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CROSSING THE INNOVATION DIVIDE

Doris Estelle Long*

While intellectual property has long been perceived as a method for protecting, and ultimately valuing, innovation, it is an imperfect measure. With its traditional bias in favor of innovation as delimited by Western views of individuality and technological progress, intellectual property is not only an imperfect measure, but also one that has contributed to the undervaluing of non-Western innovation and creativity. This undervaluation has denied developing and least-developed countries a right of compensation for local innovation, which has contributed to the continuing imbalance in economic development. Recognizing a broader definition of compensable innovation that includes non-Western concepts, including innovation and creativity based on so-called traditional knowledge, would allow the holders of such knowledge to participate as partners in emerging knowledge-based industries. Ultimately, protection of "generational" innovation could provide a strong tool for wealth transfer that serves to make developing nations active participants in their own sustainable development. More significantly, establishing a rational system of protection for traditional knowledge would bring social justice back into the issue of innovation protection. As we remake innovation systems in response to the changes demanded by the global digital marketplace, rational protection for traditional knowledge must be a part of that change if we are to achieve equitable, sustainable values for innovative activity in the twenty-first century.

* Professor and Chair of the Intellectual Property, Information Technology and Privacy Group, The John Marshall Law School. I would like to thank the organizers and participants of the Temple Law Review Symposium on Law Without Borders: Current Legal Challenges Around the Globe for their comments, which helped strengthen this Article and the ideas contained therein. I would also like to thank the various sponsors and participants at the following workshops and conferences where diverse aspects of the issues addressed in this Article were discussed, including: the Yale Law School Access to Knowledge Conference; the third annual Intellectual Property & Communications Law Program Symposium at Michigan State University College of Law; the ninth annual Conference of the Association for the Study of Law, Culture and the Humanities, at Syracuse University College of Law; the Conference on Creative Processes and the Public Domain, at The John Marshall Law School; the inaugural meeting of the Working Group on Property, Citizenship, and Social Entrepreneurism; and the Conference on Intellectual Property, Sustainable Development and Endangered Species: Understanding the Dynamics of the Information Ecosystem, at Michigan State University College of Law. Finally, I would like to thank my codebater at the Temple Symposium, Professor Peter Yu, for always challenging me to think more deeply about the issues and potential resolutions to the knotty problems of traditional knowledge protection. This Article is dedicated to the many people over the years, and in diverse countries, with whom I have discussed and debated the issue of traditional knowledge protection. They are far too numerous to name individually but they have each helped to shape my views, although not necessarily in the manner some of my debaters anticipated. As always, any errors belong solely to me.
INTRODUCTION

In today's Innovation Era, when labor-based economies are being eschewed in favor of the more robust development base provided by knowledge-based industries, one of the most critical divides between the so-called developed and developing world may be the one regarding the scope, depth, and sustainability.
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of commercial and industrial development. This divide is the result of a great many historical, political, cultural, and geographic factors whose complexity and causality scholars continue to debate. Yet when seen through the lens of intellectual property law, the relatively slow economic and industrial development of certain parts of the world may well be caused, at least in part, by the reduced economic value given to local innovation.

"Innovation" has become the watchword of the twenty-first century. It is capabilities and the same general lack of economic and industrial growth. See infra Parts II and III for a discussion of generational innovation.


4. Even the briefest analysis of the extent to which "innovation" has become a new catchphrase for the twenty-first century demonstrates the depth and breadth of its adoption to refer to everything from new inventions to new web pages. A recently conducted Google search of the term "innovation" disclosed approximately 115,000,000 entries in English using the term. Innovation - Google Search, http://www.google.com/search?hl=en&q=innovation&btnG=Google+Search (last visited Feb. 23, 2009). A search for the related term "innovative" disclosed approximately 135,000,000 entries in English. Innovative - Google Search, http://www.google.com/search?hl=en&q=innovative&btnG=Google+Search (last visited Feb. 23, 2009). A Google Book search disclosed approximately 5,440 books containing the term "innovation" in the title. In Title: Innovation - Google Book Search, http://books.google.com (search "Advanced Book Search" for "innovation" in "title" field) (last visited Feb. 23, 2009). The uses disclosed by these searches are almost as varied as the number of references uncovered. See infra note 5 for examples of the use of the word "innovation." The Western romance with the concept of innovation is not in itself new. To the contrary, as countless historians have demonstrated, the pursuit of innovation for the sake of innovation, and a belief in the positive impact of such innovations, can be dated at least from the Middle Ages. See, e.g., Robert FrieDel, A Culture of Improvement: Technology and the Western Millennium 155-69 (2007) (discussing culture of innovation during Middle Ages); David S. Landes, The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present 41 (2d ed. 2003) (describing series of innovations in eighteenth-century England that gave rise to factory system). Yet innovation seems to have gone beyond the status of a simple catchphrase or social fad and has instead become a watchword. Like earlier watchwords, "innovation" has become the password for entrance into the twenty-first century. Not only do books, articles, and web pages address the concept, the idea of innovation has been a driving force in legal issues of the twenty-first century; where it previously had played little or no role. Thus, Lawrence Lessig's seminal book on the impact of copyright in the Digital Age, The Future of Ideas: The Fate of the Commons in a Connected World, uses the term "innovation" over eighty-seven times. See Lawrence Lessig, The Future of Ideas: The Fate of the Commons in a Connected World passim (2001). Courts have similarly adopted the concerns of "innovation" in connection with copyright protection under U.S. law. See, e.g., Digital Commc'ns Assocs., Inc. v. SoftKlone Distrib. Corp., 659 F. Supp. 449, 462 (N.D. Ga. 1987) (using "innovative" as synonym for expressive originality for first time in reported U.S. copyright cases); see also Doris Estelle Long, When Worlds Collide: The Uneasy Convergence of Creativity and Innovation, 25 J. Marshall J. Computer & Info. L. (forthcoming 2008) (discussing appearance of term "innovation" in U.S. copyright cases in the latter decades of the twentieth century after computer programs had been granted protection under U.S. copyright laws). Yet the inclusion of innovation concerns in an area of law that previously has largely focused on creativity demonstrates not simply how dedicated the Western world has become to the concept of innovation as a watchword, but how problematic this watchword has proven to be. Not only
used to describe everything from new communication technologies to the latest web postings.\(^5\) Like every good watchword, "innovation" has no precise meaning. It has been defined as everything from "introducing something new"\(^6\) to "a scientific approach for finding newer better ideas and solutions to problems, which make life easier and simpler to live."\(^7\) In the arena of economics, Joseph Schumpeter defined innovation as "[t]he introduction of a new good . . . a new method of production . . . [t]he opening of a new market . . . [t]he conquest of a new source of supply . . . [and] [t]he carrying out of the new organisation of any industry."\(^8\) A report by the Task Force on Science, Technology and Innovation of the U.N. Millennium Project\(^9\) similarly emphasizes the entrepreneurial foundations of innovation and its critical role in helping transform countries from reliance on the exploitation of natural resources to technological innovation as a basis for development.\(^10\) This emphasis on technology and entrepreneurship is reflected in the Oslo Manual on Guidelines for Collecting and Interpreting Innovation Data ("Oslo Manual")\(^11\)

is the term being misused in connection with copyright protection, Long, supra, it has also begun to lose its meaning. Quite simply, if everything is innovative, then nothing is. One of the premises of this Article is that the concept of innovation must be given a clearer meaning so that true forms of innovation—including generational innovation, can be properly protected. In short, the watchword must be redefined.


10. Id. at 81.

11. Oslo Manual Third, supra note 8, at 147.
produced by the Organization for Economic Co-Operation and Development. The Oslo Manual defines innovation as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations." In addition to the concept of newness shared by these varied definitions is a concept of change or evolution. In fact, innovation itself is largely a process of creation and diffusion.

However defined, innovation lies at the heart of economic and industrial development; more precisely, successful innovation lies at the heart of such development. The complex interplay of factors that leads to successful innovation is well beyond the scope of this Article. Yet what appears abundantly

12. Id. at 46. One of the aspects clarified in this broader definition of innovation is that this broader definition recognizes that innovation includes adoption of products, processes, and methods from others. Compare id. (recognizing innovation as either new development or one significantly adapted from previous work), with Oslo Manual Second, supra note 8, at 16, 31 (giving more narrow definition of innovation).

13. See, e.g., Oslo Manual Third, supra note 8, at 31–32 (stating that diffusion is central to innovation).

14. In other fora I have challenged the presumed equation of innovation with creativity (and vice versa). For purposes of both encouraging such activities and crafting public policies that provide the appropriate balance between creator's rights and the public, the issues posed by creativity versus innovation in my opinion require different analyses. See generally Doris Estelle Long, Dissonant Harmonization: Limitations on "Cash n' Carry" Creativity, 70 ALB. L. REV. 1163 (2007) [hereinafter Long, Dissonant Harmonization] (distinguishing concept of innovative creativity from aesthetic creativity); Doris Estelle Long, Innovating New Connections in Intellectual Property Analysis: A Review of William van Caenegem's Intellectual Property Law and Innovation, 13 MELBOURNE MEDIA ARTS & L. REV. (forthcoming 2008) (book review) (describing how concepts of innovation and creativity have been blurred in policy debate). Such differentiation necessarily means that products of innovation are generally most readily protected, if at all, under patent, industrial design, or trade secret regimes. Given the addition, however, of such "innovative" works as computer software to the copyright arena, the question of the scope of protection provided for innovative (as opposed to creative) works must also include an analysis of copyright doctrines as well. I continue to maintain that such inclusions help explain much of the alleged overbreadth in protection of which copyright law is accused since the latter decades of the twentieth century. However, for purposes of analyzing the undervaluation of indigenous, tradition-based innovation and creativity in connection with its role in the creation of sustainable economic development, the distinction between the two regimes lacks the same significance. For this reason, I am using the terms "innovation" and "generational innovation" to include both innovative and creative products and processes in this Article.

15. The success of a particular innovative act is not capable of easy measurement. Thus, for example, while studies often cite the number of patents owned by nationals as evidence of innovation, patents are an inexact measure since some innovation is not covered by patent protection and other innovation may be covered by multiple patents. See, e.g., OECD, The Measurement of Scientific and Technological Activities: Using Patent Data as Science and Technology Indicators, at 15–16, OCDE/GD(94)114 (Jan. 1, 1994), available at http://www.oecd.org/dataoecd/33/62/2095942.pdf (discussing methodological shortcomings of using patents as indicators of innovation). In addition, while the invention of a particular product may qualify as an innovative act, if the product is not implemented effectively—such as through successful marketing or diffusion to others in the field—it is difficult to describe such innovation as successful, at least at this particular stage of its evolution. See, e.g., Oslo Manual Third, supra note 8, at 59 (discussing success of innovation); WILLIAM VAN CAENEGRAM, INTELLECTUAL PROPERTY LAW AND INNOVATION 61 (2007) (noting commercial worthlessness of majority of patents).
clear, despite its simplicity, is that successful innovation cannot occur unless, in fact, innovation occurs. One of the critical factors in encouraging such innovation is the potential for economic return. I do not mean to suggest that economic profit is the sole or even the most significant motivating factor behind all innovation. To the contrary, as the emerging evidence of unpaid-for innovative collaboration in areas such as computer software and medical research demonstrates, innovation may be undertaken for reasons that have little to do with direct economic compensation. However, in areas that require significant capital investments in either research and development or safety and environmental testing (such as in the case of pharmaceuticals), economics continues to play a critical role.

Even if economics did not play a role in incentivizing innovation, the economic valuation of innovation plays an undeniable role in creating innovation enterprises. These enterprises lie at the heart of sustainable development.

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16. Not even the present day intellectual property system assures any particular level of economic return on innovation. To the contrary, any such return is determined in part by the market value accorded the innovation in question. Accordingly, an invention could be extremely beneficial for society as a whole and yet be granted little value in the marketplace. Fortunately, legal protection for the products of innovation is not the only source of funding available for the investments in capital and labor required to support innovation. To the contrary, where innovation is undertaken for socially beneficial purposes, government grants, charitable funding, nongovernmental organizations, and other nonprofit organizations continue to play a significant role in such funding efforts. See, e.g., Andrew A. Toole & Anwar Naseem, Leveraging Public Investments with Private Sector Partnerships: A Review of the Economics Literature, in STRATEGIES TO LEVERAGE RESEARCH FUNDING: GUIDING DOD'S PEER REVIEWED MEDICAL RESEARCH PROGRAM app. D (Michael McGeary & Kathi E. Hanna eds., 2004) (discussing diverse public and public private research funding combinations). Several authors have proposed alternative methods of compensating innovative activities. See, e.g., JOSEPH E. STIGLITZ, MAKING GLOBALIZATION WORK 124 (2006) (advocating use of medical prizes to fund critical medical research); Michael Abramowicz, Perfecting Patent Prizes, 56 VAND. L. REV. 115, 127-70 (2003) (discussing several proposals for establishment of patent prize system).

17. Among the most noteworthy examples are the Open Software Movement and the beginning steps being taken to create an open source network for pharmaceuticals. See generally Pharmaceutical Licensing Network, http://www.farmavita.net (last visited Feb. 23, 2009) (facilitating communication and encouraging licensing and technology transfer among pharmaceutical professionals); PhOSCo, http://www.phosco.com (last visited Feb. 23, 2009) (providing network for pharmaceutical licensing and business development that allows for offers and demands to be sought and met for new pharmaceutical technology).


Without some commercial value attaching to the creation, distribution, and use of innovative processes, products, or services, innovation fails as a source of sustainable development. It is only through the development of commerce as a result of the perceived economic value of innovative enterprises that local innovation can serve a critical role in the sustainable development of a country.\(^\text{20}\)

The undervaluation of local innovation by devaluing what I refer to as "generational innovation" denies developing and least-developed countries a right of compensation for a large source of local innovation—utilizing the generational knowledge and practices of their inhabitants. "Generational innovation" is quite simply innovation using tradition-based knowledge, works, and practices. On its face, the term generational (meaning across generations) innovation appears an oxymoron. Yet the generational collaboration that tradition-based innovation represents fits within the evolutionary nature of collaboration once the Western concepts of individuated creativity and time-constrained uniqueness are removed.\(^\text{21}\) As the Oslo Manual acknowledges, "innovative activities" include novelty determinations that may be based on the knowledge or use of the innovation by a particular "firm."\(^\text{22}\) Thus, innovation includes products, knowledge, and services that are "new to the firm."\(^\text{23}\) This evolutionary focus on innovation as a measure of novelty along the knowledge diffusion chain supports "generational innovation" as "innovation" shorn of Western concepts of what protectable "innovation" should look like.\(^\text{24}\) According to the Oslo Manual,

There are two main reasons for using "new to the firm" as the minimum requirement of an innovation. First, adoption of innovations is important for the innovation system as a whole. It involves a flow of knowledge to adopting firms. Furthermore, the learning process in adopting an innovation can lead to subsequent improvements in the innovation and to the development of new products, processes and other innovations. Second, the main impact of innovation on economic activity stems from the diffusion of initial innovations to other firms.


\(^{21}\) See infra Part II for a discussion of generational collaboration.

\(^{22}\) Oslo Manual Third, supra note 8, at 18.

\(^{23}\) Id.

\(^{24}\) See infra Part II for a discussion of the removal of Western concepts of protection.
Diffusion is captured by covering innovations that are new to the firm.\(^\text{25}\) Just as expanding concepts of innovation have slowly begun to move innovation analysis away from a single focus on enterprise innovation, so too the concepts of innovation should continue to expand to capture the innovative activities involved in tradition-based innovation. To the extent that such generational innovation does not always create absolutely new products, it nevertheless increasingly plays a role in the diffusion of new products and processes via a vis much of the developed world.\(^\text{26}\)

One technique for correcting the valuation imbalance for generational innovation is to establish a viable system of protection for traditional knowledge.\(^\text{27}\) Such a system may ultimately serve as a tool for wealth transfer.\(^\text{28}\) As holders of generational innovation receive economic value for their innovations, because they are protected from unauthorized and uncompensated uses, developing nations will become partners in their own development. Wealth will be transferred from the developed to the developing world on the basis of innovation diffusion in a partnership system, and not simply as the result of the vagaries of technical training or development aid.\(^\text{29}\) Re-evaluating the economic value of generational innovation ultimately has the potential of contributing not only a more socially just balance in economic and technology transfer costs, but also one that may endure beyond changing aid cycles.

In Part I, I examine the adverse impact that the Western-based intellectual property ("IP") system has had on the valuation of generational innovation.

\(^{25}\) Oslo Manual Third, supra note 8, at 18.


\(^{27}\) Cf Doris Estelle Long, Is Fame All There Is?: Beating Global Monopolists at Their Own Marketing Game, 40 GEO. WASH. INT'L L. REV. (forthcoming 2008) (manuscript at 25-31, on file with author) (advocating development of traditional knowledge protection to create strong local marks).


\(^{29}\) See, e.g., Doris Estelle Long, Small States and the Challenge of Intellectual Property Protection, INT'L L. NEWS, Summer 2004, at 1, 7-8 (noting Article 8 of TRIPS mandates developed countries provide other nations with technical assistance to facilitate development, but details of assistance are largely left to discretion of developed countries, and advocating small states develop training policies based on what would best facilitate their development).
Focusing on the uniqueness requirements imposed by present IP systems, I contend that such systems continue to devalue indigenous innovation and deny it even the ephemeral promise of economic benefits granted innovation that complies with Western concepts of technological progress and individuated creativity.

In Part II, I examine the critical roles of generational collaboration and change on generational innovation. I contrast such elements with Western concepts of protectable innovation that place indigenous innovation outside present legal protection regimes.

In Part III, I explore the relationship between generational innovation and traditional knowledge and examine critical issues that must be addressed in crafting a traditional knowledge regime that provides useful support for effective valuation of generational innovation. I provide a list of critical questions that must be answered and suggest some possible solutions to the current limbo of domestic and international protection for traditional knowledge.

In Part IV, I examine the impact of the failure to appropriately value generational innovation. I contend that the devaluation of generational innovation by present regimes is not only harmful to sustainable development efforts, but actually reverses the flow of technology transfers from developing countries to developed ones with no concomitant wealth transfer.

In Part V, I suggest that the uniqueness of generational innovation must be protected through a system that corrects present misconceptions regarding traditional knowledge. These misconceptions include devaluation of generational collaboration, misplaced reliance on authentication systems to resolve such devaluations, and a failure to address the needs of the diaspora.

I conclude by contending that in our efforts to remake innovation systems in response to the changes demanded by the global digital marketplace, rational protection for traditional knowledge must be a part of that change if we are to achieve equitable, sustainable values for innovative activity in the twenty-first century.

I. THE ECONOMIC REWARDS OF INNOVATION

A report by the Task Force on Science, Technology and Innovation of the U.N. Millennium Project emphasizes the progressive nature of innovation and its critical role in helping developing countries move from their traditional status as providers of labor and natural resources to a new status as a source of technology- and knowledge-based goods and services. Yet the current intellectual property system, with its Western-based concepts of protectable innovation and creativity, may serve as a significant stumbling block to the creation of local knowledge-based economies, because it fails to value non-Western innovative activities.

30. STI Report, supra note 9, at 24.
Whether or not intellectual property laws may be justified domestically under theories of natural law, labor protection, or personality defense on an international basis, post-TRIPS, the philosophy behind such protection seems clear. Quite simply, intellectual property is about protecting the products of innovation as items of commerce. It is in this guise as a regime for protecting innovation perceived to have value on a commercial basis that intellectual property has become a de facto measure for valuing local innovation. Yet this measure remains seriously flawed because of its historic failure to accord value to innovation outside the narrow confines of Western views of technological progress and individual ingenuity.

The Agreement on Trade Related Aspects of Intellectual Property Rights ("TRIPS") is the premier multinational agreement governing the protection of intellectual property rights of the twenty-first century. Administered by the World Trade Organization, it has been acceded to by 152 countries. Although frequently criticized for its strong IP protectionist stance, TRIPS today remains the single most significant focus regarding the standard for the international protection of intellectual property rights, including, significantly for this Article,


32. See Peter Jaszi, Beyond Economics: The Protection of Authorship as a Cultural Value, in INTERNATIONAL INTELLECTUAL PROPERTY LAW, supra note 31, at 127 (recognizing decision to protect intellectual property stems from value placed on creative acts required to transform ideas into products).

33. Id. at 132-34 (discussing protection of author personality).

34. TRIPS, supra note 2. Established in 1994 and administered by the WTO, TRIPS remains one of the most significant multilateral intellectual property treaties of the twenty-first century. Id.; INTELLECTUAL PROPERTY AND INTERNATIONAL TRADE: THE TRIPS AGREEMENT xvii (Carlos M. Correa & Abdulqawi A. Yusuf eds., 1998).

35. Works protected by intellectual property have a long historical relationship with economic (trade) issues. One of the earliest reported trademarks was found on pottery in Mesopotamia—an undoubted article of commerce. See generally Doris Estelle Long, "Globalization": A Future Trend or a Satisfying Mirage?, 49 J. COPYRIGHT SOC'Y U.S.A. 313, 324 (2001). The Berne Convention itself arose from the concerns of Victor Hugo and others over the lack of sufficient international protection for their creative endeavors. Id.


37. See, e.g., SUSAN K. SELL, PRIVATE POWER, PUBLIC LAW: THE GLOBALIZATION OF INTELLECTUAL PROPERTY RIGHTS 165 (2003) (noting developing countries were reluctant to agree to TRIPS due to its inclusion of IP protections); Marci A. Hamilton, The TRIPS Agreement: Imperialistic, Outdated, and Overprotective, 29 VAND. J. TRANSNAT'L L. 613, 616 (1996) (denouncing TRIPS' imposition of "Western intellectual property system").
copyright and patents. The preamble to TRIPS plainly recognizes that the philosophy behind the protection of intellectual property on an international scale is trade utilitarianism. It stresses that the reason behind the treaty was member countries' "desir[e] to reduce distortions and impediments to international trade."38 The treaty itself contains numerous provisions directed expressly to the market impact of intellectual property protection, including compulsory licensing provisions for patents to meet domestic market needs,39 and provisions that permit exceptions to intellectual property protection to combat market abuses.40

In reality, while the negotiation of TRIPS under the auspices of the General Agreement on Tariffs and Trade,41 and its subsequent inclusion among the umbrella agreements under which members of the World Trade Organization operate,42 are strong evidence of the commercial roots of intellectual property protection, it is not the first instance of such an intimate relationship between intellectual property and market economics. To the contrary, the Berne Convention,43 which is the foundational international treaty for the protection of copyrights,44 was the result of an Authors Union formed by such luminaries as

38. TRIPS, supra note 2, pmbl. (emphasis added).
39. TRIPS, supra note 2, art. 31.
40. TRIPS, supra note 2, art. 40(2) (permitting members to prohibit licensing conditions or practices that "constitute an abuse of intellectual property rights having an adverse effect on competition in the relevant market").
42. These umbrella agreements cover a wide range of topics, including Sanitary and Phytosanitary measures; Trade in Services, Agriculture, and Textiles; and Technical Barriers to Trade as well as Trade Related Aspects of Intellectual Property Rights. See generally Marrakesh Agreement Establishing the World Trade Organization, Apr. 14, 1994, 108 Stat. 4809, 1867 U.N.T.S. 154 (providing Uruguay Round agreements).
43. Berne Convention, supra note 2.
44. The other significant copyright treaties include TRIPS, the World Intellectual Property Organization ("WIPO") Copyright Treaty, and the Universal Copyright Convention ("UCC"). See TRIPS, supra note 2, art. 9(1) (incorporating by reference all substantive articles of Berne Convention with exception of Article 6bis, dealing with moral rights); WIPO Copyright Treaty art. 7, Dec. 20, 1996, S. TREATY DOC. NO. 105–17 (1997), 36 I.L.M. 65 (clarifying right of authors to control use of their works in digital environment); Universal Copyright Convention, July 24, 1971, 25 U.S.T. 1341, 943 U.N.T.S. 178 (serving largely as counterpoint to Berne Convention for those countries like, United States, that wanted to retain statutory formalities, such as notice and registration, for copyright protection, and that wanted to eliminate obligations to protect moral rights under copyright). Since the accession to the Berne Convention in 1989 by the United States, which was perceived as one of the strongest supporters of the UCC, the UCC has generally been losing significance internationally. See Silke von Lewinski, The Role and Future of the Universal Copyright Convention, UNESCO E-COPYRIGHT BULLETIN Oct.–Dec. 2006, at 1–13, available at http://unesdoc.unesco.org/images/0015/001578/157846e.pdf (noting that although nearly 100 states are contracting parties to the UCC, its importance has decreased due to adherence to the Berne Convention by the United States and former Union of Socialist Soviet Republics).
Victor Hugo in part to combat the increasing economic harm to authors from the pirating of their works in foreign countries.45

This economic overlay gives both TRIPS and intellectual property more generally a significant role in the economic development of a country. This role is not limited to the critical and contested question of the extent to which intellectual property protection may promote foreign direct investment in a growing economy.46 To the contrary, regardless of which side of this debate you are on, there is no question that, as the premier legal regime for both encouraging and protecting creative and innovative works,47 the IP system has become the default means for measuring the economic value of such works.48 Yet the innovative and creative activity that is valued under this system is of a very precise type. It is innovation and creativity as valued by the Western European countries that first crafted such protection regimes49 and were at the forefront of international efforts in the middle to late nineteenth century to harmonize such regimes on an international basis.50

45. See RICKETSON, supra note 2, at 14, 46-49 (outlining different IP laws in eighteenth-century European countries that led to necessity of Berne Convention); Doris Estelle Long, What if Dickens Had Succeeded? International Copyright, 'Creative Adaptations' and Ebenezer Scrooge (unpublished work in progress, on file with author) (describing efforts of Charles Dickens to encourage United States to provide copyright protection to foreign authors).


47. Despite the numerous challenges and various other fora in which diverse alterations to the TRIPS model of protection are being developed, these challenges still use as their initial point of departure the TRIPS Agreement. While scholars may discuss “regime shifts,” see Laurence R. Helfer, Regime Shifting: The TRIPs Agreement and New Dynamics of International Intellectual Property Lawmaking, 29 YALE J. INT’L L. 1, 13-18, 53-81 (2004) (describing progression of regime shifts in developed countries from WIPO to GATT to TRIPS), or question the viability of TRIPS as a continuing basis for regulating intellectual property in the area of biotechnology, see Amy Kapczynski, The Access to Knowledge Mobilization and the New Politics of Intellectual Property, 117 YALE L.J. 804, 835-37 (2008) (noting emergence of group coalitions successfully advocating for changes in intellectual property laws in many areas, including software and medicine), the reality is that TRIPS remains a jumping off point for discussion because it has become the de facto standard for comparison for international IP protection.

48. See infra notes 67-79 and accompanying text for a discussion regarding the economic rights granted creators and innovators under the present intellectual property system.

49. The first reported copyright law was enacted in England in 1709. See Peter Jaszi, Toward a Theory of Copyright: The Metamorphoses of “Authorship,” 1991 DUKE L.J. 455, 455 (referencing Statute of Anne as foundation for literary IP rights). The first reported trademark type regulation may have been enacted in Venice in the Middle Ages. See STEPHEN P. LADAS, THE INTERNATIONAL PROTECTION OF INDUSTRIAL PROPERTY 8-9 (1930) (describing regime of monopolies and executive privileges in Hanseatic cities during Middle Ages).

50. Multinational treaties governing intellectual property rights were first established in Europe, including, most notably, the Berne Convention for the Protection of Literary and Artistic Works in 1886 and the Paris Convention for the Protection of Industrial Designs in 1883. See Daniel J. Gervais, The Internationalization of Intellectual Property: New Challenges from the Very Old and the Very New,
Law is part culture, part politics, and part history. And the history of intellectual property protection is a history of romantic notions of authorship and ingenuity.\(^5\) The identifiable single author, painting alone in the garret, has become the symbolic vision behind present copyright protection systems in which protection is grounded in the "individual rights"\(^5\) of a single, identifiable author\(^5\) to control his or her works. Even if patent law is not quite so romantically premised, except perhaps in the obligation to identify the inventor\(^4\) and in the U.S. practice of granting patent rights to the first to invent (as opposed to the first to file),\(^5\) it is still based on the Western notion of progress
through science and technology. While this Western faith in progress through science is largely perceived to date from the seventeenth century, technological innovation has been valued since at least the Middle Ages in Western Europe, and has ultimately led to a culture of innovation that has often been cited as one of the reasons for the present advanced status in the economic development of the West. I do not mean to suggest that non-Western cultures did not also value innovation, including scientific innovation. To the contrary, countries such as China and India were the sources of numerous scientific advances through the ages. But, unlike the West, neither India nor China established an innovation valuation system that granted economic exploitation rights to the creators of such innovations. Nor did either country succeed in establishing until recently the culture of innovation that lies at the heart of the history of the economic development of the West. As Robert Friedel acknowledges in his work A Culture of Improvement: Technology and the Western Millennium,

Over the past thousand years there has developed in the West a “culture of improvement,” an environment in which significant, widely shared value has come to be attached to technical improvement and conditions have been cultivated to encourage and sustain the pursuit of improvement. Related to the value attached to improvement is the

(2005) (tracing romantic origins of inventor genius). If copyright is filled with the romance of the artist in the garret, then arguably, at least in the United States in its early days, patent is filled with the romance of the single inventor working in a makeshift lab in the garage. See, e.g., JOHN H. LIENHARD, HOW INVENTION BEGINS: ECHOES OF OLD VOICES IN THE RISE OF NEW MACHINES 8 (2006) (discussing our “seemingly atavistic need to credit one individual for the work of many”). In today’s global, digital environment of high tech collaboration, neither image may be realistic, if they ever were.


57. See, e.g., FRIEDEL, supra note 4, at 8 (pointing out rising societal value of innovation via technological advancement during Middle Ages); LANDES, supra note 4, at 15–22 (discussing developments during Middle Ages leading to increased economic enterprise).

58. See, e.g., WILLIAM H. MCNEILL, THE RISE OF THE WEST: A HISTORY OF THE HUMAN COMMUNITY 654 (2d ed. 1991) (stating new technologies began to transform West as other cultures fell behind); NATHAN ROSENBERG & L.E. BIRDZELL, JR., HOW THE WEST GREW RICH: THE ECONOMIC TRANSFORMATION OF THE INDUSTRIAL WORLD 3 (1986) (stating past two hundred years has been unprecedentedly long period of prosperity and examining reasons behind such prosperity).

59. See, e.g., IDRIS, supra note 46, at 11 tbl.1.1 (describing scientific advances achieved in India during the Moghul Empire when no patent protection existed); ROBERT TEMPLE, THE GENIUS OF CHINA: 3,000 YEARS OF SCIENCE, DISCOVERY, AND INVENTION 9–10 (1986) (describing diverse scientific advances in China before Chinese established patent laws).

60. See TEMPLE, supra note 59, at 9–10 (positing that neither Chinese innovators nor their inheritors effectively claimed their inventions).
widespread expectation that improvement will indeed occur in most realms of technology.\textsuperscript{61}

Whether or not a property-based rights system such as the one represented by current intellectual property regimes is necessary to encourage the creation of innovative works, such a system has undoubtedly played a role in the historical development of a culture of innovation in the West. By serving as a basis for valuing such works on an economic basis, intellectual property law has been a means for encouraging their creation and use.\textsuperscript{62}

While scholars may debate the utility of the property-based nature of rights granted under current IP regimes,\textsuperscript{63} or the scope of exceptions for intellectual property protection in today’s digital environment,\textsuperscript{64} the basic notion of individuated creativity remains at the core of Western intellectual property

\begin{footnotesize}
\textsuperscript{61} FRIEDEL, supra note 4, at 6.
\textsuperscript{62} See, e.g., LIPSEY supra note 56, at 261 (including improved intellectual property laws as reason for Western economic advances); see also HISAMITSU ARAI, WIPO, INTELLECTUAL PROPERTY POLICIES FOR THE TWENTY-FIRST CENTURY: THE JAPANESE EXPERIENCE IN WEALTH CREATION 15, 73–78 (1999) (describing use by Japan of strong patent law protection to create its own technology industry); PAT CHOATE, HOT PROPERTY: THE STEALING OF IDEAS IN AN AGE OF GLOBALIZATION 105 (2005) (describing Germany’s use of patent laws to maintain global monopoly in chemical industry during early decades of twentieth century). The promise of an economic return for innovative acts may be even more critical for inventions that impact health, safety, or the environment. The high cost of much innovative activity, particularly in the critical areas of health, safety, and agriculture, where innovations must be tested for safety and environmental harm, means that some form of economic support for such research must be provided. While government grants, nonprofit institutions, nongovernmental organizations, and other public and private charitable sources may exist to support such research, the patent laws were developed to provide an alternative to these sources. See, e.g., VAN CAENEGEREM, supra note 15, at 4 (stating intellectual property rights help protect against market risk). Patent laws do not require that the only sources for funding for research that results in patentable inventions are derived from the economic benefits secured by such laws. Similarly, their existence does not prevent other funding sources beyond those secured by the exploitation of the patent grant. In an age where global pandemics such as AIDS, tuberculosis, and malaria continue to kill millions, removing the alternative sources of funding provided by the economic exploitation rights granted under patent laws seems a foolhardy approach at best. I do not mean to suggest that these exploitation rights should not be balanced against the needs of developing and least-developed countries in providing essential medicines, such as the potential solution provided under Article 31bis of the Annex to the Protocol Amending the TRIPS Agreement. Amendment of the TRIPS Agreement, Annex to the Protocol Amending the TRIPS Agreement art. 31bis, WT/L/641 (Dec. 6, 2005). However, efforts to eliminate completely the potential research funding benefits of patents are ill founded. To meet many of the critical health and safety challenges we need both “open source” funding equivalents as well as patents to assure adequate sources of funding. See supra note 17 for examples of “open source” funding equivalents.
\textsuperscript{64} See LESSIG, supra note 4, at 180–82 (comparing exceptions to copyrights in physical world in relation to cyberspace counterparts).
\end{footnotesize}
systems. Even those who suggest a reduction in the scope or type of protection afforded intellectual property rights in the Digital Age do not suggest a complete eradication of such protections. But consider what this Western focus on individuality and technology-based progress says about creative and innovative activities that do not readily fit within this model. Are works that are the product of collaboration less valuable than single-authored works? Is only innovation based on the latest scientific and technological advances worthy of compensation or does economic value also reside in innovation based on practices that have been perfected through generations of use?

Under present intellectual property regimes, generational knowledge and practices cannot generally be protected. Copyright requires "originality." Whether such originality is demonstrated through a "modicum of creativity," through evidence of "intellectual creations," or by "skill, labour and judgment," Morning Star Poles, weavings, and other works of generational creativity generally lack such "originality" because they reproduce the patterns and expressions that other generations have created. At best, works of generational creativity may be granted a "thin copyright," sufficient only to protect modifications to tradition-based expressions against unauthorized identical duplications.

65. I do not mean to suggest that recognition of individual authorship is a Western construct. To the contrary, numerous cultures value the identification of authorship. Thus, for example, while copyright protection did not exist in India when the Bhagavad Gita or the Mahabharata were being written, the authors of such works were credited. See, e.g., KRISHNA DHARMA, MAHABHARATA: THE GREATEST SPIRITUAL EPIC OF ALL TIME 15 (1999) (crediting Mahabharata to Vyasadeva); see also SIVA VAIDHYANATHAN, COPYRIGHTS AND COPYWRONGS: THE RISE OF INTELLECTUAL PROPERTY AND HOW IT THREATENS CREATIVITY 193 n.11 (2001) (noting that authorial credit was given in India, even in absence of copyright). Similarly, while no copyright existed in China, the writings of Confucius were still accredited to Confucius. See Burton Watson, Introduction to THE ANALECTS OF CONFUCIUS 6 (Burton Watson trans., 2007) (attributing up to twenty ancient sections or "Books" to Confucius in Chinese literary tradition). More recently, during the opening months of the National Museum of the American Indian in Washington, D.C. I observed that each exhibit contains information regarding the "authors" (my term, not theirs) of the exhibits in question.

66. Thus, for example, Lawrence Lessig, who has routinely criticized the scope of protection for copyright in the Digital Age, insists that he does not support the eradication of all such protection. See, e.g., LESSIG, supra note 4, at 107-08 (commenting on benefits of copyright in creative process). Similarly, those who criticize the extension of patent protection to software innovations do not suggest that the patent system itself should be abolished. See, e.g., James Gleick, PATENTLY ABSURD, N.Y. TIMES MAG., March 12, 2000, at 44 (arguing much of patent system's value lies in disclosure of technologies that might otherwise be hoarded as trade secrets). Even Jerome Reichman, who suggests that a property-based system should be eschewed in favor of one based on product liability rules, does not advocate the elimination of some form of economic reward for creators, merely a change in the basis on which such rewards are enforced. See Reichman & Lewis, supra note 63, at 345 (acknowledging property-rights-based system has benefits).


68. TRIPS, supra note 2, art. 10(2) (providing TRIPS originality standard for databases).


70. See, e.g., Trek Leasing, Inc. v. United States, 66 Fed. Cl. 8, 11 n.4, 12-13, 19 (2005) (stating...
Indigenous inventions fare no better. Protection for inventions under patent law requires "novelty" and "nonobviousness." While technology-based advances generally meet the high standard of uniqueness required under patents, tradition-based innovations automatically fail because they have been in use too long to be novel. Thus, generational innovations such as the use of Neem seed as a fertilizer or of turmeric to clean wounds cannot be protected under patent, while the application of technology to such innovations, in the form of extraction processes to obtain the active ingredient, and the results of such extractions, generally demonstrate sufficient novelty for protection.

Ultimately, the uniqueness requirements under copyright and patent law serve to place the products of tradition-based innovation beyond legal protection. Instead, such innovation is placed into the public domain, where
innovators lose any right of control over their works. This loss of control is critical to the economic valuation of innovative activities. Without the legal right to control the use of one's creative or innovative work, or at a minimum to be compensated for such uses under a liability rule, tradition-based innovation cannot be used to generate wealth by their holders. At its core, intellectual property protection values innovation by granting the producers of innovative and creative works the economic benefits of their efforts. Through the grant of exclusive rights to control the use of the patented invention or the copyrighted work, the law grants innovators the ability to seek compensation for the exploitation of their works. Such a system does not assure that socially useful innovation will always achieve an economic reward. To the contrary, only those works that are perceived as having value in the marketplace, either through

75. Dutfield, supra note 74, at 238; see also Doris Estelle Long, Curtailing the Imperialism of the Public Domain or Changing the Rules of the Great Game for the Intellectual Property Empire 20 (May 2008) (unpublished manuscript, on file with the author) [hereinafter Long, Curtailing Imperialism] (contending, despite apparent agreement to place traditional knowledge in public domain, such domain is not monolithic state requiring such heavy-handed measures to assure adequate access to information). For a comprehensive overview of the literature regarding the public domain, see Pamela Samuelson, Enriching Discourse on Public Domains, 55 DUKE L.J. 783, 786–813 (2006).

76. It is possible that the ability to control the use of one's work might be achieved through other means, including contractual agreements. Schuler, supra note 72, at 177–78. Where, however, an innovation falls outside the scope of patent protection, it is highly unlikely that a third party would agree by contract to pay for an invention it could use without compensation if it so chooses. The only significant exception might be for those inventions where secret knowledge regarding the innovation, such as know-how or show-how, is sought to enhance the use of public domain innovations.

77. See Reichman, supra note 63, at 1777 (suggesting liability principles should be basis for innovation law). I am not suggesting that product liability rules should be used to protect generational innovation. I believe such rules might prove useful in areas where the holder of the generational innovation is willing to license third party use and where the only issue is the amount of compensation for such use. Where, however, there are concerns over deculturizing uses or other uses beyond compensation, liability rules are problematic. See Long, Dissonant Harmonization, supra note 14, at 1184 (recognizing possibility of multiple motivations, including economic gain, for aesthetic creativity).

78. See TRIPS, supra note 2, art. 28(1)(a) (stating exclusive rights include right to prohibit third parties from making, using, importing, or selling patented invention without authorization of patent holder).

79. In reality, copyright owners are not granted the right to control the use of their works. Unlike patents, where holders are granted the right to prohibit the unauthorized use of their invention, id., copyright owners can only control the public distribution of their works (whether by reproduction, performance, transmission, or communication), see, e.g., WIPO Copyright Treaty, supra note 44, art. 6(1) (granting authors exclusive right to distribute works to public through sale or otherwise); Berne Convention, supra note 2, arts. 9, 11, 12 (granting rights of reproduction, performance, and adaptation). Once a work has been made publicly accessible, the copyright holder cannot control a third party's ability to actually use the work, including reading text or listening to music in private. Whether such permitted uses can be controlled through the application of technological protection measures remains one of the most critical issues in the development of copyright standards in the Digital Age. See, e.g., Chamberlain Group, Inc. v. Skylink Techs., Inc., 381 F.3d 1178, 1182–84 (Fed. Cir. 2004) (denying protection for universal garage door openers under Digital Millennium Copyright Act for failure to prove unauthorized use of copyrighted software).
popularity (for copyrighted works) or industrial adoption (for patents), will generally attract investment capital. Nevertheless, lacking the value of uniqueness defined by Western concepts of legal protection for innovation, most generational innovation cannot even count on this ephemeral promise of economic return.

II. INNOVATION THROUGH NON-WESTERN EYES

Western innovation systems impose burdens on legal protection that exclude the innovative acts of those who do not share the same views regarding individuated, technologically based progress as the sole source of economically valuable innovation. As the WIPO report on The Attempts to Protect Expressions of Folklore and Traditional Knowledge so succinctly stated,

It seems that copyright law may not be the right, or certainly the only, means for protecting expressions of folklore. This is because, whereas an expression of folklore is the result of an impersonal, continuous and slow process of creative activity exercised in a given community by consecutive imitation, works protected by copyright must, traditionally, bear a mark of individual originality.80

It is this value for the generational passage of knowledge and practices that lies at the heart of non-Western, indigenous creativity and innovation. Thus, for example, the Kuna Yala of the San Blas Islands in Panama use elaborate embroidery designs consisting of a reverse appliqué pattern historically used on their dresses and blouses.81 These designs, generically referred to as "molas," traditionally are based on geometric patterns that may represent characters in traditional stories or myths.82 Yet within the transmission of this tradition-based practice is room for the change that affects all traditions and culture. Thus, for purposes of commercialization, the Kuna Yala have begun to create new patterns to meet the market desires of consumers who seek bolder colors or more recognizable pattern designs such as fish and other shapes.83 This change in the face of collisions with other cultures demonstrates an often-forgotten aspect of generational innovation: it is not static.84 It is not a reification of culture for

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80. WIPO Forum, supra note 74, ¶ 17.
82. Salvador, supra note 81, at 54.
83. Id. I was told by some of the Kuna Yala that they chose to make mola patterns in bright blue and depicting fairly realistic, but stylized, versions of fish because these designs were very popular with American tourists. Yet despite the use of new designs, they insisted that the new style molas be created using the same hand-stitched reversed-appliqué techniques that they had used historically for the more traditional designs that they wore on their clothing. These women also told me they would never wear one of these new designs themselves because they did not consider them "authentic" patterns.
84. To the contrary, much generational innovation encapsulates the steady evolution resulting from contact with other cultures, including those of the external consumer marketplace. See, e.g.,
reification’s sake. At the World Forum on the Protection of Folklore in 1997, Terri Janke described folklore as a “living and continually evolving tradition. . . . Its continued practice is vital to the identity and survival of [its holders].”85 This same description could be used to describe all generational innovation. Such innovation represents a distinctly non-Western focus on social collaboration and perfection of information through controlled transmission across generations. These values appear to be in direct opposition to the individuated, technologically based constructs of progress contained within present intellectual property system.

Under present copyright and patent regimes, protected creative and innovative works must not only bear the necessary hallmarks of uniqueness,86 they must also be the product of individuated creatorship.87 While copyright recognizes the concept of joint authorship arising from collaborative efforts,88 the terms of such collaboration are often narrowly constrained by time and activity requirements. Thus, for example, under U.S. copyright law, to qualify as a joint author, the authors in question must have intended at the beginning to work together to create a single work.89 Such intentional collaboration


86. See supra notes 67-73 for sources that discuss the various hallmarks of uniqueness.

87. Such individuated creatorship obligations are contained in the need for an identifiable author under copyright and an identifiable inventor under patent, see, e.g., 17 U.S.C. § 302(c) (2006) (reducing period of copyright protection to maximum of 95 years from date of first publication or 120 years from date of creation unless author is identified during her lifetime); 35 U.S.C. §§ 111, 115 (2006) (requiring identification of author as part of oath to support valid patent application), in the specification of intellectual property rights as “private rights,” TRIPS, supra note 2, pmbl., cl. 4, and in the narrow definition of who may share authorial and inventive rights, see infra notes 89-92 and accompanying text for a discussion regarding collaborative ownership rights.

88. See 17 U.S.C. § 201(a) (establishing that “[t]he authors of a joint work are co[-]-owners of copyright in the work’’); Berne Convention, supra note 2, art. 7bis (dealing with calculation of terms of protection for “work of joint authorship”).

89. See 17 U.S.C. § 101 (defining “joint work” as one “prepared by two or more authors with the intention that their contributions be merged into inseparable or interdependent parts of a unitary whole” (emphasis added)); Copyright, Designs and Patents Act, 1988, c. 48, § 10(1) (U.K.) (defining “work of joint authorship” as “a work produced by the collaboration of two or more authors in which the contribution of each author is not distinct from that of the other author or authors”). The application of domestic copyright law to the question of joint authorship (versus the role of helpful but unrecognized collaborator, without copyright protection privileges) is extremely complex. Under U.S. law, for example, there are conflicting opinions regarding the need for each author to make a copyrightable contribution to the work as a whole. Compare Aalmuhammed v. Lee, 202 F.3d 1227, 1231-32 (9th Cir. 2000) (concluding, in addition to requiring copyrightable contributions, that collaborator must have been author as well), with Gaiman v. McFarlane, 360 F.3d 644, 660-61 (7th Cir.
necessarily imposes a time constraint on protectable collaborative efforts. Once a work has been created, "collaboration" becomes "adaptation," which requires the approval of the original creator. Thus, if two individuals work together to create computer code for a video game, they might qualify as joint authors. If, however, one person creates the code, and a second individual revises that code, the second individual is no longer a joint author. To the contrary, he has now become the creator of a derivative work and must receive the permission of the first author to create his revision, unless such adaptation qualifies as permissible fair use. Worse, under present U.S. law, if such time-separated collaborator does not receive permission, and his collaborative activities are not otherwise privileged, even if the second putative author has a separate copyright in his own original contributions to the adapted work, he would be unable to defend his copyrighted adaptations against others' infringing uses.

Collaborative activities under present patent regimes are less constrained than under copyright. There is no requirement that joint inventors under U.S. law work together to create a new invention. To the contrary, joint inventorship under U.S. law exists even if the two do not physically work together or even make equivalent contributions to the conception of the patented invention, or to the subject matter of its claims. Even if an individual only contributes to a
single claim, by conceiving of the patentable element in the claim, she qualifies as full joint inventor. Like copyrights, patents impose a time constraint on collaboration. Inventive collaboration must take place before the invention is conceived of in its totality or enters the public domain through prior public activities such as use or publication.

Protected creative and innovative works under Western views of value-added innovation are not only the product of individuated creation, but their economic value to such creators is also time-constrained. While authors are granted rights to the economic exploitation of their works, subject to critical fair use exceptions, such rights end after a specified period of time. Under

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95. See, e.g., Ethicon, Inc. v. U.S. Surgical Corp., 135 F.3d 1456, 1460-64 (Fed. Cir. 1998) (recognizing joint inventorship status for researcher who only contributed to two claims in a fifty-five claim patent); Fina Oil & Chem. Co. v. Ewen, 123 F.3d 1466, 1473 (Fed. Cir. 1997) (holding joint inventor need not have contributed to each element of invention or have conceived of entire invention).

96. See, e.g., Fina Oil, 123 F.3d at 1473-74 (finding joint inventorship requires each inventor contribute in a significant manner to clear conception of invention).

97. 35 U.S.C. §§ 102-103 (listing public acts which cause invention to lose necessary attributes of novelty or nonobviousness). If an invention lacks patentability due to the absence of novelty or nonobviousness, then the "collaborator" is free to use it under patent law, but would no longer qualify as a joint inventor. To the contrary, the rights to any "derivative" invention that she creates would belong exclusively to her since the creator of the underlying invention would have no rights under patent to assert an interest in her derivative invention. See Diamond v. Diehr, 450 U.S. 175, 191-92 (1981) (recognizing that although mathematical formula in itself is not patentable, process using mathematical formulas may be patentable when viewed as whole).

98. See supra note 79 and accompanying text for examples and discussion of how these economic rights are bounded by the rights to control the distribution, reproduction, performance, and adaptation of the works. In the Digital Age, such economic exploitation rights extend to use of the work on the Internet, even though the ability to enforce those rights has proven problematic in the era of peer-to-peer file trading and other uses unauthorized by the economic rights holder. See, e.g., WIPO Copyright Treaty, supra note 44, art. 6 (granting authors exclusive right to make their work available to public); Fred von Lohmann, Measuring the Digital Millennium Copyright Act Against the Darknet: Implications for the Regulation of Technological Protection Measures, 24 Loy. L.A. Ent. L. Rev. 635, 637-48 (2004) (discussing diverse problems in protecting copyright on Internet, including darknets and failure of Digital Millennium Copyright Act to solve such problems). Losses due to digital piracy on the Internet are virtually incalculable given the untraceable nature of such end-user-based activities. It is impossible to determine how much loss is caused by online pirate activities because it is impossible to measure accurately the failure to buy a given work. Cf. OECD, The Economic Impact of Counterfeiting and Piracy, at 15-16, 21-25, DSTI/IND(2007)/PART4/REV1 (2007), available at http://www.oecd.org/dataoecd/13/12/38707619.pdf (describing difficulty in determining actual piracy and counterfeiting figures, and proposing new econometric model). Current estimates by the Motion Picture Association of America, for example, place losses due to Internet piracy at approximately $2.3 billion for 2006 alone, which can only be a guess at best. L.E.K., THE COST OF MOVIE PIRACY (2006), www.mpaa.org/leksrumaryMPA%20revised.pdf; see also Copy Culture, N.Y. TIMES, Mar. 28, 2005, at C8 (reporting widespread sentiment that government is powerless to regulate steadily increasing amount of bandwidth and users on file-sharing websites).

99. Both the Berne Convention and TRIPS recognize limitations and exceptions to the exclusive rights granted to copyright authors. See TRIPS, supra note 2, art. 13 (establishing three-part test for acceptable limitations and exceptions to copyright); Berne Convention, supra note 2, arts. 9-10bis (recognizing limited exceptions for reproduction, quotations, teaching, and reporting). In the United States, exceptions and limitations to rights under copyright are referred to under the general rubric of
TRIPS this period of time must be at least for the life of the author plus an additional fifty years.101 Inventors are granted similarly time-constrained rights to the economic exploitation of their works. Patent protection must last for at least twenty years from the date of application.102 Once this period ends, an inventor’s ability to exercise any form of economic control over the work similarly ends. Time-sensitive innovation is therefore encouraged, while innovation grounded in traditions and practices handed down through generations receives no economic exploitation rights.103

The failure to value tradition-based innovation by granting generational innovators economic exploitation rights automatically devalues innovative acts that fall outside Western precepts. While Western precepts of innovation focus


100. Internationally, such rights end fifty years after the author’s death. See TRIPS, supra note 2, art. 12 (providing protection for minimum period of fifty years from creation or authorized publication of work where protection of work is not calculated according to life of person and work is not photographic or work of applied art). However, many countries including the United States currently extend the period of protection to life plus an additional seventy years. See, e.g., 17 U.S.C. § 302 (stating that under U.S. law term of copyright endures for life of author plus seventy years); Council Directive 2006/116/EC, art. 1(1), 2006 O.J. (L 372) 12, 13 (directing that EU member states harmonize protection laws to accord protection for duration of author’s life plus seventy years).

101. TRIPS, supra note 2, art. 12.

102. Id. art. 33. Interestingly, unlike copyright protection, even countries that are perceived to favor relatively strong patent protection, such as the United States, have not extended the period of protection beyond the minimum required twenty year term, excluding extensions for patent pendency during agency approvals for medical and other health and safety patents. See generally John P. Sinnott, William Joseph Cotreau & Jessica M. Sinnott, 2B-2P WORLD PATENT LAW AND PRACTICE (1997) (providing detailed information about patent laws in United States and abroad).

103. The absence of such rights may not only adversely impact sustainable development, it may deprive the world of the benefits of indigenous knowledge in the critical areas of health, biodiversity, and environmental conservation. While the process of generational innovation may be the initial result of noneconomic impulses, including spiritual and communal “gifting,” see, e.g., David Bollier, Silent Theft: The Private Plunder of Our Common Wealth 27–41, 81–82 (2002) (discussing workings of indigenous gift economies and Western understandings of these economies), as generational innovators begin to diffuse their innovations through authorized commodification, economic rights may provide needed funds to involve a larger, presently untapped source for innovations in this area—indigenous peoples.
on technology, time constraints, and individuated creatorship,\textsuperscript{104} non-Western innovation contains no such limitations.\textsuperscript{105} To the contrary, local or tradition-based innovations do not require the addition of technology, have value across generations, and are not only the result of collective creation, but are also held collectively by members of the relevant tribe.\textsuperscript{106} These differences have led to devaluation of innovative knowledge “painstakingly generated by distinct communities over the course of centuries”\textsuperscript{107} to such an extent that such knowledge is often considered “free”\textsuperscript{108} or “a happy accident—naturally occurring wealth that is free for the taking.”\textsuperscript{109} Despite its critical role in indigenous innovation, so-called traditional knowledge\textsuperscript{110} remains largely unprotected and, hence, undervalued.

III. TRADITIONAL KNOWLEDGE AND GENERATIONAL INNOVATION

There is no agreed upon definition for the concepts of “traditional knowledge” or its recently developed subset “traditional cultural expressions.”\textsuperscript{111} “Traditional knowledge” at its broadest meaning covers a potentially large body of knowledge and practices, handed down through generations. This includes a wide variety of spiritual and cultural beliefs and practices, tangible works, folklore, folk art, folk remedies, and information and techniques regarding the use and conservation of the surrounding biota (flora and fauna).\textsuperscript{112} Recognizing

\begin{itemize}
\item \textsuperscript{104} See supra notes 68–72, 103 and accompanying text for a discussion of the legal and cultural definitions of innovation.
\item \textsuperscript{105} See supra notes 80–85 and accompanying text for a discussion of non-Western concepts of innovation.
\item \textsuperscript{106} See infra Part III for a detailed discussion of traditional knowledge protection, including the protection of generational innovation. See RONALD V. BETTIG, COPYRIGHTING CULTURE: THE POLITICAL ECONOMY OF INTELLECTUAL PROPERTY 12–13 (1996) (discussing communitarian view of property and culture in Indian and Balinese traditions); Christopher S. Byrne, Chilkat Indian Tribe v. Johnson and NAGPRA: Have We Finally Recognized Communal Property Rights in Cultural Objects?, 8 J. ENVTL. L. & LITIG. 109, 110–11 (1993) (discussing communitarian view of property in Native American traditions).
\item \textsuperscript{107} BOLLIER, supra note 103, at 81 (describing arguments made by RAFAI, Global Trade Watch, and others who support protection of what Bollier refers to as “cultural knowledge”).
\item \textsuperscript{108} Id.
\item \textsuperscript{109} Id. (referring specifically to Western perceptions of indigenous innovations in agriculture and medicine).
\item \textsuperscript{110} See infra Part III for a discussion of traditional knowledge and the issues surrounding the scope of its protection as intellectual property.
\item \textsuperscript{111} In fact, the necessity for any clear definition is one of the issues still under debate before the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (“IGC”) of the World Intellectual Property Organization. See WIPO Intergovernmental Comm. Intell. Prop. and Genetic Res., Traditional Knowledge and Folklore [IGC], The Protection of Traditional Cultural Expressions/Expressions of Folklore: Factual Extraction, Annex 7–26, WIPO/GRTKF/IC/12/4(b) (Jan. 31, 2008) (detailing comments by members and observers on traditional cultural expressions of folklore and including suggested categories of inclusion).
CROSSING THE INNOVATION DIVIDE

that separate treatment may be required for works that represent indigenous expression, such as folklore, folk art, and folk rituals, a subcategory of traditional knowledge has gradually developed over time using the term "traditional cultural expressions" ("TCEs"). The present division between traditional knowledge and TCEs is roughly equivalent to the division between patent-protected inventions and copyright-protected works under intellectual property regimes.

No current multilateral treaty establishes a protection regime for traditional knowledge. To the contrary, to the extent that international organizations


113. See, e.g., WIPO IGC, The Protection of Traditional Cultural Expressions/Expressions of Folklore: Overview of Policy Objectives and Core Principles, 11, WIPO/GRTKF/IC/7/3 (Aug. 20, 2004) [hereinafter TCE 2004 Core Principles] (stating that terms "traditional cultural expressions" and "expressions of folklore" are used synonymously); Rosemary J. Coombe, Protecting Cultural Industries to Promote Cultural Diversity: Dilemmas for International Policymaking Posed by the Recognition of Traditional Knowledge, in International Public Goods, supra note 63, at 599, 600 (noting WIPO use of "traditional cultural expressions" in conjunction with "expressions of folklore" in response to concerns of negative connotation of latter).

114. Traditional knowledge is often used synonymously with the concept of biodiversity to cover the practices and traditions involving agriculture, flora, fauna, and other biogenetic resources, as covered by the Convention on Biological Diversity. See Convention on Biological Diversity art. 8(j), done June 5, 1992, S. Treaty Doc. No. 103-20 (1993), 1760 U.N.T.S. 79 (requiring member countries to "respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity"); Coombe, supra note 113, at 599–600 (noting term traditional knowledge may include biological fields). By contrast, the term "traditional cultural expressions" is often used synonymously with the concepts of folklore and other generational expressive endeavors. See TCE 2004 Core Principles, supra note 113, at 11 (noting use of term "traditional cultural expressions" synonymously with expressions of folklore). In a relatively recent development, some have begun to differentiate between "traditional cultural expressions" and "expressions of folklore" ("EOF"). Agnés Lucas-Schloetter suggests that narrower terms such as folklore may allow for more focused, and ultimately more successful, protection for various aspects of what she refers to as "traditional culture."

115. Article 8(j) of the Convention on Biological Diversity comes the closest to recognizing the need to protect traditional knowledge by requiring Contracting Parties "as far as possible and as appropriate" and "subject to [their] national legislation" to

[r]espect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage
have considered the issue, they have often decried protection for traditional knowledge on the grounds that such protection would harm public access to information. Part of the difficulty in crafting an acceptable protection regime for traditional knowledge is the definitional problems posed by such a concept. Since by its very nature most traditional knowledge does not readily fit within the contours of existing legal regimes for the protection of innovation, either those legal regimes must be changed—a daunting task—or a sui generis system of protection must be created. This system may borrow from intellectual property precepts. But the special nature of traditional knowledge necessarily requires protection that is uniquely crafted to meet the special needs and challenges of traditional knowledge holders. While a complete analysis of the issues and challenges faced in crafting such a scheme is beyond the scope of this Article, among the critical issues that need to be resolved in creating an effective, rational traditional knowledge system useful in the effective valuation of generational innovation are the following:

the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.

Convention on Biological Diversity, supra note 114, art. 8(j). The Convention on Biological Diversity, however, does not establish any standards for such protection or answer any of the critical questions regarding the scope of protection to be afforded traditional knowledge. See infra notes 117-143 for a discussion of issues raised in establishing this scope of protection.


117. See supra Part II for a discussion of the traditional limits of intellectual property protection.

118. This does not mean, however, that such sui generis systems must necessarily be domestic law systems. To the contrary, while domestic systems serve as a useful testing ground for future international standards, unless traditional knowledge is granted the equivalent international protection for its innovative value as that granted to innovation under traditional intellectual property regimes, then generational innovation will remain undervalued. See generally Lucas-Schloetter, supra note 85 (discussing existing protections as well as need for additional protections of folklore).

119. For example, some of the precepts for the protection of TCEs in tangible form, such as the right to authorize public reproduction, distribution, or adaptation, might be based on copyright authorization principles. These principles, however, would have to be modified to take into consideration the special issues that arise from the use of protected TCEs, including the concern over deculturized modifications. See, e.g., David Howes, Cultural Appropriation and Resistance in the American Southwest: Decommmodifying "Indianness," in CROSS-CULTURAL CONSUMPTION: GLOBAL MARKETS, LOCAL REALITIES 138, 142-144 (David Howes ed., 1992) (examining adverse impact on Hopi culture and religion of inappropriate use of Kachina imagery in Marvel comic book); Doris Estelle Long, The Impact of Foreign Investment on Indigenous Culture: An Intellectual Property Perspective, 23 N.C. J. INT'L L. & COM. REG. 229, 243-46 (1998) (discussing problem of deculturizing uses of traditional knowledge).
1. What is the definition of the scope of practices, traditions, and works for which protection may be sought? Should protection be limited to tangible works (similar to the protection provided for copyrightable expression)? Or should intangible practices and beliefs be capable of some form of exclusive appropriation? Should protected knowledge be limited to knowledge held by indigenous groups, or should it include all types of culturally attributable knowledge, including that held by immigrant groups within a country? Most groups that have examined the issue have focused on indigenous groups as the source of traditional knowledge, yet culturally attributable knowledge is not necessarily limited to such groups.

2. What rights should be granted to the holders of protected traditional knowledge? Should property-based rights be granted or should equitable compensation for the authorized use of such knowledge be sufficient? The Tunis Model Law on Copyright for Developing Countries, one of the earliest international models for the protection of traditional knowledge, suggested the use of a “domaine public” system requiring compensation for use of “works of national folklore.” Many countries that have adopted domestic laws.

120. Establishing the scope of “traditional knowledge” can involve some complexity. See, e.g., WIPO, Fact-Finding, supra note 112, at 25 (containing wide-ranging descriptions of traditional knowledge including spiritual beliefs); BROWN, supra note 112, at 2 (describing indigenous groups' claims to kangaroo as sacred animal).

121. See, e.g., WIPO Fact-Finding, supra note 112, at 23 (noting that traditional knowledge includes but is not limited to knowledge held by indigenous peoples); BROWN, supra note 112, at 9–10 (noting protection efforts focus on indigenous cultures); Long, supra note 112, at 318 (defining traditional knowledge as broadly covering “knowledge and practices . . . handed down through generations,” including spiritual and cultural beliefs and folklore).


123. See supra note 78–79 and accompanying text for a discussion of author's control and compensation for patented and copyrighted works. Many sui generis regimes that provide protection for the use of traditional knowledge relating to biodiversity concerns require that “equitable benefits” be provided to the relevant group. See, e.g., Biodiversity Law, No. 7788, art. 63 (Republic of Costa Rica) (requiring “equitable distribution of benefits” for access to biogenetic resources); WIPO IGC, Genetic Resources: Draft Intellectual Property Guidelines for Access and Equitable Benefit-Sharing, ¶ 15, WIPO/GRTKF/IC/7/9 (July 30, 2004) (discussing inclusion of benefit-sharing provisions in international agreements); Secretariat of the Convention on Biological Diversity, Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of Their Utilization, ¶¶ 46–48 (2002) (discussing type, timing, and distribution of monetary and nonmonetary benefits).

124. The Tunis Model Law was adopted in 1976, and created with the joint assistance of WIPO and UNESCO. Lucas-Schloetter, supra note 85, at 340.

125. UNESCO & WIPO, Tunis Model Law on Copyright for Developing Countries, ¶ 6 (1976) (describing protection of “works of national folklore”) [hereinafter Tunis Model Law]; see also id. ¶ 17 (requiring payment to appropriate authority based on percentage of receipts from use of work,
governing the use of traditional knowledge (as opposed to TCEs) have similarly imposed compensation obligations, often in the form of equitable benefit sharing for the commercial uses of indigenous knowledge.\textsuperscript{126} By contrast, domestic laws have often subjected TCEs to property-type protection under domestic laws, including protection under domestic copyright laws.\textsuperscript{127}

3. Who should be defined as the holder of protected traditional knowledge? Many indigenous groups consider traditional knowledge, including TCEs, to belong to the group as a collective whole.\textsuperscript{128} Who speaks for the group when there is no organized governance structure to hold such rights? Many early suggestions for the treatment of traditional knowledge granted such rights to the government as a default authority.\textsuperscript{129} Yet such authorities may lack both suitable knowledge of tribal practices to determine authorization issues and a sufficient desire to assure that compensation for authorized uses is provided to the holders of the knowledge.\textsuperscript{130} Due to history, politics, or even tribal expulsion, members of an indigenous group may be divided to such an extent that they may inhabit different countries.\textsuperscript{131} Thus, for example the Iroquois now occupy both the

\textsuperscript{118}See, e.g., Tunis Model Law, supra note 125, commentary to § 6 (providing economic and moral rights in “works of national folklore” shall be exercised “by the competent national authority empowered to represent the people that originated them” (emphasis added)); Lucas-Schloetter, supra note 85, at 288 (listing countries that grant authorizing authority for use of folklore to national copyright bureaus).

\textsuperscript{127}See, e.g., Tunis Model Law, supra note 125, commentary to § 6 (providing economic and moral rights in “works of national folklore” shall be exercised “by the competent national authority empowered to represent the people that originated them” (emphasis added)); Lucas-Schloetter, supra note 85, at 288 (listing countries that grant authorizing authority for use of folklore to national copyright bureaus).


\textsuperscript{128}See, e.g., Lucas-Schloetter, supra note 85, at 266–340 (detailing diverse countries that protect folklore, including those that do so by granting copyright protection).

\textsuperscript{129}See, e.g., Yumbulul v. Reserve Bank of Australia (1991) 21 I.P.R. 481, ¶ 4 (noting clan is traditional owner and manager of rights of Morning Star Pole); see also Matthias Leistner, Traditional Knowledge, in INDIGENOUS HERITAGE AND INTELLECTUAL PROPERTY, supra note 28, at 49, 57 (noting traditional knowledge is owned collectively); Long, supra note 112, at 324 (noting traditional knowledge belongs to group as whole); Silke von Lewinski, Introduction to INDIGENOUS HERITAGE AND INTELLECTUAL PROPERTY, supra note 28, at 1, 3 (noting concept of individual property is alien to indigenous peoples).

\textsuperscript{130}Among the critical issues that require the intimate knowledge that only members of the relevant group possess are considerations of sacredness and deculturizing uses. See, e.g., Bollier, supra note 103, at 81–82 (discussing view of many communities that land and life are sacred and not to be individually owned); see also Angela R. Riley, “Straight Stealing”: Towards an Indigenous System of Cultural Property Protection, 80 Wash. L. Rev. 69, 90 (2005) (detailing critical role of indigenous peoples in crafting appropriate protection regimes for their traditional knowledge).

Which group should have the right to authorize use of shared knowledge or receive compensation for its authorized use? What happens if there is a conflict between two previously associated groups? How should such a conflict be resolved? Given the critical nature that traditional knowledge plays in the identity and even cultural survival of a particular indigenous group, subjecting conflict resolutions to simple court actions seems in direct contrast to the sensitive cultural issues underlying any such conflict.

4. What rights should those who have left the tribe be allowed to exercise in connection with traditional knowledge? The diaspora may exist by choice, as with those who chose to leave the tribal group to emigrate elsewhere, or by expulsion, as when one has violated tribal laws and subsequently been denied the benefits of tribal membership. Should the reason for removal impact the rights permitted to the diaspora? Article 27 of the Universal Declaration of Human Rights recognizes that “[e]veryone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits.” Whether this right represents a fundamental human right, and is therefore governed by such norms, remains unclear. Even more difficult is the problem of the extent to which someone has a right to participate in one’s culture regardless of one’s physical location on tribal lands. The question of the relationship between traditional knowledge, human rights, and an individual’s continuing right to use tradition-based practices and works when such individual becomes a member of the diaspora remains unsettled.


133. Such conflicts may even arise where tribes no longer have a single organized governing structure, or where the group in question has not yet authorized any particular organization to deal with requests to utilize traditional knowledge. See, e.g., BROWN, supra note 112, at 119–25 (detailing difficulties that arose when conflicting organizations claimed exclusive rights to authorize ethnobotanical studies of Maya).

134. TCE 2004 Core Principles, supra note 113, at Annex II, 3. While the focus of this Article is the role of traditional knowledge protection as a method for valuing generational innovation, such protection also serves a valuable role in helping indigenous peoples to maintain their culture in the face of modernity. See BROWN, supra note 112, at 234–42 (discussing distinction between goals of providing wider intellectual property protection and protecting indigenous culture); Rosemary J. Coombe, The Recognition of Indigenous Peoples' and Community Traditional Knowledge in International Law, 14 ST. THOMAS L. REV. 275, 279 (2001) (stating that supporting and encouraging traditional knowledge leads to “revitalization of local languages” and greater biodiversity).

135. Thus, for example, in Yumbulul v. Reserve Bank of Australia, the creator of the Morning Star Pole at issue in that case was subjected to “considerable criticism” for violating tribal rules governing the commercial use of such poles. (1991) 21 I.P.R. 481, ¶ 21.


137. See, e.g., Helfer, supra note 116, at 49 (stating intellectual property protections under second clause of Declaration’s Article 27 are fundamental); Yu, supra note 116, at 1071–73 (discussing conflicting views about and internal tensions of rights included in Article 27).

138. See, e.g., Long, supra note 112, at 326 (raising several unanswered questions regarding relationship between various types of knowledge); see also Doris Estelle Long, Address at the Association for the Study of Law, Culture and Humanities 9th Annual Conference in Syracuse: Cultural Rights and the Diaspora: A Proposal (Mar. 17, 2006) (transcript on file with the author)
5. Given the diverse potential claimants to the "ownership" of traditional knowledge, what processes should resolve disputes over authorization or compensation? While TRIPS requires enforcement of intellectual property rights through civil processes, the cultural and spiritual issues raised by traditional knowledge disputes may require mediation or some process of conciliation to resolve them. Professor Danielle Conway-Jones has observed, Western property ownership confers three basic rights: to possess and enjoy, to alienate, and to destroy. Those rights assume private, individual ownership, and the result of such ownership notions is a view of land and personal property as subject to private, individual control. The Western property model does not accommodate the concept of a reciprocal relationship with the land or other property or a concept of communal ownership of goods and resources.

The communal, spiritual nature of this relationship requires dispute resolution processes that honor this unique relationship. As opposed to traditional litigation-based processes for intellectual property rights, we may need to integrate human-rights-based processes that more accurately reflect the nature of the rights at issue.

(discussing whether individual who is no longer subject to minority or indigenous group's control is entitled to practice that group's cultural traditions).

139. See Long, supra note 112, at 324 (contrasting individualistic and group ownership). I use the term "ownership" advisedly. As Erica-Irene Daes recognized, Indigenous peoples do not view their heritage in terms of property at all — that is, something which has an owner and is used for the purpose of extracting economic benefits — but in terms of community and individual responsibility. Possessing a song, story or other medicinal knowledge carries with it certain responsibilities to show respect to and maintain a reciprocal relationship with the human beings, animals, plants and places with which the song, story or medicine is connected. For indigenous peoples, heritage is a bundle of relationships, rather than a bundle of economic rights. To sell it is necessarily to bring the relationship to an end.


140. See TRIPS, supra note 2, arts. 41-61 (detailing enforcement procedures).


142. See, e.g., TRIPS, supra note 2, arts. 41-61 (establishing minimum procedural protections for intellectual property, including availability of civil and criminal processes).

143. This human-rights-based process would necessarily include within it consideration of indigenous dispute resolution processes. See, e.g., Riley, supra note 130, at 86–91 (noting problem with use of Western legal systems and encouraging use of tribal law instead). The use of such processes is supported by the human rights overlay for the protection of traditional knowledge. Article 27 of the Universal Declaration of Human Rights recognizes that "[e]veryone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits." Universal Declaration of Human Rights, supra note 136, art. 27(1); see also International Covenant on Civil and Political Rights, G.A. Res. 2200A (XXI), art. 27, U.N. Doc. A/6316 (Dec. 16, 1966), available at http://www2.ohchr.org/English/law/ccpr.htm (protecting right of religious and
There is no doubt that the issues surrounding the scope of protection to be granted traditional knowledge are daunting. But these issues are no more problematic than the question of the protection of "traditional" intellectual property in today's global digital environment. They are also no less significant, in light of the relationship between protection for traditional knowledge and economic valuation for generational innovation.

For those who question the economic value of generational innovation, consider the burgeoning market in counterfeit indigenous works, or the role that biopiracy plays in pharmacochemical innovations. Yet without a legal protection system, the generational innovation of indigenous cultures remains economically undervalued.

I do not mean to suggest that the protection of traditional knowledge is only about the extent of compensation owed to indigenous holders for the exploitation of their knowledge and works. To the contrary, there are significant portions of traditional knowledge, and particularly TCEs, where the holders of such cultural expressions are seeking protection against any form of exploitation. This excluded knowledge relates to sacred works. Its protection bears no relationship to the encouragement or valuation of innovation, nor are the works covered by this excluded category created in response to the same impulses that

linguistic minorities to participate in their culture, practice their religion, and speak their language); International Covenant on Economic, Social and Cultural Rights, G.A. Res. 2200A (XXI), arts. 1, 15, U.N. Doc. A/6316 (Dec. 16, 1966), available at http://www.unhchr.ch/html/menu3/b/a_cescr.htm (recognizing all people have right to self-determination, to take part in cultural life, and to enjoy benefits of scientific progress); Ninth International Conference of American States, American Declaration of the Rights and Duties of Man, art. 13 (May 1948), available at http://www.cidh.org/Basics/English/Basic2.American%20Declaration.htm (recognizing every person has right to participate in cultural life and community). Without entering into the debate over whether this cultural participation right qualifies as a fundamental human right, see Helfer, supra note 116, at 57-61 (discussing different approaches to intersection of human rights and intellectual property rights); Yu, supra note 116, at 1075-78 (discussing relationship between human rights and intellectual property rights), the focus on self-determination, mediation, and collectivity that are at the heart of dispute resolution mechanisms for human rights violations appear better suited to meeting the twin goals of dispute resolution and respect for indigenous peoples at the heart of traditional knowledge protection, see, e.g., Long, supra note 112, at 324-25 (discussing self-determination, self-management, and mediation as methods to protect traditional knowledge of indigenous peoples).

144. See, e.g., Betsy J. Fowler, Preventing Counterfeit Craft Designs, in POOR PEOPLE'S KNOWLEDGE, supra note 20, at 113, 113-14 (noting global competition to provide low price products has caused increase in counterfeiting of artisan crafts); Riley, supra note 130, at 72-73 (noting theft of traditional knowledge and appropriation of culture have been more widely acknowledged in recent decades).

145. See, e.g., BOLLIER, supra note 103, at 79-84 (discussing "bioprospecting" of developing countries by Western entities); VANDANA SHIVA, PROTECT OR PLUNDER?: UNDERSTANDING INTELLECTUAL PROPERTY RIGHTS 49-61 (2001) (defining and analyzing examples of biopiracy); Schuler, supra note 72, at 161-76 (providing examples of biopiracy).

146. See, e.g., BROWN, supra note 112, at 11-16 (detailing conflicts arising from publishing photographs and details of sacred Hopi ceremonies); TERRI JANKE, OUR CULTURE, OUR FUTURE: REPORT ON AUSTRALIAN INDIGENOUS CULTURAL AND INTELLECTUAL PROPERTY RIGHTS 19 (1998) (describing various deculturizing uses of sacred works).
underlay much innovative activity. In addition, there are other forms of traditional knowledge for which exploitation may be acceptable, but limitations may be placed on the types of uses in order to maintain the cultural integrity of the work. Thus, for example, third parties may create weavings using traditional patterns so long as the patterns are not changed in a manner that alters their cultural meaning.

One of the positive developments in the years of international debate over traditional knowledge protection is that individual countries have begun to provide sui generis protection for domestic traditional knowledge. Countries such as New Zealand, Panama, and Peru, among others, have recognized that individual groups should define which aspects of their traditional knowledge require protection. Some countries have actually established a registration system for traditional knowledge, in which group holders are requested to indicate the items, practices, and processes they are either willing to license for use or are not willing to license for any use at all. This identification process is critical since it may provide the initial grounds of agreement on the terms under which others may use certain selected aspects of traditional knowledge. In effect, indigenous identification of willingly exploitable knowledge and works—the core of generational innovation—is a critical first step in crafting a regime that appropriately values local innovation.

I have assumed that the creation of sacred works is largely encouraged through religious impulses that are not generally driven by economic valuation issues. That does not mean that the sale of sacred works might not form a potential local enterprise that could form part of a program for sustainable development. It simply means that noneconomic issues will control the creation and sale of such works.

See, e.g., Fowler, supra note 144, at 117–18 (citing Australian case law that recognizes collective ownership by community and individual custodians within community who must act in best interests of community); Eric C. Kansa, Jason Schultz & Ahrash N. Bissell, Protecting Traditional Knowledge and Expanding Access to Scientific Data: Juxtaposing Intellectual Property Agendas via a "Some Rights Reserved" Model, 12 INT’L J. CULTURAL PROP. 285, 299–301 (2005) (discussing options for customizing licenses to accommodate cultural heritage). For example, the Maori have created three categories of authentication marks: one for those goods which are created by Maori artists; one for works created through Maori collaboration with third parties; and a third for those works created by non-Maori, but in a manner in keeping with Maori traditions. Toi Iho, http//www.toiiho.com/Default.aspx?tabid=249 (last visited Feb. 27, 2009).

See, e.g., Trade Marks Act, 2002, pt. 2, § 17(1) (N.Z.) (prohibiting trademark registration which would likely offend “a significant portion of the community,” including indigenous cultures); On the Special Intellectual Property Regime upon Collective Rights of Indigenous Communities, for the Protection of Their Cultural Identities and Traditional Knowledge, and Whereby Set Forth Other Provisions, No. 20, art. 1 (2000) (Pan.) (protecting traditional knowledge and culture of indigenous peoples); Law Introducing a Protection Regime for the Collective Knowledge of Indigenous Peoples Derived from Biological Resources, No. 27811, art. 1 (2002) (Peru) (recognizing right and power of indigenous peoples to define their collective knowledge).

No. 20, art. 1, 7–9; No. 27811, art. 20; see also Leisner, supra note 128, at 92–102 (discussing specific regulations established in Peru, Panama, Portugal, and Philippines).

See, e.g., Riley, supra note 130, at 131 (suggesting groups begin self-identification process for protection under sui generis regimes). While this self-identification process is critical, registration requirements should serve a notification purpose. Lack of registration should not presumptively prohibit the protection of a practice or work of generational innovation.
CROSSING THE INNOVATION DIVIDE

Registration procedures admittedly present their own problems. One of the obvious difficulties is the honest concern that if indigenous groups register the practices, works, and knowledge that they do not want the public to use, those are precisely the items that end up being the first ones that third parties commercialize (with or without the indigenous holders' permission). Furthermore, such registration procedures, while in accordance with the general practice of requiring registration for patents, impose a burden on traditional cultural expressions (such as folk art) that copyright law prohibits.

Despite these obvious limitations, at least a registration system, adequately funded and supported so as to avoid any undue burden on indigenous groups, should help begin the critical identification process. Whether traditional knowledge holders ultimately decide to register those works for which no third party use would be granted, such as in the case of sacred works, is less critical at this stage than that they begin the process of deciding what precise works and practices, if any, for which they would permit or absolutely deny exploitation rights. Such identification obviously must be undertaken in good faith and can only be crafted by traditional knowledge holders or those they have designated to participate in the process. Understandably, some groups will refuse to participate in such a designation system, in part because such a system does not adequately reflect their beliefs or their concept of knowledge, or because everything is a part of their heritage and culture and therefore deserves protection against third party uses.

Participation in the process must be voluntary. The point is to properly value generational innovation for purposes of supporting its use as part of the effort to support sustainable development. No intellectual property system forces a creator to protect his work. Neither should a traditional knowledge

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152. See, e.g., Brown, supra note 112, at 13–15 (detailing Hopi concerns about unauthorized publication of photographs of their sacred ceremonies).

153. Only inventions for which applications have been filed with the relevant domestic authority are protectable under patent regimes. See TRIPS, supra note 2, art. 29 (setting conditions for patent applications).

154. See Berne Convention, supra note 2, art. 5(2) (specifying that no formalities can be imposed on "enjoyment" and "exercise" of rights under copyright).

155. Long, supra note 112, at 327 (warning that if laws deem everything sacred or otherwise incapable of commercial use then workable system for traditional knowledge protection may not be possible).


157. See Kaitlin Mara, Indigenous Groups Express Concerns on IP Protection of Their Knowledge, INTELLECTUAL PROPERTY WATCH, Mar. 3, 2008, http://www.ip-watch.org/weblog/2008/03/03/indigenous-groups-express-concerns-on-ip-protection-of-their-knowledge (detailing comments of Seneca Nation member that Western law should not protect knowledge because West does not have right to that knowledge).

158. See, e.g., Tavana, supra note 28, at 19–20, 25 (recommending traditional knowledge and modern scientific knowledge be integrated to advance sustainable development). See supra notes 19–20 and accompanying text for a discussion of valuation, innovation, and substantial development.

159. In fact, the choice not to apply for protection effectively dedicates patented inventions and
IV. THE IMPACT OF THE FAILURE TO VALUE GENERATIONAL INNOVATION

For those steeped in the history and philosophy of intellectual property regimes, the first reaction to the demand for protection of traditional knowledge (including works containing or reflecting TCEs) is often a rejection of any possible protection for generational innovation. Without the creation of something unique enough to be considered "valuable" under the present intellectual property system, no legal protection should exist. Yet despite Western precepts, there is value in the generational passage of knowledge and in the perfection of that knowledge by such controlled transmission; otherwise biopiracy and commodification of cultural intangible cultural heritage would not be such critical issues. Others contend that no protection for generational innovation should occur because it would remove valuable information from the public domain. Labeling protection a denial of access to information, however, simply continues a historic tradition of Western devaluation of generational innovation. This devaluation is not merely a reflection of Western values of individuated creativity. It is a continuing exclusion from innovation protection regimes of previously excluded voices. At the time that intellectual property regimes were being developed and perfected in the West, the twin forces of colonialism and racism excluded the holders of traditional knowledge from such deliberations. In a time when traditional legal regimes for innovation are changing in response to the new demands of technology and globalization, copyrighted works to the public. The clarity of the dedication of copyrighted works to the public was arguably greater under the 1909 Copyright Act in the United States, which limited copyright protection to works that had been federally registered. See Copyright Act of 1909, ch. 320, § 7, 35 Stat. 1075, 1077 (codified as amended at 17 U.S.C. § 102 (2006)) (excluding from protection works of public domain, works published before act took effect and not already copyrighted in the United States, and works published by United States government). Thus, the affirmative choice not to seek federal registration for a copyrighted work arguably demonstrated a clearer intent to dedicate the work to the public. Today, since no registration is required for copyright protection to attach, see 17 U.S.C. § 408(a) (indicating that obtaining registration of copyright claim is not condition of copyright protection), lack of such registration does not contain the same clear intent to forgo legal protection for the work in question.

160. See supra notes 62-65 and accompanying text for a discussion of the Western culture of innovation.

161. See Long, supra note 112, at 621 (suggesting protection of traditional knowledge may limit people’s access to that knowledge).

162. See supra Part II for an analysis of Western precepts of innovation.

163. See Long, Curtailing Imperialism, supra note 75, at 20 (noting developed nations have set boundaries of public domain); Bellagio Declaration (1993), reprinted in DORIS ESTELLE LONG & ANTHONY D’AMATO, A COURSEBOOK IN INTERNATIONAL INTELLECTUAL PROPERTY 1025, 1026 (2000) (contending contemporary intellectual property law protects individual creators and excludes custodians of tribal culture, medicine, art, music, and valuable seeds).

164. See, e.g., WIPO Copyright Treaty, supra note 44, arts. 11, 12 (requiring protection against unauthorized use of copyrighted works and digital rights management information).
there is no defensible reason for the continuing failure to protect previously excluded voices or their creative and innovative efforts.

One of the critical issues facing developing countries today is the need for transfer of technology from the developed countries. Article 7 of TRIPS expressly recognizes that

[...]he protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.¹⁶⁵

Yet one of the results of TRIPS appears to be a continuation of an uneven playing field in connection with wealth or technology transfer. While the developed world continues to insist on the protection of its innovations—through the minimum required enforcement procedures established under TRIPS¹⁶⁶—it provides no similar protection for generational innovation. Where the developed countries have "valuable" innovation (technology), the generational innovation of the developing world only qualifies as freely accessible works in the public domain. There is in fact a type of technology transfer occurring. But it is a technology transfer that flows in the wrong direction.

Even more problematically, the continuing refusal to value the generational innovation of developing countries in fact makes it nearly impossible for this unequal flow of technology to be reversed. If the technology (generational innovation) of the developing countries is free, then none of the wealth created from its exploitation is ever transferred to them in exchange for the valuable traditional knowledge their citizens may possess.

V. HONORING THE UNIQUENESS OF GENERATIONAL INNOVATION

In crafting a traditional knowledge regime that effectively protects generational innovation, there are three critical misconceptions that must be avoided. The first is the misguided notion that traditional knowledge is static.¹⁶⁷ Generational innovation is worthy of protection because of the value in preserving traditions and in transmitting those traditions across generations so that "collaboration" occurs across time. But it is not static. No tradition based on a living culture can be static because such traditions do not exist in a static environment. Culture has always changed in response to a variety of factors, including history, ecology, politics, and culture. Generational innovation, with its

¹⁶⁵. TRIPS, supra note 2, art. 7.
¹⁶⁶. See id. arts. 41-61 (establishing minimum procedural requirements for “effective” enforcement of intellectual property rights).
anchor in cultural identifiability, necessarily relies upon knowledge, works, and practices that may (and most likely will) change over time. Consequently, traditional knowledge protection should not reify tradition for the sake of reification. To the contrary, the benefit of a traditional knowledge regime is the grant to holders of the right to control and exploit those changes that they desire to exploit.

The second critical misconception is that authentication systems fulfill the needs of indigenous innovators for protection. While authentication undoubtedly plays a role in the commercial exploitation of some traditions, the goal of generational innovation is not merely to assure that only identifiably authentic knowledge was used in the creation of the good or service in question. While authentication can serve a useful purpose, enhancing the value of brands used on truly unique goods, such authentication limits do not adequately address the valuation goals of protecting generational innovation. Such innovation should not be protected simply because it is authenticated as having been based on the traditions of a particular tribe. It should be protected for the same reason that patented inventions are protected—because as a whole they represent valuable innovation.

Finally, when crafting a rational traditional knowledge regime designed to recognize the value of generational innovation, the unique nature of the holders of such knowledge must be acknowledged. If traditional knowledge is collective and cultural in nature, then the rights of the diaspora must be considered in crafting any such regime. Failure to do so will only lead to future, and potentially unnecessary, conflict.

CONCLUSION

Protection of "generational" innovation could provide a strong tool for wealth transfer, making developing nations active participants in their own sustainable development. Such generational innovation, however, remains undervalued since it falls outside the Western norms for protectable innovation represented by the imperfect measure of intellectual property regimes. This undervaluation has denied developing and least-developed countries a right of compensation for local innovation, contributing to the continuing imbalance in economic development. Worse, it has actually contributed to a backwards flow of technology transfer as developed countries use the generational innovation of their developing neighbors without compensation. Recognizing a broader

168. Only works attributable to a particular culture qualify for the heightened protection of a traditional knowledge regime. See, e.g., Michael Hassemer, Genetic Resources, in INDIGENOUS HERITAGE AND INTELLECTUAL PROPERTY, supra note 28, at 151, 164 (noting that current legal protection applies in limited circumstances because much traditional knowledge lacks requisite novelty).

169. See SCAFIDI, supra note 55, at 63-66 (describing importance of authentication in different societies as means to identify source).

170. See Long, Is Fame All There Is?, supra note 27 (manuscript at 28–29) (noting global value of authentication marks on unique goods cannot be challenged).
definition of compensable innovation that covers non-Western innovative norms—including recognition of the economic value of intergenerational collaboration, collective "ownership," and the perfection of information through controlled transmission across generations—would allow generational innovators the ability to participate as equal partners in emerging knowledge-based industries. More significantly, establishing a rational system of protection for traditional knowledge that supports generational innovation, while honoring the unique relationship of traditional knowledge to its holders, would bring social justice back into the issue of innovation protection. As we remake innovation systems in response to the changes demanded by the global digital marketplace, rational protection for traditional knowledge must be a part of that change if we are to achieve equitable, sustainable values for innovative activity in the twenty-first century.