare the insightful analysis of the importance of such conditions in Maria Brincker, 'Privacy in Public and the Contextual Conditions of Agency' in Tjerk Timan, Bryce Clayton Newell, and Bert-Jaap Koops (eds), *Privacy in Public Space* (Cheltenham: Edward Elgar, 2017) 64; and, similarly, see Margaret Hu, 'Orwell's 1984 and a Fourth Amendment Cybersurveillance Nonintrusion Test' (2017) 92 *Washington Law Review* 1819, 1903-1904.

<sup>86</sup> The Royal Society and British Academy, *Connecting Debates on the Governance of Data and its Uses* (London, December 2016) 5.

<sup>87</sup> (London: Bloomsbury, 2003).

<sup>88</sup> (London: Penguin Books, 1954) (first published 1949).

<sup>89</sup> (London: Vintage Books, 2007) (first published 1932).

<sup>90</sup> To be sure, there might be some doubt about whether the regulation of particular acts should be treated as a matter of the existence conditions or the agency conditions. For present purposes, however, resolving such a doubt is not a high priority. The important question is whether we are dealing with a bottom-line condition.

<sup>91</sup> Frank Pasquale, *The Black Box Society* (Harvard University Press, 2015) 52.

<sup>92</sup> Shannon Vallor, *Technology and the Virtues* (New York: Oxford University Press, 2016) 203 (emphasis in original).

<sup>93</sup> Vallor (n 92).

<sup>94</sup> Vallor (n 92).

<sup>95</sup> Vallor (n 92) (emphasis in the original).

morally prohibited, permitted, or required. However, the articulation and contestation of both individual and collective perspectives (like all other human social acts, activities and practices) are predicated on the existence of the commons.

*The regulatory responsibility to respect the community's fundamental values*

Beyond the fundamental stewardship responsibilities, regulators are also responsible for ensuring that the fundamental values of their particular community are respected. Just as each individual human agent has the capacity to develop their own distinctive identity, the same is true if we scale this up to communities of human agents. There are common needs and interests but also distinctive identities.

From the middle of the Twentieth Century, many nation states have expressed their fundamental (constitutional) values in terms of respect for human rights and human dignity.<sup>96</sup> These values clearly intersect with the commons conditions and there is much to debate about the nature of this relationship and the extent of any overlap for example, if we understand the root idea of human dignity in terms of humans having the capacity freely to do the right thing for the right reason,<sup>97</sup> then human dignity reaches directly to the commons' conditions for moral agency.<sup>98</sup> However, those nation states that articulate their particular identities by the way in which they interpret their commitment to respect for human dignity are far from homogeneous. Whereas, in some communities, the emphasis of human dignity is on individual empowerment and autonomy, in others it is on constraints relating to the sanctity, non-commercialisation, non-commodification, and non-instrumentalisation of human life.<sup>99</sup> These differences in emphasis mean that communities articulate in very different ways on a range of beginning of life and end of life questions as well as questions of human enhancement, and so on.

Recalling the second wave of technological disruption, one question that should now be addressed is whether, and if so how far, a community sees itself as distinguished by its commitment to regulation by rule and by human agents. Is it distinctively East coast or West coast in its regulatory culture? In some smaller scale communities or self-regulating groups, there might be resistance to a technocratic approach because compliance that is guaranteed by technological means compromises the context for trust this might be the position, for example, in some business communities (where self-enforcing transactional technologies, such as blockchain, are rejected).<sup>100</sup> Or, again, a community might prefer to stick with regulation by rules

and by human agents because, valuing public participation in setting standards as well as some flexibility in their application, it is worried that, with a more technocratic approach, there might be both reduced participation and a loss of flexibility.

If a community decides that it is generally happy with an approach that relies on technological features rather than rules, it then has to decide whether it is also happy for humans to be out of the loop. Where the technologies involve AI, the 'computer loop' might be the only loop that there is. As Shawn Bayern and his co-authors note, this raises an urgent question, namely: 'do we need to define essential tasks of the state that must be fulfilled by human beings under all circumstances?'<sup>101</sup> Furthermore, once a community is asking itself such questions, it will need to clarify its understanding of the relationship between humans and robots in particular, whether it treats robots as having moral status, or legal personality, and the like.<sup>102</sup>

In Europe, the latter question is still under relatively early discussion with a number of views being expressed.<sup>103</sup> However, in relation to the former question, Article 22 of the GDPR stakes out a default prohibition on solely automated decisions which have legal or other significant effects in relation to an individual and it then provides for humans to be brought back into the loop where the default does not apply. That said, the Article, as drafted, gives rise to many nice points of legal interpretation<sup>104</sup> and, more importantly, makes bold assumptions about the visibility and discrete nature of 'decisions' in technological infrastructures as well as about the confidence of (and in) human arbitrators who are brought back into the loop.<sup>105</sup>

It is, of course, essential that the fundamental values to which a particular community commits itself are consistent with (or cohere with) the commons conditions; and, if we are to talk about a new form of coherentism as I will suggest we should it should be focused in the first instance on ensuring that regulatory operations are so consistent.

*The regulatory responsibility to seek an acceptable balance of interests*

This takes us to the third tier of regulatory responsibility. As we have said, with the development of a regulatory-instrumentalist mind-set, we find that much of traditional tort and contract law is overtaken by an approach that seems to promote general policy objectives (such as supporting and encouraging beneficial innovation) while balancing this with countervailing interests. Given that different balances will appeal to different interest groups, finding an acceptable balance is a major challenge for regulators.<sup>106</sup>

<sup>96</sup> See Roger Brownsword, 'Human Dignity from a Legal Perspective' in M. Duwell, J. Braavig, R. Brownsword, and D. Mieth (eds), *Cambridge Handbook of Human Dignity* (Cambridge: Cambridge University Press, 2014) 1.

<sup>97</sup> For such a view, see Roger Brownsword, 'Human Dignity, Human Rights, and Simply Trying to Do the Right Thing' in Christopher McCrudden (ed), *Understanding Human Dignity* (Proceedings of the British Academy 192) (Oxford: The British Academy and Oxford University Press, 2013) 345; and, 'Developing a Modern Understanding of Human Dignity' in Dieter Grimm, Alexandra Kemmerer, and Christoph Möllers (eds), *Human Dignity in Context* (Baden-Baden: Nomos; Oxford: Hart, 2018) 299.

<sup>98</sup> See, Roger Brownsword, 'From Erehwon to Alpha Go: For the Sake of Human Dignity Should We Destroy the Machines?' (2017) 9 *Law, Innovation and Technology* 117.

<sup>99</sup> See Deryck Beylvelevd and Roger Brownsword, *Human Dignity in Bioethics and Biolaw* (Oxford: Oxford University Press, 2001); Tim Caulfield and Roger Brownsword, 'Human Dignity: A Guide to Policy Making in the Biotechnology Era' (2006) 7 *Nature Reviews Genetics* 72; and Roger Brownsword, *Rights, Regulation and the Technological Revolution* (Oxford: Oxford University Press, 2008).

<sup>100</sup> See, the excellent discussion in Karen E.C. Levy, 'Book-Smart, Not Street-Smart: Blockchain-Based Smart Contracts and The Social Workings of Law' (2017) 3 *Engaging Science, Technology, and Society* 1.

<sup>101</sup> Shawn Bayern et al (n 36) 156.

<sup>102</sup> See, e.g., Bert-Jaap Koops, Mireille Hildebrandt, and David-Olivier Jaquet-Chiffelle, 'Bridging the Accountability Gap: Rights for New Entities in the Information Society?' (2010) 11 *Minnesota Journal of Law, Science and Technology* 497; and Joanna J. Bryson, Mihailis E. Diamantis, and Thomas D. Grant, 'Of, for, and by the people: the legal lacuna of synthetic persons' (2017) 25 *Artif Intell Law* 273.

<sup>103</sup> See, e.g., Thomas Burri, 'The EU is right to refuse legal personality for Artificial Intelligence' (opinion piece available at <https://www.euractiv.com/section/digital/opinion/the-eu-is-right-to-refuse-legal-personality-for-artificial-intelligence/>) (last accessed December 14, 2018).

<sup>104</sup> See, e.g., Sandra Wachter, Brent Mittelstadt, and Luciano Floridi, 'Why a Right to Explanation of Automated Decision-Making Does Not Exist in the General Data Protection Regulation' (2017) 7 *International Data Privacy Law* 76.

<sup>105</sup> On the latter point, see the fine analysis in Hin-Yan Liu, 'The Power Structure of Artificial Intelligence' (2018) 10 *Law, Innovation and Technology* 197, 222.

<sup>106</sup> For a very helpful analysis of 'output' legitimacy (acceptability), see Chris Reed, 'Why Judges Need Jurisprudence in Cyberspace' (2018) 38 *Legal Studies* 263; and see, too, Roger Brownsword, 'Law, Regulation, and Tech-

Today, we have the perfect example of this challenge in the anxious debate about the responsibilities of Internet intermediaries, the argument being that they should be required to be far more active in monitoring the content they carry, failing which they should be held accountable for the negative consequences that ensue, where these consequences range from teenagers self-harming and committing suicide to parents declining vaccines for their children to acts of terrorism.<sup>107</sup> At the core of this debate is the question of whether intermediaries should be required to monitor content or simply act after the event by taking down offending content. In principle, we might argue that such intermediaries should be held strictly liable for any or some classes of illegal content; or that they should be liable if they fail to take reasonable care; or that they should be immunised against liability even though the content is illegal. If we take a position at the strict liability end of the range, we might worry that the liability regime is too burdensome to intermediaries and that online services will not expand in the way that we hope; but, if we take a position at the immunity end of the range, we might worry that this treats the Internet as an exception to the Rule of Law and that it becomes a hostage to fortune (inviting the illegal activities of copyright infringers, paedophiles, terrorists and so on). In practice, most legal systems balance these interests by taking a position that confers an immunity but only so long as the intermediaries do not have knowledge or notice of the illegal content. Predictably, now that the leading intermediaries are large US corporations with deep pockets, and not fledgling start-ups, many think that the time is ripe for the balance to be reviewed.<sup>108</sup> However, finding a balance that is generally acceptable, in both principle and practice, is another matter.

## 5.2 The Rule of Law

Technological management appeals because it promises to be more effective than rules; but, its brute instrumentalism demands that its use is conditioned by principles that give it legitimacy—otherwise, there is no reason why regulatees should at least acquiesce in its use. Although, as specified, technological management is materially different to the traditional legal enterprise of subjecting human conduct to the governance of *rules*, it is imperative that we apply the spirit of the Rule of Law to the regulatory use of technological measures.

Even though there are many conceptions of the Rule of Law, I take it that the spirit of this ideal is that it sets its face against both arbitrary governance and irresponsible citizenship.<sup>109</sup> Advocates of particular

nology: Supporting Innovation, Managing Risk and Respecting Values' in Todd Pittinsky (ed), *Handbook of Science, Technology and Society* (Cambridge: Cambridge University Press, 2019).

<sup>107</sup> For a couple of recent examples, see Mark Bridge, Tom Knowles, and Kate Devlin, 'Footage of massacre spread over the Internet' *The Times*, March 16, 2019, p. 8 (reporting that, following the two mass shootings of Muslim worshippers in Christchurch, social media companies were being accused of 'aiding and abetting' terrorism), and Chris Smyth, 'Anti-vaccine posts could be banned' *The Times*, March 27, p. 2. For general discussion of the issues, see Lilian Edwards, "'With Great Power Comes Great Responsibility?': The Rise of Platform Liability' in Lilian Edwards (ed), *Law, Policy and the Internet* (Oxford: 2019) 253, esp 285-289. It should be noted that in the UK government's recent White Paper on this topic (n 9), it is proposed that there should be a new regulatory framework that 'will set clear standards to help companies ensure safety of users while protecting freedom of expression' (para 14).

<sup>108</sup> For a particularly compelling analysis, see Marcelo Thompson, 'Beyond Gatekeeping: the Normative Responsibility of Internet Intermediaries' (2016) 18 *Vanderbilt Journal of Entertainment and Technology Law* 783; and Reed (n 107).

<sup>109</sup> Compare Deryck Beylveled and Roger Brownsword, *Law as a Moral Judgment* (London: Sweet and Maxwell, 1986; Sheffield: Sheffield Academic Press, 1994) Ch. 9; and Roger Brownsword, *Law, Technology and Society:*

conceptions of the ideal will specify their own favoured set of conditions (procedural and substantive, thin or thick) for the Rule of Law which, in turn, will shape how we interpret the line between arbitrary and non-arbitrary governance as well as whether we judge citizens to be acting responsibly or irresponsibly in their response to acts of governance.<sup>110</sup> Viewed in this way, the Rule of Law represents a compact between, on the one hand, lawmakers, law-enforcers, law-interpreters, and law-appliers and, on the other hand, the citizenry. The understanding is that the actions of those who are in the position of the former should always be in accordance with the authorising constitutive rules (with whatever procedural and substantive conditions are specified); and that, provided that the relevant actions are in accordance with the constitutive rules, then citizens (including lawmakers, law-enforcers, law-interpreters, and law-appliers in their capacity as citizens) should respect the legal rules and decisions so made. In this sense, no one—whether acting offline or online—is above the law<sup>111</sup>; and the Rule of Law signifies that the law rules.

Similarly, if we apply this ideal to the acts of regulators—whether these are acts that set standards, or that monitor compliance, or that take corrective steps in response to non-compliance—then those acts should respect the constitutive limits and, in turn, they should be respected by regulatees provided that the constitutive rules are observed.<sup>112</sup>

In principle, we might also—and, indeed, I firmly believe that we should—apply the ideal of the Rule of Law to technological management.<sup>113</sup> The fact that regulators who employ technological management resort to a non-normative instrument does not mean that the compact is no longer relevant. On the one side, it remains important that the exercise of power through technological management is properly authorised and limited; and, on the other, although citizens might have less opportunity for 'non-compliance', it is important that the constraints imposed by technological management are respected. To be sure, the context of regulation by technological management is very different to that of a normative legal environment but the spirit and intent of the compact remains relevant.

The importance of the Rule of Law in an era of technological management should not be understated. Indeed, if we are to re-invent law for our technological times, one of the first priorities is to shake off the idea that brute force and coercive rules are the most dangerous expressions of regulatory power; the regulatory power to limit our practical options might be much less obvious but no less dangerous. Power, as Steven Lukes rightly says, 'is at its most effective when least observable.'<sup>114</sup>

While I cannot here specify a model Rule of Law for future communities, I suggest that the following conditions, reflecting the three-tiered scheme of regulatory responsibilities, merit serious consideration.<sup>115</sup>

*Re-imagining the Regulatory Environment* (Abingdon: Routledge, 2019) Ch. 5.

<sup>110</sup> Generally, see Joseph Raz, 'The Rule of Law and its Virtues' (1977) 93 *LQR* 195; and David Dyzenhaus, 'Recrafting the Rule of Law' in David Dyzenhaus (ed), *Recrafting the Rule of Law* (Oxford: Hart, 1999) 1.

<sup>111</sup> Compare Joel R. Reidenberg, 'Technology and Internet Jurisdiction' (2005) 153 *University of Pennsylvania Law Review* 1951, resisting the claims of the 'Internet separatists' and defending the application of the Rule of Law to online environments.

<sup>112</sup> Compare Karen Yeung, *Securing Compliance* (Oxford: Hart, 2004).

<sup>113</sup> Compare Mireille Hildebrandt, *Smart Technologies and the End(s) of Law* (Cheltenham: Edward Elgar, 2015).

<sup>114</sup> Steven Lukes, *Power: A Radical View* (2nd ed) (Basingstoke: Palgrave Macmillan, 2005) 1.

<sup>115</sup> Compare Roger Brownsword, 'The Rule of Law, Rules of Law, and Techno-

First, for any community, it is imperative that technological management (just as with rules and standards) does not compromise the essential conditions for human social existence (the commons). The Rule of Law should open by emphasising that the protection and maintenance of the commons is always the primary responsibility of regulators. Moreover, all uses of technological management, whether by public regulators or by private regulators or actors should respect this fundamental responsibility.

Secondly, where the aspiration is not simply to be a moral community (a community committed to the primacy of moral reason) but a particular kind of moral community, then it will be a condition of the Rule of Law that the use of technological management (just as with rules and standards) should be consistent with its particular constitutive features whether those features are, for instance, liberal or communitarian in nature, rights-based or utilitarian, and so on. Such is the logic of the second tier of responsibility.

As we have said, many modern communities have articulated their constitutive values in terms of respect for human rights and human dignity.<sup>116</sup> In an age of technological management, this might translate into a human right (or corresponding duties derived from respect for human dignity) to know whether one is interacting or transacting with a robot, to being cared for by humans (rather than robots which can appear to care but without really caring),<sup>117</sup> to having a right to have 'bad news' conveyed by another human,<sup>118</sup> and to reserving the possibility of an appeal to a human arbitrator against a decision that triggers an application of technological management that forces or precludes a particular act or that excludes a particular person or class of persons.<sup>119</sup>

Looking ahead, one (possibly counter-intuitive) thought is that a community might attach particular value (based on its interpretation of respect for human rights and human dignity) to preserving both human officials (rather than machines) and rules (rather than technological measures) in the core areas of the criminal justice system.<sup>120</sup>

logical Management' *Amsterdam Law School Research Paper No. 2017-35* (2017) 9-17. Available at: <https://ssrn.com/abstract=3005914>. See, too, Gavaghan (n 33), where, at 135, it is suggested that, in addition to asking the general question about whether a measure is 'likely to be effective, what we think of the values it embodies, whether the likely benefit is worth the cost, and so forth', we should ask whether technological measures are (i) visible, (ii) flexible, (iii) simply enforcing rules already agreed upon by democratic means, and (iv) employing unusually intrusive or inflexible means of enforcement.

<sup>116</sup> See, Roger Brownsword, 'Human Dignity from a Legal Perspective' in Marcus Duwell, Jens Braavig, Roger Brownsword, and Dietmar Mieth (eds), *Cambridge Handbook of Human Dignity* (Cambridge: Cambridge University Press, 2014) 1.

<sup>117</sup> See, e.g., Sherry Turkle, *Alone Together* (New York: Basic Books, 2011) esp. at 281-282 (concerning the case of Richard).

<sup>118</sup> Earlier this year, it was reported that Ernest Quintana's family were shocked when they saw that a 'robot' displaying a doctor on a screen was used to tell Ernest that doctors (at the Californian hospital where he was a patient) could do no more for him and that he would die soon: see Michael Cook, 'Bedside manner 101: How to deliver very bad news' *Bioedge* (March 18, 2019). Available at <https://www.bioedge.org/bioethics/bedside-manner-101-how-to-deliver-very-bad-news/12998> (last accessed April 3, 2019).

<sup>119</sup> Compare Gavaghan (n 33). However, the extent to which the possibility of human intervention can make much practical difference when smart machines are known to outperform humans is moot. For insightful discussion, see Hin-Yan Liu (n 105).

<sup>120</sup> Compare Roger Brownsword and Alon Harel, 'Law, Liberty and Technology Criminal Justice in the Context of Smart Machines' (2019) 12 *International Journal of Law in Context* (forthcoming) and Deryck Beyleveld and Roger Brownsword, 'Punitive and Preventive Justice in an Era of Profiling, Smart Prediction and Practical Preclusion' (2019) 12 *International Journal of Law in Context* (forthcoming).

To ring-fence core crime in this way promises to retain some flexibility in the application of rules that carry serious penalties for their infringement as well as preserving an important zone for moral development (and display of moral virtue). Indeed, in some communities, this zone might be thought to be so critical to the very possibility of moral development that the eschewal of technological solutions is seen as reaching back to the commons conditions themselves.<sup>121</sup>

Thirdly, where the use of technological management is proposed as part of a risk management package, so long as the community is committed to the ideals of deliberative democracy, it will be a condition of the Rule of Law that there needs to be a transparent and inclusive public debate about the terms of the package. It will be a condition that all views should be heard with regard to whether the package amounts to both an acceptable balance of benefit and risk as well as representing a fair distribution of such risk and benefit (including adequate compensatory provisions). Before the particular package can command respect, it needs to be somewhere on the spectrum of reasonableness. This is not to suggest that all regulatees must agree that the package is optimal; but it must at least be reasonable in the weak sense that it is not a package that is so unreasonable that no rational regulator could, in good faith, adopt it. Such is the shape of the third tier of responsibility.

For example, where technologically managed places or products operate dynamically, making decisions case-by-case or situation-by-situation, then one of the outcomes of the public debate might be that the possibility of a human override is reserved. In the case of driverless cars, for instance, we might want to give agents the opportunity to take control of the vehicle in order to deal with some hard moral choice (whether of a 'trolley' or a 'tunnel' nature) or to respond to an emergency (perhaps involving a 'rescue' of some kind).<sup>122</sup>

Similarly, there might be a condition that interventions involving technological management should be reversible—a condition that might be particularly important if measures of this kind are designed not only into products and places but also into people, as might be the case if regulators contemplate making interventions in not only the coding of product software but also the genomic coding of particular individuals. It should be noted, however, that while reversibility might speak to the acceptability of a technological measure, it might go deeper, to either second or first tier responsibilities.

Fourthly, where following community debate or public deliberation, particular limits on the use of technological management have been agreed, those limits should be respected. Clearly, it would be an abuse of power to exceed such limits. In this sense, the use of technological management should be congruent with the particular rules agreed for its use, as well as being coherent with the community's constitutive rules.<sup>123</sup>

Fifthly, the community will want to be satisfied that the use of technological measures is accompanied by proper mechanisms for accountability. When there are problems, or when things go wrong, there need to be clear, accessible, and intelligible lines of accountability. It needs to be clear who is to be held to account as well as how they are to be held to account; and, the accounting itself must be meaningful.<sup>124</sup>

<sup>121</sup> Compare the discussion in Roger Brownsword (n 98).

<sup>122</sup> For discussion of such moral hard choices, see Roger Brownsword, *Law, Technology and Society Re-imagining the Regulatory Environment* (Abingdon: Routledge, 2019) 249-251.

<sup>123</sup> Compare Gavaghan (n 33).

<sup>124</sup> See Joshua A. Kroll, Joanna Huey, Solon Barocas, Edward W. Felten, Joel R.



Sixthly, a community might be concerned that the use of technological management will encourage some mission creep. If so, it might stipulate that the restrictive scope of measures of technological management or their forcing range should be no greater than would be the case were a rule to be used for the particular purpose. In this sense, the restrictive sweep of technological management should be, at most, co-extensive with that of the equivalent (shadow) rule.<sup>125</sup>

Seventhly, it is implicit in the Fullerian principles of legality<sup>126</sup> that regulators should not try to trick or trap regulatees; and this is a principle that is applicable whether it is rules or technological measures that are employed as regulatory instruments. Accordingly, it should be a condition of the Rule of Law that technological management should not be used in ways that trick or trap regulatees and that, in this sense, the administration of a regime of technological management should be in line with the reasonable expectations of regulatees (implying that regulatees should be put on notice that technological management is in operation).<sup>127</sup> Crucially, if the default position in a technologically managed regulatory environment is that, where an act is found to be available, it should be treated as permissible, then regulatees should not be penalised for doing the act on the good faith basis that, because it is available, it is a lawful option.

Eighthly, regulatees might also expect there to be a measure of public scrutiny of the private use of technological management. Even if public regulators respect the conditions set by regulatees, it will not suffice if private regulators are left free to use technological management in ways that compromise the planetary conditions or the essential context for agency, or violate the community's constitutive principles, or exceed the agreed and authorised limits for its use. Accordingly, it should be a condition of the Rule of Law that the *private* use of technological management should be compatible with the general principles for its use.

### 5.3 A New Coherentism

In the bigger picture of regulatory responsibilities, where the paramount responsibility is to ensure that no harm is done to the commons, we might wonder whether a traditional coherentist mind-set is appropriate. If regulators think in such a coherentist way, they might fail to take the necessary protective steps – steps that might involve new rules, or the use of measures of technological management, or both. While the commons is being compromised, we might fear, coherentists will be concerned only with the integrity of doctrine.

Such a concern invites the thought that a regulatory-instrumentalist approach is a better default but it is only so if regulators are focused on the relevant risks – namely, the risks presented by technological development to the commons' conditions. Moreover, we might want to add that regulatory-instrumentalism with this particular risk focus is only a better default if it is applied with a suitably precautionary mentality. Regulators need to understand that compromising the commons is always the worst-case scenario.<sup>128</sup> Alongside such

a default, a technocratic approach might well be appropriate. For example, if we believe that a rule-based approach cannot protect the planetary boundaries, then a geo-engineering approach might be the answer.<sup>129</sup> However, it needs to be borne in mind that, with a resort to technological management, there is potentially more than one kind of risk to the commons: an ineffective attempt to manage risks to the existence conditions might actually make things worse; and an effective intervention for the sake of the existence conditions might compromise the conditions for self-development and moral agency (because both autonomy and virtue presuppose a context in which one acts freely).

Accordingly, the third element in the re-invention of law is the articulation of a 'new coherentism'. New coherentism reminds all those who act as regulators of two things: first, that their most urgent regulatory focus should be on the commons' conditions; and, secondly, that, whatever their interventions, and particularly where they take a technocratic approach, their acts must always be compatible with the preservation of the commons.

In future, the Courts – albeit the locus for traditional coherentist thinking – will have an important role to play in bringing new coherentism to bear on the use of technological measures. Most importantly, it will be for the Courts to review the legality of any measure that is challenged relative to the authorising and constitutive rules; and, above all, to check that particular instances of technological management are consistent with the commons-protecting ideals that are inscribed in the Rule of Law. In short, although traditional coherentism might have been prized by private lawyers, the new coherentism is material to questions of public and constitutional law, and beyond that it reaches through to the maintenance of the essential conditions for any community of human agents. Moreover, whatever the significance of the contested distinction between the public and the private, it is certainly not that private regulators have a licence to pursue their own interests regardless of their responsibilities for the preservation and protection of the commons.

With a new coherentist mind-set, it is not a matter of checking for internal doctrinal consistency, nor checking that a measure is fit for its particular regulatory purpose. Rather, a renewed ideal of coherence should start with the paramount responsibility of regulators, namely, the protection and preservation of the commons. All regulatory interventions should cohere with that responsibility. This means that the conditions for both human existence and the context for flourishing agency should be respected. In line with such thinking, in 2017, when researchers met at Asilomar in California to develop a set of precautionary guidelines for the use of AI, it was agreed (in Principle 21) that 'risks posed by AI systems, especially catastrophic or existential risks, must be subject to planning and mitigation efforts commensurate with their expected impact.'<sup>130</sup>

Moreover, as we have emphasised, if the commons is to be respected, technological management should not be employed in ways that compromise the context for agency and moral community.

Reidenberg, David G. Robinson, and Harlan Yu, 'Accountable Algorithms' (2017) 165 *University of Pennsylvania Law Review* 633, 702-704.

<sup>125</sup> Compare Gavaghan (n 33).

<sup>126</sup> Seminally, see Lon L. Fuller, *The Morality of Law* (New Haven: Yale University Press, 1969). For an application of the Fullerian principles to particular instances of cyberlaw, see Chris Reed, 'How to Make Bad Law: Lessons from Cyberspace' (2010) 73 *MLR* 903, esp at 914-916.

<sup>127</sup> Compare Gavaghan (n 33) on visibility, at 135-137 (do we know that technological measures are employed, do we know that they are in operation in a particular place or at a particular time, and do we know the precise details or limits of such measures?).

<sup>128</sup> Compare Deryck Beylveled and Roger Brownsword, 'Complex Technology,

Complex Calculations: Uses and Abuses of Precautionary Reasoning in Law' in Marcus Duwell and Paul Sollie (eds), *Evaluating New Technologies: Methodological Problems for the Ethical Assessment of Technological Developments* (Dordrecht: Springer, 2009) 175; and 'Emerging Technologies, Extreme Uncertainty, and the Principle of Rational Precautionary Reasoning' (2012) 4 *Law Innovation and Technology* 35.

<sup>129</sup> For discussion, see Jesse Reynolds, 'Solar Climate Engineering, Law, and Regulation' in Brownsword, Scotford, and Yeung (n 26) 799.

<sup>130</sup> Available at <https://futureoflife.org/ai-principles/> (last accessed March 18, 2019)

Consider, for example, the much debated and protean concept of privacy. A popular view is that respect for privacy should be applied in a ‘contextual’ way.<sup>131</sup> However, there is Context and there are contexts. There is Context (in the sense of the commons) and then there are many contexts that rely on the integrity of the commons. So, if it is judged that privacy reaches through to the interests that agents necessarily have in the commons’ conditions, particularly in the conditions for self-development and agency, it is neither rational nor reasonable for agents, individually or collectively, to authorise acts that compromise these conditions (unless they do so in order to protect some more important condition of the commons). As Maria Brincker expresses this point:

Agents act in relation not to singular affordances but to affordance spaces: choices are always situated calibrations of multiple interests and purposes given the perceived opportunities. To assess the values and risks of potential actions we need to have expectations regarding the consequences of those actions.<sup>132</sup>

It follows, argues Brincker, that without some degree of privacy ‘our very ability to act as autonomous and purposive agents’ might be compromised.<sup>133</sup> On the other hand, if privacy (and, likewise, data protection) is judged to be simply a legitimate informational interest that has to be weighed in an all things considered balance of interests, then we should recognise that what each community will recognise as a privacy interest and as an acceptable balance of interests might well change over time. To this extent, our reasonable expectations of privacy might be both ‘contextual’ and contingent on social practices.<sup>134</sup> That said, a community might wish to define itself by giving privacy an elevated status (as a right or a fundamental right) which regulators will then need to respect as an overriding interest. However, no community can rationally define itself in ways that are incompatible with the common interest in the essential infrastructural conditions.

Next, measures of technological management should cohere with the particular constitutive values of the community such as respect for human rights and human dignity, the way that non-human agents are to be treated, and so on and its particular articulation of the Rule of Law. At Asilomar, it was agreed (in Principle 11) that ‘AI systems should be designed and operated so as to be compatible with ideals of human dignity, rights, freedoms, and cultural diversity’; and, in its recently published report, *Ethics Guidelines for Trustworthy AI*, the EC High-Level Group on Artificial Intelligence has explicitly based its guidance on the regional commitment to human rights.<sup>135</sup> As the Expert Group interprets this commitment, the foundational respect

for human rights is ‘rooted in respect for human dignity thereby reflecting what we describe as a ‘human-centric’ approach in which the human being enjoys a unique and inalienable moral status of primacy in civil, political, economic and social fields.’<sup>136</sup> Moreover, although the report reflects a broad spectrum of concerns, the Group recognises that its guidelines also have a dimension of depth. Accordingly, having cautioned that some trade-offs might have to be made, the Group then emphasises that certain ‘fundamental rights and correlated principles are absolute and cannot be subject to a balancing exercise (e.g. human dignity).’<sup>137</sup> No doubt, the Courts will face many challenges in developing a coherent account of these principles (for example, with regard to the interpretation of ‘humanity’) but the critical point is that they should always be guided by a new coherentist understanding of their role and responsibility.

There will also be challenges to technological management on procedural grounds. Once again, there will be work for the Courts. Where explicit procedures are laid out for the adoption of technological management, the Courts will be involved in a familiar reviewing role. However, there might also be some doctrinal issues of coherence that arise—for example, where it is argued that the explicit procedural requirements have some further procedural entailments; or where the Courts, having developed their own implicit procedural laws (such as a practice raising a legitimate expectation of consultation), find that the body of doctrine is not internally coherent.

Coherence might be an ideal that is dear to the hearts of private lawyers but, in an era of technological management, it is once coherence is brought into the body of public law that we see its full regulatory significance. Regulation, whether normative or non-normative, will lack coherence if the procedures or purposes that accompany it are out of line with the authorising or constitutive rules that take us back to the Rule of Law itself; and, regulation will be fundamentally incoherent if it is out of line with the responsibility for maintaining the commons. In short, we can continue to treat coherence as an ideal that checks backwards, sideways, and upwards; but, the re-imagination of this ideal necessitates its engagement with both the full range of regulatory responsibilities and the full repertoire of regulatory instruments.

## 5.4 Institutional Design

If we are to be properly geared for the discharge of our regulatory responsibilities, this might call for some redesigning of the institutions on which we rely both nationally and internationally. While we can expect national regulators to deal with the routine balancing of interests within their communities as well as respecting the distinctive values of their particular community, the stewardship of the commons seems to call for international oversight. We can start with some remarks about the arrangements nationally for engaging with emerging technologies and then we can turn to the possible international regulation of the commons.

### *The design of national institutions*

In the United Kingdom (and, I suspect, in many other nation states), there are two contrasting features in the institutional arrangements that we have for engaging with and regulating new technologies. On the one hand, there is no standard operating procedure for undertaking the initial review of such technologies; and, on the other hand, the Rule of Law in conjunction with democracy dictates that the Courts should settle disputes in accordance with established legal princi-

<sup>131</sup> See, e.g., Daniel J. Solove, *Understanding Privacy* (Cambridge, Mass.: Harvard University Press, 2008), and Helen Nissenbaum, *Privacy in Context* (Stanford: Stanford University Press, 2010).

<sup>132</sup> Maria Brincker (n 85) 88. Similarly, see Margaret Hu, ‘Orwell’s 1984 and a Fourth Amendment Cybersurveillance Nonintrusion Test’ (2017) 92 *Washington Law Review* 1819, 1903-1904.

<sup>133</sup> Brincker (n 85) 64.

<sup>134</sup> Compare the insightful analysis in Bert-Jaap Koops and Ronald Leenes, ‘“Code” and the Slow Erosion of Privacy’ (2005) 12 *Michigan Telecommunications and Technology Law Review* 115.

<sup>135</sup> High-Level Expert Group on Artificial Intelligence, *Ethics Guidelines for Trustworthy AI* (European Commission, Brussels, April 8, 2019). Compare, too, the five overarching principles in the House of Lords Select Committee on Artificial Intelligence’s Report on AI in the UK; ready, willing and able? (Report of Session 2017-19, published 16 April 2017, HL Paper 100) at para 417: available at [https://publications.parliament.uk/pa/ld201719/ldselect/ldai/100/10007.htm#\\_idTextAnchor025](https://publications.parliament.uk/pa/ld201719/ldselect/ldai/100/10007.htm#_idTextAnchor025) (last accessed August 11, 2018).; and the Google White Paper, *Perspectives on issues in AI governance* (January, 2019), see <https://ai.google/static/documents/perspectives-on-issues-in-ai-governance.pdf>.

<sup>136</sup> High-Level Expert Group (n 135) 10.

<sup>137</sup> High-Level Expert Group (n 135) 13.

ples and that it is for the Legislature and the Executive to formulate and agree public policies, plans and priorities. In other words, while there is no expectation about who will undertake the initial review or how that review will be approached, we have very definite expectations about the role and reasoning of judges and advocates in the Courts (where the discourse is coherentist) and similarly about the policy-making members of the Legislature and Executive (where the discourse is regulatory-instrumentalist). The question is: where in this institutional design do we find the responsibility for stewardship of the commons and for the community's distinctive values?

To start with the initial engagement with, and review of, an emerging technology, it seems to be largely a matter of happenstance as to who addresses the issue and how it is addressed at any rate, this is the case in the UK. To pick up an earlier example, in the late 1970s, when techniques for assisted conception were being developed and applied, but also being seriously questioned, the response of the UK government was to set up a Committee of Inquiry chaired by Mary Warnock. In 1984, the Committee's report (the Warnock Report) was published.<sup>138</sup> However, it was not until 1990, and after much debate in Parliament, that the framework legislation, the Human Fertilisation and Embryology Act 1990, was enacted. This process, taking the best part of a decade, is regularly held up as an example of best practice when dealing with emerging technologies. Nevertheless, this methodology is not in any sense the standard operating procedure for engaging with new technologies—indeed, there is no such procedure.

The fact of the matter is that legal and regulatory responses to emerging technologies vary from one technology to another, from one legal system to another, and from one time to another. Sometimes, there is extensive public engagement, sometimes not. On occasion, special Commissions (such as the now defunct Human Genetics Commission in the UK) have been set up with a dedicated oversight remit; and there have been examples of standing technology foresight commissions (such as the US Office of Technology Assessment)<sup>139</sup>; but, often, there is nothing of this kind. Most importantly, questions about new technologies sometimes surface, first, in litigation (leaving it to the Courts to determine how to respond) and, at other times, they are presented to the legislature (as was the case with assisted conception).

With regard to the question of which regulatory body engages with new technologies and how, there can of course be some local agency features that shape the answers. Where, as in the United States, there is a particular regulatory array with each agency having its own remit, a new technology might be considered in just one lead agency or it might be assessed in several agencies.<sup>140</sup> Once again, there is a degree of happenstance about this. Nevertheless, in a preliminary way, we can make three general points.

First, if the question (such as that posed by a compensatory claim made by a claimant who alleges harm caused by a new technology) is put to the Courts, their responsibility for the integrity of the law will push them towards a traditional coherentist assessment. Typically, courts are neither sufficiently resourced nor mandated to undertake a risk assessment let alone adopt a risk management strategy (unless

the legislature has already put in place a scheme that delegates such a responsibility to the courts).<sup>141</sup>

Secondly, if the question finds its way into the legislative arena, it is much more likely that politicians will engage with it in a regulatory-instrumentalist way; and, once the possibility of technological measures gets onto the radar, it is much more likely that (as with institutions in the EU) we will see a more technocratic mind-set.

Thirdly, if leaving so much to chance seems unsatisfactory, then it is arguable that there needs to be a body that is charged with undertaking the preliminary engagement with new technologies. The remit and challenge for such a body would be to ensure that there is no harm to the commons; to try to channel such technologies to our most urgent needs (relative to the commons); and, to help each community to address the question of the kind of society that it distinctively wants to be—doing all that, moreover, in a context of rapid social and technological change. As Wendell Wallach rightly insists:

Bowing to political and economic imperatives is not sufficient. Nor is it acceptable to defer to the mechanistic unfolding of technological possibilities. In a democratic society, we—the public—should give approval to the futures being created. At this critical juncture in history, an informed conversation must take place before we can properly give our assent or dissent.<sup>142</sup>

Granted, the notion that we can build agencies that are fully fit for such purposes might be an impossible dream. Nevertheless, I join those who argue that this is the right time to set up a suitably constituted body,<sup>143</sup> one that would underline our responsibilities for the commons as well as facilitating the development of each community's regulatory and social licence for these technologies.<sup>144</sup> Possibly this might be along the lines of the Centre for Data Ethics and Innovation as announced by the UK government in late 2017,<sup>145</sup> the wide-ranging terms of reference for which require it to analyse and anticipate risks and opportunities, to agree and articulate best practice, and to advise on the need for action. However, this is a matter for further discussion.

<sup>141</sup> Perhaps we should view Patent Offices in this light. In the 1980s, there were major decisions to be made about the patentability of biotechnological products and processes, models of which could not be brought into the Office to demonstrate how they worked and which also raised complex moral issues. For extended discussion, see Alain Pottage and Brad Sherman, *Figures of Invention: A History of Modern Patent Law* (Oxford: Oxford University Press, 2010); and, on the moral dimension of these debates, see Deryck Beyleveld and Roger Brownsword, *Mice, Morality and Patents* (London: Common Law Institute of Intellectual Property, 1993).

<sup>142</sup> See, Wendell Wallach, *A Dangerous Master* (Basic Books, 2015) 10.

<sup>143</sup> Amongst many matters in this paper that invite further discussion, the composition of such a Commission invites debate. See, too, Wallach (n 142) Chs 14-15.

<sup>144</sup> Compare Geoff Mulgan's proposal for the establishment of a Machine Intelligence Commission: available at <http://www.nesta.org.uk/blog/machine-intelligence-commission-uk> (blog 'A machine intelligence commission for the UK', February 22, 2016: last accessed December 11, 2016); Olly Bustom et al, *An Intelligent Future? Maximising the Opportunities and Minimising the Risks of Artificial Intelligence in the UK* (Future Advocacy, London, October 2016) (proposing a Standing Commission on AI to examine the social, ethical, and legal implications of recent and potential developments in AI); HC Science and Technology Committee, Robotics and Artificial Intelligence HC 145 2016-17.

<sup>145</sup> See 'Autumn Budget 2017: 25 things you need to know' (H.M. Treasury, November 22, 2017) point 16: available at <https://www.gov.uk/government/news/autumn-budget-2017-25-things-you-need-to-know> (last accessed November 25, 2017). Compare, too, discussion in Part 3 of the White Paper on online harms (n 9) with regard to whether functions and responsibilities of the proposed independent regulator should be undertaken by a new or by an existing regulatory body.

<sup>138</sup> Report of the Committee of Inquiry into Human Fertilisation and Embryology (London: HMSO, Cm. 9314, 1984).

<sup>139</sup> On which, see Bruce Bimber, *The Politics of Expertise in Congress* (Albany: State University of New York Press, 1996) charting the rise and fall of the Office and drawing out some important tensions between 'neutrality' and 'politicisation' in the work of such agencies.

<sup>140</sup> Compare, Albert C. Lin, 'Size Matters: Regulating Nanotechnology' (2007) 31 *Harvard Environmental Law Review* 349.

In the light of this, consider briefly the much-debated question of who should be liable for what if there are accidents that involve autonomous vehicles. It goes without saying that it makes little sense to try, in a coherentist way, to apply the principles for judging the negligence of human drivers to questions of liability concerning vehicles in which there is no human in control and where the nature of the technology militates against simple causal accounts when things ‘go wrong’. Yet, if these questions are taken up in the courts, we must expect that judges (reasoning like coherentists) will try to apply notions of a reasonable standard of care, proximate cause, and so on, to determine responsibility for very complex technological failures.<sup>146</sup> Indeed, when Joshua Brown was killed while driving his Tesla S car in autopilot mode,<sup>147</sup> Tesla (presumably anticipating litigation or a discourse of fault and responsibility) were quick to highlight the safety record of their cars, to suggest that drivers of their cars needed to remain alert, and to deny that they themselves were careless in any way. By contrast, if regulators in a legislative setting approach the question of liability and compensation with a risk-management mind-set, they will not need to chase after questions of fault or, at any rate, as in the UK Automated and Electric Vehicles Act 2018, insurance and compensation will come first with insurers (and owners) of automated vehicles then able to pursue existing (fault-based) common law claims. In this way, the challenge will be to articulate the most acceptable (and financially workable) compensatory arrangements that accommodate the interest in transport innovation with the interest in the safety of passengers and pedestrians.<sup>148</sup> Ideally, regulators should take a view only after an independent emerging technologies body (of the kind that we do not, but surely should, have) has informed and stimulated public debate.

#### *International stewardship of the commons*

The commons is not confined to particular nation states. The conditions for human existence on planet Earth are relevant to all nation states and can be impacted by each nation state’s activities. The same applies where nation states interfere with the conditions for flourishing agency beyond their own national borders. Whether in relation to the conditions for human existence or for the enjoyment of human agency, there can be cross-border spill-over effects. Accordingly, if the essential infrastructure for human social existence is to be secured, this implies that there needs to be a considerable degree of international co-ordination and shared responsibility.<sup>149</sup>

Given that the international regulatory architecture is already extensive, we might think that securing the commons will only require some minor adjustments or additions. On the other hand, stewardship of the kind that is contemplated requires a distinctive and dedicated approach. It might be, therefore, that we need to have bespoke international laws and new international agencies to take this project forward.<sup>150</sup> Moreover, because politics tends to operate

with short-term horizons, it also implies that the regulatory stewards should have some independence from the political branch, but not of course that they should be exempt from the Rule of Law’s culture of accountability and justification.<sup>151</sup>

Whatever the ideal design, we have to take into account the realities of international relations. One of these realities is that there are at least three kinds of international citizens: first, there are functioning states amongst whom many are good citizens of the international order (respecting the rules of international law); secondly, there are functioning states that are also superpowers (who largely dictate and veto international initiatives as well as playing by their own rules); and, thirdly, there are rogue states (who play by no rules).<sup>152</sup> If the regulatory stewards were drawn from the good citizens, that might be fine insofar as an agency so populated would be focused on the right question and motivated by concerns for the common interest of humans. However, they might find that they are blocked in their efforts to introduce necessary measures of technological management; and, without the support of others, they will be in no position to ensure compliance with whatever precautionary standards they might propose.

A second reality is that, where the missions of international agencies include a number of objectives, trade (rather than human rights or environmental concerns) will often be prioritised.<sup>153</sup> It follows that, if the regulatory stewards are within an international agency, the mission must be limited to the protection of the commons. Even then, there would be no guarantee that the stewards would be immunised against the usual risks of regulatory capture and corruption. In short, unless the culture of international relations is supportive of the stewards, even the ideal regulatory design is likely to fail.

The moral seems to be that, if the common interest is to be pursued, this is a battle for hearts and minds. As Neil Walker has remarked in relation to global law, our future prospects depend on ‘our ability to persuade ourselves and each other of what we hold in common and of the value of holding that in common.’<sup>154</sup> An international agency with a mission to preserve the commons might make some progress in extending the pool of good citizens but to have any chance of success all nation states need to be on board.

## 6. Concluding Remarks

In this article, I have described two ways in which law is disrupted by new technologies. To some extent, this is an old story. From the industrial revolution onwards, legal rules have needed remedial attention as their deficiencies are exposed as it becomes apparent that the prevailing rules are not fit for regulatory purpose. That said, the very idea of *a rule not being fit for regulatory purpose* is itself expressive of a radically disrupted way of thinking. Crucially, though, this old story is now joined by a new disruptive story in which it is the taken-for-

<sup>146</sup> I take it that, if autonomous vehicles have to be at least as safe as driven vehicles, there would be a difficulty in presenting them as ‘dangerous’ in a way that would get a product liability claim to first base.

<sup>147</sup> Reported at <https://www.theguardian.com/technology/2016/jun/30/tesla-autopilot-death-self-driving-car-elon-musk> (last accessed November 14, 2017).

<sup>148</sup> For analysis and proposals, see Maurice Schellekens, ‘No fault compensation schemes for self-driving vehicles’ (2018) 10 *Law, Innovation and Technology* 314.

<sup>149</sup> See David A. Wirth, ‘Engineering the Climate: Geoengineering as a Challenge to International Governance’ (2013) 40 *Boston College Environmental Affairs Law Review* 413, esp. at 430-436.

<sup>150</sup> Compare, e.g., Seth D. Baum and Grant S. Wilson, ‘The Ethics of Global Catastrophic Risk from Dual Use Bioengineering’ (2013) 4 *Ethics in Biology, Engineering and Medicine* 59; Grant Wilson, ‘Minimizing global catastrophic

and existential risks from emerging technologies through international law’ (2013) 31 *Virginia Environmental Law Journal* 307; and Dennis Pamlin and Stuart Armstrong, ‘Twelve risks that threaten human civilisation: The case for a new risk category’ (Oxford: Global Challenges Foundation, 2015) 182 (mooting the possibility of establishing a Global Risk Organisation, initially only with monitoring powers).

<sup>151</sup> See, too, Roger Brownsword (n 78).

<sup>152</sup> Compare Gerry Simpson, *Great Powers and Outlaw States* (Cambridge: Cambridge University Press, 2009).

<sup>153</sup> See, e.g., Sheldon Leader, ‘Collateralism’ in Roger Brownsword (ed) *Global Governance and the Quest for Justice Vol IV: Human Rights* (Oxford: Hart, 2004) 53.

<sup>154</sup> Neil Walker, *Intimations of Global Law* (Cambridge: Cambridge University Press, 2015) 199.

granted assumption that social ordering is to be achieved through rules that is challenged and, concomitantly, that the Rule of Law is exclusively about rule by rules and about application and enforcement of the published rules by human agents. Regulation in future might be more a matter of a conversation between smart machines than a debate in a legislative forum where the participants are human agents.

Given such disruption, what should we do? I have suggested that we should reframe our thinking, re-imagining law as a part of a much more inclusive regulatory environment, an environment that features not only rule-based normative signals but also measures of non-normative technological management. So re-imagined, we can develop a jurisprudence that marks up the credentials of rules rather than technological measures, and vice versa.

There is no guarantee that rules and technological measures can peacefully co-exist. However, if we are to re-invent law, I have suggested that we first need to put in place a grounded and hierarchically ordered scheme of regulatory responsibilities. That scheme can then be used to inform each community's articulation of the Rule of Law (constraining and authorising the use of measures of technological management) and it can be taken forward through a new and revitalised form of coherentist thinking together with new institutional arrangements.

Rationally, humans should need little persuading: what we all have in common is a fundamental reliance on a critical infrastructure; if that infrastructure is compromised, the prospects for any kind of legal or regulatory activity, or any kind of persuasive or communicative activity, indeed for any kind of human social activity, are diminished. If we value anything, if we are positively disposed towards anything, we must value the commons. If we cannot agree on that, and if we cannot agree that the fundamental role of law is to ensure that power is exercised only in ways that are compatible with the preservation of the infrastructure of all other infrastructures, then the story of disruption, re-imagination and re-invention certainly will not end well.

Finally, I should emphasise that when I say 'we' I mean 'especially we lawyers'. Quite possibly, it will be those lawyers who have an interest in regulation or in emerging technologies who are in the vanguard. However, I would not want to limit responsibility in this way. For, if, as lawyers, we understand how this story should end, then we have a special responsibility to do our best to ensure that it does go well. In this story, we are not merely observers; we have a responsibility for constitutions and for codes, but above all we have a responsibility for the commons and for humanity.