

DECONSTRUCTING JEFFERSON'S CANDLE: TOWARDS A CRITICAL REALIST APPROACH TO CULTURAL ENVIRONMENTALISM AND INFORMATION POLICY

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ABSTRACT: This paper introduces critical realism to information policy theory. It employs the “founding myth” of contemporary information policy, Thomas Jefferson’s candle, to excavate the philosophical roots of the ubiquitous view that “information” is an inexhaustible “natural” resource. It shows how mathematical information theory has been employed to transport Jefferson’s Candle into a space where “information” and “culture” are merely social constructs. This social constructivism, the paper argues, saps the “cultural environmentalist” program of normative force. The paper suggests that a critical realist view of “information” and “culture,” tied to norms drawn from environmental virtue ethics, offers a helpful way forward. It concludes with suggestions about how the critical realist perspective could inform debates about Internet governance.

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In this article, I hope to move information policy towards firmer normative ground by introducing the resources of critical realism and environmental virtue ethics to information law and policy scholarship. Critical realism is a broad philosophical and epistemological approach that avoids the extremes of

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modern positivism and postmodern skepticism.¹ It acknowledges the social aspects of knowing, creating, and inventing, but insists that human social construction is grounded in a deeper reality. It rejects the reduction of society to the autonomous individual but respects the capacity of individuals to transform culture. This balanced, realist approach to knowledge, information, and culture suggests a philosophical and normative basis for information policy that is deeper than pragmatic welfare economics and richer than bare assertions of political will.

Culture, like the natural environment, will flourish if well tended and collapse if polluted and despoiled. The cultural environmentalism movement, which represents the reigning postcritical approach to information policy, is meant to compare human culture to the natural environment, but it strips the environmental metaphor of any normative force when it depicts culture as infinitely malleable. A critical realist perspective suggests that culture, like the natural environment, can be shaped by human activity only within the limits established by the reality in which we find ourselves.

The givenness of nature means that some attitudes and practices concerning the conservation and stewardship of natural resources are better tuned to the flourishing of nature than others. An individual is not entirely free to make her own meanings in relation to the natural environment if nature and the human communities that depend on it are to flourish. Likewise, it is crucial for cultural environmentalists to focus on particular normative virtues and practices that promote the flourishing of the cultural environment. The cultural environmentalist movement can benefit greatly from the application of environmental virtue ethics.

My move towards a critical realist approach to information policy starts with the archeology of our founding myth—Thomas Jefferson's candle. Part I examines the view of "information" that originally informed intellectual property policy in the United States. It excavates the intellectual roots of Thomas Jefferson's famous metaphor of knowledge as the flame on a candle. Jefferson's candle is a statement not only about the economics of monopolies, but also, and primarily, about the *ontology* of information. Information, for thinkers such as Jefferson who were steeped in Francis Bacon's philosophy of science, Isaac Newton's mechanistic universe, and John Locke's sensationalist epistemology, constituted access to the term, "Nature-as-it-is."

1. "Critical realism" should be distinguished from "critical legal studies." The two are unrelated. Critical realism is a broad movement in philosophy, social theory and epistemology. See *DICTIONARY OF CRITICAL REALISM* 96–105 (Mervyn Hartwig ed., Routledge 2007) [hereinafter CR]. Critical legal studies focuses on deconstructing the legal system as an instrument of economic, racial and class oppression. See GEORGE C. CHRISTIE & PATRICK H. MARTIN, *JURISPRUDENCE: TEXT AND READINGS ON THE PHILOSOPHY OF LAW* 1046–51 (2d ed. 1995). Critical realism would reject the reductionist program of critical legal studies, while recognizing the importance of exposing the power structures inherent in the law. See Alan Norrie, *Between Structure and Difference: Law's Relationality*, in *CRITICAL REALISM: ESSENTIAL READINGS* 723 (Margaret Archer ed., Routledge 1998) (stating that merely deconstructionist approaches to law, helpfully challeng[e] the false certainties that attend traditional ways of understanding law" but that "ultimately this confrontation with alterity seems a blind alley").

Part II describes the postmodern “romantic author” critique of intellectual property and the cultural environmentalism movement that arose out of the critique. It then answers the aporia arising from the continued importance of the modernist Jeffersonian view of information to this postmodern movement. It suggests that the Jeffersonian view of information was adapted to the cultural environmentalist critique via mathematical information theory. Jefferson's Nature-as-it-is became Claude Shannon and William Gibson's disembodied “bits” of code. This unnatural fusion has left contemporary information policy on a wobbly foundation.

Part III introduces critical realism to intellectual property scholarship. It argues that critical realism conveys a richer sense of the ontology of information and culture than the existing schizophrenic fusion of Jefferson and Foucault. Part IV introduces some ideas about how this new perspective can contribute to progress in debates over information policy, particularly concerning Internet governance and the law of virtual worlds.

I. NEWTON, BACON, LOCKE:
THE FATHERS OF CONTEMPORARY
INTELLECTUAL PROPERTY POLICY
(OR, WHY WE CARE WHAT JEFFERSON
THOUGHT ABOUT PATENTS)

If nature has made any one thing less susceptible than all others of exclusive property, it is the action of the thinking power called an idea . . . He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening me.²

—Thomas Jefferson

A. Is the Game Worth the Candle?

Thomas Jefferson's famous metaphor of knowledge as the flame on a candle has illuminated—or singed, depending on one's perspective—all corners of intellectual property theory. It has been cited by the U.S. Supreme Court,³ law and economics scholars,⁴ postmodern deconstructors of th

2. Thomas Jefferson to Isaac MacPherson (Aug. 13, 1813), in 3 THE FOUNDER'S CONSTITUTION 42–43 (Philip B. Kurland & Ralph Lerner eds., University of Chicago Press 2000 (1986)), available at http://press-pubs.uchicago.edu/founders/documents/a1_8_8s12.html. Jefferson further states in that letter

[t]hat ideas should freely spread from one to another over the globe, for the moral and mutual instruction of man, and improvement of his condition, seems to have been peculiarly and benevolently designed by nature, when she made them, like fire, expansible over all space, without lessening their density in any point, and like the air in which we breathe, move, and have our physical being, incapable of confinement or exclusive appropriation.

Id. at 42.

3. *Graham v. John Deere Co.*, 383 U.S. 1, 8 n.2 (1965).

4. *See, e.g.*, Mark A. Lemley, *Property, Intellectual Property, and Free Riding*, 83 TEX. I. REV. 1031, 1031 (2005).

romantic author,"⁵ champions of open and free culture,⁶ "New Chicago school" analysts of "code" as "law,"⁷ and many others.⁸ Why is Jefferson so important to contemporary intellectual property theory? As Adam Mossoff asks, in the title of a recent paper, "*Who Cares What Thomas Jefferson Thought About Patents?*"⁹

Mossoff asserts that the intellectual property clause was grounded in natural rights, social contract, and labor theory rather than in Jefferson's embryonic utilitarian notion of economic nonrivalry.¹⁰ Perhaps Mossoff is correct that Locke's labor theory informs early American intellectual property law more deeply than Jefferson's utilitarian focus on monopolies.¹¹ We should still care about Jefferson's candle, however, because his writings reflect common Enlightenment beliefs about the *ontological* status of information. Jefferson's candle is shaped by the metaphysics, epistemology, and philosophy of science that informed the American Enlightenment. These ideas inform *both* the natural rights and utilitarian strands of early intellectual property theory.

A complete account of what "information" meant during the Enlightenment is beyond the scope of a single essay. We can, however, offer a brief sketch of what key thinkers such as Jefferson thought about information by excavating three pivotal sources: Isaac Newton's metaphysics, John Locke's epistemology, and Francis Bacon's philosophy of science.

5. James Boyle, *The Second Enclosure Movement and the Construction of the Public Domain*, 34 LAW & CONTEMP. PROBS. 33, 53 (2003); Alan L. Durham, *The Random Muse: Authorship and Indeterminacy*, 44 WM. & MARY L. REV. 569, 607 n.226 (2002); SIVA /AIDHYANATHAN, COPYRIGHTS AND COPYWRONGS 24 (2001).

6. See, e.g., JOHN PERRY BARLOW, THE ECONOMY OF IDEAS (1994) <http://www.wired.com/wired/archive/2.03/economy.ideas.html>; Yochai Benkler, *Constitutional Bounds of Database Protection: The Role of Judicial Review in the Creation and Definition of Private Rights in Information*, 15 Berkeley Tech. L. J. 535, 542 & n.22 (2000) (stating that Jefferson's candle metaphor suggests "a very specific sophistication about information as a good.").

7. See, e.g., LAWRENCE LESSIG, CODE AND OTHER LAWS OF CYBERSPACE 132 (1999); James Gibson, *Re-Reality Data*, 80 NOTRE DAME L. REV. 163, 173 n.27 (2004).

8. As Adam Mossoff notes, "[t]he Jeffersonian story of patent law reigns supreme in the courts, among intellectual property professors, and in historical scholarship." Adam Mossoff, *Who Cares What Thomas Jefferson Thought About Patents? Reevaluating the Patent "Privilege" in Historical Context*, 92 CORNELL L. REV. 953, 967 (2007). See also Justin Hughes, *Copyright and Incomplete Historiographies: Of Piracy, Propertization, and Thomas Jefferson*, 79 S. CAL. L. REV. 993, 998-99 & n.7 (2006) (noting that "references to Jefferson are common currency" in intellectual property scholarship).

9. Mossoff, *supra* note 8.

10. *Id.* Mossoff argues that contemporary intellectual property scholarship types intellectual property rights as 'privileges' based on "an anachronistic reading of the historical record." *Id.* at 968. As Mossoff correctly notes, "[b]ecause the intellectual context of the eighteenth and nineteenth centuries has been lost to us today, it is necessary to reestablish this context in order to understand the meaning of the patent 'privilege.'" *Id.* at 969 (footnote omitted).

11. *Id.*

B. Newton, Bacon, and Locke

Isaac Newton was a towering figure—the towering figure—of seventeenth- and eighteenth-century science. In his magisterial *Principia Mathematica*, Newton demonstrated how his laws of motion and gravitation could fully describe the motions of any body in the universe.¹² Newton gave Jefferson a mechanistic universe that could be directly and fully described through universal mathematical laws.¹³ Newton's laws were fixed and immutable, established by God at the creation.¹⁴ To know Newton's laws was to know the mind of God.¹⁵

Eighteenth-century rationalists seized Newton's ideas and took them in new directions.¹⁶ Newton's deterministic laws suggested that traditional notions of divine agency required revision. Any level of divine causation beyond that of natural laws—what earlier thinkers such as Thomas Aquinas called “primary causation”—became superfluous. To know the natural laws that govern the universe, then, was to access reality directly, without the need for further inquiry about the will of God.¹⁷

This context helps explain the antipathy towards monopoly on information represented by Jefferson's candle. Jefferson's aversion to possession of information was not grounded solely in the infant economy's need to be free of restrictive crown privileges, although that surely is part of the story. It was also deeply grounded in the Newtonian belief that a discrete body of informa-

12. ISAAC NEWTON, *THE PRINCIPIA: MATHEMATICAL PRINCIPLES OF NATURAL PHILOSOPHY* (I. Bernard Cohen & Anne Whitman trans., 1999) (1687).

13. See BERNARD COHEN, *SCIENCE AND THE FOUNDING FATHERS* at 256 (Norton 1997) (stating that “[b]asic to the Newtonian system were the great generalizations of a universe governed by immutable natural laws and of harmony as the pattern and product of these laws.”)

14. *Id.*

15. *Id.*

16. As James Hackney summarizes Newton's influence:

Newton postulated that time and space could be measured as absolute entities and were fixed. . . . Absolute time and space can be contrasted to the relational view put forward by Leibniz, who believed that space and time were not independent but tied to other things and events. The scientific debate between the absolutist view (Newtonian) and the relational (Leibniz) spilled over into philosophy because it was linked to general speculation regarding space, time, and human perception. Absolutism triumphed, supported the geometric vision, and allowed determinism to prevail.

JAMES HACKNEY, JR., *UNDER COVER OF SCIENCE: AMERICAN LEGAL-ECONOMIC THEORY AND THE QUEST FOR OBJECTIVITY* 12 (Duke U. Press 2007). The Newtonian view of the universe heavily influenced the early formalist “scientific” view of the common law. *Id.* at 11–19. The study of law came to be viewed as a scientific exercise of deducing specific rules from the fixed first principles of a “natural” law. *Id.* For an excellent summary of how the new systematic view of science, combined with a Cartesian, mathematical view of knowledge, influenced legal theory, see M.H. Hoeflich, *Law & Geometry: Legal Science from Leibniz to Langdell*, 30 AM. J. LEGAL HIST. 95 (1986). See also Barbara J. Shapiro, *Law and Science in Seventeenth Century England*, 21 STAN. L. REV. 727, 734–35 (1969) (stating that, in the seventeenth century, “[n]atural law though hardly a novel conception in European thought, moved to the center of political analysis and was then gradually transformed from a religious to a more secular and scientific conceptual framework that sought to deal with the universal regularities of men in societies as others deal with the regularities of physical nature.”).

17. See, e.g., HACKNEY, *supra* note 16, at 12.

on, including the “laws” that support human liberty, is “out there,” available or possession by any rational person.¹⁸

Francis Bacon supplied thinkers such as Jefferson with a philosophy of science that understood the scientific enterprise as a gradual accumulation of verifiable facts that constitute reality.¹⁹ Bacon understood proper scientific practice to consist in disciplined empirical observation and testing, which would produce a steady increase in useful knowledge. His model for the natural sciences was the practice of mechanical arts:

Signs are also to be drawn from the increase and progress of systems and sciences. For what is founded on nature grows and increases, while what is founded on opinion varies but increases not In the mechanical arts, which are founded on nature and the light of experience, we see . . . these (as long as they are popular) are continually thriving and growing, as having in them a breath of life, at first rude, then convenient, afterwards adorned, and at all times advancing.²⁰

18. It is clear that a structured, somewhat deterministic view of law and nature influenced the framers of the Constitution. See COHEN, *supra* note 13, at 258–62 (1995). For example, James Madison referred to Newtonian principles of celestial physics in relation to the stability of the political system. *Id.* at 258. Likewise, the Federalist Papers are replete with references to Newtonian mechanics. *Id.* at 269–72. Although the Newtonian influences on the Constitution seem evident, there is little direct evidence of what the founders specifically intended by Constitution’s patent clause, the only direct reference to “science” in the Constitution. U.S. CONST. art. I, § 8, cl. 8, para. 8; COHEN, *supra* note 13, at 238–43. In particular, the patent clause has been the subject of intense discussion surrounding and following *Eldred v. Ashcroft*, 537 U.S. 186, 211–218 (2003). In *Eldred*, the Court rejected the argument that the preamble to the Copyright Clause prohibits an extension of the copyright term for works already protected by copyright. For summaries of the debate surrounding the *Eldred* Court’s interpretation of the intellectual property clause, see Dotan Oliar, *Making Sense of the Intellectual Property Clause: Promotion of Progress as a Limitation on Congress’s Intellectual Property Power*, 94 Geo. L.J. 1771 (2006); Paul M. Schwartz & William Michael Treanor, *Eldred and Lochner: Copyright Term Extension and Intellectual Property as Constitutional Property*, 112 Yale L.J. 2331 (2003). Edward Walterscheid has illuminated the traditional theory that the intellectual property clause was a means of limiting monopolistic crown privileges. Edward Walterscheid, *To Promote the Progress of Science and Useful Arts: The Background and Origin of the Intellectual Property Clause of the United States Constitution*, 2 J. Intell. Prop. L. 1 (1994). More recently, Dotan Oliar has demonstrated that the “preamble” to the intellectual property clause—“to promote the Progress of Science and useful Arts”, U.S. CONST. art. I, § 8, cl. 8, para. 8.—was intended as a substantive limitation on Congress’ power. Oliar, *supra*. Oliar does not explore how this notion of “progress” is rooted in Newton, Bacon, and Locke, but he does argue that the framers believed science progressively obtains useful knowledge. *Id.* at 1809–10.

19. See Brian Vickers, *Francis Bacon and the Progress of Knowledge*, 53 J. HIST. IDEAS 195, 516–17 (1992) (stating that “Bacon shifts the discussion from the concept of ‘entity’ to the new idea that ‘it is solely the motion and arrangement of the minutest parts of bodies that can account for their macroscopic appearance.’ By conceiving Forms as ‘combinations of material units and simple motions’ which acted as ‘intrinsic agents’ in the constitution of matter, Bacon opened the door ‘for a purely mechanistic or materialistic type of explanation in natural philosophy.’”).

20. FRANCIS BACON, *NOVUM ORGANUM*, reprinted in 8 THE WORKS OF FRANCIS BACON, at 106 (James Spedding et al. ed., Taggard & Thompson 1863) (1620).

The notion that reality is amenable to systemization through bite-size induction, that knowledge is unified and ever advances in incremental steps and that this advance of knowledge produces beneficial advances in technology, lies close to the heart of the thinkers who birthed contemporary intellectual property law. In a letter to Benjamin Waterhouse, for example, Thomas Jefferson muses on the cumulative nature of invention:

But the question, who commenced the revolution? is as difficult as that of the first inventors of a thousand good things . . . the fact is, that one new idea leads to another, that to a third, and so on through a course of time until some one, with whom no one of these ideas was original, combines all together, and produces what is justly called a new invention. I suppose it would be as difficult to trace our revolution to its first embryo.²¹

In the same letter, Jefferson expresses his great optimism about the advance of science and technology:

When I contemplate the immense advances in science and discoveries in the arts which have been made within the period of my life, I look forward with confidence to equal advances by the present generation, and have no doubt they will consequently be as much wiser than we have been as we than our fathers were, and they than the burners of witches. Even the metaphysical contest, which you so pleasantly described to me in a former letter, will probably end in improvement, by clearing the mind of Platonic mysticism and unintelligible jargon.²²

These are notions with a direct lineage to Bacon.²³ They echo resoundingly in the intellectual property clause's statement of purpose: "to promote the progress of science and useful arts."²⁴

Finally, John Locke's epistemology and theory of language also influenced Jefferson's candle. Locke's epistemology rooted knowledge in the foundation of human reason, and endowed human propositions with the capacity to establish universal, fully translatable truth claims.²⁵ Like Bacon

21. Letter from Thomas Jefferson to Benjamin Waterhouse (Mar. 3, 1818), in *THE WRITINGS OF THOMAS JEFFERSON* 162, 163 (Albert Ellery Berg, ed., 1905).

22. *Id.* at 164–65.

23. John Adams held an even more pragmatic, goal-oriented view of scientific progress. He famously stated that "nature itself is all Arcanum; and I believe it will remain so. It was not intended that men with their strong passions and weak principles should know much. Without more decisive and magisterial moral discernment, much knowledge would make them too enterprising and impudent." Handler, "Nature Itself is All Arcanum": *The Scientific Outlook of John Adams*, 120 *PROC. OF AMER. PHIL. SOC.* 216, 224 (1976). In Adams' view, the sciences find their true vocation as servants of agriculture, manufactures, and commerce." *Id.* at 223.

24. U.S. Const. art. I, § 8, cl. 8.

25. See generally Roger Woolhouse, *Locke's Theory of Knowledge*, in *THE CAMBRIDGE COMPANION TO LOCKE* (Cambridge University Press 1994), at 146–71; Stanford University, *John Locke*, in *STANFORD ENCYCLOPEDIA OF PHILOSOPHY* § 2.3 (Stanford University, Revised 2006) (discussing Locke's theory of language), available at <http://plato.stanford.edu/entries/locke/>.

Locke attempted to develop an empiricist epistemology that would escape the solipsism of Cartesian rationalism and yet provide certain knowledge of the world as it is.²⁶

Locke rejected Descartes' concept of innate ideas.²⁷ Instead, Locke argued that people are born with a mental *tabula rasa* and acquire ideas through experience.²⁸ Experience comes through external data impinging on the senses (sensations) and internal experience ("reflection").²⁹ A person can know his or her own existence, and the existence of God, intuitively. Knowledge of the external world, however, comes only from sense data.³⁰

Locke's views about empirical knowledge led to and were complemented by his view of language. For Locke, cognition is prior to language.³¹ Human ideas (cognition) can accurately represent the world, and human language can accurately convey human ideas.³² Language, then, can correspond to reality.³³ The acquisition of knowledge involves making accurate observations and conveying the ideas generated by those observations in plain language.³⁴ As Locke summarized it:

26. Cartesian rationalism attempted to achieve certain knowledge starting with the data of human reason alone. Descartes believed that some ideas—such as the idea of one's own existence, summarized in his famous dictum "*cogito ergo sum*"—are innate and self-evident. Only innate ideas, Descartes held, are certain—all other ideas, including those derived from the senses, could suit from mistake or deception. Therefore, Descartes sought to build the quest for certain knowledge on the foundation of innate ideas. The famous problem with Descartes' approach is that it led to solipsism, and thereby threatened to undermine the quest for certain knowledge. See, e.g., Carla Essse, *Enlightenment Epistemology and the Laws of Authorship in Revolutionary France, 1777–1793*, 30 REPRESENTATIONS 109 (1990).

27. For a comparison of Descartes and Locke, see H.A.S. Schankula, *Locke, Descartes, and the Science of Nature*, 41 J. HIST. IDEAS 459, 475–77 (1980) (noting that "Locke's repudiation of Descartes' method and logic and his consequent repudiation of Descartes' epistemology and philosophy of science are evident in several places throughout the *Essay*. . . . In Locke's considered 'mature' opinion, the correct method of discovery in the natural sciences (including, apparently, psychology) is not 'the high priori method' of the Scholastics or, more especially, of the Cartesians; it is 'the plain historical method' of Robert Boyle and his fellows in the early Royal Society of London.").

28. *Id.*

29. *Id.*

30. *Id.*

31. Locke states "[w]ords being voluntary signs, they cannot be voluntary signs imposed by man on things he knows not. That would be to make them signs of nothing, sounds without signification." JOHN LOCKE, *Of the Signification of Words*, in AN ESSAY CONCERNING HUMAN UNDERSTANDING 291, 291–92 (25th ed., 1825).

32. Locke identified three purposes of language: "First, [t]o make known one man's thoughts to one another; Secondly, [t]o do it with as much ease and quickness as possible; and thirdly, thereby to convey the knowledge of things." *Id.* at 370.

33. Locke did not, however, assert that language corresponds *directly* to reality. Rather, language signifies ideas, which in turn represent reality. *Id.* at 290 (stating that people "often suppose their words to stand also for the reality of things," but that "it is a perverting the use of words, and brings unavoidable obscurity and confusion into their signification, whenever we make them stand for any thing but those ideas we have in our own minds.").

34. Locke's theory of language was not naïve; he recognized that human language often is ambiguous. He proposed a number of ways in which speakers could make their meaning more plain. See *id.* at 375–84.

Knowledge then seems to me to be nothing but the perception of the connection and agreement, or disagreement and repugnancy, of any of our ideas. In this alone it consists. Where this perception is, there is knowledge; and where it is not, there, though we may fancy, guess, or believe, yet we always come short of knowledge.³⁵

Locke's epistemology and his theory of language wonderfully complement Bacon's account of observational science and Newton's mechanist universe. Bacon's method of careful, discrete observation and progressive data accumulation suggests a means whereby people can acquire reliable sense data. Newton's mechanistic universe suggests that the sense data people acquire by such a method relate to an unchanging, predictable external reality. Locke's epistemology says that such sense data produces ideas ascertainable to human reason and that language can imperfectly but accurately convey ideas which are prior to language. Human knowledge of the world as it is rests on a firm empirical foundation.

Under a worldview so heavily informed by Newton, Bacon, and Locke, "information" consists of universal propositions that directly describe reality. "Information," then, is essentially synonymous with "Nature." One who knows something knows Nature-as-it-is. Nature-as-it-is is an undivisible given—some resources found in Nature may be used up, but Nature itself is inexhaustible. Information cannot be used up—information constitutes the universe itself, and all rational beings have equal access to it. Jefferson's candle is Nature itself.³⁶

35. *Id.* at 385.

36. It is not surprising that some strands of intellectual property scholarship rely heavily on Locke's labor theory. See, e.g., JOHN LOCKE, *Of Property*, in *SECOND TREATISE OF GOVERNMENT* 18, 19 (C. B. MacPherson ed., 1980) (stating that "[i]t being by him removed from the common state nature hath placed it in, it hath by this labour something annexed to it, it excludes the common right of other men: for this labour being the unquestionable property of the labourer, no man but he can have a right to what that is once joined to, at least where there is enough, and as good, left in common for others.") (emphasis added). See also Justin Hughes, *Created Facts and the Flawed Ontology of Copyright Law*, 83 *NOTRE DAME L. REV.* 43, 98-99 (2007); Justin Hughes, *The Philosophy of Intellectual Property*, 77 *GEO. L.J.* 287, 300-14 (1988); Wendy J. Gordon, *A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property*, 102 *YALE L.J.* 1533, 1544-55 (1993); Alfred C. Yen, *Restoring the Natural Law: Copyright as Labor and Possession*, 51 *OHIO ST. L.J.* 517, 529-31 (1990).

II. THE ROMANTIC AUTHOR AND INFORMATION ECOLOGY

1. The Romantic Author Critique and Cultural Environmentalism

Many sources describe challenges to the Enlightenment's foundationalist account of knowledge.³⁷ Given the significant debates in epistemology and in the history and philosophy of science since Bacon, Newton, and Locke, one would expect to find robust postcritical intellectual property literature deconstructing the ontological fiction that "information" and Nature are equivalent. The only serious postmodern critique of intellectual property within legal scholarship, however, focuses instead on textual criticism and the "romantic author."³⁸

Michel Foucault's essay, *What Is an Author?* set the stage for the romantic author critique.³⁸ Foucault viewed the concept of "authorship" as historically contingent on Enlightenment individualism and as reflecting a drive to privatize and control knowledge.³⁹ Martha Woodmansee and others criticized Foucault's historical perspective with an account of how the concept of authorship in eighteenth-century Germany was tied to the rise of the book trade.⁴⁰

The "romantic author" critique was taken up as an interdisciplinary movement within intellectual property scholarship through the Society for Critical Exchange, which produced the Bellagio Declaration.⁴¹ The heart of the Bellagio Declaration is a notion of intellectual property as a power play founded on the fiction of the solitary inventor or author.⁴² As the Bellagio Declaration signatories affirmed:

37. For example, Alasdair MacIntyre demonstrates how the rationalist-empiricist understanding of the role and limitations of human reason led to a crisis in ethical thought. Alasdair MacIntyre, *AFTER VIRTUE* 51–61 (2d ed. 1984). In the classical tradition, ethics were derived from a priori notion concerning how humanity "ought to be." *Id.* With the rise of empiricism and rationalism, the notion of an "ought" became divorced from what "is." *Id.* Science and the scientific method—the only path to certain knowledge—therefore could not inform ethical reflection. *Id.* Ethics then became a matter of mere emotions, or worse, an expression of Nietzsche's naked will to power. *Id.* In a somewhat similar vein, James Hackney chronicles how legal theory progressed from natural law formalism through legal realism, critical legal studies, and relativistic pragmatic economic analysis. See HACKNEY, *supra* note 16.

38. Michel Foucault, *What Is an Author?*, in *TEXTUAL STRATEGIES: PERSPECTIVES IN POST-STRUCTURALIST CRITICISM* 141–60 (1st ed. 1979).

39. See Hesse, *supra* note 26, at 109.

40. See *id.* at 110.

41. See Society for Critical Exchange, <http://www.case.edu/affil/sce/index.html>; The Bellagio Declaration, <http://www.case.edu/affil/sce/BellagioDec.html>.

42. See The Bellagio Declaration, <http://www.case.edu/affil/sce/BellagioDec.html>.

Contemporary intellectual property law is constructed around a notion of the author as an individual, solitary and original creator, and it is for this figure that its protections are reserved. Those who do not fit this model—custodians of tribal culture and medical knowledge, collectives practicing traditional artistic and musical forms, or peasant cultivators of valuable seed varieties, for example—are denied intellectual property protection.⁴³

James Boyle developed a theory of law and information based on the poststructuralist critique of authorship.⁴⁴ Boyle suggested that prior to the eighteenth-century Enlightenment, authors were viewed as ordinary craftsmen, one relatively small piece of a collective effort to produce a text.⁴⁵ Boyle argued, however (drawing on Woodmansee, and, in turn, on Foucault), that eighteenth-century Enlightenment thinkers came to view authorship as an act of inspiration, a flash of genius.⁴⁶ The author, in this view, added something new, transformative, and original to that which already existed.⁴⁷ The author then has a moral right to protect and control this aspect of his or her person.⁴⁸

Boyle argued that this historically contingent concept of authorship continues to underwrite the economic perspective on law and information. “[B]ecause in most conflicts the paradigm of authorship tends to fit one side better than the other,” he says, “this romantic grounding provides economic analysis with at least the illusion of certainty. Authors tend to win.”⁵⁰ Having deconstructed the power relationship that lies at the heart of contemporary intellectual property policy, Boyle suggested that we need a politics of information instead of the seemingly disinterested language of economics.⁵¹

Boyle supplied the framework for political commitment by drawing on the resources of the environmental movement.⁵² Information, Boyle suggests, is part of a “socially and technologically constructed reality” that constitutes a sort of information ecosystem.⁵³ Like a natural ecosystem, the information ecosystem is a fragile, interconnected whole.⁵⁴ The tools of environmental economics, including the costs of externalities and the regulatory and market measures for reducing them, can be applied to issues surrounding the conse-

43. *Id.*

44. James Boyle, *A Theory of Law and Information: Copyright, Spleens, Blackmail, and Insider Trading*, 80 CAL. L. REV. 1413, 1441–42 (1992); JAMES BOYLE, *SHAMANS, SOFTWARE AND SPLEENS: LAW AND THE CONSTRUCTION OF THE INFORMATION SOCIETY* (Harvard University Press 1997).

45. Boyle, *A Theory of Law and Information*, *supra* note 44, at 1451–52.

46. *Id.* at 1464–65.

47. *Id.* at 1465 (stating “[i]n this vision, the author was not the journeyman who learned craft and then hoped to be well paid for it. The romantic author was defined not by mastery of prior set of rules, but instead by the transformation of genre, the revision of form. Originality became the watchword of artistry.”).

48. *Id.* at 1468–69.

49. *Id.*

50. *Id.* at 1527.

51. *Id.* at 1538–40.

52. James Boyle, *A Politics of Intellectual Property: Environmentalism for the Net?*, 87 DUKE L.J. 87, 113 (1997).

53. *Id.* at 93.

54. *Id.* at 108–09.

ation of the information environment.⁵⁵ In addition, the coalition politics of the environmental movement can serve as a model for disparate groups interested in preserving different aspects of the information commons.⁵⁶

3. Deconstructing the Romantic Author and the Cultural Environment

The romantic author critique and cultural environmentalism metaphors have proven compelling to many writers and activists, as evidenced by the scholarly and political energy devoted to preserving and expanding the public domain since the late 1990's.⁵⁷ Despite its promise, however, it is unclear whether cultural environmentalism has captured the public imagination or significantly impacted public policy.

The years since the dawn of cultural environmentalism have produced more and more fences throughout the cultural commons—including the Digital Millennium Copyright Act,⁵⁸ the U.S. Supreme Court's blessing over copyright term extensions,⁵⁹ an expansive European Union database right,⁶⁰ judicial decisions eviscerating the experimental use exception to patent infringement,⁶¹ toothless compromise on access to patented medicines under TRIPS and other efforts to enclose the international cultural commons,⁶² a sustained wave of "reverse private attorney general" litigation by content holders against file sharers,⁶³ an explosion of gene patents,⁶⁴ aggressive intellectual property

55. *Id.*

56. *Id.* at 110–11.

57. See James Boyle, *Cultural Environmentalism and Beyond*, 70 LAW & CONTEMP. PROBS. 17 (2007) (noting that "[i]f one looks at these institutions and actors and at the range of issues to which they focus—from software to drug patents, from the reverse engineering of software to access to archival records, the obvious question is 'how did they overcome the collective action problem?' What ties together a critique of digital locks and the access to medicines movement? I think the answer points to the usefulness of the environmental analogy.").

58. 17 U.S.C. §§ 1201–1205 (1998).

59. *Eldred v. Ashcroft*, 537 U.S. 186 (2003).

60. See THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION, Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31996L009:EN:HTML>.

61. *Madey v. Duke University*, 307 F.3d 1351, 1361–62 (Fed. Cir. 2002).

62. See Gen. Council of the World Trade Org., *Implementation of Paragraph 6 of the Doha Declaration on the TRIPS Agreement and Public Health*, Aug. 30, 2003, http://www.wto.org/english/tratop_e/trips_e/implem_para6_e.htm. See also David W. Opderbeck, *Patents, Essential Medicines, and the Innovation Game*, 58 VAND. L. REV. 501, 513–18 (2005) (discussing compromise decision); Peter K. Yu, *The International Enclosure Movement*, 82 IND. L.J. 827, 872–81 (2007).

63. See David W. Opderbeck, *Peer-to-Peer Networks, Technological Evolution, and Intellectual Property Reverse Private Attorney General Litigation*, 20 BERKELEY TECH. L.J. 1685, 688–89 (2005) (discussing and providing statistics on music industry lawsuits against file sharers).

64. See Committee on Intellectual Property Rights in Genomic and Protein Research and Innovation, REAPING THE BENEFITS OF GENOMIC AND PROTEOMIC RESEARCH: INTELLECTUAL PROPERTY RIGHTS, INNOVATION, AND PUBLIC HEALTH 101–16 Stephen A. Merrill & Anne-Marie Fazzia eds., (The National Academies Press 2006) [hereinafter NAP REPORT]. This report notes

acquisition and enforcement by universities,⁶⁵ a significant increase in intellectual property litigation,⁶⁶ and so on. Even those developments that rest on intellectual property rights, such as a recent wave of U.S. Supreme Court decisions concerning patent law and a set of patent reform proposals working through Congress, generally reflect successful arguments by industry concerning the costs of litigation rather than the efforts of cultural environmentalists.⁶⁷

Of course, the political economy of regulatory capture provides a more important explanation for cultural environmentalism's failure to stem the tide towards stronger authorial rights.⁶⁸ But there are at least two additional substantive reasons for this failure: historiography and indeterminacy.

1. *Historiography*

Part of the problem with cultural environmentalism is that the underlying romantic author critique is flawed. It seems clear that the romantic author underwrites the "moral rights" stream of intellectual property policy, though the philosophical underpinnings are likely more Hegelian than its advocates seem to suggest.⁶⁹ It is not clear, however, that the romantic author critique accurately captures the strands of eighteenth-century Enlightenment thought that most directly informed American intellectual property policy.

that the rate of gene patenting activity accelerated rapidly in 1991, from an average of about 100 per year to a peak of 4,500 in 2001. *Id.* at 101–02. The study identified approximately 33,100 nucleic acid patents. *Id.* at 101. These include patents explicitly claiming 20 percent of the genes in the human genome. *Id.* at 102. The study does not, however, find evidence for a biotechnology patent thicket. *Id.* See also Yann Joly, *Open Source Approaches in Biotechnology: Utopia Revisited*, 59 ME. L. REV. 385, 395–98 (2007) (collecting empirical studies of anticommons effects in biotechnology).

65. See NAP REPORT, *supra* note 64, at 117–18 (describing university patent licensing practices).

66. ADMIN. OFFICE OF THE U.S. COURTS, STATISTICAL TABLES FOR THE FEDERAL JUDICIARY, Table C-2 (2001–2005), <http://www.uscourts.gov/stats/index.html>. From 2000–2005 the number of copyright, patent, and trademark cases filed in the U.S. federal courts increased approximately 30%, from 8,640 to 12,009 cases. *Id.* The number of patent cases filed in the U.S. federal courts increased by 111% from 1991–2000. Gauri Prakesh-Canjels, *Trends in Patent Cases: 1990–2000*, 41 IDEA 283, 284 (2001). At the same time, it should be noted that the U.S. Supreme Court has issued several opinions in recent years that likely will reduce the incidence of patent infringement lawsuits, and that Congress has seriously considered patent reform legislation designed to tighten requirements for patents and reduce patent damage awards. See *Microsoft Corp. v. AT&T Corp.*, No. 05-1056, slip op. at 1–2 (U.S. 2007) (restricting extrajurisdictional enforcement of U.S. patents); *KSR Int'l Co. v. Teleflex Inc.*, No. 04-1350, slip op. at 11–12 (U.S. 2007) (broadening standards for finding a patent invalid for obviousness); *Medlumm Inc. v. Genentech Inc.*, 549 U.S. 118, 128 (2007) (patent licensee may seek declaratory judgment of patent invalidity before terminating license); *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 391–92 (2006) (no automatic injunctions in patent infringement cases); H.R. 1908, 110th Cong. (2007), 2007 Cong. US HR 1908 (Westlaw); S. 1145, 110th Cong. § 2 (2007), 2007 Cong. US HR 1145 (Westlaw).

67. See Hesse, *supra* note 26.

68. See, e.g., David W. Opperbeck, *The Penguin's Paradox: The Political Economy of International Intellectual Property and the Paradox of Open Intellectual Property Models*, 37 STAN. L. & POL'Y REV. 101, 102–03 (2007).

69. Cf. Hughes, *supra* note 36, at 350–51.

As Carla Hesse has demonstrated, some streams of thought within the French Enlightenment contradict the romantic author paradigm.⁷⁰ Some French Enlightenment thinkers whose epistemology tended towards Descartes' rejection of innate ideas, such as Denis Diderot, argued that authors have a moral obligation to their work because ideas spring *sui generis* from the author's mind.⁷¹ This is consistent with the romantic author thesis. Other French thinkers, however, such as the Marquis de Condorcet, whose epistemology was more akin to Locke's sensationalist conception of ideas, have rejected this position.⁷²

Condorcet argued that because ideas arise through sense perceptions, and sense perceptions give more or less direct access to Nature, no one person can claim a natural moral privilege to "possess" an idea.⁷³ Moreover, because ideas are based on sense perceptions and are not created by individual minds, an infinite number of people can share the idea without diminution.⁷⁴ In fact, Condorcet argued, authorial privileges tend to unnaturally limit access to ideas and to promote literary embellishment rather than the sort of plain language that communicates ideas directly.⁷⁵

The differences between Condorcet and Diderot concerning authorial privileges reflect the broader eighteenth-century debates between Cartesian rationalists and Lockean empiricists.⁷⁶ It is impossible to discuss in detail here how that debate wound into the thinking of the American founders. It does seem clear, however, that the empiricist tradition reflected in the Scottish Enlightenment significantly influenced the founders.⁷⁷ Indeed, Jefferson's observation that "one new idea leads to another, that to a third, and so on through a course of time until some one, with whom no one of these ideas was original, combines all together, and produces what is justly called a new invention" belies the notion that Jefferson's candle is rooted in romantic author or romantic inventor tropes.⁷⁸ This empiricist, pragmatic American vision of intellectual property that was inaugurated in the intellectual property clause of the U.S. Constitution—and not the romantic author deconstruction of that clause—still prevails around the world.

70. Hesse, *supra* note 26, at 115. The historical context for Hesse's discussion is a debate in pre-Revolutionary France about whether to abolish the Paris Publishers' and Printers' Guild. See *id.* at 114–15. The Guild was in fact suppressed during the Revolution. *Id.* at 117–19. The first statutory property law that was adopted after the revolution granted authors a limited privilege in their works. *Id.* at 119–20. The primary political motivation for this move, however, was not to enhance authorial power, but rather to commoditize books and to control the flow of seditious literature. *Id.* at 119–24.

71. *Id.* at 114.

72. *Id.* at 115.

73. *Id.* at 115–16.

74. *Id.* at 116.

75. *Id.*

76. *Id.* at 117.

77. See, e.g., Roy Branson, *James Madison and the Scottish Enlightenment*, 40 *J. HIST. EDUC. STUD.* 235 (1979); Daniel Walker Howe, *Why the Scottish Enlightenment Was Useful to the Framers of the American Constitution*, 31 *COMP. STUD. SOC'Y HIST.* 572, 572–73 (1989) (summarizing studies of links between the American founders and Scottish Enlightenment thought).

78. Letter from Thomas Jefferson to Benjamin Waterhouse, *supra* note 21.

2. Indeterminacy

In addition to its questionable historiography, the romantic author-culture environmentalist movement has faltered because of its indeterminacy. What exactly is "culture," and what is a "healthy" cultural environment? How can such questions be answered without devolving into naked assertions of political will?

The difficulty of these questions is illustrated in a recent series of articles published in *Law & Contemporary Problems* in honor of James Boyle.⁷⁹ Some of these articles seek to apply the cultural environmentalist critique to the network neutrality debate.

At first blush, it seems difficult to situate the network neutrality debate within the romantic author framework. This is because the network neutrality debate concerns control over bandwidth, not control over an identifiable "work" or "invention." Nevertheless, Susan Crawford seeks to contextualize the network neutrality debate with the romantic author framework by suggesting that the telephone and cable companies have positioned themselves as romantic "network builders."⁸⁰ Crawford wonderfully invokes this image: "It is as if a hard-hatted young builder is standing before us, sleeves rolled up, a coil of fiber over his shoulder, muscles rippling, eager to achieve the American dream of property ownership and all its benefits of leases, lending, and upward mobility."⁸¹ As with traditional authorship and inventorship, however, it is not entirely clear that deconstructing the romantic figure entirely clarifies the debate.⁸²

Crawford is certainly right that there is an element of valorization in industry rhetoric. The Telecommunications Industry Association (TIA), for example, emphasizes the "needs of service providers in a competitive market to manage the security and functionality of *their* networks."⁸³ The primary thrust of industry rhetoric, however, valorizes unregulated competition in markets rather than authorship and ownership.⁸⁴ In talking points available on its Web site, for example, the National Cable and Telecommunications Association (NCTA) states that

79. See Symposium, *Cultural Environmentalism @ 10*, 70 LAW & CONTEMP. PROBS. (2007).

80. Susan P. Crawford, *Network Rules*, 70 LAW & CONTEMP. PROBS. 51, 53–54 (2007).

81. *Id.* at 54.

82. Crawford ably deconstructs any notion of cable and telephone companies as romantic builders. *Id.* at 68–69 (noting that "the reality is that the telcos (or the cablecos or wirelesscos) do not create the entire value of 'the internet' and it is 'the internet' that their subscribers want access. . . . Although the providers do not share this view, the engineers who designed the internet know that it is nothing but an agreement to interconnect and to use a common protocol and naming system.").

83. NCTA.com, TIA Broadband Agenda, http://www.tiaonline.org/gov_affairs/issues/broadband/documents/TIABroadbandAgenda.pdf (last visited March 14, 2009). The TIA "is the leading trade association representing the global information and communications technology (ICT) industries. . . ." See <http://www.tiaonline.org/about/> (last visited Feb. 18, 2009).

84. See NCTA.com, Internet Regulation, <http://www.ncta.com/IssueBrief.aspx?contentId=2715> (last visited Dec. 14, 2007).

Those who call for regulation of the Internet in the name of “network neutrality” are offering a solution in search of a problem since there is no evidence of a market failure justifying the imposition of common carrier-like regulation on broadband services. “One size fits all” Internet Regulation would replace the workings of the marketplace with government regulation, and choose today what business models are, and are not, permissible. By contrast, in the current market-driven environment, companies have the freedom to experiment with multiple business models, producing more choices and competition in content and providers for consumers, and more innovation than ever before.⁸⁵

In fact, far from suggesting that romantic innovators should be rewarded for their creativity and labor, the NCTA argues that big internet companies such as Google and Yahoo! are backing network neutrality in an improper effort to control the Internet.⁸⁶

A second and perhaps more important weakness in the existing cultural environmentalism approach to network neutrality arises at the ontological and epistemological level concerning the nature of “culture” and “information.” Proponents of cultural environmentalism have not adequately defined “culture,” except for an apparent assumption that culture is socially constructed all the way down.⁸⁷ For example, Brett Frischmann tied some of his thoughts about spillovers to cultural environmentalism in a review of Yochai Benkler’s important book *The Wealth of Networks*.⁸⁸ Frischmann noted that the “cultural environmentalism” metaphor remains amorphous because the nature of “culture” is undefined in legal scholarship concerning information policy.⁸⁹ Fur-

85. NCTA.com, Internet Regulation—Full Brief, <http://www.ncta.com/IssueBriefs/Internet-Regulation.aspx?view=2> (last visited Mar. 14, 2009). The NCTA is the primary trade association for the cable industry in the United States. See NCTA.com, About NCTA, <http://www.ncta.com/about/About/AboutNCTA.aspx> (last visited Dec. 14, 2007).

86. See NCTA.com, “Internet Regulation—Q&A,” available at <http://www.ncta.com/IssueBriefs/Internet-Regulation.aspx?view=3> (last visited March 4, 2009) (stating that “[s]ome of the loudest proponents of Internet Regulation are large companies, like Google and Yahoo!, that are seeking to lock their market dominance in place. These companies flourished in large part because cable operators, telephone companies, and wireless providers have invested billions in building a broadband infrastructure that supports their business model.”). Oral Testimony of Kyle McSlarrow, President & CEO, NCTA, before U.S. Senate Commerce Committee regarding “Network Neutrality,” (Feb. 7, 2006), <http://www.ncta.com/DocumentBinary.aspx?id=11> (stating that “what is really going on here is that companies that started as entrepreneurs and innovators are now so invested in the status quo that they fear—not cable or telephone broadband providers—but at next idea, the next search engine that takes off. What they are asking you to do is to freeze the Internet in place, with their position in the marketplace locked in.”).

87. See Julie E. Cohen, *Network Stories*, 70 LAW & CONTEMP. PROBS. 91, 92 (2007) (stating that “[t]his is, paradoxically, where the power of the environmental analogy ends; arguments from biodiversity and evolutionary theory will not do. What makes the network good can only be defined by generating richly detailed ethnographies of the experiences the network enables and the activities it supports, and articulating a normative theory to explain what is good, and worth preserving, about those experiences and activities.”).

88. Brett M. Frischmann, *Cultural Environmentalism and the Wealth of Networks*, 74 U. HI. L. REV. 1083 (2007).

89. *Id.* at 1091–92 (stating that “[r]emoving the ‘ism’ and leaving aside the political call to arms, we are left with a metaphor that remains insufficiently worked out.”).

ther, Frischmann argued, the environmental metaphor breaks down because the natural environment is not socially constructed.⁹⁰ In contrast, culture Frischmann says, "is an 'artifact,' something made by humans."⁹¹

The inability to define "culture" beyond mere social construction cripples our ability to manage intractable social problems in the networked world. For example, one significant empirical question that is almost always ignored by cultural environmentalists is the problem of network "pollution."⁹² Proponents of network neutrality who write from a cultural environmentalism perspective cite the explosive growth in user-generated content as evidence that an open environment best preserves and expands the cultural commons.⁹³ But there is evidence that, like a national park choked with overgrown brush that has never been cleansed by fires, the open Internet encourages repetitive content, spam and deceptive publications, all of which impose social costs.⁹⁴

90. *Id.* at 1092.

91. *Id.*

92. Gian Maria Greco & Luciano Floridi, *The Tragedy of the Digital Commons*, 6 ETHN. INFO. TECH. 73, 76 (2004) (stating that "improving the Infosphere by bridging the digital divide without paying due attention to the necessary responsibility of the users, is likely to bring about an increase in bandwidth saturation and information pollution.");

93. See, e.g., Crawford, *supra* note 80, at 69. Crawford notes that "[t]o connect with other people to find groups and affiliations, users are publishing 70,000 new blogs daily, and updating 700,000 existing blogs." *Id.* at 73 (citing About Technorati Media, <http://technoratimedia.com/about/>).

94. See, e.g., Angela Edmunds & Anne Morris, *The Problem of Information Overload: Business Organizations: A Review of the Literature*, 20 INT'L. J. INFO. MGMT. 17, 22 (2006) (stating that "A thread that runs through the literature is that, although there is an abundance of information, it is often difficult to obtain useful and relevant information among the vast volume of information which, at the very least, need to be scanned through to find the nuggets."); Byun Kwon Lee & Wei-Na Lee, *The Effect of Information Overload on Consumer Choice Quality in an Online Environment*, 21 PSYCHOL. & MARKETING 159 (2004) (quantifying effects of online information overload on consumer choice); PRANAM KOLARI ET AL., CHARACTERIZING THE SPLOGOSPHERE, (2006), <http://www.blogpulse.com/www2006-workshop/papers/splogosphere.pdf> (empirical description of spam blogs or "splogs"); PRANAM KOLARI ET AL., DETECTING SPAM BLOGS: A MACHINE LEARNING APPROACH (2006), http://ebiquity.umbc.edu/_file_directory/papers/260.pdf. Yochai Benkler dubs this the "Babel objection," and argues that it can be effectively overcome in open, peer-produced networks through the voluntary ranking and filtration mechanisms inherent in such networks. See YOCHAI BENKLER, THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM 10 (2006). As Frank Pasquale has observed, existing copyright rules likely exacerbate this "information overload externality" problem. See Frank Pasquale, *Copyright in an Era of Information Overload: Toward the Privileging of Internet Categorizers*, 60 VAND. L. REV. 135 (2007).

Cultural environmentalists also ignore how the actual content of user-generated communications affects the cultural commons. The openness of the Internet may facilitate terrorist activities.⁹⁵ Are Al Qaeda and the Aryan Brotherhood part of the cultural commons? Terrorism is a particularly difficult example for cultural environmentalists such as Yochai Benkler who believe the key normative concerns in favor of open network architecture are liberal norms such as autonomy, freedom to participate, and individual meaning making.⁹⁶ Do these norms extend to terrorists intent on exterminating liberal democracy through violence?⁹⁷

95. See, e.g., Michael Zanini & J.A. Edwards, *The Networking of Terror in the Information Age*, in, NETWORKS AND NETWARS: THE FUTURE OF TERROR, CRIME, AND MILITANCY 29 (Suzanne Spiekermann & Ronfeldt eds., 2001); GABRIEL WEIMANN, TERROR ON THE INTERNET: THE NEW FRONTIER, THE NEW CHALLENGES ix-x (2006). Weimann's description of terrorist activities on the Internet mirrors the sort of language cultural environmentalists use to describe the ways in which online networks free users from institutional, physical, and temporal boundaries:

In recent years, the Internet has allowed the art of terrorist communications to evolve to a point where terrorists are enabled to control the entire communications process: they can determine not only the content and context of their messages but also the means by which their messages are projected into cyberspace and targeted toward specific audiences.

The implications of this development are enormous: the terrorists are challenging the monopoly over mass communications long held by conventional and commercial state-owned television and radio broadcasting outlets and by the state and privately-owned press.

96. See BENKLER, *supra* note 94. For a discussion of how Benkler's work can be situated in the cultural environmentalism paradigm, see Frischmann, *Cultural Environmentalism and the Wealth of Networks*, *supra* note 88, at 1085.

97. Other criminal and unsavory uses of the Internet also spring to mind—from phishing fraud instructions for producing amphetamines and pipe bombs to “astroturf.” “Phishing” is the use of counterfeit Web sites and e-mails to mine personal information such as credit card numbers. See, e.g., Jennifer Lynch, *Identity Theft in Cyberspace: Crime Control Methods and Their Effectiveness in Combating Phishing Attacks*, 20 BERKELEY TECH. L.J. 259 (2006). Instructions for producing or obtaining recreational drugs, bombs, and other weapons abound on the Web. See, e.g., Paul M. Wax, *Just a Click Away: Recreational Drug Web Sites on the Internet*, 109 CALIF. COMM. & HIGH TECH. L. 449 (2002). “Astroturf” refers to the manipulation of lobbying and public relations campaigns using Web sites, blogs and e-mail by a few activists posing as a mass movement. See, e.g., Robert M. Bartow, *Some Peer-to-Peer, Democratically, and Voluntarily Produced Thoughts*, 5 J. CALIF. COMM. & HIGH TECH. L. 449, 457–60 (2007).

An equally difficult problem is that of pornography.⁹⁸ Some cultural environmentalists and others might argue that such expressions of human sexuality represent a benefit of an open network. Some studies suggest, however, that much of the pornography available on the Internet involves images of female subservience, that the Internet pornography industry exploits socially and economically vulnerable women, and that men who view Internet pornography regularly are more likely to engage in physical violence against women.⁹⁹ In addition, a significant percentage of Internet pornography involves the exploitation of children.¹⁰⁰ Moreover, some studies suggest that the addictive quality of pornography imposes social costs in lost productivity.¹⁰¹

Do these activities represent a healthy cultural commons, or are they the form of environmental pollution, or are they both at the same time? At very least, we must acknowledge that the terrorism and violence or child pornography facilitated by open networks might not represent a "healthy" cultural environment. On this point, cultural environmentalism as a merely constructivist project can only remain silent: culture is what it is, and the "is" need lead to any particular "ought."

98. See Bartow, *supra* note 97, at 454–56. As Professor Bartow notes,

Generally when "bad knowledge" is communicated, the locus of the harm is related to end uses. Instructions for building bombs, or for manufacturing amphetamines out of cold medicine, or for tapping into strangers' bank accounts do not cause any real damage until they are followed. With pornography, however, simply "producing" the "information" can inflict emotional or physical damages on living humans, such as HIV transmission. Pornography is also deeply linked to sex trafficking and slavery. The role of the Internet in enabling and incentivizing the production of pornography is a nontrivial aspect of the information society's big picture

Id. See also YOUTH, PORNOGRAPHY, AND THE INTERNET 21 (Dick Thornburgh & Richard S. Tedlow, eds., 2002) (noting that "on today's Internet, it is easy to find graphically depicted acts image heterosexual and homosexual intercourse (including penetration), fellatio, cunnilingus, masturbation, bestiality, child pornography, sadomasochism, bondage, rape, incest, and so on."). One study found that 42% of Internet users aged 10 to 17 years had been exposed to Internet pornography the prior year, and that 66% of those exposures were unwanted. Janis Wolak, et al., *Unwanted Exposure to Online Pornography in a National Sample of Youth Internet Users*, PEDIATRICS 247, 247 (2007).

99. See, e.g., Patricia M. Greenfield, *Inadvertent Exposure to Pornography on the Internet: Implications of Peer-to-Peer File-Sharing Networks for Child Development and Families*, APPLIED DEV. PSYCHOL. 741, 744 (2004) (noting that high-risk factors of Internet pornography "include impulsivity, hostility to women, and promiscuity" and that, among adolescent boys and young men, "very frequent use of pornography is associated with a much higher rate of sex aggression than found in youth of the same risk level who use pornography somewhat, seldom or never."); but see Neil Malamuth, et al., *Pornography and Sexual Aggression: Are There Reliable Effects and Can We Understand Them?*, 11 ANN. REV. SEX RES. 26 (2000) (discussion of conflicting studies).

100. See, e.g., JOHN CARR, CHILD ABUSE, CHILD PORNOGRAPHY, AND THE INTERNET (2004) (stating that "the arrival of the Internet has almost certainly led to an increase in the volume of child pornography in circulation and to an increase in the overall level of sexual offense against children and young people. It has also almost certainly led to an overall increase in exposure of children and young people to a wider range of undesirable or age-inappropriate sex materials, that are abusive in character or may become so.").

101. See, e.g., Ethel Quayle et al., *Sex Offenders, Internet Child Abuse, and Emotion Avoidance: The Importance of Values*, 11 AGGRESSION & VIOLENT BEHAV. 1 (2006) (discussing the addictive nature of child pornography).

Pragmatic Approaches in the Critical Vein and Shannon Information

Although the romantic author-cultural environmentalist movement has made little practical progress in its own right, the cultural critique underlying the movement is far from dead. Instead, the romantic author critique has been fused with other notions about “information” to create a focus on the “law” of code within the context of a liberal, social contractarian political framework.¹⁰² Open source and free culture advocates such as Yochai Benkler and Lawrence Lessig, for example, argue that open access to information can promote efficiency as well as enhance democracy.¹⁰³ Through this mechanism, cultural environmentalism has attempted to co-opt the resources of pragmatic economic analysis. The results can be helpful, but often the indeterminacy problem persists.

Lessig and many other writers who focus on the promise and perils of networked technology reflect an odd mix of influences. They unabashedly adopt a Jeffersonian-Enlightenment stance about disembodied information.¹⁰⁴ And yet, Lessig acknowledges that he has been “especially influenced” by James Boyle’s postmodern critique of intellectual property policy.¹⁰⁵ How are Lessig and other critical scholars able to fuse Enlightenment empiricism with postmodern, antirealist, social and linguistic constructionism? The answer is contemporary information theory, particularly as applied to social theory about communications networks and the Internet.

The telecommunications revolution of the twentieth century produced theories of information that have profoundly influenced intellectual property policy. In 1948, Claude Shannon published *A Mathematical Theory of Communication*, which marked the beginning of modern information theory.¹⁰⁶ Shannon’s primary concern was to describe how communications could be compressed and transmitted over a communication system with minimal interference or data loss.¹⁰⁷ Shannon demonstrated mathematically how the content of a communication could be taken from one medium, encoded and compressed, stored, transmitted over another medium, decoded and decom-

102. See Julie Cohen, *Creativity and Culture in Copyright Theory*, 40 U.C. DAVIS L. REV. 51, 1154–55 (2007) (noting that tensions in copyright theory “spring from a set of first-order methodological commitments associated with liberal political theory. They define the boundaries of copyright’s epistemological universe in a way that excludes many other approaches to investigating and theorizing about creative processes. The result is that despite the voluminous amount of copyright scholarship now being published, copyright theory remains impoverished in important outcome-determining ways.”).

103. See, e.g., LESSIG, *supra* note 7; BENKLER, *supra* note 94, at 10.

104. Lessig, quoting at length from Jefferson’s Letter to Isaac MacPherson, says “Jefferson said it better than I” LESSIG, *supra* note 7, at 132. After referring to Jefferson’s candle, Lessig writes “[u]nlike apples, and unlike houses, ideas are something I can take from you without dishonoring what you have.” *Id.*

105. *Id.* at 241 n. 7.

106. Claude Shannon, *A Mathematical Theory of Communication*, 27 BELL SYS. TECH. J., 9, 379–423, 623–56 (1948).

107. See *id.*

pressed, and delivered to another medium, with minimal data loss.¹⁰⁸ The concepts underlie all contemporary digital communications networks, including the algorithms that allow communication across the diverse nodes of the Internet.¹⁰⁹

Shannon's mathematical information theory is important for contemporary intellectual property scholarship in two ways. First, Shannon demonstrated the semantic content of a communication can be extracted from original medium, converted into a digital signal or code, sent across a communication channel with minimal data loss, and extracted by various types of receivers.¹¹⁰ Second, Shannon showed that a communications channel need not be limited to a single message.¹¹¹ Because signals can be compressed during transmission and amplified by the receiver, multiple users can share the same channel "space."¹¹²

The notion that "code" can be abstracted from the communications medium resonates with the Jeffersonian Enlightenment idea of the "laws of Nature." It suggests that "information" is indeed an abstract property that can be used up—that information is nonrivalrous. But the abstract concept "code" also resonates with postmodern ideas about language and knowledge construction. Code is like the "signifier" of a "sign" that has no meaning in itself.¹¹³ It is nothing but an arbitrary string of zeros and ones, until it is interpreted from within a particular context to refer to something signified.¹¹⁴ The connection between code, semiotics, and social constructivism, in turn, resonates with the notion of "cyberspace" that fueled the imaginations of technologists—and legal theorists—as they began wrestling with the enormous challenges of the Internet. "Cyberspace" came to be seen as a sort of "plac

108. *See id.*

109. *See* Claude Shannon 1916–2001, <http://www.research.att.com/~njas/doc/ces5.html> (stating that "[t]he foundation of our Information Age is this transformation of speech, audio, image, and video into digital content, and the man who started the digital revolution was Claude Shannon who died February 24, at the age of 84, after a long struggle with Alzheimer's disease.").

110. *See* Shannon, *A Mathematical Theory of Communication*, *supra* note 106.

111. *See* Yochai Benkler, *Some Economics of Wireless Communication*, 16 HARV. J. L. & TECH. 25, 40–45 (2002). As Benkler notes, Shannon's theory about "[p]rocessing gain poses a fundamental challenge to the prevailing paradigm, in that with processing gain there is no necessity that anyone be the sole speaker in a given 'channel.'" *Id.* at 43.

112. *Id.*

113. As Katherine Hayles notes, for information theorists such as Norbert Wiener, "messages are constituted, measured and communicated not as things-in-themselves but as relational differences between elements in a field. Communication is about relation, not essence. . . . perception, mathematics, and information all concentrate on pattern rather than content." KATHERINE HAYLES, *HOW WE BECAME POSTHUMAN: VIRTUAL BODIES IN CYBERNETICS, LITERATURE, AND INFORMATICS* 91, 98 (1999).

114. For a general discussion of semiotics, *see* Stanford Encyclopedia of Philosophy, *Hermeneutics*, <http://plato.stanford.edu/entries/hermeneutics/#Semiotics> (last visited Aug. 2007); Daniel Chandler, *Semiotics for Beginners*, <http://www.aber.ac.uk/media/Documents/S4sem02.html> (last visited Aug. 1, 2007).

at is constructed by code.¹¹⁵ Jefferson could shake hands with Foucault and Saussure in cyberspace.¹¹⁶

The philosophical aspects of the role of code in constructing cyberspace theory naturally provided the backdrop for legal theorists as the growth of the Internet began to attract their attention in the 1990s. Lawrence Lessig's famous dictum that "code is law" is deeply Shannonesque.¹¹⁷ "Code" is law because "code," as abstracted, compressed "information," governs conduct in a nonnatural, constructed "world" of cyberspace.¹¹⁸

Lessig's notion of "architecture" in his account of the "New Chicago School" of regulation previews this constructivist account of "code."¹¹⁹ The "New Chicago School," Lessig explained, concerns four types of constraint at regulate behavior: law, social norms, markets, and architecture.¹²⁰ "Architecture," Lessig said, "is a constraint that will sound much like 'nature.'" ¹²¹ By "nature" Lessig did not mean exactly the Jeffersonian concept of natural law,

115. See WILLIAM J. MITCHELL, *CITY OF BITS: SPACE, PLACE, AND THE INFOBAHN* 21 (1995) (noting that "[p]laces in the cyberspace of the Net are software constructions."); Julie Cohen, *Cyberspace as/and Space*, 107 *Colum. L. Rev.* 210 (2007). As Cohen notes, "[a]mong U.S. legal scholars, Code in particular has become the foundational text for current theories of cyberspace as space." *Id.* at 222.

116. Katherine Hayles ties informatics to Saussure's notion of signs and signifiers as follows: "[i]n Informatics, the signifier can no longer be understood as a single marker, for example a black ink mark on a page. Rather it exists as a flexible chain of markers bound together by the arbitrary relations specified by relevant codes. . . . A signifier on one level becomes a signified on the next higher level. Precisely because the relation between signifier and signified at each of these levels is arbitrary, it can be changed with a single global command." HAYLES, *supra* note 113, at 131. She later compares the "disembodied gaze" of Foucault's Panopticon to informatics and notes that "[c]oincident with cybernetic developments that stripped information of its body were recursive analyses within the humanities, especially the archaeology of knowledge pioneered by Michel Foucault, that saw the body as a play of discourse systems." *Id.* at 192.

117. Lessig does not refer directly to Shannon when he asserts that "code is law." See LESSIG, *supra* note 7, at 1–8. Lessig states that he draws his notion of code as law from William Mitchell. See MITCHELL, *supra* note 115, at 111 (stating "[o]ut there on the electronic frontier, code is the law."). Mitchell pictured "code" as a sort of entity that could be controlled by individuals. See *id.* at 112. He assigned a principal role to "code" in the "construction" of a new domain of existence that had come to be called "cyberspace." *Id.* at 109.

118. MITCHELL, *supra* note 115, at 109. As Mitchell put it,

Somehow along the line, our conception of what a computer is began to change fundamentally. It turns out that these electronic boxes . . . are primarily *communication* devices—not dumb ones like telephone handsets, that merely encode and decode electronic information, but smart ones that can organize, interpret, filter, and present vast amounts of information. Their real role is to construct cyberspace—a new kind of place for human interactions and transactions.

See also Pam Higham, *Keeping it Real: A Critique of Postmodern Theories of Cyberspace*, in *POSTMODERNISM: AN INTRODUCTION TO CRITICAL REALISM* 159, 160 (Jose Lopez & Barry Potter, eds., 2001) (noting that "cyberspace marries together deconstruction and computer technology Hence the developers of the emerging cyberspace sought a practical application of deconstructionist theories and had the technology to do so.").

119. Lawrence Lessig, *The New Chicago School*, 27 *J. LEGAL STUD.* 661 (1998).

120. *Id.* at 662–63.

121. *Id.* at 663.

but rather, "the world as I find it."¹²² Lessig cited Michel Foucault as an example of someone who is concerned with the regulatory aspects of "architecture."¹²³ In fact, Lessig accorded Foucault a significant role in suggesting that "architecture" is malleable and subject to the totalitarian drive to "make culture serve power."¹²⁴

The second important aspect of Shannon's theories—that multiple users can share a communications channel—supports the notion of an open digital "commons." Yochai Benkler, for example, drew on Shannon to demonstrate that spectrum is not really a discrete, closed resource that must be rationed. Rather, Benkler argued, the correct thing to measure is network communications capacity.¹²⁶ Shannon's theory of processing gain demonstrates that many messages can travel over the same channel without interference.¹²⁷ The most significant limitation relating to channel capacity is the receiver technology, not the capacity of the channel.¹²⁸ Further developments in information theory relating to cooperative networks showed that a multiplicity of users employing nodes and repeaters could actually increase the efficiency with which information can be communicated.¹²⁹ "Bandwidth," then, "is not an independent and finite resource whose amount needed for a communication is fixed prior to the act of communicating. . . ."¹³⁰ There is no pressing need to ration bandwidth.

Benkler extended these ideas in his general theory of peer production. The notion of an "information commons" is efficient from a welfare perspective because information theory shows that large amounts of disparate information can be sent in disembodied form across a given communication channel without significant loss or interference.¹³² This openness in a communication channel promotes autonomy, democracy, and innovation. Open source networks can foster democratic participation because every individual in the network can use and contribute to the "code," without any person or group exercising ownership. Recently, scholars have begun to apply

122. *Id.*

123. *Id.* at 665.

124. *Id.* at 665 n.19, 691.

125. Yochai Benkler, *Some Economics of Wireless Communications*, 16 HARV. J. L. & T. (2002).

126. *Id.*

127. *Id.* at 42–43.

128. *Id.*

129. *Id.* at 44–46.

130. *Id.* at 47.

131. See BENKLER, *supra* note 94, at 15.

132. See Kevin Werbach, *Supercommons: Toward a Unified Theory of Wireless Communication*, 82 TEX. L. REV. 863, 875–76 (2004).

133. *Id.* at 876–77.

ilar insights drawn from Shannon’s information theory to thorny questions biodiversity and gene patents.¹³⁴

The Shannonesque notion of information as “code” and of the code-carrying channel capacity as highly elastic is reflected in Brett Frischmann’s recent work on information “infrastructure.”¹³⁵ Building on some of the insights of Benkler and Lessig, Frischmann argued that information can sometimes be equated with physical public goods “infrastructure.”¹³⁶ This analytical move enabled Frischmann to argue that, from a supply-side perspective, welfare is often enhanced when information “infrastructure” is made openly available rather than propertized.¹³⁷ Lessig suggested that “code is law” and that the “code layer” should remain open; Benkler suggested that opening the “code layer” can result in efficiencies of scale under some circumstances; and Frischmann demonstrated that the “code layer” can sometimes be equated to physical public goods infrastructure. Frischmann thus brilliantly married Benkler’s and Lessig’s insights with the more traditional law and economics scholarship of leading intellectual property theorists such as Mark Lemley. In fact, Frischmann and Lemley together have published work on “spillovers,” which argued that treating intellectual inputs as infrastructure opens the door to consideration of potential positive spillover effects of open access models.¹³⁸

The limitations of Frischmann and Lemley’s approach become apparent, however, when they attempt to apply it in a specific context, such as the network neutrality debate.¹³⁹ Frischmann and Lemley suggested that an open infrastructure Internet model produces beneficial spillovers in the form of widespread end-user participation in a variety of socially valuable productive activities.¹⁴⁰ A network discrimination model, in contrast, preferences end uses that “generate observable and appropriable benefits” over end uses that

134. See Jim Chen, *Webs of Life: Biodiversity Conservation as a Species of Information Policy*, 89 IOWA L. REV. 495 (2004). Chen argues that “[i]nsights drawn from the regulation of the Internet and information technology can help us formulate jurisdynamically robust, pragmatically attainable programs for environmental protection.” *Id.* at 501. See also Dan L. Burk, *The Problem Process in Biotechnology*, 43 HOUS. L. REV. 561, 586–88 (2006) (critiquing the application of information theory to biotechnology patents). As Burk notes, “since information is encoded as molecular structure, the information is *only* useful when embodied in such structures” *Id.* at 7.

135. See generally, Brett M. Frischmann, *An Economic Theory of Infrastructure and Commons Management*, 89 MINN. L. REV. 917, 990–1003 (2005).

136. *Id.*

137. *Id.* at 996–98. Because basic research, in Frischmann’s view, is fundamentally an input to a variety of productive uses, the positive externalities associated with opening access to this infrastructure must be weighed against the free rider problem. He concludes, “the balance tips heavily toward access” because transaction costs relating to patent and other property rights in stream research stifle downstream innovation.” *Id.* at 995. Indeed, he says, “relying on property-secured, market-driven management of basic research results [is] almost outrageous, much like the seemingly ridiculous hypothetical of granting ownership of Lake Michigan to an individual property owner.” *Id.* at 997–98.

138. Brett M. Frischmann & Mark A. Lemley, *Spillovers*, 107 COLUM. L. REV. 257 (2007).

139. See *id.* at 294–98.

140. *Id.* at 297.

“generate spillovers.”¹⁴¹ Further, they suggested, a network discrimination model likely will reduce applications-level innovation, because the value that innovation will accrue to the owners of the network.¹⁴² Therefore, tl concluded, “[p]reserving Internet spillovers requires preserving network n trality.”¹⁴³

While critical scholars might appreciate this conclusion, they might less sanguine about the means used to reach it. A glaring problem is that argument raises a host of unexplored and unresolved empirical questio What empirical basis is there for the claim that network discrimination wo result in fewer positive externalities than an open system? A pay-p bandwidth system might make users more careful and systematic in their of the network, and might thereby produce innovations that have greater sp over benefits than a bandwidth-neutral network.¹⁴⁴ As Christopher Yoo not from a welfare perspective, “the desirability of complete standardization & interoperability is an empirical question that cannot be answered a priori.” This issue circles us back to the problem that plagues the cultural enviro mentalist movement generally: indeterminacy. Just as we can ask wheti information overload, pornography and terrorism represent a “healthy” c tural environment, we can ask whether the negative externalities of these . tivities might outweigh any potentially positive spillover benefits from “op ness.” This question seems impossible to answer without a more tangible sep of what “information” is and about how that “is” relates to the “ought.”

III. CRITICAL REALISM, THE TACIT DIMENSION, AND SOCIAL RIVALRY

A. Information and Embodiment

There is a growing sense among information policy scholars of varic stripes that our theories lack adequate normative grounding. Julie Cohen t been particularly outspoken about the “need to tackle the normative theory: formulate a theory of ‘the network’ as a whole that explains what makes

141. *Id.* at 298.

142. *Id.*

143. *Id.*

144. *See, e.g.*, Christopher S. Yoo, *Beyond Network Neutrality*, 19 HARV. J. LAW & TECH 22–25 (noting circumstances under which network neutrality could limit innovation driven end-user demand). *But see* Brett M. Frischmann & Barbara van Schewick, *Network Neutrality & the Economics of an Information Superhighway: A Reply to Professor Yoo*, 37 JURIMETRICS J. 1 (2007).

145. Yoo, *supra* note 144, at 25. Yoo suggests the following empirical considerations: “[T level of aggregate demand, heterogeneity of network uses, the variability in network traffic flo end users’ need for network reliability, and the extent to which technological change reorganizing the natural boundaries between levels that were previously separated by a natu interface. . . .” *Id.*

od.”¹⁴⁶ Cohen suggests we move away from the notion of “abstract, disembodied information” and instead focus on “all of the concrete, everyday ways which the open Internet enables the creation of meaning by and for real people in real spaces.”¹⁴⁷

Cohen is one of the few legal scholars who recognized the tension between empiricist and constructivist ways of thinking about information. She argued that all of the debates about cyberspace and the digital commons in the legal scholarship literature improperly conceive of cyberspace as entirely disembodied and separate from “real” space. Instead, Cohen suggested, cyberspace should be conceived as an “extension and evolution of everyday spatial practice—as space neither separate from real space nor simply a continuation of it.”¹⁴⁸ Any regulation of cyberspace must concern the connections between cyberspace and “lived space.”¹⁴⁹ The key question for legal theory, then, is how cyberspace changes experienced space.¹⁵⁰

Although legal theorists who have wed information theory to Jefferson’s advice to think of the digital commons as infinitely plastic, the physical reality is that information flows across networks are not so malleable.¹⁵¹ Thus, cyberspace’s difference is neither fixed nor unidirectional, but manifests as a problematic and always emergent tension between a broadening out and a closing in of boundaries and networks.¹⁵²

These insights about technology, information, and embodiment suggest fruitful avenues for navigating away from the foundationalist Jeffersonian cyberspace metaphor concerning information. A robust postmodern critique of knowledge and culture need not lead to groundless relativism, but instead can “open[] the way for an account of the nature and development of knowledge that is both more robust and far more nuanced than anything that liberal political philosophy has to offer.”¹⁵³ This emphasis on embodiment supports a move towards a teleological ethic of intellectual property focused on human capabili-

146. Cohen, *supra* note 87, at 91. See also Frischmann, *supra* note 88, at 1085 (“a normative account of the range of values at stake in the context of the cultural environment, their relative importance, and their interdependence with each other and with human institutions and actions or remains underdeveloped.”).

147. Cohen, *supra* note 87, at 91, 93 (2007).

First, the network enables the creation of meaning, for both individuals and groups. What we need now is to dispense with the equally abstract romanticism of cyberspace exceptionalism and emphasize all of the concrete, everyday ways in which the open Internet enables the creation of meaning by and for real people in real spaces. Not bits, not abstract, disembodied information, that has independent properties of flow, but meaning. Second, meaning emerges through and because of the opportunities for play that the network affords.

Cohen artfully marries cognitive theory to her critique of “space” and concludes that “[t]he cyberspace metaphor is neither an arbitrary fiction that can be jettisoned nor a description of some real, external reality, but rather an inevitable perceptual byproduct of the human cognitive apparatus.” Cohen, *supra* note 115, at 212–13.

148. Cohen, *supra* note 115, at 212–13.

149. *Id.* at 213.

150. *Id.* at 235.

151. *Id.* at 239.

152. *Id.* at 240.

153. See Cohen, *supra* note 102, at 1165.

ties and flourishing.¹⁵⁴ Cohen identified the Foucauldian tradition that “emphasizes the social construction of systems of knowledge,” the Frankfurt school that examines the political economy of culture, and the phenomenological approach to language and cognition, as possible sources of a thick account of culture for copyright theory.¹⁵⁵

Cohen is right to emphasize that these postmodern strands of cultural analysis do not necessarily lead to a sort of nihilistic relativism.¹⁵⁶ These traditions in themselves, however, remain problematic because they cannot adequately account for the notion of “progress.” As Cohen acknowledged (and advocated), the postmodern social theory she draws on requires “that ‘progress’ be assigned a more open-ended interpretation.”¹⁵⁷ “Progress,” in this reading, “consists, simply, in that which causes knowledge systems to come under challenge and sometimes to shift.”¹⁵⁸ This seems to equate *différance* neologism coined by Jacques Derrida, with “the progress of science and useful arts.”¹⁵⁹

The notion that “progress” is a “shift” in knowledge is linked to the antirealist ontologies that underlie merely constructivist social theories. For example, Cohen discussed Tomas Kuhn’s model of “paradigm shifts” as an example of what “progress” might mean in the natural sciences.¹⁶⁰ Kuhn presented an antirealist model in which scientific practice never moves people closer to understanding a natural world that exists independent of human social construction.¹⁶¹ This is problematic for many reasons, including that it offers no support for universal guiding norms. The indeterminacy problem persists.

154. See *id.* at 1159 (stating “I would like to focus on the capabilities approach developed by Martha Nussbaum and Amartya Sen.”) (citing AMARTYA SEN, DEVELOPMENT AS FREEDOM (1999); Martha C. Nussbaum, *Aristotelian Social Democracy*, in LIBERALISM AND THE GOOD (Bruce Douglass et al. eds., 1990)).

155. Cohen, *supra* note 102, at 1166–67.

156. *Id.* at 1166–68 (expressing dismay that “the same copyright scholars who can generate lengthy disquisitions on the distinctions between Locke and Mill, or Habermas and Rawls, Demsetz and Arrow have tended to lump all things ‘postmodernist’ together and equate them with nihilism.”).

157. *Id.* at 1168.

158. *Id.*

159. *Différance* is a neologism coined by Jacques Derrida. See Stanford Encyclopedia of Philosophy, Postmodernism, <http://plato.stanford.edu/entries/postmodernism/#5> (last visited Feb. 1, 2008). *Différance* is observed in the deconstruction of texts as the distance between the function of a text and its apparent or historical meaning. See *id.*

160. Cohen, *supra* note 102, at 1168; see also THOMAS S. KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS (3d ed. 1996).

161. See, e.g., Theodore Arabatzis, *Can a Historian of Science be a Scientific Realist?*, PHIL. SCI. 5531, 5536–39 (2001) (noting that, on Kuhn’s reading of the history of science, “realism becomes an impossible doctrine, since the realist presupposition of a single world that theories approximate is denied.”).

Towards a Critical Realist Approach to Information

In this section, I hope to move past the impasse in information policy theory by adopting some of the social analysis and critique represented by social constructivism, political economy, and hermeneutics, without decoupling the notion of “progress” from realism. This approach reflects a “critical realism” concerning how human knowledge is acquired and drawn from philosophers of science such as Roy Bhaskar and Michael Polanyi.¹⁶²

For critical realists, society is *both* a preexisting given and a product of human activity.¹⁶³ Individuals do not create society, but they do continually produce and transform society.¹⁶⁴ Society is neither a reified structure that exists apart from human activity nor an entirely voluntary creation of individuals.¹⁶⁵ Roy Bhaskar likens this “transformational model of social activity” to a sculptor who creates something out of the materials and tools available to her.¹⁶⁶ The result is that society emerges from, but is not reducible to, the choices of individuals.¹⁶⁷ Society is “a complex totality subject to change both in its components and their interrelations.”¹⁶⁸

Critical realists recognize that knowledge has both social and physical dimensions.¹⁶⁹ There is a reality external to human perception, language, and

162. See generally, ROY BHASKAR, *A REALIST THEORY OF SCIENCE* (Verso 2d ed. 1997); MICHAEL POLANYI, *THE TACIT DIMENSION* (1983). See also DCR, *supra* note 1, at 419 (defining “social constructionism”). As the DCR notes, in contrast to social constructionists, critical realists hold that social reality is emergent and stratified; the world is constituted prior to our understanding of it, and prior to our talk or knowledge of it.” *Id.*

163. See generally ROY BHASKAR, *THE POSSIBILITY OF NATURALISM: A PHILOSOPHICAL CRITIQUE OF THE CONTEMPORARY HUMAN SCIENCES* (Routledge 3d ed. 1998) (1979).

164. *Id.* at 36.

165. *Id.* at 39 (stating that “society must be regarded as an ensemble of structures, practices and conventions which individuals reproduce or transform, but which would not exist unless they do so.”).

166. *Id.* at 37.

167. *Id.* at 37–44.

168. *Id.* at 41. In many respects, critical realism’s transformational model of society sounds like the New Chicago School’s model of law and norms. The difference is that for cyberlaw scholars in the New Chicago School tradition, the architectural “code” that makes up online spaces is entirely socially constructed—whether code-infrastructure is “open” or “closed” is entirely contingent on the individuals who participate in the digital commons. See Part II, *supra*. In contrast, in the critical realist view, “culture,” “code” and “infrastructure” are not entirely the voluntary creations of autonomous individuals. Bhaskar’s treatment of language and grammar is intriguing here. The rules of grammar, Bhaskar observes, are not infinitely malleable—they impose real, even limits on our speech. BHASKAR, *supra* note 163 at 36. The rules of grammar, however, do not determine what we say; meaning is not reducible to the rules of grammar. *Id.*

169. Roy Bhaskar, a germinal critical realist philosopher, states that

Any adequate philosophy of science must find a way of grappling with this central paradox of science: that men in their social activity produce knowledge which is a social product much like any other, which is no more independent of its production and the men who produce it than motor cars, armchairs or books, which has its own craftsmen, technicians, publicists, standards and skills and which is no less subject to change than any other commodity. This is one side of ‘knowledge.’ The other is that knowledge is ‘of’ things which are not produced by men at all: the specific gravity of mercury, the process of electrolysis, the mechanism of light propagation. None of these ‘objects of knowledge’ depend on human activity. If men ceased to exist sound would continue to travel and

cognition.¹⁷⁰ Human perception, language, and cognition, however, limit o direct epistemic access to reality.¹⁷¹ Human perception of reality is a “transitive” dimension because it is subject to change based on human language history, and culture.¹⁷² Reality itself, however, is “intransitive.”¹⁷³ According to Roy Bhaskar, reality is stratified and can be conceived as three layers: empirical (observable by human), actual (existing in time and space), and real (“transfactual and enduring more than our perception of it”).¹⁷⁴

Bhaskar thus emphasized the social aspects of human knowing—of information—without reducing all of reality to a human construction. An important aspect of Bhaskar’s social theory of knowledge is his rejection of “methodological individualism”—the notion that societies are reducible to individuals.¹⁷⁵ A “social atomism” in which the analysis of societies can be reduced to the preferences of individuals will never adequately explain social action. But neither is society merely the result of collective pressures on individuals or a simple dialectic between these two poles.¹⁷⁷ Rather, society has a dual character: social groups provide the ground through which individuals reproduce and sometimes transform society.¹⁷⁸ A level of reality can emerge from a more basic level without being reducible to the more basic level.¹⁷⁹

Like Bhaskar, Michael Polanyi sought to mitigate the destructive tendencies of positivism without destroying the normativity of science. One of Polanyi’s primary concerns was the danger of authoritarian control over science extant in the then communist East.¹⁸⁰ Polanyi was keen to demonstra

heavy bodies fall to the earth in exactly the same way, though ex hypothesi there would be no-one to know it.

BHASKAR, *supra* note 162, at 21.

170. See CRITICAL REALISM: ESSENTIAL READINGS ix–xiii (Margaret Archer, et al. ed. 1998) (noting that “critical realism claims to be able to combine and reconcile *ontological realism*, *epistemological relativism*, and *judgmental rationality*.”) (emphasis in original).

171. BHASKAR, *supra* note 162, at 21.

172. *Id.*

173. *Id.*

174. *Id.* at 21–62.

175. *Id.*

176. *Id.*

177. *Id.*

178. *Id.*

179. *Id.* at 113 (stating that “the operations of the higher level cannot be accounted for solely by the laws governing the lower-order level in which we might say the higher-order level ‘rooted’ and from which we might say it was ‘emergent.’”).

180. Polanyi explains this concern at the beginning of one of his key works, *The Tacit Dimension*. POLANYI, *supra* note 162. Describing the denial of independent science and communism, Polanyi says “I was struck by the fact that this denial of the very existence of independent scientific thought came from a socialist theory which derived its tremendous persuasive power from its claim to scientific certainty. The scientific outlook appeared to have produced a mechanical conception of man and history in which there was no place for science itself.” *Id.* at Polanyi’s views, of course, were not entirely unique; they fit nicely into a constellation of contemporary philosophers of science who deconstructed the positivism that emerged following the collapse of Baconian science, including figures such as Thomas Kuhn, Imre Lakatos, and to some extent Paul Feyerabend. See, e.g., KUHN, *supra* note 160; IMRE LAKATOS, *THE METHODOLOGY OF SCIENTIFIC RESEARCH PROGRAMMES* (Cambridge Univ. Press 1978); PAUL FEYERABEND, *AGAINST METHOD* (Verso 3d ed. 1993) (1975).

at science is an inherently social enterprise just like any other human project, and that as a social enterprise science must be subject to democratic control.¹⁸¹ Also like Bhaskar, Polanyi recognized that reality is stratified.¹⁸² Each level of reality operates under the ‘marginal control’ of higher levels, but the higher levels are not reducible to the lower.¹⁸³

Polanyi recognized that positivism fails because it relies on some unverifiable foundations. As Polanyi noted, “It is indeed logically impossible for the human mind to divest itself of all uncritically acquired foundations. For our minds cannot unfold at all except by embracing a definite idiom of beliefs, which will determine the scope of our entire subsequent fiducial development.”¹⁸⁴ The notion of positivism itself, then, depends on an idiomatic structure that is neither verifiable nor self-evident.

Polanyi also emphasized the communal nature of scientific practice and the “tacit” knowledge involved in such communal information transfers. As he noted, “[t]he transmission of beliefs in society is mostly not by precept, but by example . . . [t]he whole practice of research and verification is transmitted by example and its standards are upheld by a continuous interplay with criticism within the scientific community.”¹⁸⁵ Thus, scientific knowledge is a set of socially constructed analogical models that are developed through practices acquired and implemented in unique social networks.

Finally, Polanyi realized that the social networks through which scientific practices are transferred, like all social networks, incorporate elements of social control. One of the principal means of control over scientific information networks is peer review. Polanyi observed that scientific journal referees are the chief Influentials, the unofficial governors of the scientific community. By their advice they can either delay or accelerate the growth of a new line of research.¹⁸⁶

181. POLANYI, *supra* note 162.

182. *Id.* at 29–32.

183. *Id.* For a discussion of how Polanyi’s thought might relate to Bhaskar’s on this point, see 2 ALISTER MCGRATH, A SCIENTIFIC THEOLOGY: REALITY at 226 (2002). Interestingly, the stratification of reality can also be observed in Thomas Aquinas’ approach to law. See William S. Newbaker II, *Thomas Aquinas and the Metaphysics of Law*, 58 ALA. L. REV. 575, 600–02 (2007). It is noted that “Thomas assumes that a single scientific method is insufficient to enable investigation of all types of reality, and this assumption affects his account of law.” *Id.* at 600.

184. MICHAEL POLANYI, SCIENTIFIC THOUGHT AND SOCIAL REALITY 76 (Fred Schwartz ed., International University Press 1974).

185. *Id.* at 61.

186. *Id.* at 20. Polanyi stated that:

The referees advising scientific journals may also encourage those lines of research which they consider to be particularly promising, while discouraging other lines of which they have a low opinion. The dominant powers in this respect are, however, exercised by referees advising on scientific appointments, on the allocation of special subsidies, and on the award of distinctions. Advice on these points, which often involve major issues of the policy of science, is usually asked from and tendered by a small number of senior scientists who are universally recognized as being the most eminent in a particular branch. They are the chief Influentials, the unofficial governors of the scientific community. By their advice they can either delay or accelerate the growth of a new line of research.

Id. Cf. LEE SMOLIN, THE TROUBLE WITH PHYSICS: THE RISE OF STRING THEORY, THE FALL OF A SCIENCE, AND WHAT HAPPENS NEXT (Houghton Mifflin Company 2006), at 334–48 (describing

Under a critical realist view, scientific information is not exactly like a flame on Jefferson's candle, burning in the open, available to be shared equally among any other candles that might be pointed towards the light. In the language of critical realism, Jefferson's candle captures the intransigent aspects of reality, but it does not reflect the transitive, socially embedded aspects of human science.

The truth is that "the progress of science and the useful arts" often is more like a poker game than a candle. There is indeed a deeper structure that underlies the game—the basic rules of probability that constrain the possible configurations of hands—which all the players can share, and in fact must take as a "given."¹⁸⁷ But there are also aspects of the game that are socially constructed—the specific rules of Texas Hold 'em Poker. And, there are very particular aspects of the game that are embodied in local tacit knowledge—the slight incline of a player's head that signals a bluff, the way a pattern of betting suggests whether to "hold 'em" or "fold 'em" (or run), the "feel" of the rock with its subconscious chemical and emotional signs, the intuition that comes from experience.¹⁸⁸ It simply is not true that a new player could read a patent disclosure on Texas Hold 'em Poker and thereby possess exactly the same "flame" as the longtime players.¹⁸⁹

The same is true of the "progress of science and of the useful arts." As Polanyi observed, the relationship between laypeople and scientists, and between scientists of different disciplines, is based on authority.¹⁹⁰ Only a very limited set of people with specialized training, experience, and equipment can effectively test most scientific claims.¹⁹¹ It is not possible to read a jour-

tendency of peer review system to enforce paradigms of normal science and discourage risk taking).

187. Thanks to Charles Sullivan for this insight.

188. Polanyi makes a similar point concerning the game of chess:

The playing of a game of chess is an entity controlled by principles which rely on the observance of the rules of chess; but the principles controlling the game cannot be derived from the rules of chess. The two terms of tacit knowing, the proximal, which includes the particulars, and the distal, which is their comprehensive meaning, would then be seen as two levels of reality, controlled by distinctive principles. The upper one relies for its operations on the laws governing the elements of the lower one in themselves, but these operations of it are not explicable by the laws of the lower level. And we could say that between the two such levels a logical relation holds, which corresponds to the fact that the two levels are the two terms of an act of tacit knowing which jointly comprehends them.

POLANYI, *supra* note 162, at 34–35.

189. A similar analogy could come from golf (or any other game or sport). If Tiger Woods wrote a patent describing his golf game, I could not possess his swing by reading it. Even if I could modify my body to gain all of Tiger's physical strength and coordination so that I could technically reproduce his swing mechanics—a substantial modification indeed—I would not be able to *play golf* like Tiger. Sports psychologists refer to tacit skills such as "field awareness" and "flow" to describe the "something extra" that great champions possess as a result of a mysterious blend of physical, intellectual and emotional makeup, practice, and experience. See MIHA CSIKZENTMIHALYI, *FLOW: THE PSYCHOLOGY OF OPTIMAL EXPERIENCE* (1990); SUSAN JACKSON & MIHALY CSIKZENTMIHALYI, *FLOW IN SPORTS: THE KEY TO OPTIMAL PERFORMANCE AND EXPERIENCES* (1999).

190. POLANYI, *supra* note 162, at 63–64.

191. *Id.*

ticle or a patent and to truly “possess” the flame of knowledge flickering within it.¹⁹² Scientists must participate in a system of “mutual control” that involves consensual oversight based on something less than full possession of each other’s ideas.¹⁹³

In many ways, this recognition of the social aspects of the scientific enterprise resonates with the “romantic author” critique. True scientific innovations spring from a vast range of information which the scientist accepts unchallenged as a background to his problem.¹⁹⁴ It differs from the romantic author critique, however, in its ontological realism. A scientist’s research decisions are personal judgments exercised responsibly with a view to a reality with which he is seeking to establish contact.¹⁹⁵ In this sense, the practice of a scientific discipline is a tradition that is continually being extended towards the goal of better understanding the aspects of reality with which it is concerned.¹⁹⁶ A critical realist view allows for *genuine* “progress.”

Contemporary intellectual property theory has been impoverished by its failure to recognize the stratified nature of reality and the tacit and social dimensions of knowing. As a result, our debates about policy tend to founder over unanswerable empirical questions or they are marked by a retreat to a critique of authorship grounded in a constructionist ontology that empties any notion of the “*progress* of science and the useful arts” of any real meaning.¹⁹⁷

In contrast to constructivist theories of technology and cyberspace, in which “[h]uman beings are viewed as infinitely malleable in response to technological development,” from a critical realist perspective “moral principles and values are believed to result from ‘real, intrinsic characteristics of the

192. *Id.* As Polanyi notes,

In the first place, you cannot possibly get hold of the equipment for testing, for example, a statement of astronomy or of chemistry. And supposing you could somehow get the use of an observatory or a chemical laboratory, you would probably damage their instruments beyond repair before you ever made an observation. And even if you should succeed in carrying out an observation to check upon a statement of science and you found a result which contradicted it, you would rightly assume that you had made a mistake.

193. *Id.* at 72–74.

194. *Id.* at 80.

195. *Id.* at 77. Moreover, Polanyi notes, this effort to contact external reality is not limited to efforts to obtain scientific knowledge. It “holds for all seeking and finding of external truth.” *Id.*

196. *Id.* at 82. Polanyi notes the progressive nature of the tradition: “[s]cientific tradition gives its capacity for self-renewal from its belief in the presence of a hidden reality, of which current science is one aspect, while other aspects of it are to be revealed by future discoveries.” *Id.* Progress, however, is not necessarily linear: “[a]ny tradition fostering the progress of thought must have this intention: to teach its current ideas as stages leading on to unknown truths which, when discovered, might dissent from the very teachings which engendered them.” *Id.* As discussed briefly in Part IV, the notion of science as a “tradition” leads nicely into a virtue ethics approach to intellectual property policy. See also David W. Opderbeck, *A Virtue-Centered Approach to the Technology Commons (Or, The Virtuous Penguin)*, 59 ME. L. REV. 315 (2007).

197. As Julie Cohen has noted, contemporary copyright theory is divided between economic and cultural modes of analysis that stem from a “precommitment either to a linear, modernist vision of creative and cultural progress or to an oppositional stance that rejects notions of progress, artistic merit, and authorial will entirely.” Cohen, *supra* note 102, at 1153.

natural and social world.”¹⁹⁸ Access to technology infrastructure is not mere a matter of economics, or of power, or of infinitely malleable socially constructed code. It also is necessarily a moral and ethical question about the use of information to construct communities. This realist moral and ethical framework can help inform policy debates with greater determinacy.

IV. TOWARDS AN ENVIRONMENTAL VIRTUE ETHICS OF INFORMATION INFRASTRUCTURE

A. Critical Realism and Virtue

The critical realist perspective suggests a particular approach to ethical reflection concerning access to information and related questions such as network neutrality. The idea that information has a tacit, social dimension suggests a communitarian ethical framework.¹⁹⁹ A robust information policy must consider broadly the ways in which granting or restricting access to information will encourage the extension of communities that promote human flourishing.²⁰⁰

Critical realism's refusal to reduce society to individuals forces us to focus on the social relations among various components of a society.²⁰¹ The nature of the internal relations of the positions persons hold in a society suggest certain rights, obligations, and practices integral to that society.²⁰² For example, economists working from a critical realist perspective suggest that relationships of *trust* are vital to many productive networks.²⁰³ This is in contrast to neoclassical models that assume rationally self-interested individual actors engaged in Darwinian competition or game theoretic models that assume a façade of cooperation rooted ultimately in self-interest.

A critical realist perspective suggests that the cultural environment *both* an ongoing project of social construction *and* a given that constrains cultural activity. In this respect, critical realism offers a corrective to Cohen, Benkler, and other scholars' overly individualistic focus on autonomy and “meaning making.” It is a mistake to view the cultural commons as *primarily* a space in which autonomous individuals can be set free to create their own meanings. Individuals might act transformatively in a culture to reshape

198. Pam Higham, *Keeping it Real*, *supra* note 118, at 165 (quoting Caroline Nevelevs, *Sociology and the Case for Realism*, 43 SOC. REV. 808, 816 (1995)).

199. See Mark Achtemeier, *The Truth of Tradition: Critical Realism in the Thought of Alasdair MacIntyre and T.F. Torrance*, 47 SCOT. J. THEOLOGY 355 (1994).

200. Economic welfare analysis clearly is one consideration in this broader ethical approach to information access questions such as those raised by the network neutrality debate. A central virtue in any account of virtue ethics is wisdom or practical reason. The exercise of practical reason requires consideration of economic consequences. But the analysis cannot begin and end with this one dimension of information. See Opderbeck, *supra* note 196, at 322. In Aristotelian terms, this virtue is called “phronesis.” *Id.*

201. See Tony Lawson, *Developments in Economics as Realist Social Theory*, in CRITICAL REALISM IN ECONOMICS: DEVELOPMENT AND DEBATE 3, 11–13 (Steve Fleetwood ed., 1999).

202. *Id.*

203. *Id.* at 12.

eanings, but individuals do not create meanings *ex nihilo*. Normative concerns relating to cultural commons must focus on virtues and practices embedded in particular communities that will promote human flourishing.

Cultural environmentalism can learn some lessons from environmental virtue ethics.²⁰⁴ An environmental virtue ethics perspective, like all virtue ethics theories, seeks to move discussions of actions and consequences into broader discussions of character.²⁰⁵ This broader perspective benefits individual agents and fosters communal values such as goodwill, dispute resolution, and a sense of interconnectedness.²⁰⁶ Cultural environmentalists are correct to emphasize the need for stories and narratives of the cultural commons, but stories alone are not enough.²⁰⁷ Such stories need to become connected to virtues and practices that enable agents who come into contact with the cultural environment to transform it in ways that benefit those agents, other agents who interact with that environment, and the environment itself.

Benevolence, for example, can be conceived of as an environmental virtue.²⁰⁸ An agent acting in the natural environment who possesses the virtue of benevolence will seek to imaginatively envision the lives of other agents acting in nature and the needs of the natural environment itself, will diligently work to understand what is in the best interests of other agents and of the natural environment, and will be motivated to act with those interests in mind.²⁰⁹ Other representative environmental virtues could include the traditional “cardinal” virtues of practical wisdom, justice, temperance, and courage; or modifications and extensions of the cardinal virtues such as humility, respect, attitude, simplicity, loyalty and tenacity; and virtues drawn from various religious traditions.²¹⁰ Such virtues, of course, have corresponding vices, such as gluttony, arrogance, greed, and apathy.²¹¹ These notions about environmental virtues and vices can apply directly to the cultural environment and can help infuse information policy debates with greater determinacy.

204. Ronald Sandler, *Introduction*, in ENVIRONMENTAL VIRTUE ETHICS 1, 3 (Ronald Sandler & Philip Cafaro eds., 2005). Environmental virtue ethics concern “the proper dispositions character traits for human beings to have regarding their interactions and relationships with the environment.” *Id.*

205. *Id.* at 2 (stating that “an adequate environmental ethic . . . requires not only an ethic of action—one that provides guidance regarding what we ought and ought not to do to the environment—but also an ethic of character—one that provide guidance on what attitudes and dispositions we ought and ought not to have regarding the environment.”).

206. See Geoffrey Frasz, *Benevolence as an Environmental Virtue*, in ENVIRONMENTAL VIRTUE ETHICS, *supra* note 204, at 132–33.

207. See Cohen, *supra* note 87, at 91.

208. Frasz, *supra* note 206, at 121.

209. *Id.* at 125.

210. See Charles Taliaferro, *Vices and Virtues in Religious Environmental Ethics*, Louke van Onsvenen, *Cardinal Environmental Virtues: A Neurobiological Perspective*, in ENVIRONMENTAL VIRTUE ETHICS, *supra* note 204, at 159–72, 173–94.

211. See Philip Cafaro, *Gluttony, Arrogance, Greed, and Apathy: An Exploration of Environmental Vice*, in ENVIRONMENTAL VIRTUE ETHICS, *supra* note 204, at 135–58.

B. Critical Realism, Virtue, and Determinacy

The perspective I have introduced in this paper suggests a way forward for information policy in a variety of areas including access to information infrastructure, the law of virtual worlds, and Internet governance. This section sketches out a critical realist-environmental virtue ethics approach in each of these areas.

"Infrastructure" is not merely the "code" layer that is at issue in debate over control of Internet connection protocols, or the "physical" layer of data cables and routers that are directly at issue in the network neutrality debate. "Infrastructure" also includes the communication between people—the information—that is enabled by and emerges out of the code and physical layer. Out of this infrastructure layer of code, cables, and communication emerges the community.²¹² Both the positivist (law and economics) and constructivist (romantic author-cultural environmentalist) sides of the network neutrality debate have missed the fact that community emerges from code, cables and content to constitute part of the "infrastructure" of the online cultural environment.

From a critical realist perspective, the community that emerges from code, cables and content has an ontological status, akin to the natural environment.²¹³ We are not entirely free, then, to construct the online cultural environment however we please. It is, like nature, in some sense a given. But it is also a social product that can be continually transformed.²¹⁴ It is not exactly like the flame on Jefferson's candle—that is, "Nature" as a sort of abstract, limitless property that can never be exhausted by possession. Like the natural environment, the online cultural environment is rivalrous in consumption. It can be managed responsibly or polluted; exploited or conserved; made public or fenced off. Control over code and cables influences the sort of communication that can happen, which in turn influences the culture that emerges, all of which produces the cultural environment succeeding generations of environmental agents must take as a given.

This perspective highlights some of the limitations inherent in the notion of property rights in information infrastructure. Information infrastructure is not only cables, code and communication; it is also community. Community by definition cannot be owned as property. Even if the telcos are aptly symbolized by a heroic, muscled hard hat laying cable on virgin turf—even if the physical dimension of Internet infrastructure could "belong" to the telcos under Locke's labor theory or some other incentive-based property theory—the community that emerges from the confluence of code, cables and communication possesses its own integrity. This emergent layer of community is not, however, an ethereal, nonrival "intellectual commons." It is a real thing, an

212. For a discussion of the code, physical, and content layers, see LESSIG, *CODE AND OTHER LAWS OF CYBERSPACE*, *supra* note 7; BENKLER, *supra* note 94.

213. See BHASKAR, *supra* note 163.

214. *See id.*

like any other real thing, it can be used up and destroyed. Efforts by the cableayers to consume this community are gluttonous, greedy, and arrogant.

The emergent community of the net is not Eden and it is not inexhaustible. Parts of it—large parts of it—are poisonous and malformed, threatening to consume the community from within. Child pornography, terrorism, and the like are not acceptable spillovers to be weighed in the consequentialist scales against other goods of open networks. Agents acting with benevolence in and towards the emergent community and towards each other will have no desire to facilitate the “meaning making” of those who exploit children and blow up quiet residential street corners.

To cultivate this space without either excessive enclosure or a tragedy of the commons, the community must transform *itself*. These are not so much issues of external economic carrots and sticks as they are issues of internal character. The community must learn to govern itself in a way that preserves its integrity against both bandwidth control and bandwidth pollution. In short, reforming and strengthening *Internet governance* is a key to these bandwidth allocation problems. Broad, democratic Internet governance will help inoculate the community against control and cooption by those who lack the virtues necessary to promote the community’s flourishing. The “solution” to problems like network neutrality and network pollution is not a discrete regulatory move by a brick-and-mortar government, or, more likely, a plethora of inconsistent moves by disparate jurisdictions, but a democratic revolution fostered by virtuous agents acting from within the emergent community itself.

It might seem that such an analysis would lead to the same conclusions as existing cultural environmentalist work using different words. For example, Yochai Benkler and Helen Nissenbaum have considered these issues in the context of open source communities.²¹⁵ They argued that open source communities should be controlled entirely by the community in a thoroughly egalitarian fashion. Therefore, they focused on virtues related to autonomy and reactivity. This suggests that the “infrastructure” of open source communities, which includes bandwidth, should be openly accessible to all users.

Benkler and Nissenbaum are right to identify certain virtues that counsel in favor of open networks. The promotion of open Internet “infrastructure” becomes more complicated, however, when infrastructure analysis is laid over a thicker account of environmental virtues and vices.²¹⁶ This is because cultural environmentalists have ignored the problem of vices in agents who access the network that result in the “pollution” of the information commons.²¹⁷ The untested assumption behind cultural environmentalism is that the cultural commons as currently received is a healthy environment that is inherently

215. Yochai Benkler & H. Nissenbaum, *Commons-Based Peer Production and Virtue*, 14 J. POL. PHIL. 394, 395 (2006).

216. Brett Frischmann moves in this direction in his recent review of Yochai Benkler’s book *THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM* (Yale Univ. Press 2006). See Frischmann, *supra* note 88, at 1083.

217. See, e.g., Gian Maria Greco & Luciano Floridi, *The Tragedy of the Digital Commons*, 6 ETHICS & INFO. TECH. 73, 76–79 (2004).

worth preserving and expanding.²¹⁸ But the cultural environment, like natural environment, cannot be shaped any which way and remain healthy. The given aspects of nature mean that some virtues and practices—such as benevolence and conservation—lead to flourishing, while some vices and practices—such as selfishness and pollution—lead to damage. The same is true of the cultural and information environment. Openness is not enough; in fact, sometimes openness can spoil pristine spaces. Those who live in a virtual environment must determine what sorts of fences are required to preserve it.

A critical realist approach also can provide a mediating structure between unexceptionalist-externalist and exceptionalist-internalist accounts of personhood in virtual spaces.²¹⁹ The first generation of cyberlaw scholarship was split between exceptionalists and unexceptionalists, who respectively view cyberspace either as a newly constructed autonomous realm or as nothing more than people sitting in front of computer terminals.²²⁰ “Second generation” cyberlaw scholarship recognizes that there is truth in each of these accounts and focuses on the liminal space where real and virtual worlds intersect.²²¹ A “person” in this liminal space exists in both an internal and external relationship to the virtual world.²²²

The critical realist conception of “culture” deconstructs the claims of Internet unexceptionalists that jurisdictional and choice of law questions involving online communities should be resolved through existing international law structures.²²³ The “place-ness” of virtual communities intuitively suggests that they are not merely conduits for “real world” transactions.²²⁴ A critical realist account of culture thickens this notion of the “place-ness” of virtual communities.

In their book “Who Controls the Internet: Illusions of a Borderless World,” for example, Professors Jack Goldsmith and Tim Wu argued that the patchwork of national laws that now govern online activity is a good thing. Goldsmith and Wu borrowed familiar arguments from debates about feder-

218. See Crawford, *supra* note 80, at 69. For example, Crawford states that the Internet “is a complex environment in which the actions of a billion autonomous human beings are constantly creating persistent, nonlinear forms of order and creativity.” *Id.*

219. For a discussion of these different perspectives, see Jonathon W. Penney, *Privacy and the New Virtualism*, 10 YALE J. L. & TECH. 194, 196–98 (2008).

220. *See id.* at 204–05.

221. *Id.* at 205.

222. *Id.*

223. For an overview of the disagreement between Internet “exceptionalists” and “unexceptionalists,” see David G. Post, *Governing Cyberspace: Law*, 24 SANTA CLARA COMPUTER & HIGH TECH L.J. 883 (2009).

224. *See id.* at 912 (noting that “there’s a ‘place-ness’ to these virtual places—not just in the way they look but in the way they persist through time, and in the way they present opportunities for an infinite variety of repeated interactions between individuals, for collective decision-making, and for common enterprise—that enables us to think about them and talk about them the way that the people who spend lots of time there often do: as true *communities*, with shared norms and customs and expectations characteristic of each and continually being created and recreated by members within each.”).

225. JACK GOLDSMITH & TIM WU, WHO CONTROLS THE INTERNET: ILLUSIONS OF A BORDERLESS WORLD viii (2d ed. 2006)

olicymaking and dispute resolution powers.²³⁸ The other models involve varying degrees of central policymaking and coordination among governments and other stakeholders.²³⁹

The WGIG Report is helpful in many ways. It recognizes that control over the Internet should not be concentrated in only one or a few governments.²⁴⁰ It emphasizes the need to include developing countries and civil society representatives in the policymaking process.²⁴¹ It fails, however, to recognize that the culture that emerges from online spaces can have its own integrity. There is no notion at all in the WGIG report that virtual communities could have any role in governing themselves, except perhaps through whatever influence civil society groups can exert on their behalf in any United Nations governing or coordinating body. This reflects the flat ontology of culture that results when the question of “governance” is reduced to the external control of cables and code.

In this regard, a critical realist perspective can thicken our understanding of law in “virtual worlds.”²⁴² Virtual worlds exemplify the critical realist notion of “culture,” in which something new and “real” emerges from that which already exists. Legal scholars have wrestled with the notion of “property” in virtual worlds and have sought to justify virtual property rights based on utilitarian, labor theory, and personhood approaches.²⁴³ The first of these theories draws on the traditional Enlightenment understanding that the relation between information and tangible property is essentially univocal except for rivalrousness; the second draws on subjective notions of what constitutes the “self” and are precursors to full-blown postmodern constructivism.²⁴⁴

When proponents of virtual property and self-governance in virtual worlds remain rooted in these traditional categories, proponents of virtual property and self-governance in virtual worlds sometimes miss the place-ness of virtual spaces. In this regard, Greg Lastowka said that “[t]he first problem with suggesting that cyberspace is a place is that it is not.”²⁴⁵ Lastowka characterized virtual worlds as something like Disney World—a blend of the real and the

238. *Id.* at 13.

239. *Id.* at 13–16.

240. *Id.*, ¶ 48 (stating “[n]o single Government should have a pre-eminent role in relation to international Internet governance.”).

241. *Id.*, ¶¶ 41, 48 (stating “[t]he WGIG also noted that one of its overarching priorities was contribute to ensuring the effective and meaningful participation of all stakeholders from developing countries in Internet governance arrangements” and “[t]he organizational form for the governance function will be multilateral, transparent and democratic, with the full involvement of governments, the private sector, civil society and international organizations.”).

242. For a description of “virtual worlds,” see M. Scott Boone, *Virtual Property and Personhood*, 24 SANTA CLARA COMPUTER & HIGH TECH. L.J. 715, 718–20 (2008); Candidus Dougherty & Greg Lastowka, *Virtual Trademarks*, 24 SANTA CLARA COMPUTER & HIGH TECH. L.J. 749, 758–73 (2008) (describing three models of virtual worlds: games funded by player descriptions; social spaces funded by advertising or virtual property exchange; and user-generated worlds funded by control of virtual property and peer production of creative goods).

243. Boone, *supra* note 242, at 722–23.

244. For a description of the philosophical roots of personhood theory, see *id.* at 728–29.

245. Greg Lastowka, *Decoding Cyberproperty*, 40 IND. L. REV. 23, 45 (2007).

unreal.²⁴⁶ He and Dan Hunter suggested that real-world courts should exercise caution concerning disputes over property and other rights in virtual world because "virtual worlds are jurisdictions separate from our own, with the own distinctive community norms, laws, and rights."²⁴⁷ A critical realist perspective provides a sound theoretical basis for this claim: virtual world, unlike Disney World, are real "places" that emerge out of but are not entirely reducible to an underlying layer of physical reality. At the very least, a critical realist account of cyberspace suggests that the unique status of virtual communities should be represented in policy discussions about Internet governance—something the WGIG process has thus far ignored.



Contemporary legal theory concerning access to information is a curious jumble. Contemporary intellectual property theory marries a Jeffersonian Enlightenment view of "Nature" with postmodern notions of the social construction of "authorship" through Shannon information theory. The result is that legal theory consistently observes the dogma that information is fundamentally a nonrivalrous economic commodity, even while it seeks to expose the power relationships that underlie debates about access to information. The fruit of this strange marriage of foundationalist epistemology, antirealist ontology, and questionable historiography is a set of intractable arguments that inevitably devolve into unanswerable empirical questions.

Critical realism presents a way forward between the bipolar positivists and postmodernist renditions of intellectual property. From a critical realist perspective, information is not merely an input, a commodity, or a code word for a power play. It can be all of those things, but at some level, information is also the skeleton of all human communities. It is in this sense that information is "infrastructure": we create information that creates communities. But the information and communities we create are not arbitrary; they are bounded by and reflective of a reality that is deeper than our human limitations. The extent to which people are able to access information-based communities is not, then, *merely* an exercise in political will. It is also, as Jefferson recognized for different reasons, a question of access to the reality that molds and shapes us, an in which we must founder or flourish.

246. F. Gregory Lastowka & Dan Hunter, *The Laws of the Virtual Worlds*, 92 CAL. L. REV. 1, 8 (2004).

247. *Id.* at 72–73.

