

# **Acceptable Intellectual Property**

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Roughly three decades ago, the political dimensions of decision making about the technological hazards embedded in contemporary societies became publicly visible, provoking the emergence of a new politics of risk. Public controversies about what constituted “acceptable risk,” and who should decide and how, proliferated in a wide range of technical domains. Social movements challenged expert definitions of risk and demanded a voice in decision making. Risk analysis became a burgeoning academic field and a ubiquitous part of regulatory politics. A domain of decision making once construed as a technical one came to be understood as having social dimensions that required institutional reforms and new modes of public participation.<sup>1</sup>

If the 1970s was the decade of lost innocence about risk, then the 1990s was the decade of lost innocence about intellectual property (IP). Until the early 1980s, decisions about IP captured relatively little public attention. The field attracted scant interest except among a narrow group of specialists who practiced in a doubly technical domain at the interface of arcane law and complex technology. Most legal scholars saw intellectual property as politically uninteresting, far removed from the exciting fields, such as constitutional law, where academic careers could be made. This is not to say that IP decisions went uncontested; indeed, vast fortunes sometimes turned on the outcomes of patent litigation. But most observers saw these battles as matters that concerned the immediate parties, not as issues that raised fundamental questions about public policy, democratic decision making, and global governance.

All of this now has changed. Beginning in the 1980s and increasingly in the 1990s, decisions about intellectual property became visible and contentious public issues. A variety of actors—including many NGOs, academics, scientists, industry groups, and governments—now view decisions about intellectual property not as rational outcomes of an autonomous process of legal reasoning, governed by precedent and safely left to appropriate experts, but as political choices with profound stakes. Aside from a small band of libertarians, virtually no one contends that the answer is to dispense with intellectual property entirely. But there is a growing sense that the intellectual and institutional foundations of IP policy are too weak to manage its newly recognized political dimensions.<sup>2</sup> Nowhere is this more true than in biotechnology, where controversies about the ownership of knowledge and biomaterials have generated profound public anxiety.<sup>3</sup> This brief discussion paper outlines the sources of tension that animate these concerns and reflects on the capacity of existing institutions to reconcile them.

## Innovation-centric theories

The pervasive sense that the governance of IP rests on weak foundations stems in part from the impoverished conceptual framework in which the issues are usually cast. In policy and academic circles, as well as in everyday life, the most common frameworks for thinking about intellectual property consider it in light of economic theories of innovation, emphasizing its role in research, development, and commercialization. For example, the most widely held views of patenting are rooted in what economists call invention-inducement theory (which holds that patent protection gives inventors an incentive to invent) and disclosure theory (which holds that patents eliminate the need for secrecy and thus encourage inventions to be widely used).<sup>4</sup> These innovation-centric perspectives may be well-suited to illuminating some important questions (e.g., under what conditions are patents in fact economically efficient?), but they shed a monochromatic light on the complex legal, political, and ethical questions that trouble contemporary discussions about intellectual property.

Legal theories of property offer an alternative frame for considering the political dimensions of IP. The law frames property not as a single entity that an owner possesses, but as a bundle of rights, inextricably woven into a fabric of relationships, expectations, entitlements, and obligations. Thus, the owners of even the most tangible forms of property, such as real estate, do not own the material entities themselves so much as a set of limited rights in their use: the right to occupy a house, but perhaps not to burn it down or convert it into an establishment for retailing illicit drugs. The owner also “possesses” a set of obligations, such as to prevent dangerous conditions from arising on the premises. The law also bestows entitlements pertaining to the house on persons other than the owner; thus, the passerby who slips on an icy sidewalk has the right to sue for damages. The relative strengths of these entitlements, many of which stand in tension with one another, is sometimes tested in court or adjusted through legislative action. As these examples suggest, the property rights connected to a house radiate outward from the material object itself, implicating a variety of persons in a network of relationships with legal, ethical, economic, and political dimensions.

This paper argues that a rights-based perspective on property provides a better starting point for thinking about the contemporary politics of IP than is offered by the narrower innovation-centric frameworks that have dominated public discussion. Because the rights perspective does not confine the analysis of rights to those rights that arise during the innovation process, it is capable of addressing a wider variety of potentially conflicting concerns and a more diverse group of social actors. At the same time, the rights framework is flexible enough to subsume under its ambit the important questions raised by innovation-centric theories of IP (e.g., how can we encourage invention and discovery?), while the reverse is not the case.

## Private science and the public domain

Beyond weak theoretical foundations, the sense that something is amiss in the world of IP stems from tensions in contemporary research systems. Put simply, there are

persistent tensions between the commercialization of the life sciences and the Enlightenment vision of science as a form of public knowledge, open to critical scrutiny and available to all. By the late 1970s, policymakers in the industrialized democracies saw efforts to capture and strengthen intellectual property rights as a means of building national competitiveness and achieving economic growth. To spur innovation and speed the translation of basic science into marketable products, they designed policies to ease the commodification of knowledge, build links between academia and industry, and expand the scope of intellectual property protection. In the United States, which moved the fastest and farthest in these directions, significant numbers of academic biologists became entrepreneurs, founding startup companies while often keeping their university positions.<sup>5</sup> During the 1980s and 1990s, the scope of patentable subject matter in biotechnology expanded dramatically. These developments, sometimes glossed as the rise of “private science,” are perhaps best understood as the growth of new research networks lodged neither in an academic nor a corporate milieu, but in hybrids of university and industry, public and private, basic and applied.<sup>6</sup>

The research community did not have a uniform reaction to these developments, but even life scientists who embraced the increasing commercialization of biology sometimes grew uneasy with aspects of these institutional changes. University policies intended to balance commercial and academic goals often sparked controversy. Academic researchers frequently complained that industry’s efforts to protect proprietary information restricted scientific openness. Worries about conflicts of interest stemming from commercial connections grew salient. Disputes over the data access policies of governmental and privately funded genome research frequently arose.<sup>7</sup> And, in a number of cases (e.g., debates about expressed sequence tags and the ownership of “research tools” ), scientists objected to the expansion of intellectual property into areas that formerly would have belonged to the public domain.<sup>8</sup>

Indeed, as patent offices issued a succession of controversial patents on genetically engineered bacteria, transgenic organisms, and genetic sequences of varying lengths and descriptions (not to mention surgical procedures and business methods), many observers worried that the subject matter considered patentable—especially in the United States—threatened to expand without limit.<sup>9</sup> In biotechnology, the ill-defined borders of biological systems and the textual character of DNA sequences contributed to a sense that clear boundaries were not being established. In this context, many commentators likened the rush to patent genes and gene fragments to a “land grab,” worrying that the public domain was being restricted without adequate consideration of the consequences.<sup>10</sup>

### Inventors and others

The new politics of intellectual property is also animated by shifts in perceptions of who is a legitimate stakeholder in decisions involving IP. Conventional intellectual property doctrine emphasizes a small cast of stylized characters, such as the inventor, the author, and the free rider, weaving them into a thin storyline about the need to reward creativity, provide incentives, and prevent theft. Indeed, a romantic conception of

invention and authorship that celebrates the creative acts of identifiable individuals (and legal persons) plays a strong role in guiding IP decision making.<sup>11</sup> But contemporary research in biology and biotechnology features a much broader group of actors who enter the process at multiple points and press a wide range of claims.

For one thing, in contemporary biology and biotechnology, research is less a matter of isolated discovery by lone individuals than of distributed networks involving teams of scientists from many disciplines and spans multiple institutions (including those based in academic, governmental, and industry organizations). Given the complex patterns of exchange in these research networks, it is not surprising that disputes sometimes arise about who among the many contributors should be credited as an author or inventor of a work.<sup>12</sup> To further complicate matters, the sources of biological materials (or their representatives), sometimes claim rights in the products of research or demand a say in how these materials are used.<sup>13</sup>

In human genetics, for example, patient groups, health activists, and populations whose DNA is sampled often consider themselves to have a right to a voice in both the process of research and in the use of research results. Questions of rights in this context have often crystallized around intellectual property. The recent conflict surrounding the patent on the Canavan disease gene provides an example. In this case, patient organizations organized an effort to find the gene, raising funds, collecting DNA samples, and attracting researchers to the problem. After a gene was found, the researcher who identified it and his employer, Miami Children's Hospital, obtained a patent and began charging royalties on a genetic test. The patient groups, which object to the royalties, filed suit claiming that the researcher and the hospital had misappropriated trade secrets when they used their children's DNA, without consent, to obtain a patent.<sup>14</sup>

Such cases reflect an effort by the consumers of emerging biotechnology to claim rights to shape the direction of its development and the terms of its commercialization. Similar issues are raised by the efforts of health activists and others to persuade pharmaceutical companies holding patents on AIDS drugs to allow them to be provided at low prices to African patients.<sup>15</sup> The innovation-centric perspective has little to say about issues of this type. In contrast, the rights perspective captures the central issues neatly as a conflict between the rights of patent holders who have spent large sums developing life-saving drugs and the rights of patients to receive medical treatment.

### New inventions and old practices

The politics of intellectual property often involve conflicts between the new claims of IP holders and the established practices of other parties. In keeping with the notion of an endless scientific and technological frontier, innovation-centric theories treat IP as new property—truly novel holdings staked out at the leading edge of knowledge production. Because IP emerges at the frontier and conveys rights to previously unexplored territory, it cannot impinge on earlier rights. But the frontier metaphor should perhaps give us pause; for the history of colonialism shows that land that distant powers perceive as uninhabited is sometimes occupied by other people.

If innovation-centric theories situate IP in an unpopulated landscape, a rights perspective positions it in a web of social relationships and practices. From the rights viewpoint, new IP does not simply fill a technological vacuum but is introduced into a field full of social actors. Put otherwise, intellectual property not only conveys rights to virgin territory but also curtails existing rights and transforms social practices.

Recent disputes over IP in plant biotechnology reflect these sharply different perspectives.<sup>16</sup> When a company inserts useful genes into an existing plant variety and patents the result, its innovation adds value to the variety. From a perspective that imagines innovation as taking place on an open and expanding field, this may seem just, for the company has produced a new and useful product. But a rights perspective would point out that the patent is also a taking, for it appropriates not only the increment in value stemming from the new genes, but also the value of the original variety. The rights of those who own, cultivate, or otherwise identify with the original variety are thus curtailed. Viewed in this light, the explosion of outrage in South Asia over what was widely perceived as the U.S. PTO granting an American company a patent on a strain of “basmati rice” is easy to understand.<sup>17</sup>

As a second example, consider so-called “Terminator” technology, which renders the seeds of genetically modified (GM) crops sterile to establish control over markets by preventing the unauthorized propagation of seeds. From the innovation perspective, such “gene protection technologies” appear to offer a legitimate and effective way to protect intellectual property rights in GM crops. But this technology also can be seen as a means to override a common law right of subsistence farmers; namely, the right, established through generations of practice, to plant next year’s crop from seeds that they grow. Responsible decision making about such technologies requires recognizing these conflicting rights and attempting to find a just solution in light of the values and interests at stake.<sup>18</sup>

## Conclusion

Decisions about intellectual property are about much more than simply finding ways to stimulate and reward innovation; they are also about accountability, control, and governance. In biotechnology, these decisions will not only determine who will own emerging technologies; they will also influence how much they will cost, to whom they will be available, who will control the direction of their development, what kinds of institutions and values will guide technological choice, and what aspects of the process will be transparent to whom. These aspects of the politics of intellectual property became visible in the 1990s, producing a new set of challenges for institutions of governance. The significance of this transformation has yet to be fully appreciated, but it is quite possible that the challenges surrounding intellectual property will come to rival those surrounding risk.

In light of the new politics of intellectual property, changes in the conceptual frameworks used to discuss IP are clearly in order. Traditional IP doctrine, with its

emphasis on innovation and its focus on a small and relatively narrow group of actors, is poorly equipped to reconcile the tensions outlined briefly above. Shifting from an innovation-centric theory of intellectual property to a rights-based framework provides one avenue for immediately broadening the discussion to encompass many critical issues. In the longer run, however, creative institutional adjustments will also be needed. There is little hope of developing acceptable intellectual property without finding new ways to ensure broader participation in policy making and creating new mechanisms to address the deep politics of this increasingly important domain.

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<sup>1</sup> See, e.g., Ulrich Beck, Risk Society: Towards a New Modernity (Newbury Park, CA: Sage, 1992); Brickman, Ronald, Sheila Jasanoff, and Thomas Ilgen, Controlling Chemicals: The Politics of Regulation in Europe and the United States (Ithaca, NY: Cornell University Press, 1985); and Mary Douglas and Aaron Wildavsky, Risk and Culture (Berkeley and Los Angeles: University of California Press, 1982).

<sup>2</sup> James Boyle, Shamans, Software, and Spleens: Law and the Construction of the Information Society (Cambridge, MA: Harvard University Press, 1996).

<sup>3</sup> IP in information technology is the other site where similar tensions exist.

<sup>4</sup> Two other prominent theories are development and commercialization theory and prospect theory. For a brief review, see Richard Nelson and Roberto Mazzoleni, “Economic Theories about the Costs and Benefits of Patents,” in National Academy of Sciences, Intellectual Property Rights and Research Tools in Molecular Biology (Washington, DC: National Academy Press, 1997).

<sup>5</sup> Martin Kenny, Biotechnology: The University-Industry Complex (New Haven: Yale University Press, 1986).

<sup>6</sup> On biotechnology as “private science,” see Arnold Thackray, ed., Private Science: Biotechnology and the Rise of the Molecular Sciences (Philadelphia: University of Pennsylvania Press, 1998).

<sup>7</sup> Stephen Hilgartner, “Data Access Policy in Genome Research,” in Arnold Thackray, ed., Private Science: Biotechnology and the Rise of the Molecular Sciences.

<sup>8</sup> National Academy of Science, Intellectual Property Rights and Research Tools in Molecular Biology (Washington, DC: National Academy Press, 1997).

<sup>9</sup> International differences in patenting policy are likely to grow increasingly important. For a UK view on business methods patents, see <http://www.patent.gov.uk/about/consultations/conclusions.htm>.

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<sup>10</sup> On the threat of a ring-fenced world, see, e.g., Heller, Michael A. and Rebecca S. Eisenberg, “Can Patents Deter Innovation? The Anticommons in Biomedical Research,” Science, 1 May 1998, pp. 698-701.

<sup>11</sup> Boyle, Shamans, Software, and Spleens.

<sup>12</sup> See, e.g., Mario Biagioli, “The Instability of Authorship: Credit and Responsibility in Biomedicine,” FASEB Journal 12:3-16, 1998; Stephen Hilgartner and Sherry I. Brandt-Rauf, “Data Access, Ownership, and Control,” Knowledge 15:355-72, 1994.

<sup>13</sup> See, e.g., Boyle, Shamans, Software, and Spleens, pp. 97-107; Sheila Jasanoff, Science at the Bar. Cambridge, MA: Harvard University Press, 1995; and Jennifer Reardon, “The Human Genome Diversity Project: A Failure to Coproduce Natural and Social Order,” Social Studies of Science (in press, 2001).

<sup>14</sup> Elliot Marshall, “Genetic Testing: Families Sue Hospital, Scientist for Control of Canavan Gene,” Science, 10 Nov 2000, p. 1062.

<sup>15</sup> See, e.g., Petersen, Melody and Donald G. McNeil, Jr., “Maker Yielding Patent in Africa for AIDS Drug,” New York Times, 15 March 2001.

<sup>16</sup> For an historically-informed analysis, see Calestous Juma, The Gene Hunters: Biotechnology and the Scramble for Seeds (Princeton, NJ: Princeton University Press, 1989).

<sup>17</sup> For representative statements from this controversy, see Basmati Action Group (<http://www.eciad.bc.ca/~lolin/basmati/boycott.html>), Financial Daily (<http://www.indiaserver.com/businessline/2000/09/27/stories/142703yo.htm>), and IP Worldwide ([http://www.ipcenter.com/0506\\_india.html](http://www.ipcenter.com/0506_india.html)).

<sup>18</sup> See, e.g., Gordon Conway's remarks to the Monsanto board of directors, June 24, 1999; Open Letter From Monsanto CEO Robert B. Shapiro To Rockefeller Foundation President Gordon Conway, October 4, 1999.