

Special Issue
Traditions, Myths, and Utopias of Personhood

A Cyborg Turn in Law?

By Mika Viljanen*

Abstract

This Article deploys cybernetic theory to argue that a novel legal impact imaginary has emerged. In this imaginary, the subjects of legal interventions are performed and enacted as cybernetic organisms, that is, as entities that process information and adapt to changes in their environment. This Article, then, argues that in this imaginary, law finds its effectiveness—not by threatening, cajoling, educating, and moralizing humans as before, but by affecting the composition of cybernetic organisms, giving rise to new kinds of legal subjects that transcend the former conceptual boundary between humans and non-humans, or persons and things. The cybernetic interventions work to change the cyborgs' behavioral responses, thus giving law a new kind modality of power. This Article develops a model for understanding cyborg regulation through case studies and argues that cyborg regulation deploys three distinct strategies. Cyborgs can be controlled through affecting the informational inputs the entities receive, through agencement practices that intervene in the material constitution of the cyborg cognitions, and, finally, by psycho-morphing humans to make them useful components of the cyborg cognitive machineries. The Article ends with a discussion of the theoretical implications of the transition to the cyborg imaginary.

* LL.D. (Turku, 2008), Acting Professor of Civil Law, University of Turku, Finland.

A. Introduction

I. Law is for Humans

Law is for humans, not for apes, dogs, trees, rats, the nature, or the universe. There is a simple reason for drawing this traditional line. Law, legal measures, and regulation, can only affect humans. All of the law's threatening, cajoling, bribing, educating, and moralizing is lost on non-humans. Non-humans lack the properties that allow law to affect its targets. In the nineteenth century, the non-humans lacked a free will and moral capacity.¹ A century later, the absence of free will had transformed into an inability to be guided by economic incentives.² Of course, we know that cracks have started to appear in the monolithic edifice of human law. Trees and rivers may sometimes have standing and have, at times, even been recognized as having personhood.³ Corporations most definitely are persons and have First Amendment rights in the US.⁴ All these things indicate that, slowly but surely, law's anthropocentricity is being questioned, as rights and agency in law have been extended to non-human things through various constructs. The boundaries of law have been pushed outwards from humans.

II. A Cyborg Trajectory

This Article attempts, however, to track another transformation in law's relationship with humans and non-humans, persons and things. It provides an account of a development where humans, non-humans, persons and things enmesh and combine to form an unprecedented legal mode of existence, one that runs perpendicular to the creeping hybridization of humans and non-humans.

The central gestalt in this story is that of a *cyborg*, a *cybernetic organism*. The cyborg as a legal entity simply does not conform to the old categorizations and their concomitant dichotomous conceptual structures of allotting everything to either to the category of persons or things. It is something new—neither human nor non-human, neither a person nor a thing.

The core argument of this Article is that law and regulation—in some quarters but not everywhere—have come to embrace a cybernetic imagination and turned into a cyborg

¹ See generally 1 FRIEDRICH CARL VON SAVIGNY, SYSTEM DES HEUTIGEN RÖMISCHEN RECHTS 331–34 (1840).

² See generally RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW (2014).

³ On the Whanganui River personhood dispute, see Elaine C. Hsiao, *New Zealand Whanganui River Agreement*, 42 ENV. POL'Y & L. 371 (2012).

⁴ *Citizens United v. Fed. Election Comm'n*, 558 U.S. 310 (2010).

practice. To be more precise, a host of new regulatory projects and interventions perform and enact cybernetic imaginations of law's intentionality and effectuality. If traditional law was effective because it could do things to humans based on their human faculties, the new cyborg law targets cyborgs and finds its impact through cyborg pathways.

III. Structure

This Article tracks cyborg law through four movements.

In Part B, I will first discuss law's anthropocentricity. The section revolves around two brief sketches of the human gestalts that serve as the vehicles through which law creates changes in its environment. The objective of the section is to serve as a counterpoint to Part D and its discussion of the cyborg regulatory approach: Cyborg law breaches the traditional boundary between law and the regulatory target.

Part C develops an understanding of what cyborgs—or cybernetic organisms—are. The section provides a succinct introduction to cybernetic theory in order to set up the following discussion of the legal cyborg imaginary.

In Part D, I deploy cybernetic theory to analyze a host of recent regulatory projects.⁵ I argue that when viewed through cybernetic lenses, these projects seem to be enacting and performing a *cyborg legal imaginary*. The regulatory targets are, first, reproduced as entities whose primary and determinative feature is that they gather and process information. They are, effectively, cyborgs. Second, new regulatory impact pathways, that is, methods for affecting the behavior of the regulatory targets, emerge. These pathways are, similarly, cyborg pathways. This Article discerns three detailed impact strategies for cyborg law. First, in information-mediated cyborg strategies, law works through inputs and outputs to underdetermine what its subject will do. Second, cyborg regulation also engages in material agencement⁶—the construction of the socio-technical assemblages that constitute the cyborg agents' cognitions and determine their behavior. Third, this Article discusses psychomorphing. Psycho-morphing is the cybernetic practice for shaping human cognitive proclivities.

This Article concludes, in Part E, with a discussion of the theoretical implications of the cybernetic turn.

⁵ The case studies include Finnish gender equality plans under the Finnish Gender Equality Act, see 609/1986 Laki naisten ja miesten välisestä tasa-arvosta [Law on Equality Between Men and Women, Gender Equality Act] (Fin.), nudging, and two different banking regulation schemes.

⁶ See *infra* Section D.III.1.

B. The Human Boundary

I. Humans in the Center

Standard legal theory narratives castigate law as a singularly human endeavor, to the point that the assumption is often not even articulated, let alone contested. Modern law inevitably pertains to humans and targets them as the objects of its interventions.⁷

The reason for this anthropocentricity is a truism. The things law does can only be done to humans: Using language to threaten, cajole, bribe, incentivize, coordinate action, and engage in moral suasion are all activities that can only affect our species. Non-humans lack the unique faculties that render us responsive to legal interventions. Imposing a legal obligation on a dog is senseless. The dog cannot understand it, and neither could a rat, a tree, nor a river. These things have no agency, will, culture, or thinking capacity. They are parts of nature.⁸

Even if traditional accounts of law are implicitly unequivocal on the centrality and inevitability of humans as the platforms which mediate law into real world effects, the distinguishing faculties that make humans uniquely capable of mediating the law's effects remain undertheorized. Two imaginations, in particular, stand out. The first performs a variety of economic human gestalts, the other frames people as moral creatures. Both share one common feature: They erect a boundary between law and the individual. Law does not constitute the individual. It enters human cognitive flows as an input that modulates the intensity of motivational impulses, but does not influence their production.

II. Variations of Deterrence

One influential way of thinking about how law achieves its power to affect people centers around the notion of *deterrence*. The deterrence imaginary conjures up a story told countless times. The sovereign—an authority with the power to issue authoritative commands—establishes a behavioral requirement on the sovereign's subjects and expects compliance. The behavioral requirement is not a wish. The subjects are under a legal obligation to obey. Further, the obligation is backed by a threat. If the subjects fail to comply, the sovereign will impose a sanction.⁹

⁷ For recent accounts, see FREDERICK SCHAUER, *THE FORCE OF LAW* (2015); SCOTT J. SHAPIRO, *LEGALITY* (2011); RICHARD H. MCADAMS, *THE EXPRESSIVE POWERS OF LAW: THEORIES AND LIMITS* (2015).

⁸ On the constant and failing boundary work required to sustain the distinction between nature and culture, see BRUNO LATOUR, *WE HAVE NEVER BEEN MODERN* (1993).

⁹ On the command model of law, see Gerald J. Postema, *Law as Command: The Model of Command in Modern Jurisprudence*, 11 *PHILOS. ISSUES* 470 (2001); Mark Greenberg, *The Standard Picture and Its Discontents*, 1 *OXFORD STUD. PHIL.* L. 39 (2011).

Humans become susceptible to the sovereign's command influence because their makeup allows the threat of a sanction to have an effect on them. In simplified terms, the human, as a subject of law, is a hedonist: To avoid the pain caused by the sanction, she will comply with the sovereign's command. The sanction provides a reason for compliance, and overrides the person's intrinsic motivation to not do the sovereign's bidding. In this imaginary, law, thus, is about the threat that the sovereign's subjects fear and seek to avoid.¹⁰ It folds the subject's future—manipulated by law to potentially contain the sanction—to bear on her choices at the present.

The exact mechanics of deterrence have been subject to intense debates for centuries. The Benthamite understanding leaves the details unarticulated: "Nature has placed mankind under the governance of two sovereign masters, pain and pleasure. It is for them alone to point out what we ought to do, as well as to determine what we shall do."¹¹ Modern microeconomics has provided law and economics with a far more nuanced understanding of the calculus of pain. *Homo economicus* is assumed to be a rational being with perfect knowledge of her surroundings and stable preference functions engaged in constant utility calculi, where the individual compares the utility of each option available to her and chooses the one that promises her the highest expected utility.¹²

Law, in turn, works on these utility maximizers by manipulating the inputs that go into the incessant calculi. In short, it manipulates the costs and benefits of the choices, creating *incentives*. The sanction exacts a toll on the expected utility flowing from a choice, measured as a function of the probability of being caught and the absolute disutility flowing from being sanctioned, while the utility gains flow from the probability of receiving a reward and the extent of the utility created by the action and reward.

Thus, the details of the deterrence stories vary. Critics have argued that the humans enacted and performed by the microeconomic account are caricatures at best, and have argued for a fuller, more forgiving understanding of human decision-making processes. For the critics, the human condition is not characterized by Becker's cool rationality, perfect information, and stable preference functions, but instead by bounded rationality,¹³ serious cognitive

¹⁰ See also SCHAUER, *supra* note 7, at 93–109 (arguing that the threat of sanction and coercion of obedience are the characteristic signifiers of all modern law).

¹¹ JEREMY BENTHAM, AN INTRODUCTION TO THE PRINCIPLES OF MORALS AND LEGISLATION OXFORD: CLARENDON PRESS 1907 at I.1 (1789).

¹² See generally Gary S. Becker, *Nobel Lecture: The Economic Way of Looking at Behavior*, 101 J. POLIT. ECON. 385 (1993). The beauty of the theory is that it can be applied even if demonstrably faulty as an empirical description, see Gary S. Becker, *Irrational Behavior and Economic Theory*, 70 J. POLIT. ECON. 1 (1962).

¹³ OLIVER E. WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM 44–45 (1985).

problems,¹⁴ imperfect and asymmetric information settings,¹⁵ and possibly unstable, time- and frame-incoherent preference functions.¹⁶ Further, whether law in fact deters and how effective it is in deterring undesirable behavior is a fervently contested question, with many critics arguing that the choices law typically seeks to affect are often beyond its reach in terms of deterrence.¹⁷

III. Moral Norms Through Law

Morals and social norms open up another imaginary of law's effectiveness.¹⁸ Here, a fraught picture emerges. In one strand of the moral imaginary, human action is not guided by self-interest. Instead, humans are, at least at times, norm-bound in their decisions. They follow both legal and social norms.¹⁹ The moral nature of humans—the fact that they can adopt and internalize behavioral norms and let them guide their behavior—renders legal interventions capable of affecting the world. If legal interventions can change or sustain the internalized norms we hold ourselves by, then law can affect our behavior.

The imaginary is variegated. How the mechanisms, in particular, function is often left vague. In addition, the economic theory has attempted to internalize norms as parts of its account of human motivation. This works to conflate the norm pathway with the utility calculus pathway.²⁰ Law creates moral norms, sustained by un-official enforcement by second and third persons, creating in the individual an incentive to comply.²¹

¹⁴ Richard H. Thaler, *From Homo Economicus to Homo Sapiens*, 14 J. ECON. PERSP. 133 (2000).

¹⁵ Joseph E. Stiglitz, *Information and the Change in the Paradigm Economics*, 92 AM. ECON. REV. 460 (2002).

¹⁶ See, e.g., Steffen Andersen et al., *Lost in State Space: Are References Stable?*, 49 INT'L ECON. REV. 1091 (2008).

¹⁷ For a general overview, see P. H. Robinson & John M. Darley, *Does Criminal Law Deter? A Behavioural Science Investigation*, 24 OXFORD J. LEG. STUD. 173 (2004).

¹⁸ The imaginary seems to have received relatively little attention in Anglophone countries, see, e.g., generally KENWORTHY BILZ ET AL., *LAW, PSYCHOLOGY, AND MORALITY*, 101–31 (2009); Eyal Zamir et al., *Law, Moral Attitudes, and Behavioral Change*, OXFORD HANDBOOK OF BEHAV. ECON. & L. (Eyal Zamir & Doron Teichman eds., 2014). It has, however, received more attention, for example in the Nordic countries, in regards to criminal law, see JUSSI TAPANI & MATTI TOLVANEN, *RIKOSOIKEUDEN YLEINEN OSA: VASTUUOPPI* 43–45 (2nd rev. ed. 2013).

¹⁹ Habitual obedience, where people's submission gains a "unreflective, effortless, engrained character of a habit," H. L. A. HART, *THE CONCEPT OF LAW* 51–54 (2nd ed. 1994), is one version of the moral-creating effect of law.

²⁰ McAdams provides the most sophisticated account of law's causal pathways. In his account, law serves an expressive, coordinating function, allowing humans to coordinate and homogenize their expectations, but it ultimately converges back on self-interested individual's calculations. See MCADAMS, *supra* note 7 *passim*.

²¹ See generally Steven Shavell, *Law versus Morality as Regulators of Conduct*, 4 AM. L. ECON. REV. 227 (2002); Jon Elster, *Social Norms and Economic Theory*, in *CULTURE & POL.* 363 (Lane Crothers & Charles Lockhart eds., 2000); Joshua W. Buckholtz & René Marois, *The roots of modern justice: Cognitive and neural foundations of social norms and their enforcement*, 15 NAT. NEUROSCI. 655 (2012).

IV. The Barrier In-between

Both imaginaries share one key commonality: They enact and maintain a distance between law and the individual, erecting a barrier in between. The barrier ensures that the law remains external to the person's psyche. As a result of this externality, that legal interventions are not constitutive of the person or her character. Law remains non-productive of the person. Law produces signals, impulses, and outside reasons for the person to choose one course of action over others. At times, it reinforces the person's intrinsic motivational impulses, and at others it counteracts them. These signals do not change how the person thinks, understands her environment, or the workings of her cognitive process. Instead, law works on the finished products of our cognitive processes. Consequently, standard accounts of law hold that legal interventions respect the *a priori* constitution of the human cognitions and volitional processes.²²

This relationship of externality is at its most explicit in the deterrent imaginary. In the moral imaginary, law, however, comes close to producing the human agency, the person it seeks to regulate, as the norms we live by shape us in important ways. They reflect our values, our ethical and aesthetic beliefs and convictions. Nevertheless, the imaginary, I think, finds a way to maintain the distance between the person and law by rendering the social norms analogous to legal rules.²³ The individuals apply the norms, and their application provides reasons for action but the norms are not internalized as part of their psyche to produce the person's intrinsic reasons.

This externality changes in cybernetic regulation. The barrier dissolves. Law infiltrates its subjects' cognitive and volitional processes.

²² In particular, feminist, black studies, and post-colonial studies scholars have argued that this may be an illusion and that legal normative power is, in fact, complicit in producing its subjects. The critics have pointed out that law frames issues, creates social institutions, sustains categorical boundaries and structures, and, most importantly, like other powerful discourses, offers subjectifiers that people can use to subjectify themselves. See, e.g., Nicola Lacey, *The Constitution of Identity: Gender, Feminist Legal Theory, and the Law and Society Movement*, BLACKWELL COMPANION TO L. & SOC'Y 471 (Austin Sarat ed., 2004); Kimberlé Williams Crenshaw, *Race, Reform, and Retrenchment: Transformation and Legitimation in Antidiscrimination Law*, 101 HARV. L. REV. 1331 (1988); EFRÉN RIVERA RAMOS, *THE LEGAL CONSTRUCTION OF IDENTITY: THE JUDICIAL AND SOCIAL LEGACY OF AMERICAN COLONIALISM IN PUERTO RICO* (2001). The accounts have typically been inspired by the work of Michel Foucault and Judith Butler, see, e.g., Michel Foucault, *Technologies of the self*, ETHICS: SUBJECTIVITY AND TRUTH 223–52 (1997); JUDITH BUTLER, *THE PSYCHIC LIFE OF POWER: THEORIES IN SUBJECTION THEORIES IN SUBJECTION* (1997).

²³ See, e.g., Shavell, *supra* note 21.

C. Introducing Cyborgs

I. Enter Cyborg and Cybernetics

As recounted briefly in the Introduction, the key point I make in this Article is that a novel and distinctly non-anthropocentric legal imaginary is slowly emerging in regulatory practice. This imaginary dethrones humans from their traditional apex in the law, circumventing their status as the sole platforms and mediators of law. Instead of humans, cyborgs now constitute the nexus through which law and regulation flow and effect changes in the external world. Most importantly, the new imaginary obliterates the distance between law and regulation and its subjects. In the cybernetic imaginary, regulatory and legal interventions produce the regulatory targets, pervade them, and constitute their nature as actors.

To understand how this cybernetic law works, a digression into the basic features of cybernetic theory is in order. Here, the story is bifurcated. There are two cybernetic theories.

II. The Union of Flesh and Circuits

The first theory framework posits cybernetic organisms as hybrid creatures of flesh and silica. This strand of cybernetics dominates our popular imagination with the cyborgs populating post-apocalyptic wastelands, dysfunctional megacities, and far away galaxies as monsters or evil man-machine hybrids. The T-800, played by Arnold Schwarzenegger in the movie series *The Terminator*, was first the mortal enemy and then a friend with a metallic endoskeleton, a computer for brains, and soft biological tissue to make the machine resemble a human. Darth Vader in *Star Wars* inverts the construction. Darth Vader was Anakin Skywalker until he turned to the dark side of the Force and, after an accident, was fitted with a respirator, and artificial legs and hands.

The modern off-shoots of the drive to fuse biological substrate and technology are found in *transhumanism*.²⁴ Transhumanism deals with human augmentation and enhancement,²⁵ with a vibrant literature discussing its ethics²⁶ and risks.²⁷ Transhumanism is, however, also shadowed by another, more fundamental framework for cybernetic thought on the relationship between humans and technology. Many theorists, such as the renowned

²⁴ Nick Bostrom, *A History of Transhumanist Thought*, 1 J. EVOL. TECHL. 1 (2005).

²⁵ Nick Bostrom & Anders Sandberg, *Cognitive Enhancement: Methods, Ethics, Regulatory Challenges*, 15 SCI. ENG. ETHICS 311.

²⁶ M. J. McNamee & S. D. Edwards, *Transhumanism, medical technology and slippery slopes*, 32 J. MED. ETHICS 513 (2006); ALLEN E. BUCHANAN, *BEYOND HUMANITY? THE ETHICS OF BIOMEDICAL ENHANCEMENT* (2011).

²⁷ NICK BOSTROM, *SUPERINTELLIGENCE. PATHS, DANGERS, STRATEGIES* ch. 9 (2014).

feminist cyborg theorist Donna Haraway²⁸ and the French philosopher Bernard Stiegler²⁹ have argued that humans are always and inescapably cyborgs.³⁰ To be human is to exist enmeshed with and inside technology. Humans constantly use tools, other physical implements, and intellectual resources to not only augment ourselves, but to make ourselves distinctly human. Our skills and capabilities are collections of different techniques, painstakingly arranged to form a scaffolding around ourselves to allow us to be ourselves. In this sense, humans are always cyborgs.³¹

III. Information Processing Cyborgs

Another possible framework for cybernetic theory also exists. For Norbert Wiener, the father of the post-World War II cybernetic thought in the US, cybernetics was about *information and information processing*. In this strand of cybernetic thought, cybernetic organisms are, pure and simple, entities that process information, take inputs and turn them into outputs, with no flesh and blood necessarily involved.³²

This cyborg imaginary reflects a crucial conceptual change: The emergence of the computer, the thinking machine as the primary archetype of cognition.³³ Cybernetics flips the direction of mimesis between human minds and computers. What happens inside the computer replaces the operations of a human mind as the primary imaginary of cognitive activity. Consequently, human minds are transformed into computers of a very particular kind: Biological information processing units with massive parallel computing power, highly deficient memory functions, and dubious decision-making software. In this imagination, the human brain is the product of an evolutionary process where both the biological wetware and cultural software emerged as the most sophisticated cognitive machines of our day, but contain nothing magical or non-replicable in them. With sufficiently advanced technology

²⁸ Donna Haraway, *A Cyborg Manifesto: Science, Technology and Socialist-Feminism in the Late Twentieth Century*, in SIMIANS, CYBORGS AND WOMEN: THE REINVENTION OF NATURE 149 (1991).

²⁹ BERNARD STIEGLER, TECHNICS AND TIME, 1: THE FAULT OF EPIMETHEUS (1998).

³⁰ For an early musical exploration of the theme, listen to KRAFTWERK, DIE MENSCH-MASCHINE (CAPITAL RECORDS, 1974).

³¹ N. Katherine Hayles, *Flesh and Metal: Reconfiguring the Mindbody in Virtual Environments*, 10 CONFIGURATIONS 297 (2002); ROSI BRAIDOTTI, THE POSTHUMAN (2013); ANDY CLARK, NATURAL-BORN CYBORGS: MINDS, TECHNOLOGIES, AND THE FUTURE OF HUMAN INTELLIGENCE (2003). Compare with Jannice Käll's chapter in this volume, 18 GERMAN L.J. (2017).

³² NORBERT WIENER, THE HUMAN USE OF HUMAN BEINGS (1974). See also generally ANDREW PICKERING, THE CYBERNETIC BRAIN: SKETCHES OF ANOTHER FUTURE (2010) (discussing the early British cybernetics thinkers).

³³ N. KATHERINE HAYLES, HOW WE BECAME POSTHUMAN ch. 1 (1999); JEAN-PIERRE DUPUY, ON THE ORIGINS OF COGNITIVE SCIENCE (2009); JEAN-PIERRE DUPUY, THE MECHANIZATION OF THE MIND (2000); Orit Halpern, *Cybernetic rationality*, 15 DISTINKTION SCAND. J. SOC. THEORY 223 (2014).

and resources, we can create a non-biological computer that is indiscernible from the human brain—a whole brain emulation.³⁴

When the move to conflate cognition with computing coalesces with the first imagery of cyborgs, as enmeshing of flesh and silica, a possibility opens up: As the computer becomes the primary reference point and site for cognition, data processing and cognition change from human-specific activities to potentially something non-human. Cognitive ability is no more a human prerogative, but the property of any thinking machine. Crucially, it becomes possible to think that cognition can be distributed from single human minds to technological systems comprising of multiple, carefully coordinated cognitive sub-entities.³⁵ A new cognitive agnosticism emerges. Cognitions may be biological, hybrids, or entirely technological. It becomes possible to conceptualize humans, possibly augmented by technological appendices, jointed into whole together with technologies, computers, physical infrastructure, and theoretical resources as giant cognitive machineries, as macrocognitions.³⁶ These macrocognitions may be cybernetic organisms. They consist of multiple circuits, as well as a wide variety of hardware, wetware, and software, but the crucial functional affinity to thinking machines remains. The macrocognitions take inputs and process them into outputs in the form of behavioral adaptations.

Edvin Hutchins' theory of distributed cognition is the seminal theoretical account of how these macrocognitions work. Hutchins argued that cognition never, in fact, had its locus in the human mind. Instead of being a human faculty, cognitive action is always extended outside and beyond the mind. Hutchins' case study example was a navy vessel. Although the ship had a dedicated navigator whose mouth usually evokes all navigational commands, Hutchins argued that navigation took place outside the navigator's mind. The commands the navigator uttered were the results of a complex socio-technological arrangement. The arrangement consisted of the navigator, his assistants, lookouts, huyes, alidades, charts and chart tables, telephones, wires, manuals, other ships, mathematicians, and countless cartographers, and spanned centuries in time. The navigator would have been useless without the machinery that was distributed around him and in which he was immersed. This led Hutchins to conclude that the mind is not the site of cognition. Cognition, instead, takes place in radically distributed cognitive assemblage composed of both human and non-human material and immaterial resources.

³⁴ See, e.g., A. Sandberg, *Feasibility of Whole Brain Emulation*, 5 *PHILOS. THEORY ARTIF. INTELL.* 251, 262 (2013) (arguing that the whole brain emulation has no "fundamental obstacles" but only requires "a large amount of engineering and research"); NICK BOSTROM, *SUPERINTELLIGENCE: PATHS, DANGERS, STRATEGIES* 35–43 (2014).

³⁵ For an early jurisprudential deployment of the idea, see SERGE TAYLOR, *MAKING BUREAUCRACIES THINK* (1984) (arguing that the environmental statements were introduced to forge a particular bureaucratic way of thinking).

³⁶ On micro- and macrocognitions, see Gary Klein & Corinne Wright, *Macro-cognition: From Theory to Toolbox*, 7 *FRONT. PSYCHOL.* 54 (2016).

D. Contours of Cyborg Law and Regulation

I. Cyborg Impact Pathways

The second strand of cybernetic theory leads me to the fundamental theoretical move of this Article. I argue that law has turned cybernetic during the last few decades. We have incorporated the information processing strand of cyborg theory into some of our regulatory structures. Here, it is important to note the limits of the thesis. I do not argue that the cybernetic turn would encompass the entire spectrum of regulatory projects. To the contrary, my thesis is that the cyborg imaginary seems to inform and explain a relatively restricted number of innovative regulatory projects.

In the following Section, I will argue that existing legal and regulatory interventions already enact and perform their subjects as cybernetic organisms which process information in distributed cognitive assemblages³⁷. To flesh out the thesis, I will develop a conceptual model for this new kind of cybernetic law and regulation. I will sketch out three partly overlapping *impact imaginaries* that explain how cybernetic regulation works and becomes effectual. I will argue that cyborg law finds its impact by: (1) Deploying information-mediated cyborg strategies, (2) engaging in material cognitive agencement, and finally, (3) psychomorphing the human components of distributed socio-technical cognitive assemblages.

The cyborg Information-mediated strategies³⁸ utilize the connection between the informational inputs that enter the cyborgs and the cyborgs' behavioral tendencies. The idea is simple: As machines, the cyborgs have predictable responses to known informational inputs. Affecting the informational inputs will change the behavioral outputs. The notion of material cognitive agencement,³⁹ in turn, puts in full play the theory of distributed material cognition. In agencement-based schemes law finds its impact by controlling the cyborgs' internal compositions as information processing entities. Controlling how and what kind of machinic assemblage information is processed will result in predictable behavioral outcomes. Psychomorphing, finally, provides an inroad into understanding how humans are embedded into cyborg cognitions as reliable "cogs and bolts" of the cognitive machineries.

To facilitate the sketches, I will investigate and comment on four regulatory frameworks which, I think, perform and enact a cyborg regulation approach. The first framework is a relatively small-scale Finnish regulatory project, embedded in the Finnish Gender Equality

³⁷ A key template for the argument can be found in Philip Mirowski's history of post-World War II US economic thought, see PHILIP MIROWSKI, *MACHINE DREAMS: ECONOMICS BECOMES A CYBORG SCIENCE* (2002).

³⁸ See *infra* at Section D.II.

³⁹ See *infra* at Section D.III.

Act. A provision in the Act requires that Finnish employers draft specific gender equality plans for eligible workplaces. The second and third schemes stem from banking regulation. The second process I will discuss is the Internal Capital Adequacy Assessment Program (ICAAP), a giant banking regulation project under the Basel Committee on Banking Supervision (BCBS) and its Basel II Accord⁴⁰ and subsequent Basel II.5 revisions.⁴¹ For my third example, I will argue that the United Kingdom's Financial Conduct Authority's Conduct Rules⁴² also deploys a similar cyborg regulation approach. The first three case studies target management-based regulation (MBR) schemes. The fourth example turns towards nudging—another emergent regulatory modality. The case studies serve two purposes. First, the discussions attempt to demonstrate that the cybernetic imaginary can, in fact, provide a more functional explanation of how the studied regulatory frameworks function than their existing alternatives. Second, the forays allow me to illustrate and further elaborate on important aspects of cyborg regulation.

II. Information-mediated Strategies

1. Slaves to Inputs

Information-mediated strategies weaponize the information dimension of the cyborg existence. Remember that the behavioral outputs of a cybernetic organism are a function of two co-dependent factors. The outputs, first, depend on the internal makeup of the cyborgs' cognitive machinery, that is, their machinic composition. This allows cyborgs to be coordinated through material agencement practices.⁴³ It is, however, important to note that the informational inputs—the second factor—are also crucial. Feeding the cybernetic organisms a particular set of data inputs will trigger largely predictable outputs, if the cognitive proclivities that flow from the cybernetic organism's machinic constitution are known. Thus, an impact pathway emerges. The cyborg's actions can be controlled by regulating the information that enters its cognitive machinery. The crucial point to note is that this information-mediated regulatory strategy skirts direct interventions into the cyborg's constitution. The cyborg itself—its inside—can be left alone.

⁴⁰ BASEL COMMITTEE ON BANKING SUPERVISION, INTERNATIONAL CONVERGENCE OF CAPITAL MEASUREMENT AND CAPITAL STANDARDS: A REVISED FRAMEWORK – COMPREHENSIVE VERSION Part III, <http://www.bis.org/publ/bcbs128.htm> (2006).

⁴¹ BASEL COMMITTEE ON BANKING SUPERVISION, ENHANCEMENTS TO THE BASEL II FRAMEWORK, <http://www.bis.org/publ/bcbs157.htm> (2009).

⁴² Financial Conduct Authority, FCA HANDBOOK COCON, <https://www.handbook.fca.org.uk/handbook/COCON/2/?date=2016-06-30>.

⁴³ See *infra* at Section D.III.

2. Feeding Information to Gender Equality Cyborgs

To illustrate how information-mediated cyborg regulation works, consider a Finnish regulatory scheme designed to advance workplace gender equality. The scheme is located in two sections of the Finnish Gender Equality Act, Sections 6(a) and 6(b). The two sections require that all Finnish employers, with over 30 employees regularly on their payrolls, must draft bi-yearly gender equality plans for each workplace. First, the plan must contain a survey of gender equality at the workplace. The survey should analyze of the distribution of men and women in different occupations and contain a pay survey detailing the differences in pay and pay grades between men and women. Second, the plan must include a list of measures that the employer plans take to promote gender equality and equality in compensation. Third, the plan is to contain an appraisal of the results of the measures contained in earlier gender equality plans. The rules require the employer to draft the plan in cooperation with employee representatives.

If one deploys the cyborg regulation model to analyze the scheme, patterns emerge. First, the rules require that a specific body is set up. The body consists of both employer and employee representatives. It does not bear direct responsibility for drafting the plan, but functions as a co-operational body that prepares it. In cybernetic terms, the body is a distributed cognition that works on gender equality issues at the workplace. It processes information, plans action, and evaluates results. The specific composition of the body will likely give it particular behavioral proclivities compared to alternative implementations. The introduction of employee representatives, for example, is likely to change the way the body operates when compared to what would likely happen if the representatives were absent.

The distributed cognition facet of the project is not, however, the key issue here. Instead, I discuss the rules to illustrate a very small scale example how the distributed cognitions can be controlled through information. The information-mediated impact mechanism becomes visible when we look at how information is used in the rules to affect the outcomes of process within the gender equality bodies. Remember that the plans must be built on a “survey of the gender situation at the workplace and analyze the responsibilities women and men have, and detail pay and pay differences.” By determining what information becomes available to the gender equality cyborg, the rules, effectively, frame and define what gender equality is and, consequently, significantly affect what will be done to address gender equality as a problem. The rules on information acquisition, first, translate the abstract idea of gender equality into a battery of discrete measurements. They turn the issue into numbers and indicators, specific categories of data. The scheme, second, ensures that these inputs serve as the focal points for the gender equality body’s cognitive work, the things that constitute the objects of strategizing, planning, and manipulations. Equality is performed and enacted and worked on through the indicators. Improvements in equality translate into improvements in the indicators.

Here the particular mode of information-mediated legal effectiveness comes into view. The informational setting has no prescribed behavioral consequences, but is likely to have a predictable impact. In this case, the informational set-up increases the odds that the plans will to contain measures that trigger changes in the indicators the rules assign as the objects of interests. Further, as the process is also normatively rigged, the indicator values will likely move towards increasing equality and, ultimately, pay parity.

3. Information Mediated Regulation in ICAAP

The ICAAP rules contain another example of how information-based cyborg regulation works. ICAAP was originally a part of the 2006 Basel II reform package,⁴⁴ the constitutive document of the pre-crisis banking regulatory paradigm, but it was augmented in 2009 with “additional guidance.”⁴⁵ Until recent years, the Basel Accords have focused on exclusively capital adequacy.⁴⁶ The capital adequacy strategy builds on the assumption that banks, by their nature, take excessive risks and over-leverage their books if not strictly regulated.⁴⁷ Consequently, regulation has centered around imposing minimum capital requirements on the firms. The goal was to ensure that individual banks hold sufficient capital reserves to guarantee macrolevel banking system stability. The ICAAP rules were introduced to complement the minimum capital strategy. They “encourage banks to develop and use better risk management techniques in monitoring and managing their risks.”⁴⁸

Risk measurement technologies, consequently, constitute the bedrock element of the monitoring prong in the Basel II ICAAP project. The anatomy of the prong is relatively simple. First, the ICAAP rules identify a selection of banking risks. The list includes, for example, credit risk, market risk, operational risk, counterparty credit risk, liquidity risk, banking-book interest rate risk, and strategic risk.⁴⁹

After identifying the risks, the rules contain a set of *de facto* mandatory blueprints for designing and implementing a functional risk-measurement system for each of the risks.

⁴⁴ BASEL COMMITTEE ON BANKING SUPERVISION, *supra* note 40, at Part III.

⁴⁵ BASEL COMMITTEE ON BANKING SUPERVISION, *supra* note 41, at 9–27.

⁴⁶ On the history of the Basel Accords, see C. A. E. GOODHART, *THE BASEL COMMITTEE ON BANKING SUPERVISION : A HISTORY OF THE EARLY YEARS, 1974–1997* (2011); DANIEL K. TARULLO, *BANKING ON BASEL: THE FUTURE OF INTERNATIONAL FINANCIAL REGULATION* (2008).

⁴⁷ On the theoretical underpinnings, see, e.g., Joao A. C. Santos, *Bank Capital Regulation in Contemporary Banking Theory: A Review of the Literature*, 10 *FIN. MARK. INSTITUTIONS INSTRUMENTS* 41 (2001); David Miles, Jing Yang & Gilberto Marcheggiano, *Optimal Bank Capital*, 123 *ECON. J.* 1 (2013).

⁴⁸ BASEL COMMITTEE ON BANKING SUPERVISION, *supra* note 40, § 720.

⁴⁹ *Id.* § 732–42.

While the rules allow banks considerable leeway in determining the specifics of the systems, they require that the banks build systems that meet strict quality standards. Encouraging good risk management, thus, translates into a requirement to build giant risk-measurement and management systems. The ensuing risk-measurement systems are giant, and hugely expensive, contraptions combining technological infrastructures, theory frameworks, and conceptual schemes with people and computing power. They constitute, in effect, distributed risk sensory systems—the banks' risk eyes and ears.⁵⁰

To understand how the systems work, consider the credit risk measurement system. Credit risk is the quintessential risk banks run. If a bank lends money to a borrower, the firm risks that the borrower may fail to repay the loan—in other words, default.⁵¹ After a default, the bank will have to make an impairment write-down to asset value and report a loss. This risk of loss is the credit risk. The credit risk measurement systems, in turn, allow banks to turn this menacing possibility into an object.

Gauging the risk with an ICAAP compliant system is by no means straightforward. To implement an advanced credit risk measurement system, a bank must first collect or otherwise procure massive amounts data on past default experience.⁵² Then, analysts must perform comprehensive and complicated statistical analyses to identify risk factors that borrowers with similar past default rates share.⁵³ Once the risk factors are known, the analysts allocate past borrowers with the identified similar features into credit grades and calculate a yearly default rate for each grade. Finally, the backward-looking default rate data are transported from the past to the future and turned into prospective default probabilities.⁵⁴ If, for example, ten out of a thousand borrowers in a grade have defaulted each year during a ten-year period, the bank may infer that the probability of default (PD) for the borrowers in the grade is one percent. Finally, the new PD data can be used as an input in value-at-risk models. The models fuse the PDs with advanced statistical theory, assumptions about correlations, and probability distributions to ultimately produce quantitative estimates of overall the riskiness of the portfolio.⁵⁵

⁵⁰ The process in which the systems are built is also an agencement process. I will discuss agencement in more detail below in Section D.III, but in relation to the ICAAP risk measurement systems.

⁵¹ BASEL COMMITTEE ON BANKING SUPERVISION, *supra* note 40, at § 452–53.

⁵² *Id.* § 462.

⁵³ *Id.* § 416.

⁵⁴ *Id.* § 447.

⁵⁵ On methodologies available at the time Basel II was designed, see, *e.g.*, Michel Crouhy, Dan Galai & Robert Mark, *A Comparative Analysis of Current Credit Risk Models*, 24 J. BANK. & FIN. 59 (2000).

I argue that the ICAAP rules on risk-measurement system designs perform a variation of the information-mediated cybernetic regulation strategy. On the one hand, the rules force banks to engage with particular objects. To expand on the example above, credit risk is compelled—of course, for a good reason—to be treated as the risk of default and ensuing impairment write-downs. The rules impose an ontology of risk on the banks, in essence requiring them to focus on this kind credit risk. On the other hand, the systems also ascribe an epistemology of the object on the banks. Here, the rules determine how the risk can be turned into a quantitative expression, and how the vaunted operative expression, probability of default, can be created.

The exact behavioral consequences of ICAAP input interventions are diffuse and hard to trace on an exact scale. The stratagem the regulators pursue does not, however, require detailed knowledge. The ICAAP rules seek to increase banking system stability by rendering banks more rational and sophisticated risk managers than they would be without intervention. To attain that purpose, the regulators articulate and re-enforce reasonable ontologies for the objects the banks should work on. In addition, they arm banks with functional epistemological technologies to know the objects. This should take the banks a long way towards stability. A bank that knows what it should be thinking about and has the ability to quantify the thing that should be at the center of its travails is likely much safer than one that remains ignorant and clueless. The behavioral consequences may be diffuse if their overall direction is desirable.

III. Material Cognitive Agencement

1. What is Material Cognitive Agencement?

The second cybernetic strategy bundle centers around what I call *agencement*. Agencement is a concept based on the work of Michel Callon, a French sociologist and one of the founding fathers of actor network theory (ANT). In two articles dating back to 2005⁵⁶ and 2008,⁵⁷ Callon argued that human economic agency should be understood as consisting of multiple parallel distributed cognitions. Agencement, then, was the operative concept that Callon coined to describe the cognition. The term is a neologism founded on a French wordplay on the two meanings of the word agencement. First, agencement is an apt notion for conceptualizing what economic agency is for Callon—becoming and existing as an economic agent is a process. Humans agencify themselves and are agencified, reflecting the first meaning of the word. The endstate of the “agencification” process is, by the second meaning of the word, an assemblage. To invest their agency, humans weave and are woven into

⁵⁶ Michel Callon, *Why Virtualism Paves the Way to Political Impotence: A Reply to to Daniel Miller's Critique of the Laws of the Markets*, 6 *ECON. SOC. EUR. ELECTRONIC NEWSL.* 3 (2005).

⁵⁷ Michel Callon, *Economic Markets and the Rise of Interactive Agencements: From Prosthetic Agencies to Habilitated Agencies*, in *LIVING IN A MATERIAL WORLD* 28 (Trevor Pinch & Richard Swedberg eds., 2008).

assemblages of heterogenous and often unexpected entities, computers, theories, identity markers, calculative devices, and other intellectual resources: Humans are “made up of human bodies but also of prostheses, tools, equipment, technical devices, algorithms, etc.”⁵⁸ In argument that, for example, Andy Clark echoes,⁵⁹ Callon argued these resources, in effect, make humans who they are, give us our capacity to make decisions and their proclivities for particular decisions. Economic actors, thus, comprise not only their material bodies and its components but also myriad of socio-technological material appendages, inescapably making for a cyborg existence.

Although Callon’s primary objective in the 2005 and 2008 articles was to explain human agency, the theory can and has been used to make sense of essentially any cognitive actor, human or not. This point was made by two British sociologists, Ian Hardie and Donald Mackenzie, in a 2007 article^{60, 61}

Hardie and Mackenzie’s article reported an ethnographic study of a hedge fund. The authors attempted to make sense of how the hedge fund became an actor. Hardie and Mackenzie demonstrated that the hedge fund as an agent consisted of an assemblage of material things: Its human principals and their brains, their cognitive styles and educational resources, but also the rotating interns, the information flows and communication equipment, computers and displays, the seating arrangements in the office, and the purpose-built calculative devices lists. Each component was determinative of how the fund acted and what it did. Any change in assemblage was likely to have an effect on the fund’s behavioral inclinations. The fund’s agency, consequently, was a function of the socio-technical agencement that it was.⁶²

⁵⁸ Callon, *supra* note 56, at 4.

⁵⁹ See, e.g., CLARK, *supra* note 31.

⁶⁰ Iain Hardie & Donald MacKenzie, *Assembling an Economic Actor: The Agencement of a Hedge Fund*, 55 Soc. Rev. 57 (2007). For other deployments, see Dan Swanton, *The Steel Plant as Assemblage*, 44 GEOFORUM 282 (2013); Cédric Calvignac & Franck Cochoy, *From “Market Agencement” to “Vehicular Agencies”: Insights from the Quantitative Observation of Consumer Logistics*, 19 CONSUM. MARK. CULT. 133–147 (2016); Luis Araujo & Hans Kjellberg, *Enacting Novel Agencements: The Case of Frequent Flyer Schemes in the US Airline Industry (1981–1991)*, 19 CONSUM. MARK. CULT. 92 (2015); Thomas Lemke, *New Materialisms: Foucault and the “Government of Things,”* 32 THEORY, CULT. & SOC. 3 (2015); Philip Roscoe, *Economic Embeddedness and Materiality in a Financial Market Setting*, 61 Soc. Rev. 41 (2013).

⁶¹ Callon himself also pointed out that “[a]gency . . . can be attributed to heterogeneous and unexpected entities which are not necessarily human beings (“the French economy” that creates unemployment; “biotechnology” which generates ethical problems; “genes” which are said to cause severe diseases and/or impairments).” Callon, *supra* note 56, at 4.

⁶² Hardie & MacKenzie, *supra* note 60, at 75–76.

If we understand that the material setup of agents, humans and non-humans alike, has a bearing on their agency, and on what the agents do, the cyborg regulatory impact pathway opens up. As Callon himself writes “[b]ecause agencies are made they can be (re)made, at least to some extent . . . [r]econfiguring an agency means (re)configuring the socio-technical agencements constituting it, which requires material, textual and other investments.”⁶³ Thus, if the regulators can determine the assemblages that agents consist of, it becomes possible to, again, under-determine how the agents behave. This is what is done in regulatory agencement processes. The rules force their targets to put in place particular cognitive agencements to effect predictable but under-determined behavioral changes.

Here, it is important to note that regulatory agencement practices are often tightly enmeshed with information-mediated cyborg regulation approaches. In fact, the information strategies often overflow into and are implemented through material agencement projects, as is done, for example, in the ICAAP. The availability of particular information—default probabilities in the example above—can only be secured by requiring the regulatory subjects to build complicated cybernetic sensory systems that are configured to produce the highly specific data feeds.

2. *Making a Capital Adequacy Cognition*

To illustrate what regulatory agencement does and how it works in practice, I will again turn towards the ICAAP and now its second prong—the rules on risk management systems. My claim is that these ICAAP rules are best understood as triggering a material agencement process that will result in the emergence of two cognitive machineries: 1) A distributed *capital adequacy cognition*; 2) a capital adequacy action system. The regulatory interventions ensure that banks design and deploy purpose-built large-scale, complicated technological machineries to develop a prudent capital adequacy awareness and prime the bank to act on that awareness. The objective of both agencement processes is to improve bank stability by inculcating organizational prudence—in other words, by fostering an organizational obsession with capital adequacy and ensuring that the obsession permeates the entire bank and translates into concrete action.

Both systems are tightly enmeshed with the risk measurement systems I discussed above. Work within the capital adequacy cognition feeds on the risk information the risk measurement systems produce, while the capital adequacy action system exists to deploy the resulting capital adequacy awareness to govern the banks’ everyday actions.

The capital adequacy cognition functions as the bank’s capital adequacy brain. The system consists of two sequential processes.

⁶³ Callon, *supra* note 56, at 4.

First, the board and senior management, high-level actors in the banks' hierarchical structures, must engage in an analytical process that attempts to situate the risks the bank faces in relation to the capital resources available to the bank. The rules, for example, provide that bank management is "responsible for understanding the nature and level of risk being taken by the bank and how this risk relates to adequate capital levels," and instruct the management undertake "[t]he analysis of [the] bank's current and future capital requirements."⁶⁴ The post-crisis Basel II.5 additional ICAAP guidance adds detail to the process. Management has to develop an integrated view of the risks across the bank's organizational silos and also understand the correlations, concentrations, and interplay of risks taken in all quarters of the bank.⁶⁵

Second, once the analytical process is finalized, the bank is required to put the resulting risk awareness to use in planning its future. Bank management is directed to formulate a "strategic plan [that] clearly outline[s] the bank's capital needs, anticipated capital expenditures, desirable capital level, and external capital sources."⁶⁶ Bank boards receive another mission. They are to set the bank's "tolerance" or "appetite" for risk. By setting the risk tolerance, the board articulates how much the bank is willing to lose in a few bad cases to make a desired level of profit under most circumstances.⁶⁷

The regulatory agencement process, thus, forces banks to set up multimember bodies of humans to monitor and process data feeds within a tightly regulated framework. The bodies have detailed, prescribed tasks, and their work is coordinated and embedded in purpose-built workflows that ensure a capital adequacy awareness will emerge.

It is important to note that the process is not normatively neutral. Instead, material resources are carefully choreographed to ensure that the decisions made within the process reflect capital adequacy concerns at the expense of profit maximization. This normative loading takes place through a mix of agencement and information-mediated strategies. The stratagem seems to be to entrench a particular organizational sensibility by inundating the bank's high-level bodies with prudentially geared tasks, devices, vocabularies, ontologies, and data. Ultimately, as these endless prudential calculations, assessments, and plans come to be performed regularly, a prudential sensibility will become immersed into the banks' organizational fabric and incorporated into its decision-making routines. The prudential tasks, thus, seem designed to overpower the bank's natural behavioral proclivities. Consequently, reckless risk-taking should be suppressed when the capital adequacy implications of the decisions are always present. The methods, however, guarantee nothing.

⁶⁴ BASEL COMMITTEE ON BANKING SUPERVISION, *supra* note 40, § 728–30.

⁶⁵ BASEL COMMITTEE ON BANKING SUPERVISION, *supra* note 41, at 12–15.

⁶⁶ BASEL COMMITTEE ON BANKING SUPERVISION, *supra* note 40, § 728.

⁶⁷ *Id.* § 730.

They can only increase the likelihood that the bank will make responsible decisions when the resources needed to make them are at its disposal.

3. Priming the Bank for Action

The ICAAP rules also require that the situational risk awareness that the capital adequacy cognition produces is deployed to affect and condition the bank's concrete actions. The rules seem to assume that banks are made up of a network of semi-independent actors—business line managements, credit committees, down to credit officers, and individual traders. These actors may, if not coordinated, entertain and perform divergent understandings of risk, incentives, and interests. The challenge is in ensuring that the hard-fought capital adequacy awareness is translated into concrete action when the down-stream actors make real-life trade-offs between credit and other risks, capital reserves, and return opportunities. The high-level capital adequacy cognition has to be able to influence the lower level actors, and to force what is a plural, hard-to-control collection of individual agents to act in accordance with capital adequacy cognition's vision. To accomplish this task, the rules sketch out a complicated set of control and coordination devices designed to subdue the potentially unruly downstream actors.

The ICAAP control devices come in three varieties. The rules distinguish between, first, controls, processes, and procedures; second, policies; and third, limits. The devices all deploy different assemblages to affect the independent risk actors within the banks.⁶⁸

The rules on controls, processes, and procedures follow well-known management patterns. They require the banks to build management systems that implement everyday hierarchical organizational accountability practices that any large-scale organizations are likely to use. The objective is to ensure that banks are coordinated bureaucratic organizations. The rules require the bank to put in place procedures to govern who or what entity has the authority to, for example, approve loans and make investment decisions, and how these decisions are made and reviewed. The idea is to script workflows that can put the capital adequacy cognition's vision of appropriate measures into action. The devices, however, retrace familiar legal patterns. They regulate the actors much like traditional command-and-control regulation does—by imposing external behavioral requirements.

Policies, by contrast, seem to put in play another imaginary. These devices work through framing, and they seem to do so in a more circumspect fashion than controls, processes, and procedures. The devices sometimes force action and script, but typically only articulate the scaffolding for the downstream actors to use while making decisions. This modality of control leaves the downstream actors some room for maneuver and improvisation while at

⁶⁸ BASEL COMMITTEE ON BANKING SUPERVISION, *supra* note 41, at 14.

the same time ensuring centralized control. A credit policy is a good example.⁶⁹ The policy allocates authority to extend or decline credit to diverse actors within the bank. A credit officer may, for example, approve applications of a certain maximum loan size to customers whose credit scores exceed a set threshold. The policy might also articulate pricing terms as a function of credit scores. It is important to note two issues. First, the policy does not script action; it only determines the cognitive tools and framework under which action should be planned and strategized, and it may prime certain action. Second, policies are important tools in homogenizing cognitive operations within the bank. Without a credit policy, each credit officer would be left to perform credit risk as a function of her individual agencement, perhaps conditioned and shaped by the psycho-morphs, prostheses, and plug-ins flowing from past training or experience. This would lead to the performance of multiple credit risks within the bank. Once a policy is imposed on the actors, however, the ontology and performance of credit risk is—at least partly—homogenized within the bank.

Limits⁷⁰ similarly set the ontological frame for their target's cognitive work. The effects are less determinate, however, as limits often only determine the outer bound for action. For example, a trading position value-at-risk limit provides a trader a target ontology by which to assess the risks she takes, but constrains her actions inside this ontology by restricting the amount of value-at-risk capital they may employ.

IV. Nudging as Intra-person Agencement

Nudging provides another example of how regulation by agencement works. Nudging is a novel, fast-spreading,⁷¹ but ethically controversial⁷² and politically disputed⁷³ approach to regulating human behavior⁷⁴. The approach sets itself apart from traditional regulatory

⁶⁹ BASEL COMMITTEE ON BANKING SUPERVISION, *supra* note 40, § 397.

⁷⁰ See *e.g.*, *id.* at § 688.

⁷¹ On the state-of-play in Europe, see, *e.g.*, Joana Sousa Lourenco et al., BEHAVIOURAL INSIGHTS APPLIED TO POLICY: EUROPEAN REPORT 2016 (2016).

⁷² For a sample of countless articles, see, *e.g.*, Cass R Sunstein, *Nudging and Choice Architecture: Ethical Considerations*, YALE J. ON REG. 1 (2014); Andreas Kapsner & Barbara Sandfuchs, *Nudging as a Threat to Privacy*, 6 REV. PHIL. PSYCHOL. 455 (2015); Jeff King & Christopher McCrudden, *The Dark Side of Nudging: The Ethics, Political Economy, and Law of Libertarian Paternalism*, CHOICE ARCHITECTURE IN DEMOCRACIES: EXPLORING THE LEGITIMACY OF NUDGING 75 (Alexandra Kemmerer et al. eds., 2016); T. M. Wilkinson, *Nudging and Manipulation*, 61 POL. STUD. 341 (2013); Pelle Guldborg Hansen & Andreas Maaløe Jespersen, *Nudge and the Manipulation of Choice*, 1 EUR. J. RISK REG. 3 (2013).

⁷³ On a critique of the "Third Way" political program of nudging, see, *e.g.*, Pierre Schlag, *Nudge, Choice Architecture, and Libertarian Paternalism*, 108 MICH. LAW REV. 913 (2010).

⁷⁴ A legal framework for understanding and evaluating nudging is still largely missing. See, *e.g.*, Alberto Alemanno & Alessandro Spina, *Nudging Legally: On the Checks and Balances of Behavioral Regulation*, 12 INT. J. CONST. LAW 429 (2014).

modalities by emphatically being what the others are not. Nudging skirts, by design, the command, threat, incentive, and social norm imaginaries of regulation. The fathers of nudging, Richard Thaler and Cass Sunstein, frame the practice by defining a “nudge, . . . [as] any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives.”⁷⁵

The impact mechanism underlying nudges effectively inverts the traditional regulatory approach. Instead of trying to override undesirable choices likely to emerge without an intervention, a nudge seeks to manipulate the choice architecture—the setting for the choice—to cause a person to make a desirable choice instead of the less favored choice.

Nudges differ in their orientation and mechanisms. Robert Baldwin distinguishes seven nudge types.⁷⁶ *Informational nudges* are relatively innocuous. They work by manipulating the informational premises underlying decisions, but sometimes also prime action by laying out possible action paths and activating people's desire to conform with others, as humans are essentially herd animals.⁷⁷ *Persuasive nudges* put emotions into use. Pictures of cancerous lungs on cigarette packs, for example, typically evoke repulsion. The emotional response is likely to decrease people's willingness to smoke. *Default choice nudges* exploit human laziness and our aversion to expend resources to make explicit choices.⁷⁸ *Architectural nudges* work by arranging the physical environment in a way that makes desirable choices easy and undesirable choices burdensome.⁷⁹ *Commitment devices* work to diminish our impulsivity,⁸⁰ while *transactional shortcuts* can be used to make desirable actions easier than the undesirable ones. Finally, *exemption nudges* lift restrictions that would otherwise be applicable to certain measures, when the actions are desirable.

⁷⁵ RICHARD H. THALER & CASS R. SUNSTEIN, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* 6 (2008).

⁷⁶ Robert Baldwin, *From Regulation to Behaviour Change: Giving Nudge the Third Degree*, 77 *MOD. L. REV.* 831, 833 (2014).

⁷⁷ THALER & SUNSTEIN, *supra* note 75, at 56–60.

⁷⁸ The results of appropriate default choice architecture are sometimes striking. Studies have, for example, shown that people enroll in organ donor programs in great numbers if the enrolment is an opt-out choice on a driver's license application form, while the enrolment rate is much lower if people are required to tick a box to opt in on the very same form. On default choice nudges, see, e.g., Cass R. Sunstein, *Deciding by Default*, 162 *UNIV. PA. L. REV.* 1 (2013).

⁷⁹ Healthy snacks, for example, can be placed close to typical routes and easily visible in stores or in academic conferences, while the unhealthy ones are stacked in hard-to-find places. See, e.g., Ida Kongsbak et al., *Increasing Fruit and Vegetable Intake Among Male University Students in an Ad Libitum Buffet Setting: A Choice Architectural Nudge Intervention*, 49 *FOOD QUALITY & PREFERENCE* 183 (2016).

⁸⁰ Gharad Bryan, Dean Karlan & Scott Nelson, *Commitment Devices*, 2 *ANNU. REV. ECON.* 671–98 (2010).

Nudging and the cyborg imagination seem, at first glance, to be an ill-fitting pair. Nudging utilizes our developing knowledge of human cognitive patterns and proclivities. In particular, second and third-degree nudges⁸¹ target human behavioral or volitional limitations and “automatic” responses by latching on to what are distinctly human rationality deficiencies, including our proneness to fall for confirmation and availability biases, overwhelming emotionality, optimism, laziness, vulnerability to framing, and general ineptitude in dealing intuitively with probabilities and, consequently, with risks and pay-outs. Thus, nudging in effect weaponizes the messiness of the human cognitive condition. It has, seemingly, nothing to do with cyborgs.

The affinities between cyborg imaginations and nudging theory, however, become visible when we look at the imagination of human cognition underlying the practice. The key idea is that choice architects can know human cognition works. The cognitive model posits that human cognition is a function of different processes that fire and activate under certain conditions.⁸² The art of nudging, then, is about utilizing this knowledge, and ultimately about bypassing, enlisting, and counteracting the countless cognitive tendencies, traits, and errors that human cognition contains. Consequently, if the choice architects are able to push the choice to a specific setting and, consequently, influence which systems and cognitive patterns are triggered, they can under-determine—on the balance of probabilities—what people will do.

In this frame, nudging emerges as a prime example of the real material agencement of human beings. The underlying theory and, consequently, nudging perform and enact humans as information processing entities that comprise multiple discreet wetware circuitries. Human behavior becomes, then, susceptible to regulators’ influence when and if the regulators can design interventions that reliably trigger specific circuits over the other possible cognitive patterns, and ultimately arrive at an intervention that gives rise to desired decisions. This imagination is, essentially, a cyborg imaginary. Humans are cognitive machines whose composition can be manipulated at will. The interventions are, however, fleeting, and unwind automatically once the choice architecture discharges, unlike the more enduring manipulations that take place in the material distributed macro-cognitions.

⁸¹ Baldwin, *supra* note 76, at 843.

⁸² For an introduction, see DANIEL KAHNEMAN, THINKING, FAST AND SLOW (2011). Surprisingly, the neuroscientific foundations and explanations of nudging still seem somewhat fuzzy. See Gidon Felsen & Peter B. Reiner, *What Can Neuroscience Contribute to the Debate Over Nudging?*, 6 REV. PHIL. PSYCHOL. 469 (2015).

V. *Psycho-morphing*

1. *What is Psycho-morphing?*

Above, I have used agencement to primarily refer to processes which are easy to understand with the metaphor of a computer as the archetypal cognitive device. Callon's original use of the concept, however, targeted persons in the first place, and also incorporated what are typically conceptualized as psychological processes. My contention is that the cyborg regulatory imagination extends also to the intra-cranial. For purposes of clarity, I will use another concept, psycho-morphing, to explore the cultural and psychological human agencement processes that lack overt technological components.

Psycho-morphing as a concept was introduced by another actor-network theory grandee, Bruno Latour, in 2005. The concept appears when Latour discusses the nature of human cognition. Latour shares Callon's idea that human cognition is, in fact, distributed to thousands of socio-technical devices or "plug-ins," "pellets," "patches," and "applets" that reside outside human mind.⁸³ This prompts Latour, however, to turn back to the intra-cranial and ask, "What about me, the ego." If we are nothing but a collection of extra-bodily things, the internal workings of the human mind seems left out, the soul hollowed: "Am I not in the depth of my heart, in the circumvolutions of my brain, in the inner sanctum of my soul, in the vivacity of my spirit, an 'individual'?"⁸⁴

For Latour, like Callon, this is not a problem. He goes on to advance a distributed cognition theory of being human, even without the material plug-ins or the wetware circuitries. This move, in effect, extends the cyborg imaginary to psychological processes. Even our egos are always "individualized, spiritualized, interiorized" by the many things we attach to ourselves and that flow through us. These are "psycho-morphs, that . . . literally lend you the shape of a psyche."⁸⁵ Latour takes up love as an example. Our experience of love and subjectivity as lovers can be traced to the abundant cultural psychomorphs, to "poems, songs and paintings, not to mention the countless retinue of angels, cherubs, putties, and arrows."⁸⁶

The outlines of the assemblages these cultural "things" create are far messier and harder to detect and track than the real, tangible ingredients that go into the giant socio-technical assemblages in material agencement projects. Nevertheless, these "subjectifier" compositions exist and make the up ego in complex interaction with the "physical" plug-ins and the biological substrata.

⁸³ BRUNO LATOUR, REASSEMBLING THE SOCIAL: AN INTRODUCTION TO ACTOR-NETWORK-THEORY 204–06 (2005).

⁸⁴ *Id.*

⁸⁵ *Id.*

⁸⁶ *Id.*

While psycho-morphs and psycho-morphing are, on the level of theory, only parts of agencement processes, keeping them apart from socio-technical material agencement processes still seems useful. Psychomorphing shines a spotlight on the plasticity of humans, and underscores that they may be encompassed by the cyborg imaginary even without the presence of material technological appendages or manipulation of biological substrate. The notion allows the cybernetic imaginary an inroad into the culturally determined parts of human existence and opens up a way to conceptualize a new, more detailed impact pathway for cyborg regulation. Regulation can, when it works through psychomorphing, encompass humans and the human psyche, reordering, on a fundamental level, the cyborgs within us. Cybernetic regulation is not only forging and cultivating non-human and hybrid cybernetic organisms. It can affect humans as well, manipulate their make-up as agents.⁸⁷

2. How Does Psycho-morphing Work in Practice?

The motivations underlying psycho-morphing interventions are clear-cut. Agencement processes typically embed humans into cognitive apparatuses that comprise a multitude of other elements. In order to function, these assemblages typically require that very particular kinds of humans be present. A CEO, an employer, or an employee in a bank's capital adequacy cognition cannot be present as anyone or as a bare human being. The human needs to have a particular identity, a specific skill set, competencies, and attitudes, and a mindset that renders her a reliable object for embedding into the assemblage as a component.

The techniques used for this purpose are often temporally distant, sometimes years or decades away, and causally diffuse from the immediate regulatory environment. This makes them difficult to trace and observe. *Training* in its different forms is, without a doubt, the most common form of psycho-morphing. Any bureaucracy or commercial organization worth its salt will require that its staff go through appropriate training to possess sufficient competence to perform its functions. Regulators, unsurprisingly, often use training requirements as parts of their regulatory schemes. The practice is mundane and uncontroversial. To me, however, training is psycho-morphing. People undergo training to make them effective information processing entities than can be embedded into expert systems.

To understand how training could be conceptualized in the cybernetic frame, take an example from Latour. In a 2004 article,⁸⁸ Latour discussed how perfume professionals,

⁸⁷ The relationship between nudging and psycho-morphing is fraught as there seems good reason to think that the rational Econs, in particular, are cultural constructs. The Econs' rationality can only be imprinted on the Humans with the help of countless years of education and training, that is, psycho-morphing and material agencement.

⁸⁸ Bruno Latour, *How to Talk About the Body? the Normative Dimension of Science Studies*, 10 *Body Soc.* 205 (2004).

“noses,” are trained. The key device in the process is a “malette à odours,” an odor kit. The kit is a collection of a wide variety purified chemicals used in perfumes. The humans undergoing training are trained to identify the fragrances. A standard account would likely argue that the kit allows the human to develop their innate ability to analyze fragrances. Latour, instead, argued that training, in fact, folds the kit into the human: “[T]he kit (with all its associated elements) is part and parcel of what it is to have a body, that is to benefit from a richer odoriferous world.”⁸⁹ A cybernetic, distributed cognition understanding of training, thus, would conceptualize the process as the fusing of material and intellectual resources to the humans.

Regulatory examples abound. One example of a way to implement the training requirements is the UK financial sector Certification Regime. The Regime requires that all employees performing FCA-specified significant-harm functions must be fit for their jobs, with the firm ensuring on a continuous basis that each person has obtained a qualification, has undergone—or is undergoing—training, possesses a level of competence, or has the personal characteristics required by the FCA general rules.

Other, non-training related regulatory psycho-morphing schemes, however, also exist. In particular, in recent years, regulators have started to focus on *mindsets* and *culture* as important targets for regulatory interventions.

The Basel ICAAP rules, again, provide a small-scale example of psycho-morphing mindsets that targets mindsets. Remember that the ICAAP rules seek to build a complicated socio-technical capital adequacy cognition. Among other things, the cognitions contain humans as their components. For example, a bank’s board and senior management, dozens of humans, constitute the prime elements of the banks’ capital adequacy cognitions. The numerous humans that make up the board and senior management, crucially, also need to have an appropriate mindset to function as expected. To do this, the rules take important but inconspicuous measures to psycho-morph the board members and senior management. First, the rules put in place a psycho-morph that provides that “senior management and the board should view capital planning as a crucial element in being able to achieve its desired strategic objectives.”⁹⁰ The move is innocuous. It attempts to reschedule the humans’ priorities. Senior management and the board should not be concerned only with profits, as bankers are typically wont to do, but take bank stability into account as an overriding priority. The revised 2009 Basel II.5 rules similarly overflow into psycho-morphing. The board of directors and senior management are now required to “possess sufficient knowledge of all major business lines” and to “have the necessary expertise to ensure that appropriate policies, controls and risk monitoring systems are effective.”⁹¹

⁸⁹ *Id.* at 207.

⁹⁰ BASEL COMMITTEE ON BANKING SUPERVISION, *supra* note 40, § 729.

⁹¹ BASEL COMMITTEE ON BANKING SUPERVISION, *supra* note 41, at 13.

More detailed psycho-morphing schemes, I argue, have sprung up elsewhere in the financial regulation landscape. In many post-crisis post-mortems, a “culture of greed” was deemed a key factor that had contributed to the financial crisis.⁹² A number of regulatory reform projects have subsequently emerged to inculcate a less toxic and predatory culture inside the banks. The UK FCA’s Conduct Rules,⁹³ introduced in 2015, probably constitute the most expansive of these projects. The rules were, paradoxically, followed by the Authority’s decision to scrap a broader review into culture in banking.⁹⁴

The Conduct Rules introduced a Code of Conduct (COCON) ruleset centering around nine high-level individual conduct and senior manager rules to guide employee and manager behavior in financial firms. The rules are on their face relatively ambiguous commands. The five individual conduct rules, for example, provide that the persons to whom they apply must “act with integrity,” “due skill and competence,” “be open and cooperative” with regulators, “pay due regard to the interests of the customers and treat them fairly”, and “observe proper standards of market conduct.”⁹⁵ Specific guidance texts on the rules, however, add considerable level of detail as the guidance enumerates a long list of “examples” that “are not intended to be an exhaustive list of the conduct that may contravene” the rules.⁹⁶ It is important to note that although a breach of the COCON regime may result in the Financial Conduct Authority imposing a sanction on the person in breach,⁹⁷ the regime is best understood as trying to instill and articulate cultural psycho-morphs that serve as markers of responsibility and accountability, rather than as rules to be followed. The Code of Conduct articulates how financial sector employees and managers should understand their position and responsibilities. The Code of Conduct, thus, serves as a reference point that the humans should use when constructing their professional psyches.

⁹² For contributions to the discussion, see, *e.g.*, GETTING THE CULTURE AND THE ETHICS RIGHT: TOWARDS A NEW AGE OF RESPONSIBILITY IN BANKING AND FINANCE (Patrick S. Kenadjian & Andreas Dombret eds., 2016); Justin O’Brien, *Fixing the Fix: Governance, Culture, Ethics and the Extending Perimeter of Financial Regulation*, 8 L. FIN. MARK. REV. 373 (2014); Alison Lui, *Greed, Recklessness and/or Dishonesty? An Investigation into the Culture of Five UK Banks between 2004 and 2009*, 16 J. BANK. REG. 106 (2015); GROUP OF THIRTY, *BANKING CONDUCT AND CULTURE. A CALL FOR SUSTAINED AND COMPREHENSIVE REFORM*, GROUP30.ORG (2015); MICHAEL POWER, SIMON ASHBY & TOMMASO PALERMO, *RISK CULTURE IN FINANCIAL ORGANISATIONS: A RESEARCH REPORT* (2013).

⁹³ Financial Conduct Authority, *supra* note 42, at COCON.

⁹⁴ See Emma Dunkley, “Banker Bashing” Draws to an End as Watchdog Scraps Review, FINANCIAL TIMES, December 31, 2015, at 1.

⁹⁵ Financial Conduct Authority, *supra* note 42, at COCON 2.1.

⁹⁶ *Id.* at COCON 4.

⁹⁷ *Id.* at COCON 3.1.1.

E. Implications

I. Three Questions

Above, I have argued that a cyborg law is emerging. In cyborg law, regulation targets information processing entities, cyborgs. The interventions seek to affect the behavioral proclivities of the cyborg cognitions by re-arranging their machinic constitutions and affecting the information the cyborgs receive.

The new cybernetic regulatory imagination raises important challenges to legal theory. To bring the article to a conclusion, I will raise two issues. The first issue pertains to what the cybernetic turn entails for our conceptions of legal agency, and what it means to act in respect of and be acted upon by the law. The second issue pertains to the eventual future transformations of legality and modalities of legal effectivity as algorithmic actors will proliferate.

II. Agentic Transformations

The cybernetic regulatory framework forces us to encounter an agentic inversion. Law is increasingly targeting and seeking to affect the behavior of non-human entities, be they organizations, technological systems, or artificial intelligence.⁹⁸ We, however, lack a theoretical framework that can accommodate the new emerging agencies and, thus, struggle to make sense of these new regulatory modalities.

As an illustration of what is stake in this agentic transformation, consider the theoretical accounts of management-based regulation,⁹⁹ the regulatory label that the ICAAP and gender equality regulatory projects attract. The accounts struggle, in particular, with mapping the targets and modalities of the interventions. For example, Cary Coglianese and Evan Mendelson argue that management-based regulation is about triggering the regulatory

⁹⁸ F. Patrick Hubbard, *Do Androids Dream: Personhood and Intelligent Artifacts*, 83 TEMP. L. REV. 405 (2010); Wendell Wallach, *From Robots to Techno Sapiens: Ethics, Law and Public Policy in the Development of Robotics and Neurotechnologies*, 3 L. INNOV. TECH. 185 (2011); Lawrence B. Solum, 70 *Legal Personhood for Artificial Intelligences*, N.C. L. REV. 1231 (1994).

⁹⁹ On management-based regulation and its close sibling, meta-regulation, see, e.g., CHRISTINE PARKER, *THE OPEN CORPORATION: EFFECTIVE SELF-REGULATION AND DEMOCRACY* (2002); Christine Parker, *Meta-regulation: Legal Accountability for Corporate Social Responsibility*, in *THE NEW CORPORATE ACCOUNTABILITY: CORPORATE SOCIAL RESPONSIBILITY AND THE LAW 207* (Doreen McBarnet, Aurora Voiculescu, & Tom Campbell eds., 2007); Cary Coglianese & David Lazer, *Management-Based Regulation: Prescribing Private Management to Achieve Public Goals*, 37 L. SOC. REV. 691 (2003); CARY COGLIANESE & EVAN MENDELSON, *META-REGULATION AND SELF-REGULATION* (2010); MIA MAHMUDUR RAHIM, *LEGAL REGULATION OF CORPORATE SOCIAL RESPONSIBILITY: A META-REGULATION APPROACH OF LAW FOR RAISING CSR IN A WEAK ECONOMY* (2013); Neil Gunningham & Darren Sinclair, *Organizational Trust and the Limits of Management-Based Regulation*, 43 L. SOC. REV. 865 (2009).

target to "respond . . . by developing its own internal regulations."¹⁰⁰ The conceptualization misses the core of management-based regulation. In empirical examples of the schemes, regulations are seldom observed but structures, processes, hierarchies, and other management devices abound. In the reflexive search for humans and rules, management-based regulation is mangled beyond recognition. Fiona Haines vocalizes the theoretical issue: She identifies a "law/practice gap." According to Haines, regulation can never directly affect practices, but needs a layer of at least social norms to affect humans.¹⁰¹

Some accounts seem to be on the verge of moving beyond rules/humans imagination as firms and other collectives are increasingly coached in anthropomorphic language, in effect creating non-human, non-individual agencies. Christine Parker, for one, has argued that corporate social responsibility practices seek to create "corporate consciences" and migrate the focus from substance to a disembodied organization "process aimed at a substance."¹⁰² Similar patterns emerge in Neil Gunningham and Darren Sinclair's work as they write:

The role of regulation ceases to be primarily about inspectors or auditors checking compliance with rules and becomes more about encouraging the industry or facility to put in place processes and management systems that are then scrutinized by regulators or corporate auditors. Rather than regulating prescriptively, meta-regulation seeks to stimulate modes of self-organization within the firm in such a way as to encourage internal self-critical reflection about its performance.¹⁰³

Ultimately, the issue of regulatory targets and modality still eludes the author's theorization attempts.

The cyborg imaginary offers a way out. It suffers from none of the problems which handicap the standard rule/human ontology of law. The framework has no trouble explaining the lack of rules or humans as mediators of regulation, nor does it struggle with the firm-level, disembodied, non-human, and non-individual emphasis of management-based regulation as the interventions affect their targets' internal process directly.

¹⁰⁰ COGLIANESE & MENDELSON, *supra* note 99, at 150.

¹⁰¹ Fiona Haines, *Regulatory Failures and Regulatory Solutions: A Characteristic Analysis of the Aftermath of Disaster*, 34 L. Soc. INQ. 31, 31, 35 (2009).

¹⁰² Parker, *supra* note 99, at 212, 235.

¹⁰³ Gunningham & Sinclair, *supra* note 99, at 866.

The break with the past is, however, radical. We seem to be on the edge of a transformation that contests our basic assumptions of what law is made of and how it functions. In particular, the cyborg transformation calls for a reconsideration of our conceptions of agency in legal and regulatory contexts. It is important to note that the change cuts further and deeper into the legal fabric than the more traditional discussions about agentic hybrids, such as trees, rivers, or other natural objects. Once the non-humans of cyborg law enter the field as active targets of regulatory interventions, we are no longer thinking about how non-humans can be accommodated and rendered partial agents in legal contexts while retaining for humans the hegemonic position they have enjoyed for centuries.¹⁰⁴ The cyborg is not a stand-in. It is the real thing.

If we take the cyborg imagination for real, the entire agentic structure inverts, in two senses. In the cybernetic imaginary, first, the subject-object of legal interventions is not a human. It is a cybernetic organism, of which humans constitute only one “sub-species.” Under this outlook, humans are dethroned from the apex of legal agency. The humans may still be subjects of legal interventions, but they fall under law’s influence because and to the extent that they are parts or containers of information processing entities.

This entails, second, that the entire intentionality of law in relation to non-humans recombines. Most attempts to ascribe a status of a legal agent to non-humans have focused on a *passive agency*, that is, on ensuring that these new agents are able to inertly enjoy and make defensive claims to rights and protections. The hybrids have not been the subjects of legal interventions as they have lacked the capability to be moved by law directly. All direct interventions flowed through and been mediated by humans. Law was able to do something for the non-human things, but nothing to them. This changes with the emergence of the cyborg imaginary. The non-humans gain a new active status inside regulatory contexts. They can be law’s immediate targets. Simultaneously, the modality changes. Law comes to penetrate its subject and affect them and their makeup directly, and not just by issuing outside signals that act as inputs in processes beyond law’s reach.

It is, however, important to keep in mind two caveats. First, the cyborg model is not a theory of everything. To the contrary, the model organizes and explains a tiny sliver of the regulatory universe. Most regulatory interventions still perform and enact distinctly non-cybernetic imaginaries. Humans are, thus, still highly relevant. Second, even in the examples discussed above, the cybernetic imaginary is augmented by other imaginaries. Bankers, for example, face the threat of prosecution for criminal misconduct. Banks may similarly lose their license if they do not comply with the ICAAP rules, while the gender equality cognitions are buttressed by a threat of a fine under Gender Equality Act Section 17 should the

¹⁰⁴ The continuing human hegemony is clearly visible in, for example, Christopher Stone’s argument; things can be subject to law in the sense of having a standing, rights, and a guardian to sue in their name. See CHRISTOPHER D. STONE, *SHOULD TREES HAVE STANDING?* (2010).

employer not comply with her legal obligation to draft a plan. Thus, in my account, there is no singular regulatory imaginary. Instead, regulatory projects simultaneously perform and enact multiple regulatory imaginations, sometimes even within one contemporaneous regulatory project. In this sense, the argument retraces Pierre Schlag's dizzying exposition of the aesthetic of American law. As in Schlag's account, my conviction is that law is a plural phenomenon and that multiple imaginaries of law inform and constitute its enactments.¹⁰⁵ The political and aesthetical struggles determine which of the imaginaries is enacted.¹⁰⁶

III. Future Law

The second issue I raise is future. My claim is that cybernetic regulation heuristic seems to open up a crucial vista into the future of law. As algorithmic decision-making will proliferate, the cybernetic imaginary may provide a glimpse of how law will function in the future.

Algorithmic, non-human decision-making is bound to proliferate as robots and artificial intelligence applications emerge and become more common. This change is likely to be disruptive and challenge many established patterns in regulation and legal thinking. The core factor in the process is that advances in artificial intelligence, machine learning, and robotics will inevitably render humans increasingly irrelevant as instigators of causal chains. As a result, the law's incessant anthropocentricity will become an anachronistic burden.

The cybernetic regulatory approach, however, lacks the ballast. It will be up for the task of regulating algorithm-governed entities. The approach can be attuned to a wide variety of cognitive assemblages as it is agnostic on their specific makeup, rendering any information processing entity amenable to regulation. The only requirement is that the entity can be reconfigured, rearranged, or controlled by the interventions. The plasticity of cybernetic regulation, thus, seems to offer an avenue to pursue effective governance of a world where humans are a side-show. By focusing regulatory efforts on affecting the machinic constitution of the agents, law may retain its edge.¹⁰⁷

This type of law, however, has little to do with the law that we are now accustomed to dealing with. Its basic modality will be radically different. The move is fundamental. We will move from affecting the results of external and immutable cognitive processes with signal inputs that do not affect the processes themselves to something. The new kind of law coagulates around concerted efforts at choreographing and rearranging the formerly

¹⁰⁵ See Pierre Schlag, *The Aesthetics of American Law*, 115 HARV. L. R. 1047, 1107–09 (2002). Compare also with Selkälä & Rajavuori chapter in this volume, 18 GERMAN L.J. (2017).

¹⁰⁶ Schlag, *supra* note 105, at 1110.

¹⁰⁷ For a similar argument, see MIREILLE HILDEBRANDT, SMART TECHNOLOGIES AND THE END(S) OF LAW: NOVEL ENTANGLEMENTS OF LAW AND TECHNOLOGY 217–19 (2015).

impregnable cognitions. This change reconfigures law's intentionality in two important ways.

First, traditional legal interventions typically aim at achieving binary outcomes, where the subjects either do the regulators' bidding or not. Actions are labeled legal and illegal, prescribed or proscribed.¹⁰⁸ Although the regulators do not know whether the interventions are sufficient to achieve their planned outcome, the law articulates to its subjects what specific action patterns the regulators want to emerge. Cybernetic regulation, in contrast, recognizes, acknowledges, and feeds upon the shades of grey in law's effectivity. Cyborg regulation does not seek determine its subjects' action, but works to create the material conditions that would allow a desirable, and often fuzzily understood, end-state to emerge. There is no legal or illegal as such. There may be unacceptable cognitions (cyborg illegality) and acceptable cognitions (cyborg legality), but the cyborg legality, in particular, is one of gradations, degrees, uncertainties, and better or worse implementations. The new legality focuses on the merits of the process of arriving at the end-states, not on the end-states themselves. Cyborg regulation is, correspondingly, a game of manipulating the probabilities and intensities of desired behavior through reinforcing the material processes, patterns, and assemblages that regulators think make such behavior more likely. Radical uncertainty reigns over the effects, however. The subjects are only primed to take the desired actions. The regulators cannot know whether the particular cognitive machinery will at a given instance, in fact, emerge out of the manipulations nor will they know that the cognition, it existed, would even produce the desired outcome.

Second, cyborg regulation as a template inverts the normal temporality of law. It is important to note that most legal interventions function through folding a future on their targets, by forcing them to internalize the consequences of their actions. In threat-based law, for example, the legal subject will be deterred from taking a particular decision if and when the threat of the sanction makes the once desired future undesirable after the individual factors in the sanction. The same is true of incentives-based law. In cyborg regulation, this temporality is inverted. Cyborg interventions do not attend to the future. Instead, cyborg-based regulatory interventions change the subject who makes the decision, in the present and for the future. The interventions attempt to render futures that are undesirable to regulators and unimaginable to law's subjects. They suppress choice and transgressions by proactively smothering the subjects' capacity to not do the regulators' bidding. Law turns preemptive in the present, not through the future.

¹⁰⁸ Luhmann's account of law's binary nature is probably best known. NIKLAS LUHMANN, *LAW AS A SOCIAL SYSTEM* 90–91 (2005).