

# A VIRTUE-CENTERED APPROACH TO THE BIOTECHNOLOGY COMMONS (OR, THE VIRTUOUS PENGUIN)

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## A VIRTUE-CENTERED APPROACH TO THE BIOTECHNOLOGY COMMONS (OR, THE VIRTUOUS PENGUIN)

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### I. INTRODUCTION

Intellectual property protection is the key factor for economic growth and advancement in the biotechnology sector. Patents add value to laboratory discoveries and in doing so provide incentives for private sector investment into biotechnology development. The Biotechnology Industry Organization advocates a strong and effective global intellectual property system.<sup>1</sup>

—Biotechnology Industry Organization

The explosion of patenting rather than delivery as a metric for investment in biological sciences, while hinting at great opportunities in the accelerating pace of discovery, has created a thicket of rights, self-reinforcing barriers, and added costs of impediments to innovation.<sup>2</sup>

—Cambia BiOS Initiative

These apparently radically different views about biotechnology intellectual property policy seem to represent a deep division about whether patents and other Intellectual Property Rights (IPRs) encourage or discourage innovation. This division, however, is in many ways superficial. Although these statements reach very different conclusions, both are based on common utilitarian philosophical and ethical assumptions about IPRs. In particular, both assume that IPRs are fundamentally merely economic tools or instruments that can be evaluated primarily through empirical arguments about the correlation between strong IPRs and rates of innovation. Though the empirical conclusions of the Biotechnology Industry Organization (BIO) and Cambia represent a fissure between different approaches to IPR policy in biotechnology research, that fissure penetrates only the crust of a larger utilitarian and instrumentalist structure.

The instrumentalist emphasis of the current biotechnology IPR debate is not surprising. In the American tradition, intellectual property law has long been justified primarily by instrumentalist concerns. Thomas Jefferson famously acceded to the “embarrassment” of patent and copyright monopolies because he believed a limited

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1. Biotechnology Industry Organization, *Intellectual Property*, <http://www.bio.org/ip/> (last visited Jan. 26, 2007).

2. Cambia BiOS Initiative, *The Cambia BiOS Initiative: Implementation Phase 3* (Jan. 31, 2006), <http://www.bios.net/daisy/bios/2029/version/1/part/4/data/>.

monopoly would encourage the production of new scholarship and inventions.<sup>3</sup> The framers' willingness to allow this embarrassment for the greater good is enshrined in the Intellectual Property Clause of the U.S. Constitution.<sup>4</sup> Countless judicial opinions refer to intellectual property law as a tool that provides necessary incentives to creators and innovators.<sup>5</sup> Intellectual property policy directed at biomedical research is expressly instrumentalist. For example, the Bayh-Dole Act,<sup>6</sup> which permitted the patenting of inventions developed through government-funded research, was "designed to . . . encourage private industry to utilize Government financed inventions through the commitment of the risk capital necessary to develop such inventions to the point of commercial application."<sup>7</sup>

The American instrumentalist approach to intellectual property in part reflects John Locke's influence on the American founders. A substantial body of recent scholarship has explored the Lockean justification for intellectual property.<sup>8</sup> As Justin Hughes has noted, American intellectual property jurisprudence is largely rooted in Locke's labor theory.<sup>9</sup> One strand of that theory holds that labor is inherently unpleasant, such that property rights in the fruits of the laborer's efforts are required as an incentive for the laborer to engage in the unpleasant activity.<sup>10</sup> This instrumental claim about labor as incentive has a utilitarian foundation, because labor is necessary to promote the public good.<sup>11</sup> A second strand of Lockean labor theory is the

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3. Letter from Thomas Jefferson to Isaac McPherson (Aug. 13, 1813), available at <http://www.temple.edu/lawschool/dpost/mcphersonletter.html>.

4. The Constitution gives Congress the power "To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." U.S. CONST. art. I, § 8, cl. 8. See also Justin Hughes, *The Philosophy of Intellectual Property*, 77 GEO. L.J. 287, 303-04 (1988) ("Even the Constitution's copyright and patent clause is cast in instrumental terms.")

5. See, e.g., *Diamond v. Chakrabarty*, 447 U.S. 303, 307 (1980) ("The patent laws promote [the progress of science and the useful arts] by offering inventors exclusive rights for a limited period as an incentive for their inventiveness and research efforts."); *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480-81 (1974) ("The patent laws promote [the progress of science and the useful arts] by offering a right of exclusion for a limited period as an incentive to inventors to risk the often enormous costs in terms of time, research, and development. The productive effort thereby fostered will have a positive effect on society through the introduction of new products and processes of manufacture into the economy, and the emanations by way of increased employment and better lives for our citizens.")

6. Pub. L. No. 96-517, §§ 200-211, 94 stat. 3015, 3019-29 (1980) (codified as amended at 35 U.S.C. §§ 200-212).

7. H.R. Rep. 109-409, at 2 (2006) (quoting H.R. Rep. 96-1307(I), at 3 (1980), as reprinted in 1980 U.S.C.C.A.N. 6460, 6462). An April, 2006 House Report concerning the Bayh-Dole Act recites the Act's alleged successes in similarly instrumentalist terms: the Act, it states, "has helped to catalyze a quarter century of enhanced research and development within the United States and led to dramatic improvements in public health and safety, a strengthened and better resourced higher education system in the U.S., and the development of new domestic industries that have created tens of thousands of highly skilled jobs for American citizens." *Id.* at 3.

8. See, e.g., Benjamin G. Damstedt, *Limiting Locke: A Natural Law Justification for the Fair Use Doctrine*, 112 YALE L.J. 1179 (2003); Wendy Gordon, *Render Copyright Unto Caesar: On Taking Incentives Seriously*, 71 U. CHI. L. REV. 75 (2004); Hughes, *supra* note 4; Lior Zemer, *The Making of a New Copyright Lockean*, 29 HARV. J.L. & PUB. POL'Y 891 (2006).

9. Hughes, *supra* note 4, at 300-05.

10. *Id.* at 303.

11. *Id.* Some scholars distinguish Locke's natural law arguments from utilitarian justifications for intellectual property. See Edwin C. Hettinger, *Justifying Intellectual Property*, 18 PHIL. & PUB. AFFS. 31

proposition that when labor is applied to nature, the value added by the laborer merits a reward.<sup>12</sup> Although the value-added theory is a normative proposition, it is understood in an instrumentalist or consequentialist sense to mean that laborers will only add value to nature if they expect to receive equal value in return from society.<sup>13</sup> The Lockean instrumental argument, Justin Hughes notes, “clearly has dominated official pronouncements on American copyrights and patents.”<sup>14</sup>

The instrumentalist approach to intellectual property has nearly fully occupied the international sphere. The Trade Related Aspects of Intellectual Property agreement (TRIPS), in particular, reflects the view that the “social purpose” of intellectual property “is to provide protection for the results of investment in the development of new technology, thus giving the incentive and means to finance research and development activities.”<sup>15</sup>

Much of the legal and economic scholarship relating to IPR policy and the biotechnology commons explores this instrumentalist approach. Michael Heller and Rebecca Eisenberg’s enormously influential article concerning the biomedical research anticommmons was framed in terms of deterrence and incentives to innovation.<sup>16</sup> The debate over the biotechnology anticommmons has been framed in terms of whether “exclusive rights in new knowledge will promote scientific progress,” or whether “science advances most rapidly when the community enjoys free access to new discoveries.”<sup>17</sup> The U.S. Constitution, Rebecca Eisenberg notes in one of her germinal articles on how patents affect scientific progress, “posits an instrumental justification for patents, allowing Congress to enact patent legislation for the specific purpose of promoting scientific progress.”<sup>18</sup> Similarly, scholars such as Mark Lemley and Dan Burk have explored whether tweaking the patent system in various ways would increase incentives to innovate and to develop commercial products in fields such as biotechnology and traditional pharmaceuticals.<sup>19</sup>

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(1989). Hettinger distinguishes Locke’s focus on just desert and natural entitlement to the fruits of one’s labor from incentive based utilitarian theories. *Id.* at 40-51. While it is true that Locke’s approach to property offers different moral justifications than later utilitarian theories, Locke is properly viewed in many respects as a forerunner of later utilitarians such as Jeremy Bentham. *See, e.g.,* MATT HAYRY, LIBERAL UTILITARIANISM AND APPLIED ETHICS 4 (1994).

12. Hughes, *supra* note 4, at 305.

13. *Id.* at 305-06.

14. *Id.* at 303.

15. World Trade Organization website, *What are Intellectual Property Rights*, [http://www.wto.org/english/tratop\\_e/trips\\_e/intell\\_e.htm](http://www.wto.org/english/tratop_e/trips_e/intell_e.htm) (last visited Jan. 28, 2007). A second instrumental purpose of IPRs, according to the WTO, is to “facilitate the transfer of technology in the form of foreign direct investment, joint ventures and licensing.” *Id.*

16. Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommmons in Biomedical Research*, 280 SCIENCE 698 (1998). Heller and Eisenberg argued that “[p]olicy-makers should seek to ensure coherent boundaries of upstream patents and to minimize restrictive licensing practices that interfere with downstream product development. Otherwise, more upstream rights may lead paradoxically to fewer useful products for improving human health.” *Id.* at 701.

17. Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1017 (1989).

18. *Id.* at 1024.

19. Dan L. Burk & Mark Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575 (2003).

Some scholars have begun to examine and critique the Lockean instrumentalist basis of intellectual property law more broadly and carefully. Peter Drahos, for example, takes a Rawlsian approach and argues that parties in the original position would seek to minimize proprietary control over information.<sup>20</sup> Drahos views information as a primary good because of information's central role in human planning.<sup>21</sup> Because information is a primary good that is essential to liberty, it should be distributed equally, unless unequal distribution is necessary to benefit the least advantaged members of society.<sup>22</sup> This drives Drahos to an instrumentalist view of information (and property generally), but it is a different instrumentalism than Locke's.<sup>23</sup>

For Drahos, an "instrumentalist" view of the law of information means that "law is a tool," which is employed to ensure that the Rawlsian social contract concerning access to information is kept.<sup>24</sup> Drahos thus writes from a legal realist perspective.<sup>25</sup> For Drahos, "[a]n instrumentalism of property does not commit its holder to any specific moral theory or values."<sup>26</sup> Thus, Drahos eschews economic instrumentalism based on Locke, but like many Lockeans, considers proprietary rights in information (or, as Drahos prefers, proprietary "privileges") only in the context of the specific incentives and externalities such rights might entail.<sup>27</sup>

In contrast to these instrumentalist approaches, other theorists have developed the Hegelian theme that property "provides a unique or especially suitable mechanism for self-actualization, for personal expression, and for dignity and recognition as an individual person."<sup>28</sup> In this view, private property is necessary because "to achieve proper self-development—to be a *person*—an individual needs some control over resources in the external environment."<sup>29</sup> As applied to intellectual property, this notion can take on particular force, because creative expression is an element of one's self.<sup>30</sup> Thus, although an author may alienate copies of her work, she "keeps the

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20. PETER DRAHOS, A PHILOSOPHY OF INTELLECTUAL PROPERTY 171-93 (1996).

21. *Id.* at 173-75.

22. *Id.* at 176-81.

23. *Id.* at 199-224.

24. *Id.* at 213-219.

25. *See id.* at 213 (stating that "[w]hen used in connection with law, instrumentalism refers to the idea that law is a tool"); *id.* at 213 n.53 (referring in the footnote to the "links" between instrumentalism and "pragmatism and American Legal Realism").

26. *Id.* at 214.

27. *See, e.g., id.* at 215. Drahos discusses how, under his proposal, economists would have to consider "distributive" theories as well as Pareto efficiency in assessing rules about exclusive rights or privileges in information. *Id.*

28. Hughes, *supra* note 4, at 330.

29. Margaret Jane Radin, *Property and Personhood*, 34 STAN. L. REV. 957, 957 (1982).

30. *See* Hughes, *supra* note 4, at 338. *See also* Edward J. Damich, *The Right of Personality: A Common-Law Basis for the Protection of Moral Rights of Authors*, 23 GA. L. REV. 1 (1988); Neil Netanel, *Alienability Restrictions and the Enhancement of Author Autonomy in United States and Continental Copyright Law*, 12 CARDOZO ARTS & ENT. L.J. 1 (1994); Margaret Jane Radin, *Market-Inalienability*, 100 HARV. L. REV. 1849, 1879-87 (1987); Radin, *supra* note 29. This reading of Hegel recently has been criticized by Jeanne Schroeder, who contends that, while Hegelian personality theory requires minimal protections for private property, it does not require protection for any specific *type* of property, including intellectual property. Jeanne L. Schroeder, *Unnatural Rights: Hegel and Intellectual Property*, 60 U. MIAMI L. REV. 453 (2006).

universal aspect of expression" as her own.<sup>31</sup> Alienation of the personal aspect of expression would be tantamount to slavery.<sup>32</sup>

Still others have mounted a postmodern critique of the notion of "authorship" that underlies copyrights and patents. These critics argue that intellectual property rules are based on the fiction that an identifiable "author" or "inventor" is responsible for a given creative work or invention and the related fiction that such "authors" or "inventors" can "own" information. "Authorship" or "inventorship," in this reading, is properly considered a communal practice, rather than an individual achievement. It is improper, then, to grant any individual monopoly control over what should remain accessible to the entire community.<sup>33</sup> William Fisher has characterized this as a "social planning theory" of intellectual property.<sup>34</sup>

Each of these approaches has merit. The instrumentalist justification has facilitated the rise of technology-rich industries, such as pharmaceuticals and biotechnology, and the postmodern critique appropriately focuses attention on the communal nature of creative and inventive work. But none of them seems complete in itself, and it can be difficult to draw connections between them. Moreover, none of these approaches situates intellectual property into a coherent broader context of human development and flourishing. As a result, the academic debate over intellectual property remains at a stalemate, while in the political arena the utilitarian view prevails because wealthy and powerful corporate interests support it.

We should be able to move past this stalemate. Indeed, there is an ancient understanding of ethics that could integrate the useful themes inherent in existing theories and provide a more robust and humane treatment of intellectual property in society: that of virtue ethics. Legal scholars have just begun to explore the implications of virtue ethics for law and policy and to develop a system of "virtue jurisprudence."<sup>35</sup> As leading virtue jurisprudence scholar Lawrence Solum describes it, virtue jurisprudence is in one sense a new theory, as it draws on the recent explosion of interest in virtue ethics generally.<sup>36</sup> But, Solum notes, virtue jurisprudence "is also a very old theory, rooted in Aristotle's conception of ethics, politics, and the nature of law."<sup>37</sup>

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31. Hughes, *supra* note 4, at 338.

32. *Id.*

33. See, e.g., THE CONSTRUCTION OF AUTHORSHIP: TEXTUAL APPROPRIATION IN LAW AND LITERATURE (Peter Jaszi & Martha Woodmansee, eds., 1994); Keith Aoki, *Authors, Inventors and Trademark Owners: Private Intellectual Property and the Public Domain*, 18 COLUM.-VLA J.L. & Arts 1 (1994); James Boyle, *A Theory of Law and Information: Copyright, Spleens, Blackmail, and Insider Trading*, 80 CAL. L. REV. 1415 (1992); Rosemary J. Coombe, *Objects of Property and Subjects of Politics: Intellectual Property Laws and Democratic Dialogue*, 69 TEX. L. REV. 1853 (1991); The Society for Critical Exchange, *The Bellagio Declaration*, (Mar. 11, 1993), available at <http://www.case.edu/affil/sce/BellagioDec.html>; Society for Critical Exchange, *Intellectual Property and the Construction of Authorship*, [http://www.case.edu/affil/sce/IPCA\\_main.html](http://www.case.edu/affil/sce/IPCA_main.html) (last visited Jan. 23, 2007).

34. William Fisher, *Theories of Intellectual Property*, in NEW ESSAYS IN THE LEGAL AND POLITICAL THEORY OF PROPERTY (2001).

35. See Lawrence B. Solum, *Virtue Jurisprudence: A Virtue-Centred Theory of Judging*, 34 META-PHILOSOPHY 178 (2003).

36. *Id.* at 179.

37. *Id.*

This essay is an effort to contribute to this new-but-ancient field of virtue jurisprudence by sketching out some ways in which a virtue ethics approach could relate to the debates over open source biotechnology. In the next section, I will briefly summarize the core themes of contemporary virtue ethics. I will then identify how those themes could relate to the problem of open source biotechnology.

## II. WHAT IS VIRTUE ETHICS?

### A. Summary of Virtue Ethics

Virtue ethics focus on a person's virtues or character more than on the person's individual decisions.<sup>38</sup> The central question for virtue ethics is not so much "did I make the right decision in this situation" as "have I acquired the characteristics of a virtuous person." In this way, virtue ethics is different than deontological ethics, which emphasize adherence to particular ethical rules or precepts, and utilitarian or consequentialist ethics, which examine the consequences of an action to determine whether it, on balance, benefits the public welfare. In virtue ethics, particular actions are examined in relation to how they reflect and inculcate virtue rather than in relation to whether they fall within a rule or maximize welfare.<sup>39</sup>

The concept of virtue as the focus of ethics can be traced back to ancient Greek thought. Plato enumerated the four "cardinal" virtues of fortitude, temperance, justice and wisdom.<sup>40</sup> It was Aristotle, however, who developed the virtues into a practical ethical system.<sup>41</sup> In his *Nicomachean Ethics*, Aristotle developed the concept of *eudemonia*, or "human flourishing," as the touchstone of ethics.<sup>42</sup> *Eudemonia* is

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38. For a good overview of virtue ethics, see Rosalind Hursthouse, *Virtue Ethics*, in STANFORD ENCYCLOPEDIA OF PHILOSOPHY (Fall 2006 ed.), <http://plato.stanford.edu/entries/ethics-virtue>.

39. Although this is a useful broad brush description of virtue ethics and its differences from consequentialist and deontological positions, a more detailed account of virtue ethics, which is beyond the scope of this essay, would recognize that there are similarities as well as more subtle differences among the three positions. See Rosalind Hursthouse, ON VIRTUE ETHICS 25-42 (Oxford University Press 1999).

40. EDMUND D. PELLEGRINO & DAVID C. THOMASMA, THE VIRTUES IN MEDICAL PRACTICE 4 (1993).

41. *Id.* at 4-5.

42. In the introduction to the *Nicomachean Ethics*, Aristotle states:

If, then, there is some end of the things we do, which we desire for its own sake (everything else being desired for the sake of this), and if we do not choose everything for the sake of something else (for at that rate the process would go on to infinity, so that our desire would be empty and vain), clearly this must be the good and the chief good. Will not the knowledge of it, then, have a great influence on life? Shall we not, like archers who have a mark to aim at, be more likely to hit upon what is right? If so, we must try, in outline at least, to determine what it is, and of which of the sciences or capacities it is the object. It would seem to belong to the most authoritative art and that which is most truly the master art. And politics appears to be of this nature; for it is this that ordains which of the sciences should be studied in a state, and which each class of citizens should learn and up to what point they should learn them; and we see even the most highly esteemed of capacities to fall under this, e.g. strategy, economics, rhetoric; now, since politics uses the rest of the sciences, and since, again, it legislates as to what we are to do and what we are to abstain from, the end of this science must include those of the others, so that this end must be the good for man.

ARISTOTLE, NICOMACHEAN ETHICS Bk. 1, ch. 2, <http://classics.mit.edu/Aristotle/nicomachaen.html> (last visited Jan. 28, 2007). Later in the *Nicomachean Ethics*, Aristotle describes *eudemonia* (translated here as "happiness," but better translated "flourishing") as follows:

achieved when human beings live according to their fullest human potential. The focus of ethical reflection, then, is to encourage the development of character traits, or "virtues," that enable people to achieve their fullest potential. For Aristotle, there were "intellectual" virtues of art, science, intuition, reasoning, and practical wisdom, and the "moral" virtues, which include Plato's four cardinal virtues as well as characteristics like magnanimity.<sup>43</sup>

Aristotelian virtue ethics were incorporated into Western thought by Aquinas in connection with natural law theory, as part of the "Aristotelian synthesis."<sup>44</sup> Aquinas recognized the classical virtues, but accorded special status to *phronesis*, or "practical reason," and added the "spiritual" virtues of faith, hope, and charity.<sup>45</sup>

Interest in virtue ethics waned along with the decline of natural law theory during and following the Enlightenment.<sup>46</sup> Ethical theory largely focused instead on consequentialist or deontological models.<sup>47</sup> Starting with Elizabeth Anscombe's pioneering work, however, ethicists such as Anscombe and Philippa Foot reopened the notion of virtue as central to ethical theory.<sup>48</sup> In 1984, the publication of Alisdair MacIntyre's *After Virtue* reignited interest in virtue ethics on a broader scale.

In MacIntyre's view, the "Enlightenment Project" of justifying ethics without regard to virtue failed because it lacked any meaningful notion of teleology.<sup>49</sup> MacIntyre describes ethics as that which seeks to bridge the gap between man-as-he-is

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Now that we have spoken of the virtues, the forms of friendship, and the varieties of pleasure, what remains is to discuss in outline the nature of happiness, since this is what we state the end of human nature to be. Our discussion will be the more concise if we first sum up what we have said already. We said, then, that it is not a disposition; for if it were it might belong to some one who was asleep throughout his life, living the life of a plant, or, again, to some one who was suffering the greatest misfortunes. If these implications are unacceptable, and we must rather class happiness as an activity, as we have said before, and if some activities are necessary, and desirable for the sake of something else, while others are so in themselves, evidently happiness must be placed among those desirable in themselves, not among those desirable for the sake of something else; for happiness does not lack anything, but is self-sufficient. Now those activities are desirable in themselves from which nothing is sought beyond the activity. And of this nature virtuous actions are thought to be; for to do noble and good deeds is a thing desirable for its own sake.

*Id.* at Bk. 10, ch. 6. For MacIntyre's application of the concept of *eudemonia* to contemporary virtue ethics, see ALASDAIR MACINTYRE, *AFTER VIRTUE* 148-50 (2d. ed., U. of Notre Dame Press 1984) (1981).

43. ARISTOTLE, *supra* note 42, at Bk. 6, ch. 1; PELLEGRINO & THOMASMA, *supra* note 40, at 5.

44. See PELLEGRINO & THOMASMA, *supra* note 40, at 7-8.

45. *Id.* at 8. For Aquinas's discussion of the virtues, see THOMAS AQUINAS, *SUMMA THEOLOGICA I-II*, q. 55-67 (Fathers of the English Dominican Province trans., Benzinger Bros. 1974).

46. See PHILIPPA FOOT, *VIRTUES AND VICES AND OTHER ESSAYS IN MORAL PHILOSOPHY 1* (Univ. of Cal. Press 1978) ("For many years the subject of the virtues and vices was strangely neglected by moralists working within the school of analytic philosophy.")

47. See *id.* (noting that the neglect of virtue in ethical theory "was apparently shared by philosophers such as Hume, Kant, Mill, G. E. Moore, W. D. Ross, and H. A. Prichard, from whom contemporary moral philosophy has mostly been derived").

48. See *id.*; G.E.M. Anscombe, *Modern Moral Philosophy*, 33 *PHILOSOPHY* 124 (1958). For a discussion of the recent resurgence of virtue ethics, see ROSALIND HURSTHOUSE, *ON VIRTUE ETHICS* 2-3 (1999); see also Nafsika Athanassoulis, *Virtue Ethics*, in *INTERNET ENCYCLOPEDIA OF PHILOSOPHY*, <http://www.iep.utm.edu/v/virtue.htm> (last visited Feb. 1, 2007).

49. MACINTYRE, *supra* note 42, at 51-61.

and man-as-he-ought-to-be.<sup>50</sup> MacIntyre notes that “the joint effect of the secular rejection of both Protestant and Catholic theology and the scientific and philosophical rejection of Aristotelianism was to eliminate any notion of man-as-he-could-be-if-he-realized-his-*telos*.”<sup>51</sup> Absent such a notion of teleology, moral judgments become something less than “factual statements.”<sup>52</sup>

Utilitarian ethics attempted to bridge this gap by proposing that ethical judgments are objective statements about individual preferences—or utility and the summation of such preferences—to achieve happiness for the greatest possible number of people.<sup>53</sup> However, MacIntyre notes, it soon became clear that “the notion of human happiness is *not* a unitary, simple notion and cannot provide us with a criterion for making our key choices.”<sup>54</sup> Thus, ethics began a decline into mere emotivism, in which ethical statements are nothing more than personal expressions of subjective preferences. As MacIntyre puts it, “[t]he history of utilitarianism thus links historically the eighteenth-century project of justifying morality and the twentieth century’s decline into emotivism.”<sup>55</sup> Virtue theory, then, represents an effort to ground ethical reflection in deeper soil than consequentialist or utilitarian theories allow.

### *B. The Core Axes of Community, Practices, Tradition, and Teleology*

There are four core axes around which virtue ethics turns: community, practices, tradition, and teleology. I will summarize each of these axes below, and then will suggest some ways in which they are particularly relevant to biotechnology intellectual property policy.

#### *1. Community*

Virtue ethics are communitarian. The development of individual virtue occurs only within the context of a particular community. The community shapes and defines the “virtues” that are important to the community. The goal of human flourishing is achieved only as a community embodies the virtues.

In Aristotelian thought, the notion of “excellence” is important to the communitarian context in which the virtues are developed and practiced. An analogy can be drawn here to a useful object, such as a hammer. We can ask, “what characteristics should this object embody in order to function as an excellent hammer?” We might then identify characteristics including the tool’s size, weight, balance, and striking surface.

Tied to this concept of community is the notion of life as a “narrative.”<sup>56</sup> Narratives reflect the historical arc or *telos* of a community. MacIntyre places the virtues extolled by Aristotle within the narrative framework of the heroic Greek city-

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50. *Id.* at 54-55.

51. *Id.* at 54.

52. *Id.* at 59.

53. *Id.* at 62-64.

54. *Id.* at 63.

55. *Id.* at 65.

56. See Brad J. Kallenberg, *The Master Argument of MacIntyre’s After Virtue*, in *VIRTUES AND PRACTICES IN THE CHRISTIAN TRADITION* 22 (2003).

state.<sup>57</sup> The virtues that were prominent in Aristotle and later Greek thought were those that were necessary to promote the flourishing of the ideal *polis*.

### 2. Practices

A second axis of virtue ethics is that of practices. Virtue ethics does not abjure rules or practices, but the focus is on practices rather than deontological rules.<sup>58</sup> The goal is to identify practices that will enable a community to embody its core virtues. As MacIntyre defines it, a "practice" is:

[A]ny coherent and complex form of socially established cooperative human activity through which goods internal to that form of activity are realized in the course of trying to achieve those standards of excellence which are appropriate to, and partially definitive of, that form of activity, with the result that human powers to achieve excellence, and human conceptions of the ends and goods involved, are systematically extended.<sup>59</sup>

This definition means that practices entail goods internal to the activity.<sup>60</sup> Such "internal" goods are rewards recognized by practitioners.<sup>61</sup> In addition, practices include "standards of excellence" that, when achieved, give rise to the goods internal to the practice.<sup>62</sup> Finally, practices are "systematically extended," meaning that the practices' standards of excellence, as well as the capabilities of practitioners, rise over time.<sup>63</sup>

### 3. Tradition

A third axis of virtue ethics is that of "tradition." MacIntyre conceives of "tradition" as "an historically extended, socially embodied argument, and an argument precisely in part about the goods which constitute that tradition."<sup>64</sup> By "historically extended," MacIntyre means that the tradition of a community is a narrative, comprised

57. MACINTYRE, *supra* note 42, at 131-45.

58. Edmund Pellegrino and David Thomasma have described the relationship between virtue and principles as follows:

The virtuous person is virtuous with respect to this principle [that humans qua humans are owed respect for their ability to make reasoned choices that are their own and that others may not share] not simply because she observes the principle, but because she has not initialized it, made it synonymous with her intentions with respect to other humans, is habitually disposed to respect that principle, and is disposed to do so excellently—that is, as fully as possible. Thus, the virtuous person is not virtuous because she respects the principle, but because she recognizes the fundamental and universal nature of this principle, sees it not just as a duty in the Kantian sense, but as part of her character—incised, so to speak, in the etymological sense of the word "character," into her very person and identity. The virtuous person cultivates *arête* in the way she actualizes the virtue in her moral choices and actions.

PELLEGRINO & THOMASMA, *supra* note 40, at 22.

59. MACINTYRE, *supra* note 42, at 187.

60. See Kallenberg, *supra* note 56, at 21.

61. *Id.*

62. *Id.*

63. *Id.*

64. MACINTYRE, *supra* note 42, at 222; see also Kallenberg, *supra* note 56, at 24-26.

of the individual narratives of its members over time.<sup>65</sup> Thus, a community has its own historical arc and *telos*. Moreover, traditions are “socially embodied” because they are located in communities.<sup>66</sup> Individuals within communities pledge allegiance to the text or voice that provides authoritative structure to the community.<sup>67</sup> Yet, the community’s narrative is not stagnant because new generations of community members continually reinterpret the tradition and apply it to contemporary circumstances.<sup>68</sup> In this way, over time, a living tradition represents a broad narrative that has weathered various challenges and crises.<sup>69</sup>

#### 4. Teleology

A final aspect of virtue ethics that is particularly suitable to the analysis of open source biotechnology is that of teleology. In a sense, teleology is not really a separate axis of virtue ethics, but rather is inherent in the axes of community, practices, and tradition already discussed. In fact, virtue ethics can be broadly considered as a form of teleological ethics, in that ethics is a process that moves the community towards the goal of human flourishing.

Although virtue ethics is teleological, it should not be equated with consequentialism generally, or utilitarianism in particular. Indeed, one of the motivations for focusing on virtue ethics and biotechnology innovation policy is to move the discussion out of its utilitarian rut.

It can of course be useful to attend to power relationships, utility preferences, and consequences of individual utility maximization when analyzing the legal regulation of biotechnology innovation. In fact, in a virtue ethics context, such considerations must be attended to given the importance of *phronesis* (practical wisdom) as a virtue. The problem, however, is that utilitarian approaches have dominated the legal scholarship, without a broader conception of *why* we should be concerned, as an ethical matter, about the deadweight losses caused by biotechnology patents or the effects of a putative patent-induced anticommons. As MacIntyre notes, there is nothing connecting the humans-as-we-are with the humans-as-we-should-be.<sup>70</sup> Moreover, as MacIntyre and many other critics of consequentialist ethics also note, it is impossible to simplify even one person’s utility to a basic function, much less to do so in complex political and cultural settings in which competing utilities seem incommensurable.<sup>71</sup>

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65. Kallenberg, *supra* note 56, at 25.

66. *Id.*

67. *Id.*

68. *Id.*

69. ALASDAIR MACINTYRE, WHOSE JUSTICE? WHICH RATIONALITY? 12 (1988). As MacIntyre puts it, a tradition is

an argument extended through time in which certain fundamental agreements are defined and redefined in terms of two kinds of conflict: those with critics and enemies external to the tradition . . . and those internal, interpretive debates through which the meaning and rationale of the fundamental agreements come to be expressed and by whose progress a tradition is constituted.

*Id.* at 12; see also Kallenberg, *supra* note 56, at 25.

70. See MACINTYRE, *supra* note 42, at 63-65.

71. *Id.* For a general summary of objections problems relating to the use of individual welfare functions for collective choice, see Bernard Williams, *A Critique of Utilitarianism*, in UTILITARIANISM: FOR &

In contrast, the teleology of human flourishing inherent in virtue ethics is a fully-orbed concept. It includes utility maximization functions, but is more than the sum of such functions. This is because virtue ethics starts with a broad conception of “the good” and then works backwards to the individual virtues that will support practices within communities progressing towards the good. The hope is to develop narratives, practices, examples, frameworks, and contexts that foster the *internal* development of virtue, rather than merely enforcing *external* rules that discipline preferences.

In this regard, virtue ethics also should be distinguished from ethical systems that are primarily deontological. Deontological ethics emphasize adherence to duty.<sup>72</sup> Within liberal democratic states, the sort of social contract theory attributed to John Rawls can be viewed as a type of deontological ethic that emphasizes adherence to contract-like duties.<sup>73</sup> In Rawls’s view, the preferences of different social groups are incommensurable, such that society only coheres through a shared commitment to a small number of basic rules that comprise the social contract. Most of these rules relate to the scope of *individual* rights. Virtue ethics, in contrast, is unwilling to give up on a broader notion of community.

### III. HOW CAN VIRTUE ETHICS BE APPLIED TO BIOTECHNOLOGY INTELLECTUAL PROPERTY POLICY? (THE VIRTUOUS PENGUIN)<sup>74</sup>

There presently exists no framework for how virtue ethics could apply to intellectual property. The core virtue ethics axes of community, practices, tradition, and teleology, however, seem conducive to current discussions surrounding biotechnology. In the following sub-sections, I discuss how virtue ethics can relate broadly to open source methods of production, and then develop some themes in environmental and health care virtue ethics that can be applied to open source biotechnology.

#### A. *Virtue Ethics and Open Source Production Generally*

The virtue ethics notions of community and practices seem to map well onto the open source space. As Yochai Benkler has noted, open source communities require

AGAINST 77, 135-50 (1973); AMARTYA K. SEN, COLLECTIVE CHOICE AND SOCIAL WELFARE (1970). See also JOHN RAWLS, A THEORY OF JUSTICE 19-24 (1971) (critiquing classical utilitarianism as overly individualistic).

72. The foremost proponent of this sort of ethical system was Immanuel Kant, who introduced the concept of the “categorical imperative”: “I ought never to act except in such a way that I should also will that my maxim should become a universal law.” IMMANUEL KANT, GROUNDWORK OF THE METAPHYSICS OF MORALS 15 (Mary Gregor ed., 1998). For MacIntyre’s discussion of Kant’s deontological system, see MACINTYRE, *supra* note 42, at 45-47. For a general discussion of deontological ethics, see Gerald F. Gaus, *What is Deontology? Part One: Orthodox Views*, 35 J. VALUE INQUIRY 27 (2001).

73. See generally JOHN RAWLS, A THEORY OF JUSTICE (rev. ed. 1999); JOHN RAWLS, JUSTICE AS FAIRNESS: A RESTATEMENT (2001). For MacIntyre’s discussion of Rawls, see MACINTYRE, *supra* note 42, at 246-51. For further discussion of contemporary deontological views, see Gaus, *supra* note 72; Gerald F. Gaus, *What is Deontology? Part Two: Reasons for Action*, 35 J. VALUE INQUIRY 179 (2001).

74. The “penguin” refers to the penguin character that serves as a trademark for the Linux operating system. See Linux Online, <http://www.linux.org> (last visited Mar. 26, 2007). It also refers to Yochai Benkler’s seminal article, *Coase’s Penguin, or, Linux and the Nature of the Firm*, 112 YALE L.J. 369 (2003).

a system of “social-psychological” rewards in order to flourish.<sup>75</sup> Such rewards can include the sort of “internal goods” found in MacIntyrean “practices.”<sup>76</sup> For example, a coder working on an open source software project might participate, at least in part, for the joy and satisfaction inherent in creating an elegant solution to a technical problem.<sup>77</sup> In addition, mature open source projects do not proceed aimlessly, but include standards of excellence established by the community and usually canonized by an influential individual or small group of individuals.<sup>78</sup> Finally, a pillar of open source production is the systematic extension of the project through the continuous feedback provided by numerous distributed workers.<sup>79</sup>

A tension might arise, however, between MacIntyre’s emphasis on a community’s authoritative text or voice and the notion of open source production as an enterprise comprised of essentially self-actualizing individuals. In fact, Yochai Benkler and Helen Nissenbaum emphasize the virtue of “autonomy” as a core aspect of a virtue ethics approach to commons-based peer production.<sup>80</sup> Benkler in particular emphasizes the ways in which open source peer production contributes to justice by allowing space for individual autonomy.<sup>81</sup>

But open source communities should not be conceived of as fractiously individualistic. A successful, long term open source community requires an authoritative voice or voices that regulate exchange, lend status to social-psychological rewards, and canonize valuable contributions to the project.<sup>82</sup> Open source production can indeed sometimes provide more space for individual creativity and expression than traditional hierarchical production, but such creativity and expression should be conceived in terms of virtues that lend themselves to communal practices, with such practices embedded in the narrative tradition of the community.

Once open source communities are conceived in MacIntyrean terms, it is possible to identify virtues that support the flourishing of such communities. Benkler and Nissenbaum identify three “clusters” of virtues that relate to peer production: (1) “autonomy, independence, liberation”;<sup>83</sup> (2) “creativity, productivity, industry”;<sup>84</sup> (3) “benevolence, charity, generosity, altruism”;<sup>85</sup> and “sociability, camaraderie, friendship, cooperation, civic virtue.”<sup>86</sup>

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75. YOCHAI BENKLER, *THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM* 92-99 (2006).

76. See *supra* notes 58-62 and accompanying text.

77. Some discernment is required here, however, as other types of social-psychological rewards, such as receiving praise and enhancing one’s reputation, are not properly considered “internal goods.” See Kallenberg, *supra* note 56, at 21.

78. See David W. Opderbeck, *The Penguin’s Genome, or Coase and Open Source Biotechnology*, 18 HARV. J.L. & TECH. 167, 192-95 (2004).

79. See BENKLER, *supra* note 75, at 66-68 (describing how open source networks operate).

80. Yochai Benkler & Helen Nissenbaum, *Commons-Based Peer Production and Virtue*, 14 J. POL. PHIL. 394, 405-06 (2006).

81. See BENKLER, *supra* note 75, at 8-9.

82. Opderbeck, *supra* note 78, at 192-94.

83. Benkler & Nissenbaum, *supra* note 80, at 405.

84. *Id.* at 406.

85. *Id.* at 407.

86. *Id.* at 408.

The first cluster seems difficult to relate to the communitarian axis of virtue ethics. As an example of the “virtue” of autonomy, Benkler and Nissenbaum propose “independence from the wide-ranging commercial entities influencing our actions and choices as well as from the typical array of institutional entities, whether employers, banks, agents of government, or whoever.”<sup>87</sup> In his important book *The Wealth of Networks*, Benkler stresses autonomy as a fundamental value promoted by open source production, but not from a virtue ethics framework.<sup>88</sup> In *The Wealth of Networks*, Benkler seems to approach the question of autonomy from a Kantian perspective.<sup>89</sup>

“Autonomy” seems better suited to the Kantian perspective Benkler takes in *The Wealth of Networks* than to the virtue ethics approach he takes with Nissenbaum. It may be true that commons-based production increases individual autonomy by providing alternatives to information flows produced by traditional commercial providers. But individual autonomy should not be conceived as a “virtue.” Rather, some notion of autonomy may be a component of the *eudemonia* toward which the virtues direct human practices. And the virtues, as instantiated in practices and traditions, are never merely self-directed. Practices and traditions are by definition communal, not merely individual.

A better approach to the question of autonomy within a virtue ethics framework of open source production would be to focus on the virtue of “respect” for the autonomy of others. If human flourishing requires that people have some capacity to make autonomous choices, then respecting the choices of others, and fostering communities in which such choices can be exercised, is an important virtue.<sup>90</sup> Viewed this way, it is possible to identify practices and traditions that embody this virtue.

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87. *Id.* at 406.

88. See generally, BENKLER, *supra* note 75. Immanuel Kant argued, in contrast to utilitarian ethics, that human beings are ends in themselves and possess certain basic rights that cannot be subject to a merely utilitarian calculus. See KANT, *supra* note 72; see also Marc J. Roberts & Michael R. Reich, *Ethical Analysis in Public Health*, 359 LANCET 1055, 1056 (2002). Benkler features the Kantian notion of an individual’s “life plan” in his discussion of how open source production fosters individual autonomy. See, e.g., BENKLER, *supra* note 75, at 141-42 (“As a means of diagnosing the conditions of individual freedom in a given society and context, we must seek to observe the extent to which people are, in fact, able to plan and pursue a life that can reasonably be described as a product of their own choices. . . . It is in this sense that the increased range of actions we can imagine for ourselves in loose affiliation with others . . . increases our ability to imagine and pursue life plans that would have been impossible in the recent past.”).

89. See BENKLER, *supra* note 75, at 133-175. Benkler argues that “[t]he structure of our information environment is constitutive of our autonomy, not only functionally significant to it.” *Id.* at 147. Open source production enhances autonomy because it alters the power structure of the information environment and devolves more control to the individual. See, e.g., *id.* at 161 (“By offering alternative transactional frameworks for alternative information flows, these [commons-based/open source] networks substantially and qualitatively increase the freedom of individuals to perceive the world through their own eyes, and to form their own perceptions of what options are open to them and how they might evaluate alternative courses of action.”).

90. There is, of course, significant room for discussion about the nature, extent, and role of individual autonomy in a flourishing community. It is difficult to conceive of a virtue ethic with a primarily individualistic teleology. Indeed, one of the attractions of virtue ethics is its rejection of the excessive individualism associated with the Enlightenment approach to morality. See, e.g., MACINTYRE, *supra* note 42, at 51-61 (“Why the Enlightenment Project of Justifying Morality Had to Fail”).

Benkler and Nissenbaum's focus on "creativity, productivity, [and] industry" seems closer to the heart of virtue ethics.<sup>91</sup> They helpfully note that creativity, productivity, and industry can be considered part of a MacIntyrian "practice."<sup>92</sup> Peer production provides additional avenues for individuals to engage in creative and productive work, and thus can facilitate valuable practices.<sup>93</sup>

In addition, Benkler and Nissenbaum note that peer production encourages the "other-regarding" virtues of "benevolence, charity, generosity, [and] altruism."<sup>94</sup> Participants in open source communities give time, resources, and talents to the project, ordinarily without direct financial remuneration.<sup>95</sup> As Benkler and Nissenbaum note, however, the literature concerning open source culture is ambiguous concerning whether participants offer their time, resources, and talents for altruistic reasons or as part of an essentially self-interested medium of exchange.<sup>96</sup>

Finally, Benkler and Nissenbaum focus on the virtues of "sociability, camaraderie, friendship, cooperation[, and] civic virtue."<sup>97</sup> It is here that their link between virtue ethics and peer production is perhaps most salient. This cluster of virtues involves providing resources to a community engaged in a common project with a common goal. The concept is similar, Benkler and Nissenbaum note, to the American founders' notion of politics as contribution to the public good.<sup>98</sup> Whatever their psychological motives, the multifarious contributors to an open source project provide small inputs of time, resources, and talent, which cumulate to a much larger good.

#### *B. Virtue and Biotechnology as an Environmental and Public Health Community*

If virtue ethics concepts can apply generally to open source production, can they apply to biotechnology, and specifically to open source biotechnology? Benkler and Nissenbaum argue that the ethical implications of any technology include not only the uses to which a purportedly "neutral" technology is put, but also the manner in which the technology's architecture and functionality affect those uses.<sup>99</sup> Here they helpfully draw on technology and society theorists such as Marshall McLuhan and Lewis Mumford.<sup>100</sup> Open source production, Benkler and Nissenbaum suggest, structurally incorporates virtues that lead to greater human freedom. If we fail to encourage open source production, "[w]e might miss the chance to benefit from a distinctive socio-technical system that promotes not only cultural and intellectual production but constitutes a venue for human character development."<sup>101</sup>

In this vein, we can view biotechnology, like the communications networks with which Benkler usually is most directly concerned, as another medium of information

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91. Benkler & Nissenbaum, *supra* note 80, at 406-07.

92. *Id.*

93. *Id.*

94. *Id.* at 407-08.

95. *Id.*

96. *Id.* at 408. See also Opderbeck, *supra* note 78, 192-95 (discussing open source "gift" culture).

97. Benkler & Nissenbaum, *supra* note 80, at 408-09.

98. *Id.* at 409.

99. *Id.* at 410-17.

100. *Id.*

101. *Id.* at 417.

exchange. It is tempting to draw direct parallels between computer information networks and biotechnology. Computer networks are controlled by computer code, such that control over the code equals control over the content delivered across the network.<sup>102</sup> A society that values the free exchange of ideas should therefore value an open code architecture across such computer information networks. Similarly, one could suggest that biological organisms are controlled at least to some extent by genetic code, and that those who are able to control genetic code through biotechnology will be able to control the organism, including people. The distribution of control over genetic code across peer production networks then could represent a means of democratizing control over life itself.

I have previously noted a number of difficulties with this approach.<sup>103</sup> In particular, it is not so simple to tease out a “code layer” in a living organism that might be amenable to peer production.<sup>104</sup> Although DNA is a type of code, it is far more complex than a typical computer program, and the hardware and craft knowledge needed to isolate and manipulate genetic code is not widely available.<sup>105</sup>

Nevertheless, there may be a role for open source production in biotechnology at the broad level of basic research and large-scale genomic databases and at the level of certain enabling technologies.<sup>106</sup> For example, the Cambia “BIOS” initiative and the HapMap project represent steps in this direction. And, it is at this level of basic “upstream” research that fears of a biotechnology anticommmons are most tractable. The deadweight loss of patent protection in this arena can represent significant human suffering.

The debates about biotechnology patents, then, are essentially debates about information—code—that concerns public health. We are concerned about access to biotechnology and biotechnology innovation because of the immense promise and perils of this technology as it relates to human health. Biotechnology could hold the key to a cure for AIDS or the safe disposal of the world’s toxic waste. It also could generate vast waves of environmental and social disruption, for example, if non-fertile genetically modified crops hybridize with indigenous food supplies and render them sterile.

In this regard, it should be clear that, from a virtue ethics perspective, it is not enough to treat biotechnology as simply a product in a market. Although the products of biotechnology practice can be commodified and traded in markets, and although such markets can be an important component in biotechnology policy, markets are not the *raison d’être* of biotechnology.

Biotechnology, then, is more than a set of products; it is a MacIntyrian practice that seeks to improve human health and wellbeing. In his keynote address at BIO’s 2005 annual convention, BIO President and CEO James Greenwood told the conferees, “[Y]ou serve every man, woman and child on earth. And even more impressively, you

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102. See generally LAWRENCE LESSIG, CODE AND OTHER LAWS OF CYBERSPACE (1999); Wiki Home, <http://codebook.jot.com/WikiHome> (last visited Jan. 30, 2007) (the Wiki version of Lessig’s CODE AND OTHER LAWS is a moderated open source project that will produce “version 2.0” of Lessig’s classic text).

103. See Opderbeck, *supra* note 78, at 182-85.

104. *Id.*

105. *Id.* at 195-97.

106. See *id.* at 218.

serve the uncountable billions of humans who will inhabit this planet after we are gone."<sup>107</sup> Greenwood expressed the biotechnology community's vision, hyperbolically but no doubt sincerely, as follows:

The convergence of systems biology, genomics, infomatics, proteomics, nanotechnology and personalized medicine bring us to the threshold of a new era: In the biotech century, using genetically enhanced crops, we will better feed an increasingly hungry world.

In the biotech century, we will harness enzymes to convert plant waste to fuel and to biodegradable plastics, reducing our dependence on oil.

In the biotech century, we will be able to outpace the tortures of [D]arwinian natural selection and its afflictions of disease.

There is no more noble—and no more heroic—mission than this.<sup>108</sup>

Greenwood's sentiments are echoed—even amplified—in a promotional video produced by BIO entitled "Biotechnology: Knowledge Serving Life."<sup>109</sup> The video adopts the elegiac tone of a science museum film or public television documentary and intercuts brief comments from cancer and cystic fibrosis patients, optimistic and earnest talking-head scientists projected against CSI-like blue-tinted backgrounds filled with wiggling microorganisms, and colorful images of Midwestern farms and Asian village wells. The narration borders on messianic. At the video's close, the narrator tells us:

Dreams begin with inspiration and flourish with determination and courage. Such are the dreams of today's biotechnology leaders. Their dream of improving the human condition offers hope to those who suffer, relief to those who are ill, and fullness of life to those we love. Within our reach is a future unimaginable a generation ago. Think of a world where starvation is replaced with healthful diets, where manufacturing products and energy are made with natural renewable resources, where our environment is preserved for tomorrow's generations. Biotechnology: furthered by faithfully exploring the unknown and boldly embracing the possible. The world's great new frontier is upon us.<sup>110</sup>

The video includes similar teleological comments from industry leaders. For example, Dr. Leroy Hood, President of the Institute for Systems Biology, says:

If the mission of man is to make suffering less, if the mission of man is to deal with hunger and starvation, and if the mission of man is to educate and to better the population, I would argue that the kinds of technologies that we're talking about here are going to be utterly key in the future for doing that.<sup>111</sup>

Likewise, Robert Beach, Ph.D., President of the Donald Danforth Plant Science Center, says:

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107. Hon. James C. Greenwood, Biotechnology Industry Organization 2005 Keynote Speech (Jun. 20, 2005), <http://www.bio.org/events/2005/media/greenwood.asp>.

108. *Id.*

109. Biotechnology Industry Organization, *Biotechnology: Knowledge Serving Life*, <http://www.bio.org/news/video/greatnewfrontier.asx> (last visited Jan. 29, 2007).

110. *Id.*

111. *Id.*

I'm terribly optimistic of the science. If we do it all right, we *will* make a better world, a world that is cleaner in its environment, a world that uses less agricultural chemicals and that we really can pull this all together through integration of genetics and engineering and agriculture and manufacturing and politics and policy, and it all is gonna work.<sup>112</sup>

Of course, these are public relations pieces as much as they are true reflections of sentiments in the biotechnology community, and one might be permitted a bit of cynicism about the motivation of altruism versus motivation derived from the prospect of cashing out stock options in a buy-out or public offering. These sentiments do, however, reflect a genuine sense of purpose in the biotechnology community, however attenuated or pinched it might be at times by other priorities. That real sense of purpose can form the basis of practices that extend the biotechnology narrative towards the ultimate goal of human flourishing.<sup>113</sup>

Because of this linkage with healthcare and the environment, it is useful to examine how virtue ethics relates to those fields. Fortunately, virtue ethics concepts are well-developed both in relation to health care and the environment. In the next sections, I will sketch some relevant virtue ethics perspectives on health care and environmental issues. I will then offer some suggestions for how those perspectives could relate to biotechnology intellectual property policy.

### *1. Environmental Virtue Ethics*

There are at least four broad approaches to environmental virtue ethics. First, a policy or action can be evaluated as an extension of basic interpersonal virtues.<sup>114</sup> Interpersonal virtues are those that concern relationships among humans.<sup>115</sup> These include virtues such as honesty, temperance, gratitude, and generosity.<sup>116</sup> Such virtues can be extended to relationships between humans and nonhuman animals or the natural environment, assuming there is some ground for holding such relationships commensurable.<sup>117</sup> The virtue of gratitude, say, might apply in relation to the way in which one benefits from the natural environment, just as it applies to benefits one receives from other people.<sup>118</sup>

A second strategy for environmental virtue ethics focuses on agent benefit.<sup>119</sup> Here the relevant question is how the virtue in question benefits its possessor.<sup>120</sup> Under this approach, concern for the natural environment is a virtue because a clean

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112. *Id.*

113. Of course, the biotechnology community itself cannot answer the question of why human flourishing should provide the overarching framework for this particular community's goals and practices. That broader question can only be answered by theology, philosophy, and other metaphysical disciplines. (My thanks to Brad Kallenberg for mentioning this important qualifier.)

114. Ronald Sandler, *Introduction: Environmental Virtue Ethics*, in ENVIRONMENTAL VIRTUE ETHICS 1, 4 (Ronald Sandler & Philip Cafaro eds., 2005).

115. *Id.*

116. *Id.*

117. *Id.*

118. *Id.*

119. *Id.*

120. *Id.*

environment is conducive to the actor's health and to the enjoyment of natural resources.<sup>121</sup> Such enjoyment includes not only the use of things like clean air and water, but also the aesthetic experience of unpolluted spaces.<sup>122</sup>

Another approach is to study the character of environmental role models.<sup>123</sup> Such role models provide examples of character traits comprising environmental virtue. Telling the stories of such role models inculcates those virtues in the life of the community.<sup>124</sup>

Finally, environmental virtue can be grounded in concepts of human excellence.<sup>125</sup> Under this framework, a virtue is something that enables human beings to flourish. The virtues of generosity and charity, for example, enable individuals to contribute to the social groups to which they belong, and thereby enhance individual well-being.<sup>126</sup>

## 2. *Virtue Ethics and Health Care*

Virtue ethics as applied to health care primarily focuses on the character traits of a virtuous practitioner given the ends of medical practice.<sup>127</sup> For example, Justin Oakley and Dean Cocking have suggested that a doctor's role must be defined in regard to the teleology of medical practice, which is the promotion of human health.<sup>128</sup> An "ethical" doctor is one who possesses the character traits or virtues that support this practice.<sup>129</sup> Oakley and Cocking identify these virtues as beneficence, truthfulness, trustworthiness, courage, and humility.<sup>130</sup> A physician who possesses these virtues will put the patient's needs above her own, provide patients with accurate information, keep patient confidences and respect patient autonomy, seek the patient's good despite

121. *Id.*

122. *Id.*

123. *Id.* at 5.

124. This represents a form of the virtue ethic found in the "heroic" societies discussed by MacIntyre. See MACINTYRE, *supra* note 42, at 121-30. MacIntyre suggests that

perhaps what we have to learn from heroic societies is twofold: first that all morality is always to some degree tied to the socially local and particular and that the aspirations of the morality of modernity to a universality freed from all particularity is an illusion; and secondly that there is no way to possess the virtues except as part of a tradition in which we inherit them and our understanding of them from a series of predecessors in which series heroic societies hold first place.

*Id.* at 126-27.

125. Sandler, *supra* note 114, at 5.

126. *See id.*

127. *See, e.g.,* JUSTIN OAKLEY & DEAN COCKING, *VIRTUE ETHICS AND PROFESSIONAL ROLES* (2001); Ann Marie Begley, *Practising Virtue: A Challenge to the View that a Virtue Centered Approach to Ethics Lacks Practical Content*, 12 *NURSING ETHICS* 622 (2005); P. Gardiner, *A Virtue Ethics Approach to Moral Dilemmas in Medicine*, 29 *J. MED.* 297 (2003).

128. OAKLEY & COCKING, *supra* note 127, at 74-85.

129. *Id.* at 92.

130. *Id.* at 92-93. Beneficence is "a disposition to focus on the patient's own psychophysical needs, and to distinguish which procedures are genuinely necessary for the patient's health and which would be excessive (and so to avoid 'defensive medicine'), and to desire the removal of the patient's impairment, for the patient's own sake, along with a sensitivity and tactfulness in dealing with the vulnerabilities common to sick people." *Id.* at 92-93.

personal risks, and recognize when it is necessary to call upon the expertise of other practitioners.<sup>131</sup>

Edmund Pellegrino and David Thomasma have developed a virtue ethics approach to medical practice and health care policy<sup>132</sup> in response to the principle-based model that has largely dominated medical ethics since the first publication of Tom Beauchamp and James Childress' *Principles of Biomedical Ethics*.<sup>133</sup> Beauchamp and Childress' approach centers on four core principles—respect for autonomy, nonmaleficence, beneficence, and justice—from which particular rules can be derived.<sup>134</sup> Beauchamp and Childress view virtues and character as adjuncts that enhance or round out an assessment of conduct based on principles and rules.<sup>135</sup> However, they consider acts that go beyond what is strictly required by principles and rules as supererogatory and not morally required.<sup>136</sup> Thus, although Beauchamp and Childress attend to the virtues, their ethic remains Kantian and deontological.

Pellegrino and Thomasma, in contrast, recognize the importance of principles and rules, but accord priority to virtue.<sup>137</sup> In their view, a virtuous person is not a person who merely observes a principle, but one for whom the principle is “synonymous with her intentions with respect to other humans, [and who] is habitually disposed to respect that principle, and is disposed to do so excellently—that is, as fully as possible.”<sup>138</sup> For the virtuous person, a principle is not merely a Kantian duty, but is “incised, so as to speak, in the etymological sense of the word ‘character,’ into her very person and identity.”<sup>139</sup>

Pellegrino and Thomasma also depart from the deontological approach in where they locate the source of virtue. The source of virtue is not obedience to principles per se, but is located in the ends or purposes of the physician-patient relationship.<sup>140</sup> This reflects the communitarian and teleological nature of virtue ethics.<sup>141</sup> In order to determine what a virtuous practitioner looks like, one must first understand the ends of medicine, which include the restoration of health and the alleviation of pain and discomfort.<sup>142</sup>

With these concepts in view—virtue as primary, and the location of the virtues in the teleology of the community of practice—Pellegrino and Thomasma define a number of cardinal virtues in medical practice. These include fidelity to the trust a patient places in a physician, justice, fortitude, compassion, temperance, integrity, and self effacement.<sup>143</sup> All of these virtues are anchored by practical wisdom or

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131. *Id.*

132. PELLEGRINO & THOMASMA, *supra* note 40.

133. TOM L. BEAUCHAMP & JAMES F. CHILDRESS, *PRINCIPLES OF BIOMEDICAL ETHICS* (5th ed. 2001).

134. *Id.* at 12-14.

135. *Id.* at 26-39.

136. *Id.* at 39-51.

137. PELLEGRINO & THOMASMA, *supra* note 40, at 20-29.

138. *Id.* at 22.

139. *Id.*

140. *Id.* at 52.

141. *Id.*

142. *Id.* at 52-53.

143. *Id.* at 65-161.

*phronesis*.<sup>144</sup> A physician in whom such virtues have become ingrained will tend to observe Beauchamp and Childress's four principles, but will also extend and go beyond those principles towards a more holistic relationship to her patients and participation in the medical community.

*C. Applications of Open Source, Environmental, and Health Care  
Virtue Ethics to Biotechnology*

Against this background of how virtue ethics has been applied to open source communities, environmental problems, and health care, it is possible to identify several themes that can support a virtue ethics approach to open source biotechnology.

First, biotechnology is part of a broader community of science. We should ask, "what characteristics are embodied in the biotechnology community that, if developed, will enable it to function as an excellent scientific/public health community?" The communitarian focus of virtue ethics maps well onto the ideal of biotechnology research as a community of science. The communitarian focus also encourages us to think about what sort of community we want the biotechnology community to become.

As we consider biotechnology as a community, we can focus on the practices that support the virtues integral to that community. Here, the concepts of "internal goods," "standards of excellence," and "systematic extension" are inherent both in communities of science as well as in open source communities. The environmental virtue ethics concept of "agent benefit" also meshes well with this teleological, practice-oriented view of biotechnology. The biotechnology practitioner seeks ways to produce healthier, more abundant crops, or to eliminate the polluting by-products of farm or industrial activities.<sup>145</sup> The extension of these practices moves the community closer to its *telos*.

Likewise, the health care virtue ethics concept of the virtuous practitioner applies to those engaged in the practice of biotechnology. The virtues identified by Oakley and Cocking in reference to medical doctors can apply to biotechnology researchers, although with a different focus. While the question whether a medical doctor is a beneficent, truthful and trustworthy practitioner is defined largely in relation to the patient, the biotechnology researcher is defined in relation to the scientific research community and the public. A truthful and trustworthy researcher, for example, will

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144. *Id.* at 84-91.

145. As BIO, the biotechnology industry's leading trade group, notes, "[w]hen people are asked what they think of when they hear the word *biotechnology*, they respond with phrases like 'biomedical research,' 'breakthrough medicines,' 'cures' and 'hope for the future.' Health care is, after all, the number one market for biotechnology." Biotechnology Industry Organization, *Health Care/Overview*, <http://www.bio.org/healthcare> (last visited Feb. 2, 2007). Concerning agriculture, BIO states that "[t]oday biotech plant products offer growers the ability to reduce pesticide use, minimize soil erosion, optimize land use and reduce cancer-causing fungal compounds (mycotoxins) in grains. Products are now in development with nutritional benefits for consumers." Biotechnology Industry Organization, *State Policy Priorities for Agricultural Biotechnology*, <http://www.bio.org/foodag/positions/agribio.asp> (last visited Feb. 2, 2007). Concerning industrial pollution, BIO states that "industrial biotechnology is facilitating a new industrial revolution that can bring a cleaner future with better products at lower cost." Biotechnology Industry Organization Press Release, Report Finds Industrial Biotechnology is Sparking a New and Cleaner Industrial Revolution (June 3, 2004), [http://www.bio.org/news/newsitem.asp?id=2004\\_0603\\_01](http://www.bio.org/news/newsitem.asp?id=2004_0603_01).

provide an accurate report of her results, and a beneficent researcher will place the goal of fostering beneficial scientific knowledge above other strategic or personal concerns.

Similarly, Pellegrino and Thomasma's concepts of fidelity to trust and self-effacement apply directly to biotechnology research. As they note, when a researcher accepts public funds and benefits from public facilities and research-conducive social arrangements, the researcher enters into a "covenant with society in which the primary goods cannot be power, personal profit, prestige, or pride."<sup>146</sup> Such financial and reputational rewards are "external" to the practice of research and ought not to dominate the internal goods such as increasing knowledge and developing useful technology.<sup>147</sup> Moreover, because the research community depends on access to the research of others, a virtuous researcher must be able to balance legitimate self-interest with an understanding that her results should be accessible to others.<sup>148</sup> Pellegrino and Thomasma particularly criticize the "industrial model" of research. As they note, "[g]aining the competitive edge, establishing priority and ownership of information, cornering the market, getting the patent, choosing research topics on their future investment possibilities—these are the values of industry. They encourage the wrong kind of self-interest and frustrate the primary aim of research."<sup>149</sup> A practice such as open access publishing, which embodies an open source ethos, is particularly valuable because it builds on the internal goods of the biotechnology community.<sup>150</sup>

In addition, the virtue of justice can play an important role in a virtue ethics approach to biotechnology. Justice as a virtue is "the strict habit of rendering what is due to others."<sup>151</sup> Justice includes the principle of beneficence and the virtue of benevolence, as well as a commitment to social justice.<sup>152</sup> Pellegrino and Thomasma identify "skimming and dumping"—the practice of treating only the best paying patients and not treating the poor—as examples of poor policies that virtuous practitioners should strive to avoid.<sup>153</sup> Similar concerns apply to the biotechnology research community, particularly concerning the allocation of research support.

Finally, all these virtues must be anchored by the core virtue of *phronesis* or practical wisdom. In this regard, it is important to remember that market-based and open source production methods are not necessarily at odds. When transaction costs are low, markets might often distribute biotechnology resources more efficiently than other methods, and intellectual property rights might facilitate efficient exchanges.<sup>154</sup> In the quote that opens this essay, the Biotechnology Industry Organization states that "[i]ntellectual property protection is the key factor for economic growth and

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146. PELLEGRINO & THOMASMA, *supra* note 40, at 135.

147. *Id.*

148. *Id.* at 136-37.

149. *Id.* at 136.

150. For a detailed discussion of the political economy of open access publishing models, including the political difficulties they face, see David W. Opperbeck, *The Penguin's Paradox: The Political Economy of International Intellectual Property and the Paradox of Open Intellectual Property Models*, 18 STAN. L. & POL'Y REV. (forthcoming 2007), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=927261](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=927261).

151. PELLEGRINO & THOMASMA, *supra* note 40, at 92.

152. *Id.* at 94-98.

153. *Id.* at 98.

154. See Opperbeck, *supra* note 78, at 218-223.

advancement in the biotechnology sector."<sup>155</sup> It is too simplistic to assert that this reflects mere greed. There is an element of virtue in this statement, as it reflects a measure of practical wisdom gained as the biotechnology community has extended its practices over time. And yet, if BIO's recent promotional video is correct, and the biotechnology's core teleology is to "make suffering less . . . deal with hunger and starvation, and . . . educate and to better the population,"<sup>156</sup> economic growth and advancement do not exist in a vacuum. Economic growth and advancement in the biotechnology sector advance a broader purpose. At times, that broader purpose might better be extended through practices that focus on results other than economic growth.

These core virtues of beneficence, fidelity to trust, justice, and practical wisdom cohere nicely with the set of virtues required for excellence in open source production. If such virtues can become foundational to the discussion of biotechnology intellectual property policy, open science alternatives could be viewed not as potential adjuncts in cases of market failure, nor as a socialistic utopian panacea, but rather as a set of practices that can contribute to the *eudemonia* toward which biotechnology strives. Open source communities can then provide a third way between outright dedication to the public domain and restrictive patenting and licensing policies.

#### IV. CONCLUSION

The debate over intellectual property policy concerning biotechnology seems intractable. Instrumentalists dicker about how to tweak the incentives in order to produce the best mix of innovation and disclosure, without stepping back to ask whether the consequentialist approach is best on a broad scale. Hegelians seem to have little to say about biotechnology, given that researchers seem to bear little resemblance to the artists and poets who most obviously pour their personalities into their work. Postmodern critics offer some trenchant critiques of the current system, but suggest few alternatives that could be realized in contemporary biotechnology.

Perhaps the biotechnology "thicket" has as much to do with these conflicting underlying philosophies of intellectual property as it does with individual patent rights that must be cleared to conduct research in this field. Virtue ethics may illuminate a path forward. By recognizing that biotechnology is a community dedicated to human flourishing, and focusing on the practices that move that community ever towards its goal, the assumptions and language we use to describe biotechnology intellectual property policy may begin to change. Change will not come rapidly or dramatically, given the political interests involved.<sup>157</sup> But if the ethical dialogue begins to change, efforts to change policy should gain more traction. The time is right for a new vision of intellectual property grounded in the ancient virtues.

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155. See *supra* note 2 and accompanying text.

156. See *supra* note 102 and accompanying text.

157. For a discussion of the political economy of open intellectual property models, biotechnology, and international intellectual property law, see Opderbeck, *supra* note 150.

