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Commercialization and Benefit Sharing from Traditional Knowledge:

Case Studies from the United States

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Executive Summary

In the 1990s some developing countries began to complain that knowledge generally held and/or sourced in their countries was being exploited in the developed world without the sharing of access to and benefits from its commercialization.

Since then, some holders of traditional knowledge have called for wider legal and economic recognition of their rights.[1] They question whether conventional intellectual property rights (IP) can be relied on to manage traditional knowledge[2] and whether treaties such as Trade-Related Aspects of Intellectual Property Rights (TRIPs) are likely to benefit developing nations.[3]

In the course of this discussion it is useful to remember that many developed countries have also possessed traditional knowledge. But did the intellectual property frameworks in these developed countries facilitate or hinder the commercialization of this traditional knowledge? Did the traditional IP legal framework facilitate access and benefit sharing without the need to create a new system specifically tailored to traditional knowledge? To our knowledge the subject of traditional knowledge in the developed world has been given insufficient attention in the IP literature.

The purpose of this research project was to uncover and examine case studies of the commercialization of traditional knowledge derived from the United States, and to observe how the existing IP structures in the U.S. facilitated the commercialization of traditional knowledge, and to what degree the existing IP structures aided or hindered both commercialization and the sharing of access and benefits.

Such a review suggests an optimistic view of conventional IP rights in relation to traditional knowledge. In the United States, the commercialization of traditional knowledge has proceeded for many years within a conventional IP framework. The case studies of the commercialization of folklore, music, foods, medicines, and other products in the United States below show that markets supported by conventional IP have played a key role in gaining recognition and respect for holders of traditional knowledge. Holders of traditional knowledge have often been able to avail themselves of the protection of IP. Furthermore, consumers have enjoyed tremendous benefits from the development of products that incorporate traditional knowledge. Revenue streams protected by IP rights entice new competitors to enter the field and help resolve short-term crises of supply and demand. Innovation protected by IP has even helped to solve issues such as how to use compounds from rare wild plants without risking their extinction.

All in all, a close look at real-world markets shows that conventional IP rights present little danger of monopoly or excessive litigation, rarely pose an impediment to research, or pose other problems that loom large in more speculative academic or activist accounts. Some real-world problems are likely to arise going forward, as many developing nations lack a strong legal, educational and financial infrastructure. The question of compensation to indigenous communities will continue to be problematic. But a desire to address these problems going forward should not blind policymakers to the reality that conventional IP can offer many benefits.

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1. *See, e.g.* WIPO, "Intellectual Property and Traditional Knowledge," WIPO Publication No. 920(E), 4 (" TK holders stress that their TK should not be used by others inappropriately, without their consent and arrangements for fair sharing of the benefits; more generally, it leads to calls for greater respect and recognition for the values, contributions and concerns of TK holders.").

2. *See, e.g.* Ibid, 5 ("This leads to some challenging questions. Is the IP system compatible with the values and interests of traditional communities—or does it privilege individual rights over the collective interests of the community?").

3. *See, e.g.* J. George and J. Van Staden, "Intellectual Property Rights: Plants and Phyto-Medicinals–Past History, Present Scenario and Future Prospects in South Africa," *South African Journal of Science* 96 (2000): 433-444.

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Background and Survey of Existing Literature

What is traditional knowledge? Existing literature discusses how to define traditional knowledge at length.[4] This paper will use the term loosely to refer to an existing body of knowledge known to a group of people long identified by their ethnic, linguistic, or geographic traits rather than by their affiliation with a formal research institution such as a firm or a university. This knowledge is usually passed from person to person orally, or recorded in a language or format not easily accessible outside its community of origin. That the leaves of the plant known as "Mormon tea" can be used to make a pleasant beverage is traditional knowledge first held by various American Indian[5] groups. How to code a computer game or decode Human DNA is not—though perhaps, five hundred years from now, it will be. Confusion can arise if one assumes that traditional knowledge is that belonging to groups usually identified as "indigenous."[6] In the Americas, American Indians, immigrant groups and the descendants of those brought here as slaves have their own traditional knowledge, as do the descendants of populations from Europe. But grappling with definitional issues is beyond the scope of this report. We can only hope that the term is sufficiently well enough understood to be used without causing more confusion than it resolves, though the definition given here is imperfect.

Existing literature on traditional knowledge mainly examines traditional knowledge in the developing world. Countries in the developing world are often adopting or enforcing intellectual property rules for the first time, under international agreements such as the General Agreement on Tariffs and Trade (GATT), TRIPS and the Convention on Biological Diversity. Developing countries feel pressure to participate in such agreements because they will bring the benefits of trade, but some constituencies are concerned that the intellectual property regimes they feel obliged to adopt are not in their own interest. The next section summarizes their major concerns, without remarking on whether these concerns are warranted or unwarranted. Discussion of the extent to which these concerns are justified follows the cases studies described later in this paper.

- **Accessibility to Creators and Producers:** Some are concerned that the citizens of developing countries may lack the resources or experience to file patents or use copyright to transform these resources into commercial products sold in international markets. Patents can be costly to obtain, and while copyrights are easily obtained, they can be hard to enforce. [7] By contrast, they feel that foreign firms are in a position to begin exploiting these resources immediately.

4. *See, e.g.* WIPO, "Intellectual Property," *supra* n. 2, 4-7.

5. The paper uses the term "American Indian" rather than "Indians." Most of the descendants of the peoples present in the Americas before 1491 seem to prefer the term "Indians" (with the exception of Alaskans). But as this paper also refers to developments in Asia, it is apt to be confusing. "Native American," literally ought to denote anyone born on the American continents, and is often so used in discussions of music. *See generally*, Charles C. Mann, *1491: New Revelations of the Americas Before Columbus* (New York: Vintage Books, 2005) 387-389.

6. *See, e.g.* UNEP-WCMC, "Composite Report on the Status and Trends Regarding the Knowledge, Innovations and Practices of Indigenous and Local Communities Relevant to the Conservation and Sustainable Use of Biodiversity," (paper prepared for the Secretariat of the Convention on Biological Diversity, August 2003), 13. ("Traditional knowledge (TK) is most frequently (and problematically) regarded as knowledge held or mobilized by 'traditional, local or Indigenous' communities. This causes its own problems, for not all indigenous peoples are traditional knowledge holders, and not all traditional knowledge holders are indigenous peoples.").

7. *See, e.g.* George and Staden, "South Africa," *supra* n. 4, n. 11 (cost of a United States patent is about $5000, about the yearly salary of a researcher in Africa); *see also* Christopher N. Kendall and Sarah Meddin, "Accessorizing Aboriginality: Heritage Piracy and the Failure of Intellectual Property Regimes to Safeguard Indigenous Culture," *Bond Law Review* 16 (2004): 166 (describing problems faced by aboriginal artists in managing their copyrights).

- **Lack of Recognition or Respect:** Some representatives of traditional cultures feel they have not been recognized or given credit for their contributions in the form of folklore, agricultural products, or traditional medicines. They may feel that their contributions have been distorted or treated with disrespect. This has been a particular concern with the transformation of folklore into copyrighted works.

- **Monopoly and Consumer Access to Products and Materials:** One commonly voiced concern is that IP rights lead to production monopolies, and will enable rights-holders to drive competitors out of business. Some worry that IP rights will lead to higher prices for goods like medicines, seeds, and raw materials.

- **Overuse of Scarce Resources:** Some observers argue that pressure to harvest resources in the developing world can lead to the endangerment of diverse species. For example, the demand for plants such as Ginkgo biloba for medicinal purposes has threatened to destroy the supply. [8]

- **Exploitation and Compensation:** Intellectual property laws work with market mechanisms that tend to reward individual authors or inventors for their contributions. They are not designed to ensure a revenue stream to those with no established formal legal claim, and include no guarantee that all who played a causal role in developing an idea share in the reward. People in developing nations feel a strong moral claim on the revenues from products developed using resources such as local plants. Thus if royalties are not forthcoming developing nations feel they ought to count the lost revenues as a cost.[9] Firms that have agreed to pay royalties are seen to have unfairly escaped the obligation by developing synthetic versions of compounds originally inspired by natural products.[10] The Convention on Biological Diversity (CBD) attempted to address some of these issues, but compensation continues to be a difficult issue.

- **Institutional Challenges to Using Intellectual Property.** Intellectual property laws are complicated to administer. A law that gives the copyright or patent owner too broad a range of protection from competitors can interfere with research. Very narrow protection might give investors little protection from copycat competitors that will soon follow. Others are concerned that intellectual property laws invite too much litigation.

Responding to the concerns described above, organizations have proposed *sui generis* laws, which depart from conventional IP rights to provide special legal protection for certain constituencies, such as farmers, and some nations have enacted *sui generis* legal regimes.[11] New ground rules have also been established to govern certain

8. E. Masood, "Medicinal Plants Threatened by Over-Use," *Nature* 385 (1997): 570.

9. *See, e.g.* R. McNally and P. Wheale, "Biopatenting and Biodiversity," *The Ecologist* 26 (1996) 222-228. (asserting that "biopiracy" costs developing nations $5.4 billion a year in lost royalties from food and drug firms that use plants developed with traditional knowledge).

10. *See, e.g.* George and Staden, "South Africa," *supra* n. 4, n. 11 & n. 13 (patents allow firms to avoid paying royalties to the source nation of a plant product, by developing synthetic versions of the original natural compounds).

11. Examples include the Indian Protection of Plant Varieties and Farmers' Rights Act (2001); The Thai Plant Variety Protection Act (PVP Act, 1999); The Indian Biological Diversity Bill (2002); The Act on the Promotion and Protection of Thai Traditional Medicinal Intelligence (1999); The Biodiversity and Community Knowledge Protection Act of Bangladesh (Draft, 1998); The Philippines Indigenous Peoples Rights Act (1997); The Plant Varieties Protection Act of Singapore (2004); The Vietnamese Ordinance on Plant Varieties (2004). Other nations with sui generis protection for some products associated with traditional knowledge include China, Indonesia, the Philippines, Taiwan, Hong Kong, Malaysia, Pakistan, Japan, Kyrgyzstan, Republic of Korea, Portugal, Brazil, Costa Rica, Peru, Panama, Portugal, South Africa, and Uzbekistan. For more examples, see WIPO, "Legislative Texts on the Protection of Traditional Knowledge," accessed January 20, 2011 at http://www.wipo.int/tk/en/laws/tk.html.

special situations in the United States.[12] For example, the National Cancer Institute now has agreements in place with indigenous peoples that will provide for them to receive a portion of the profits from the manufacture of anti-cancer drugs developed using plants found on their lands.[13] Several papers examine these different *sui generis* approaches. [14] As yet the agreements in the United States are too new to supply examples for case studies. This paper instead looks at whether and how more familiar conventional IP systems have performed. While policymakers' first impulse to alarming headlines tends to be to draft new laws, this approach tends to increase the complexity of an already complex legal landscape on a global scale. Legal quagmires themselves present obstacles to growth and cooperation, however well-intentioned. So it is helpful to study conventional IP regimes more closely before devising new ones.

Few studies offer a detailed look at traditional knowledge in the industrialized world. One of the few sources to address the topic describes the attitude to traditional knowledge in industrialized countries as follows:

> The West often assumes that it has no TK that is relevant, in the sense of 'folk' knowledge, that it once existed but has now disappeared, and that somehow science and technology have become its indigenous knowledge.[15]

"Statements strongly affirming the value of traditional knowledge are more the rule than the exception."

But the case studies below show that this statement does not accurately capture the current status of traditional knowledge in the United States today, if it ever did. Statements strongly affirming the value of traditional knowledge are more the rule than the exception.

A European study offers another view. Its thesis is that formal research mechanisms have, in supplanting traditional knowledge, resulted in its destruction.[16] Again, this does not accurately reflect the history or status of traditional knowledge in the United States. In North America, it is certain that considerable traditional knowledge has been lost. But the losses here cannot fairly be attributed to the growth of more formal research mechanisms and/or IP rights. The worst of the damage may well have been done immediately after the first contact with Europeans, whose diseases took a severe toll on American Indian populations.[17] Today the markets and more formal research mechanisms supported by intellectual property seem more

12. *See generally* Jeanne Holden, "Genetic Resources, Traditional Knowledge, and Folkore: The U.S. Approach," *Focus on Intellectual Property Rights,* April 22, 2008, accessed November 11, 2010, http://www.america.gov/st/business-english/2008/April/20080429221258myleen0.8259394.html.

13. Ibid. *See also* John T. Cross, "Justifying Property Rights in Native American Traditional Knowedge," *Texas Wesleyan Law Review* 15 (2009): 488.

14. *See, e.g.* WIPO, "Intellectual Property," *supra* n. 2; Daniel Robinson, "Exploring Components and Elements of *Sui Generis* Systems for Plant Variety Protection and Traditional Knowledge in Asia," ICTSD Programme on IPRs and Sustainable Development (March 2007), accessed January 20, 2011, http://www.iprsonline.org/unctadictsd/docs/Robinson%20Sui%20Generis%20March07.pdf; Paul Kuruk, "The Role of Customary Law under SUI Generis Frameworks of Intellectual Property Rights in Traditional and Indigenous Knowledge," *Ind. Int'l & Comp. L. Rev.* 17 (2007): 67.

15. UNEP-WCMC, "Composite Report," *supra* n. 7, 13, quoting R. Ellen and Holly Harris, *Introduction to Indigenous Environmental Knowledge and its Transformations: Critical Anthropological Perspectives*, edited by R. Ellen, P. Parkes and A. Bicker (Amsterdan: Harwood Academic Publishers, 2000) 1-34, 6.

16. *See* J. Tanner. "Property rights, Innovationsdynamik und Marktmacht, Zur Bedeutung desschweizerischen Patent- und Markenschutzes für die Entwicklung der chemischpharmazeutischen Industrie (1907-1928)," in *Die Neue Schweiz?Eine Gesellschaft zwischen Integration und Polarisierung,* edited by A. Ernst and E. Wigger (Zürich: Chronos, 1996)(In industrialized countries the growth of formal research and development of products like pharmaceuticals lead to the underestimation and abandonment of traditional knowledge and to its disappearance.).

17. Mann, *1491*, *supra* n. 6, 33-107.

likely to play a role in preserving traditional knowledge, as we will see in the case studies below.

A skeptical reader might take the view that the industrialized context is so different that case studies of traditional knowledge will shed little light on the situation outside the United States. After all, many of the concerns about traditional knowledge and intellectual property expressed in existing literature have to do with flows of resources from South to North and North to South, from developing to developed countries. But the case studies below show that these same flows of resources arise within a single country. Looking at case studies from the United States offers us a microcosmic perspective on the problem.

"...the problem with traditional knowledge is not just a 'developing world' problem..."

More broadly, the problem with traditional knowledge is not just a "developing world" problem; it is one example of a larger type of problem that arises whenever economic systems grapple with the juxtaposition of "un-owned" with "owned" resources. Resources without an easily identifiable owner, like air, the oceans, myths, wildlife, and many ideas, understanding, stories, and other cultural artifacts, cannot be packaged up and bought and sold in a market. This terminology oversimplifies the issue somewhat, in describing resources without an easily identifiable owner as "un-owned." Often these resources are understood to be owned by a community, a nation, by the public, or to be the heritage of all mankind. Either way, the problem is the same. No one can easily trade units of these goods. It is hard to assign any value to such resources, inviting their overuse in a "tragedy of the commons."[18] Once they have an owner, goods can be traded and markets will reveal their value as compared to other goods. Individuals will therefore tend to seek to transform goods from an un-owned to an owned state, to capture the value that is realized as a result.

"Transforming this knowledge into a product for the mass market protected by IP rules for the first time can yield benefits for producers in the form of profits, as well as benefits for consumers."

The "traditional knowledge" problem is of this type, as are environmental problems like overfishing. Folklore, herbal remedies, and similar traditional knowledge often (not always) have no individual author or owner. Transforming this knowledge into a product for the mass market protected by IP rules for the first time can yield benefits for producers in the form of profits, as well as benefits for consumers. In the case studies below, this paper sheds further light on this transformation.

Case Studies

Overview

These case studies survey examples of traditional knowledge that have been incorporated in IP-protected ventures in the United States. The subjects of the case studies were chosen with an eye to variety, to explore how conventional intellectual property rights intersect with traditional knowledge in a wide range of contexts. In order, the subjects of study presented are: Br'er Rabbit (folklore); Pocahontas (folklore and oral history); American Indian music; maize; wintergreen (a medicinal plant), the American mayapple (a medicinal plant); the Pacific Yew (another medicinal plant); ketchup; wine-making; and the Tulalip"Storybase" project, a proposed collection of environmental knowledge and other valuable information.

18. Garrett Hardin first used the term "tragedy of the commons." Garrett Hardin, "The Tragedy of the Commons," *Science* 162 (1968): 124. Other key works on this topic include H. Scott Gordon, "The Economic Theory of a Common Property Resource: The Fishery," *J. Pol. Econ.* 62, 2 (1954): 124-142; Anthony Scott, "The Fishery: The Objectives of Sole Ownership," *J. Pol. Econ.* 63 (1955): 116; Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (New York: Cambridge University Press, 1990); James M. Buchanan and Yong J. Yoon, "Symmetric Tragedies: Commons and Anticommons," *Journal of Law and Economics* 43, 1 (April 2000): 1-13.

The following key variables change from case to case:

- The origin of the traditional knowledge; some studies look at knowledge of European origin (wine-making), others at knowledge with African (Br'er Rabbit), Asian (ketchup), or American origins (all others).
- In some cases, particularly with music and the Tulalip Storybase Project, the holders of the knowledge retain control of it, or of resources such as land or artifacts necessary to its use; in most others the knowledge has become part of the public domain.
- The cases also vary as to how awareness of the traditional knowledge reached those who commercialized the ultimate product; some of the ultimate producers were the holders of traditional knowledge themselves, some were firms or organizations far removed from those holders.
- The cases vary in the extent to which the final product is regulated; medicines are heavily regulated, for example, while books are not.
- In some cases, independent governing institutions represent the holders of traditional knowledge, in others, they do not.
- In some cases, the group of holders of traditional knowledge is well-defined, in others, not.
- The cases vary in whether the product produced is primarily valued for its physical attributes, like medicine, or for its meaning and informational content, such as history.
- Some involve copyrighted products, others, products protected by patents or trade secrets.

Neither traditional knowledge nor innovation more generally always fits easily within the familiar rubric of patent, copyright, trade secret, or even trademark law. Much traditional knowledge is in the public domain; in itself, therefore, as such it stands outside the intellectual property system altogether. Nonetheless, the case studies below are presented in order of which of the three types of intellectual property protection—copyright, patents, or trade secrets—tend to be the best fit for the products in question.

The first cases involve copyright law.[19] This protects original works including books, music, movies, software, paintings, textiles, photographs, and sound recordings. The author of these works is given the exclusive right to publish them, with certain exceptions. The scope of copyright protection is quite narrow. Facts and names cannot be copyrighted, nor can abstract ideas or general themes. But copyright does protect an author's characters or right to make works derived from his original work, his "derivative rights."[20]

The next case studies involve patent law and its close relatives. In the United States, most innovations in manufacturing and chemistry, including medicines, come under the general patent law, the Patent Act.[21] Patent law gives the inventor of an invention the right to exclude others from making, using, selling, offering for sale, or importing into the United States the patented invention in exchange for public

19. 17 U.S.C. §§ 101 – 810.

20. 17 U.S.C. § 101.

21. 35 U.S.C. §§ 1-376.

disclosure of the invention. The patented invention must be useful,[22] novel,[23] and not obvious.[24] And it must be a process, machine, article of manufacture, or composition of matter.[25] Design patents are also available.[26] One key difference between patents and copyrights is that copyright does not protect the owner against those who create the same thing independently; patent law, however, protects the owner even against independent inventors.[27]

At one time, the courts and the United States Patent and Trademark Office questioned whether living things were patentable. [28] The law says that any new or useful "process, machine, manufacture or composition of matter" can be protected by a patent.[29] In the 1970s, inventors began filing more patent applications related to developments in biotechnology, such as micro-organisms. In 1980, in *Diamond v. Chakrabarty*, the Supreme Court decided that living things like an oil-eating bacteria could be patented, quoting from the legislative history of the 1952 Patent Act the statement that it covers "anything under the sun that is made by man."[30] The Court noted that a rule that unforeseen new technology was not patentable made little sense, because patents were intended to protect unforeseen advances. After this decision, the patent office began to grant some patents on new plants and plant technologies, as well as other biotechnological innovations.

Developers of new plants can also apply for protection under the Plant Patent Act. [31] Passed in 1930, it covers new varieties of plants, including "cultivated spores, mutants, hybrids, and newly found seedlings" that are asexually reproduced.[32] Plant patents are somewhat different than general "utility" patents, but the scope of protection is similar. The Plant Variety Protection Act,[33] passed in 1970 and amended in 1994, protects new plants such as hybrids that are sexually reproduced.

The final type of intellectual property surveyed in the case studies is trade secret protection. In the United States, copyright law, patent law, and plant patent-law are federal laws. Trade secret law is mostly state civil law and varies somewhat across the 50 states,[34]

22. 35 U.S.C. § 101; see also USPTO, "Guidelines for Examination of Applications for Compliance with the Utility Requirement", accessed January 20, 2011, at http://www.uspto.gov/web/offices/pac/mpep/documents/2100_2107.htm.

23. 35 U.S.C. § 102.

24. 35 U.S.C. § 103.

25. 35 U.S.C. § 101.

26. 35 U.S.C. §§ 171-173, 102, 103, 112, and 132.

27. 35 U.S.C. § 154.

28. Rebecca Eisenberg. "The Story of Diamond vs. Chakrabarty: Technological Change and the Subject Matter Boundaries of the Patent System," in *Intellectual Property Stories*, edited by Jane C Ginsburg and Rochelle Cooper Dreyfuss (New York: Foundation Press, 2006), 327.

29. 35 U.S.C. § 101.

30. 447 U.S. 303, 309 (1980), (citing S. Rep. No. 1979, 82d Cong., 2d Sess., at 5 (1952); H. R. Rep. No. 1923, 82d Cong., 2d Sess., at 6 (1952)).

31. 35 U.S.C. § 161.

32. 35 U.S.C. §§ 161-164. *See generally*, Foley and Lardner LLP, "Protection of Plant-Related Inventions in the United States," January 1, 2000, accessed November 10 2010, http://www.foley.com/publications/pub_detail.aspx?pubid=194.

33. 7 U.S.C. §§ 2321-2582.

34. Most states have enacted a version of the Uniform Trade Secrets Act (USTA), which tends to reduce the differences across the states.

though some federal criminal laws also concern trade secrets.[35] Generally a trade secret is any formula, pattern, device, or compilation of information used by a business to gain an advantage over competitors.[36] To enforce a trade secret, the business must make reasonable efforts to keep the idea secret.[37] A competitor who develops the same idea independently cannot be prevented from using it.[38] The protection of secrecy has long been relied on by those who make food products, as well as American Indian craftsmen in the United States, including silversmiths,[39] weavers,[40] and bead makers.[41] Trade secret protection is sometimes used to protect plants as well.

Case Study: The Tale of Br'er Rabbit (Copyright)

The trickster Br'er Rabbit is part of the traditional lore of storytellers in the Southern United States. The central character is a rabbit, who interacts with other animal characters. Br'er Fox is always trying to catch and eat Br'er Rabbit, but invariably the clever rabbit escapes. Most likely, Br'er Rabbit folklore was derived from African stories[42] brought to North America and the Caribbean by slaves.[43] One scholar identified over two hundred versions of the "Tar Baby" tale alone, in which the trickster struggles to escape from a sticky trap.[44]

35. The Economic Espionage Act of 1996 (18 U.S.C. §§ 1831-1839) makes the theft or misappropriation of trade secrets a federal crime. One provision makes it illegal to steal trade secrets for the benefit of foreign powers. 18 U.S.C. § 1831. A second provision, 18 U.S.C. § 1832, makes the theft of trade secrets for commercial or economic purposes a crime, regardless of who benefits.

36. *E.g. Buffets, Inc. v. Klinke*, 73 F.3d 965 (9th Cir. 1996)(recipes that were of no particular value could not qualify as trade secrets).

37. *E.g. Rockwell Graphic Systems, Inc. v. DEV* Industries, Inc., 925 F.2d 174 (7th Cir. 1991)(manufacturer of machine did not lose right to trade secrets by giving out some drawings of the parts to related businesses, because it would be unreasonable to insist that all their business associates share a single copy of the drawings); *Hoffmann-La Roche Inc. v. Yoder*, 950 F. Supp. 1348 (S.D. Ohio 1997)(firm that did not stamp documents "confidential" and distributed the information widely failed to maintain trade secret protection).

38. *E.g. Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470 (1974)(there is no misappropriation of a secret discovered by "fair and honest means, such as by independent invention, accidental disclosure, or by so-called reverse engineering" misappropriation).

39. *See, e.g.* John Adair, *The Navajo and Pueblo Silversmiths* (Norman: University of Oklahoma Press, 1994), 91 ("Many silversmiths do not like other Navajo watching them while they are working because they do not want their art stolen. They guard their method of making solder as if it were a trade secret.").

40. *E.g.* "Hand-woven Navajo Rug," accessed November 11, 2010, http://discovernavajo.com/photocontest.html ("the weaver of the rug, and her family are the only ones who weave the round Toadlena/Two Grey Hill Rugs. The secret is kept within the family. Keeping it a trade secret adds to the mystique and the value of the rug.").

41. *E.g.* Rose Kern, "When Did the Indians Start Making Glass Beads?" *The Native Scribe*, October 5, 2010, access November 11, 2010, http://www.prairieedge.com/tribe-scribe/ ("most of the colors were achieved by mixing metals, semi precious stones, and the formulas for making the colors is a trade secret.").

42. *See, e.g.* Daudi Muhando, *Hadithi za Kiafrika Zimekuwa za Kikristo* (London: SPCK, 1962).

43. *See* Harold Courlander, *A Treasury of Afro-American Folklore: The Oral Literature, Traditions, Recollections, Legends, Tales, Songs, Religious Beliefs, Customs, Sayings and Humor of Peoples of African Descent in the Americas* (New York, New York: Marlowe and Company, 2002, 3rd edition), 466; Riggins R. Earl, Jr., *Dark Symbols, Obscure Signs: God, Self, and Community in the Slave Mind* (Maryknoll, New York: Orbis Books, 1993), 131-32.

44. *See generally* Aurelio M. Espinosa, "Notes on the Origin and History of the Tar-Baby Story," *J. Am. Folklore* 43 (1930): 129; Aurelio M. Espinosa, "A New Classification of the Fundamental Elements of the Tar-Baby Story on the Basis of Two Hundred and Sixty-Seven Versions," *J. Am. Folklore* 56 (1943): 31.

In the nineteenth century some of the Br'er Rabbit stories were collected and published in *Harper's Weekly* by Robert Roosevelt, uncle of American President Theodore Roosevelt. President Roosevelt's autobiography records that his aunt from Georgia "knew all the 'Br'er Rabbit' stories, and I was brought up on them."[45] But the stories did not become popular until collected by Joel Chandler Harris in his book *Uncle Remus*.[46] Today, this book's attempt to reproduce African-American dialect and the stereotypical "good slave" character "Uncle Remus" are seen as demeaning to African-Americans.[47] He did make the stories accessible to a wide and appreciative audience.

"Note that copyright protects only an author's particular way of expressing his idea."

Modern author Julius Lester[48] and others have rewritten these stories to preserve their vital elements without the dated elements of Harris' presentation. Many other writers and illustrators, including Disney,[49] have produced their own versions of the original tales, either relying on Harris's records, or seeking out other records.

The Br'er Rabbit tales offer a simple example of how copyrighted works incorporate folklore. Note that copyright protects only an author's particular way of expressing his idea. The author of one Br'er Rabbit tale cannot stop another author from setting out a different version of the tale, and one creator's copyright on Br'er Rabbit cannot stop others from writing their own version of the tale or drawing their own picture.[50] But if the latter creators mimic the former too closely, they would violate the former's "derivative rights."[51] Thus a copyrighted work setting out an oral tradition does not interfere with the transmission of the oral tradition or with the creation of other works, so long as they do not imitate the copyrighted work slavishly.

45. Theodore Roosevelt, *An Autobiography* (New York, New York: MacMillan, 1913), 15.

46. Joel Chandler Harris. "Brer Rabbit and the Tar-Baby," in *The Tar-Baby and Other Rhymes of Uncle Remus* (New York, New York: Appleton and Company, 1904), 3.

47. Alice Walker. "The Dummy in the Window: Joel Chandler Harris and the Invention of Uncle Remus," in *Black on White: Black Writers on What it Means to be White*, edited by David Roediger (New York, New York:Schocken Books, 1998), 233-239 (describing how Joel Chandler Harris used African-American dialect for his own profit, leading some to think his stories were authored by an African-American); R. A. Lenhardt, "Understanding the Mark: Race, Stigma, and Equality in Context," *N.Y.U.L. Rev.* 79 (2004): 803 (explaining how characters like "Uncle Remus" served the purposes of slaveholders).

48. Julius Lester, *More Tales of Uncle Remus* (New York: Dial, 1988), viii (arguing that the Br'er Rabbit stories and other tales preserved in Uncle Remus should be considered classic folk tales rather than slave stories).

49. *Song of the South* (Walt Disney Productions 1946) (animated children's film based on tales of Br'er Rabbit and other Uncle Remus stories).

50. *See Harris v. Coca-Cola Co.*, 73 F.2d 370 (5th Cir. 1934) (copyright in a written work "Uncle Remus," does not cover the illustrations originally published with the work, even though the illustrator is trying to portray ideas expressed in the written work).

51. 17 U.S.C. § 103, 106 (2).

Pocahontas: Beyond Disney (Copyright)

Unlike Uncle Remus or Br'er Rabbit, Pocahontas was a real person, born around 1595. She was the daughter of Wahunsunacawh, also known as Emperor Powhatan, the leader of an Algonquian-speaking group in the Tidewater area of the state of Virginia. Contemporary sources report that she assisted the English colonists at the nearby settlement of Jamestown by bringing provisions in lean times and warning of dangers to the settlement. Later, she converted to Christianity and married John Rolfe. She later traveled with him to London. She died in 1617 of an illness contracted in England, possibly smallpox.

The historical record preserving the details of Pocahontas' life is not complete. For example, Captain John Smith reported that she had saved him from being executed by her tribe, but historians and anthropologists doubt the accuracy of his account, as do tribal representatives today. Some think Smith invented the story, others, that he misunderstood a tribal ritual. What is clear is that she was willing to assist the English settlers and later married an Englishman. The long history of conflict between American Indians and the colonists makes her assistance interesting, and her marriage to Rolfe adds romantic intrigue.

Thus, the historical Pocahontas was transformed into a romanticized figure of folklore and myth. Many historical accounts of her are embellished with fictional elements, and many accounts are simply fictional. Historical records do not support the view that Smith and Pocahontas were lovers, for example, but many fictional accounts portray them as such, beginning with John Davis' tale in 1803. Several films about Pocahontas have been made, including an animated Disney movie released in 1995.

The Powhatan tribe objected to the Disney movie, particularly noting that Disney had rejected their proffered advice[52] on the making of the film (Disney did hire an American Indian consultant, however). Note that their complaint was lack of respect for their traditions and for the truth, not a lack of compensation. Others defended the Disney film as an attempt to present an American Indian perspective on the arrival of European explorers.

"The extraordinary proliferation of works about Pocahontas again illustrates the narrow sweep of copyright."

Before and after the making of Disney's movie, dozens of other copyrighted works on Pocahontas have been produced, including poems, pictures, and stories and historical works for children and adults. The extraordinary proliferation of works about Pocahontas again illustrates the narrow sweep of copyright. Disney's copyright cannot stop anyone else from making a movie about Pocahontas, though it is broad enough to stop others from making movies that closely resemble Disney movies (such as adult films). It also illustrates the ability of the markets for copyrighted works to, over time, correct early tendencies to disrespect or inaccuracy.

52. Roy Crazy Horse,"The Pocahontas Myth," accessed November 11, 2010, http://www.powhatan.org/pocc.html. (statement signed by Powhatan Chief Roy Crazy Horse to the effect that "The film distorts history beyond recognition. Our offers to assist Disney with cultural and historical accuracy were rejected.").

The Music of the Americas (Copyright)

The people living in the Americas before the arrival of Europeans produced a wide array of dances, songs, and musical instruments for entertainment as well as for religious purposes. Tribal law or custom often laid down ground rules for the use of music. Under tribal law, those who first performed certain songs were considered to have the sole right to do so, though the rights can be transferred to others.[53] These customs are maintained today within the tribes. Outside tribal lands federal copyright law applies.

The copyright in music has a dual nature. Both the composer of the song or melody, and the performer, have rights under copyright law. Many traditional musical compositions, including songs originating in Europe or Africa, and old time "hillbilly music," as well as many American Indian traditional songs, are in the public domain and are not copyrightable; copyright protects new compositions. However, the performer of traditional music also has rights, known as "performance rights." An artist who records the performance of a traditional song has the right to prevent others from copying or distributing his performance, even though neither he nor anyone else holds a copyright on the composition.

"An artist who records the performance of a traditional song has the right to prevent others from copying or distributing his performance, even though neither he nor anyone else holds a copyright on the composition."

Performances of native music were first recorded in the late nineteenth century. The earliest known recordings of American Indian music were made in 1890 by Jesse Walker Fewkes, seeking to preserve a culture that he feared was "becoming extinct."[54] Frances Densmore made many more such recordings between 1907 and 1941. Over the years, the question of who owns the copyright in these recordings can be hard to determine, as with many aging non-native copyrighted books, pictures, and early films and photographs. Archivists may hesitate to republish this work (for profit or otherwise) for fear of being entangled in lawsuits. This has come to be known as the problem of "orphan works." Legislation to ease the use of these works has been proposed in the United States Congress but has not passed. (One sticking point is the fear that professional pirates, who profit from making cheap copies of hard-to-monitor works like textile designs, will deliberately strip copyright information from them, "orphaning" these works on purpose to justify reproduction on a large scale).

In spite of the "orphan works" problem, however, the Library of Congress and other organizations have made early recordings of American Indian music publicly available.[55] One observer reports that documentation of this music has at least proceeded further than documentation of other folk songs in danger of vanishing, like cowboy songs.[56] Early music educators dismissed American Indian music as a "primitive" phase on the road to the evolution of classical music.[57] Beginning in the 1940s, this

53. E. Adamson Hoebel, *The Law of Primitive Man* (New York: Atheneum, 1974) 60-62 (describing practices of the shamans of the Plains Indians of North America); WIPO, "Intellectual Property Needs and Expectations of Traditional Knowledge Holders: WIPO Report on Fact Finding Missions on Intellectual Property and Traditional Knowledge (1998-1999)," April 2001, 60 (describing interchange of rights to song by marriage among members of North American First Nations).

54. Ellen Koskoff, *Music Cultures in the United States: An Introduction* (New York: Routledge, 2005), 25.

55. *E.g.* "Omaha Indian Music," Library of Congress, accessed November 10, 2010, http://memory.loc.gov/ammem/omhhtml/omhres.html.

56. Koskoff, "Music Cultures," *supra* n. 55.

57. Terese M. Volk, *Music, Education, and Multiculturalism: Foundations and Principles* (New York: Oxford University Press, 1998) 45.

view began to change; in the 1970s and 1980s music education materials included proportionally more American Indian traditional music (along with African and Latin music). Attention to its authenticity began to increase as well, with music publishers such as the Silver Burdett company hiring ethnomusicologists to inform their decisions.[58]

"Original compositions that draw on American Indian source material enjoy copyright protection of both the performance and the source material."

Original compositions that draw on American Indian source material enjoy copyright protection of both the performance and the source material. The composer Dvorak drew on native sources for his "Symphony from the New World," performed in 1909, and he urged others to follow. This resulted in a trend towards "Indianist" compositions and the founding of companies like the Wa-Wan Press, which published their works.[59] American Indian musicians and others who performed traditional music faced some obstacles in benefitting from this increased interest, as music copyrights can be difficult to enforce. In 1909, the American Society of Composers, Authors and Publishers (ASCAP) was founded to monitor performances (especially radio and television broadcasts) of copyrighted music and collect royalties on behalf of the copyright owners. Without the assistance of such a "performing rights society" it is difficult for an individual copyright owner to enforce his copyrights. However, ASCAP's membership policies, "based on a procedure of identifying popular songs that undercounted so-called 'race' and 'hillbilly'music,"[60] excluded virtually all folk performers, including black artists and white country musicians. This continued until 1940, when a competing organization was formed, Broadcast Music Incorporated (BMI). BMI's strategy included efforts to license folk and country musicians, rhythm and blues (gospel, blues, and jazz) and music from Argentinian, Mexican, Italian, Jewish and Native American artists. Today both performing rights societies represent works from a wide array of sources.

Interest in and appreciation of American Indian music and music by American Indians is increasing. The establishment of a Grammy award for the best new Native American music has been a strong positive influence.[61] Pop music as a whole has struggled to adapt to a world in which many works are downloaded online with no means of payment to the artist. This problem has had reportedly less impact on some American Indian recordings, many of which are sold in museum gift shops to buyers looking for a quality souvenir, not cheap pop music.[62] American Indian musicians today produce an astounding array of recordings in every genre from hip-hop, to jazz, to classical as well as traditional works. Today, the *Native American Music Directory* lists 1,600 audio recordings, 100 record companies, and 35 music distributors.[63] Many works are available for streamcast or download royalty-free online. Several important artists and composers use their work to teach about Native American traditions and culture.[64]

58. Ibid, 97.

59. Koskoff, "Music Cultures," *supra* n. 55.

60. Victoria D. Alexander, *Sociology of the Arts: Exploring Find and Popular Forms* (Malden: Blackwell Publishing, 2003), 7, 141.

61. Catherine Applefield Olson, "Native American Music: Increased Exposure," Billboard, August 31, 2002, p. 26.

62. Ibid, 26.

63. Greg Gombert, Native American Music Directory (Summertown, TN: Book Pub. Co, 1997).

64. Dale Olsen. "Globalization, Culturation, and Transculturation in American Music: From Cultural Pop to Transcultural Art," in *Reflections on American Music: the Twentieth Century and the New Millennium*, edited by James R. Heintze and Michael Saffle (Pendragon Press, 2000) 282 (describing the work of Brent Michael Davids and other American Indian artists).

Maize (Patents)

The maize plant was originally domesticated by people living in South America. The nearest wild relative of domestic maize is very different from the domestic plant. Unaltered, the wild plant would have been unsuited to cultivation as a food crop. Researchers are uncertain how ancient agriculturalists created the plant we know today as maize or corn.[65] Careful and deliberate crossbreeding was certainly involved. Breeding of the many local variants of maize continued in the Americas for centuries. By the time Europeans arrived in the Americas domesticated maize was a staple food crop in North as well as South America; later, it was carried to Europe and Africa as well.

Until the 1930s, most farmers in the United States produced their own seed, using varieties developed by American Indians; hybrid seed was adopted gradually; farms in the more prosperous regions tended to adopt it first, but almost all regions had begun using hybrid seed by 1948.[66] Several larger economic trends resulted. One result was greatly increased yields for farmers at a time when prices were already falling (meaning lower food prices for consumers); some land went out of cultivation and more prosperous farmers tended to buy out less prosperous neighbors. The remaining farms grew larger. Larger tracts of land were ultimately brought under the management of larger economic entities, contributing to the rise of agribusiness.[67] Although much decried by populists the rise of these larger farms enabled the adoption of somewhat better soil conversation practices, as very small farmers cannot usually afford to leave land uncultivated.[68] And the seed business became a commodity supplied by specialized private firms.

"Due to the importance of maize as a food crop and its susceptibility to pests and diseases, researchers have shown considerable interest in maize genetics and other topics."

Due to the importance of maize as a food crop and its susceptibility to pests and diseases, researchers have shown considerable interest in maize genetics and other topics. Some research in the United States has been publicly funded and the resulting data released to the public.[69] But seed research costs are high; as a general rule, governments will not be able to afford the level of expenditures on research that could be supported by the private sector.[70] And firms sought to protect these private investments by intellectual property rights in the maize seed business, as in other sectors. Many researchers were interested in obtaining patent protection for new varieties of

65. Mann, *1491*, *supra* n. 6, 215-218.

66. Zyi Griliches, "Hybrid Corn and the Economics of Innovation," *Science, New Series*, 132, 3422 (July 19, 1960): 275-280.

67. Jack Ralph Kloppenburg, *First the Seed: The Political Economy of Plant Biotechnology*, 1492-2000 (Cambridge: Cambridge University Press, 1988) 32, 119.

68. The prevalence of very small farms in the 1930s was a significant factor in the origins of the Dust Bowl of the 1930s, "one of the most severe environmental crises in North America in the twentieth century." Zeynep K. Hansen and Gary D. Libecap, "Small Farms, Externalities, and the Dust Bowl of the 1930s," *Journal of Political Economy* 112, 3 (2004): 665-694.

69. The Maize Genetics Cooperation Stock Center, funded by the United States Department of Agriculture's Agricultural Research Service, tracks mutations of maize. Genetic data can be accessed at MaizeGDB, the Maize Genetics and Genomics Database. In 2005, the United States National Science Foundation, together with the Department of Agriculture and the Department of Energy, founded a consortium to study the maize genome. The DNA sequence information, mostly completed in 2008, was deposited in a public repository for such data, GenBank, and is available at MaizeSequence.org. Schnable et al., "The B73 Maize Genome: Complexity, Diversity, and Dynamics, *Science* 326, No. 5965 (November 2009): 1112-1115.

70. For data showing the relative contributions to research and development by the public and private sectors in maize seed research, see Michael L. Morris, "Impacts of International Maize Breeding Research in Developing Countries, 1966-98," International Maize and Wheat Improvement Center (2002): 16.

maize or other maize-related research. At first, like patents on other living things, seed and plant patents were controversial. The patent office formally ruled that plants were patentable in considering a patent on a method of producing maize seeds with higher tryptophan levels in 1985.[71]

The ruling that new plants and plant technologies can be patentable certainly does not mean that all applications for patents on new plants and plant technologies will be granted willy-nilly. They must satisfy many requirements under the patent statute, including non-obviousness and utility. These limits are illustrated by the controversy over the patentability of maize gene sequences. In 1991, J. Craig Venter and other investigators, then at the National Institutes of Health, sought to file patents on thousands of parts of DNA sequences, which he called expressed sequence tags, or ESTs. The applications were rejected on the grounds that the innovation lacked sufficient utility. The patent office continued to adapt its guidelines, and researchers continued to file for protection. Utility continued to be an issue. In 2005, the Federal Circuit decided in *re Fisher,* ruling that molecular sequences relating to maize leaf tissue could not be patented, as they were a mere research tool without particular utility.[72] The concept of "utility" is one of several key limiting concepts of patent law which helps to confine what otherwise might be a much broader impact on abstract research.

"Some difficult liability issues have arisen with respect to maize, which can propagate itself without human intervention."

Today traditional maize, maize protected by plant variety protection law, maize protected by "utility patents," and maize varieties protected as trade secrets[73] coexist in the United States. Some difficult liability issues have arisen with respect to maize. Traces of genetically modified varieties are often found in other corn crops. [74] The spread of genetic modifications to corn intended to be sold as "organic" has sometimes proved problematic. In 2001, a Minnesota farming couple, the Fitzgeralds, was affected by genetic drift when a neighbor's genetically modified corn crop spread to their fields despite the plants of shrubs and other vegetation to serve as a barrier.[75] The Fitzgeralds were trying to grow organic corn, which could be sold at a higher price; when 800 bushels of their crop showed characteristics of the genetically modified corn, they lost $2,000 in profits.[76] One question is whether the patent owners would be liable to the organic farmers; another is whether the holder of the patent

71. *Ex parte Kenneth A. Hibberd, Paul C. Anderson and Melanie Barker,* 1985 Pat. App. LEXIS 11, 227 U.S.P.Q. (BNA) 443, Lexsee 227 U.S.P.Q. 443 (Board of Patent Appeals and Interferences), September 18, 1985, accessed November 10, 2010, http://www.iplawusa.com/resources/227_USPQ_443.pdf (ruling that the Plant Patent Act and the Plant Variety Protection Act were not intended to bar the application of general patent law).

72. Gerald J. Flattmann, Joseph A. Loy and Aaron J. Schechter, "'Fisher' and Beyond: Issues for Patenting Expressed Sequence Tags," *New York Law Journal,* June 21, 2006, 1, accessed November 10, 2010, http://www.kirkland.com/siteFiles/kirkexp/publications/2290/Document1/Fisher%20and%20Beyond.pdf; *see also* Donald Zuhn, May 2, 2005 (8:20 p.m.), "Fundamental Questions of Patentability Requirements of Nucleic Acid Molecules," PatentlyO, accessed November 10, 2010, http://patentlaw.typepad.com/patent/2005/05/post.html.

73. *See Rhone-Poulenc Agro, S.A., v. DeKalb Genetics Corporation*, 345 F.3d 1366 (Now known as Aventis CropScience)(Fed. Cir. 2003) (upholding punitive damages award against firm that had had demonstrated "reprehensible" conduct in appropriating technology protected by patent and trade secret law used to grow herbicide resistant corn for its own use).

74. Daniel Lee Kleinman, *Science and Technology in Society: From Biotechnology to the Internet* (Malden: Blackwell Publishing 2005), 26 (describing cases of "genetic drift" affecting corn intended to be sold as GMO free arising in 1998, 2000, and 2001, and results of tests showing traces of genetically modified corn in most commercial seed).

75. Pollen from natural varieties of maize also tends to cross over to alter the characteristics of neighboring maize crops. The many local varieties of maize cultivated by American Indians before the arrival of Europeans were likely maintained by very careful screening and seeding practices; this, at least, does not raise the issue of patent infringement.

76. Daniel Lee Kleinman, "Science and Technology," *Supra* n. 75, 26 (describing Fitzgerald episode).

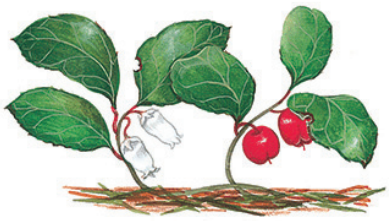
on the modified crop could also sue the farmers for patent infringement.[77] Some have suggested that Congress ought to clarify the law on liability to specify with greater particularity what ground rules should govern when a patented crop spreads without human intervention.

Some express the concern that the adoption of IP and the commercialization of farming means that farmers will become dependent on others to supply their seed. And, certainly, in the United States, most farmers no longer grow their own seed. From a policy standpoint, it does not appear desirable for them to do so, any more than it would be desirable for farmers to build their own tractors, for lawyers to pulp their own paper, or for doctors to painstakingly grind up their own medications. Greater specialization in markets means greater productivity.[78] Dependence on others for goods and services is an inevitable aspect of life in an advanced economy; without specialization, far fewer goods and services are likely to be available to anyone.

"Greater specialization in markets means greater productivity."

The maize seed business in the United States is dominated by large firms, with firms like Monsanto garnering particular attention from competition-law authorities. Economists agree that many complex economic factors, such as high research and development costs, contribute to this industry structure.[79] The seed business continues to change rapidly over time, particularly as mergers occur.[80] We discuss the issue of large firms and IP further in another section of this paper.

Wintergreen-*Gaultheria Procumbens* and Methyl Salicylate (Patents)



Wintergreen, or** Gaultheria procumbens, **is a small evergreen shrub growing in sandy or peaty soil in the woods throughout the United States and Canada. Its leaves are small, dark green, and shiny, and it bears a red berry and white flowers. Wintergreen was used for medicinal purposes by many American Indian communities.

Established uses include:

- By the Quebec Algonquian, as an analgesic and cold remedy.
- By the Algonquian of Tete-de-Boule, to treat gastrointestinal complaints and stomach-ache; a poultice of the whole plant was used to treat colds.
- Among the Ani-Yun-Wiya (Cherokee), it was used as a cold remedy, to treat gastrointestinal complaints, the leaves were chewed as a remedy for dysentery, and the leaves were chewed to treat tender gums.

77. The possibility of liability running either way invites comparisons to the work of economist Ronald Coase on liability and railroads. See Ronald Coase, "The Problem of Social Cost," *Journal of Law and Economics* 3 (1960): 1. Coase addresses how economists ought to assess liability rules related to the production of externalities such as sparks from a railroad that set fire to neighboring fields or woods. He emphasizes the importance of considering the overall costs and benefits of rules imposing or excusing the railroad from liability. But such a calculation of costs and benefits is likely to be outside the capabilities of all but an omniscient policymaker even in the short run. In the long run, costs and benefits may well change, whereas continually revisiting liability rules relied on by firms to assess risk and returns seems inadvisable, as Coase would likely be one of the first to point out. We leave further exploration of this puzzle to others.

78. Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (New York: Modern Library, 1985), 6.

79. *See,* e.g. William Wilson and Bruce Dahl, "Competition and Dynamics in Market Structure in Corn and Soybean Seed," *Antitrust Chronicle* 4, 2 (April 29, 2010).

80. Murray Fulton and Konstantinos Giannakas, "Agricultural Biotechnology And Industry Structure," *AgBioForum,* 4, 2 (2001): 137-151, accessed 2/2/2011 at http://www.agbioforum.org.

- The Chippewa used it as a blood medicine and a cold remedy.
- The Delaware used it to treat rheumatism, and as an aid to kidney function, and as a general tonic.
- The Delaware of Oklahoma used it to treat rheumatism and as a tonic.
- The Iroquois used it to treat tapeworms, rheumatism, arthritis, colds, as a kidney aid, and to treat venereal disease.
- The Mohegan used it as a kidney aid.
- The Ojibwa used it to treat rheumatism and to "make one feel good."[81]
- The Potawatomi used it to treat rheumatism, lumbago, and fevers.
- The Shennecock used it as a kidney aid.

Reportedly Mother Marie de L'Incarnation helped to spread wintergreen's medicinal reputation after learning of its benefits from American Indians in the 16th century.[82] European colonists used wintergreen as a tea, gave their children the roots to chew to retard tooth decay, and used it to treat colds, fevers, and rheumatism.[83] Wintergreen is still used as an herbal remedy today. For example, it is suggested that it can be used as a substitute for aspirin to relieve pain and inflammation, without some of the side effects of aspirin.[84]

"The process for producing natural methyl salicylate from leaves is expensive, however, and since the nineteenth century, natural sources have been insufficient to meet demand."

Wintergreen is high in compounds with medicinal properties.[85] One of these compounds in wintergreen is methyl salicylate, which is of particular medical interest because it passes through the skin; when wintergreen is used for the treatment of pain, it is often applied externally.[86] Methyl salicylate is produced by several plants, including European varieties, and the medicinal value of methyl salicylate was noted by Hippocrates.[87] However, it is present in wintergreen in especially high concentrations and is often called *oil of wintergreen*.[88] The process for producing natural methyl salicylate from leaves is expensive, however, and since the nineteenth century, natural sources have been insufficient to meet demand. Commercial products containing methyl salicylate today use a synthetic form. [89] Synthetic methyl salicylate was sold commercially by a German firm, Schimmel & Co. beginning in

81. Daniel E. Moerman, *Native American Medicinal Plants: An Ethnobotanical Dictionary* (Portland: Timber Press, 2009) 212.

82. Karyn Siegel-Maier, "Wonderful Wintergreen," accessed November 11, 2010, http://herbalmusings.com/Wintergreen.htm.

83. Ibid.

84. David M. Ribnicky, Alexander Poulev, and Ilya Raskin, "The Determination of Salicylates in Gaultheria procumbens for Use as a Natural Aspirin Alternative," *Journal of Nutraceuticals, Functional and Medical Foods* 4, 1 (2003): 39-52. (Highests levels of total salicylates found in wintergreen mainly in the form of gaultherin, which may exhibit aspirin-like effects without the side effects of aspirin).

85. Ibid.

86. Holly Phaneuf, *Herbs Demystified: A Scientist Explains How the Most Common Herbal Remedies* (New York: Marlowe and Company, 2005), 332.

87. K.D. Rainsford, *Aspirin and Related Drugs* (New York and London: Taylor and Francis, 2004).

88. "Experiment 3: Synthesis of Salicylic Acid from Oil of Wintergreen (Methyl Salicylate)," Reed College, accessed November 10, 2010, http://academic.reed.edu/chemistry/alan/201_202/lab_manual/Expt_salicylic_acid/background.html.

89. Flore Le Grand, Gerar George, Serge Akoka, "Natural Abundance 2H-ERETIC-NMR Authentication of the Origin of Methyl Salicylate," *J. Agric. Food.* Chem. 53, 13 (2005): 5125-5129 (natural product is five to seven times as expensive as the synthetic product). Alan R. Albright, "A Method for the Examination of Methyl Salicylate," J. *Am. Chem. Soc. 39, 4 (*1917): 820–825 (difference in price between natural and synthetic product resulted in fraud).

1886.[90] The process for making methyl salicylate was at first quite unsatisfactory, as the result was impure, and researchers have often studied how to improve it.

Today, methyl salicylate is used as flavoring and as a pesticide and animal repellant. Applied externally, it is used to dilate blood vessels in the skin and increase circulation (known as a rubefacient). It is also used to lower the freezing point of other compounds. It is an ingredient in Ben Gay and in Listerine mouthwash. Researchers continue to explore the properties of wintergreen in the hope of discovering other commercial and medical uses. [91]

"Although it is in patented products, methyl salicylate is a product of nature, and thus cannot be patented."

Although it is in patented products, methyl salicylate is a product of nature, and thus cannot be patented.[92] Some processes for producing methyl salicylate are sufficiently innovative to be patentable. The earliest patent on a method of making methyl salicylate was held by a German chemist, Kolbe, obtained in 1874, which was used to produce most of the methyl salicylate in commercial use for many years.[93] Many methods of making methyl salicylate today would be considered obvious. Patents are obtained on non-obvious methods of producing methyl salicylate; for example, a method for producing a product that can be marketed as having"natural aroma."[94]

90. E. Gildemeister and F. Hoffman, *The Volatile Oils Vol. 1* (Milwaukee: Pharmaceutical Review Publishing Company, 1900) 588.

91. *See* John A. Findlay, Sentsetsa Buthelezi, Guoqiang Li, and Michelle Seveck, "Insect Toxins from an Endophytic Fungus from Wintergreen," *J. Nat. Prod*.60, 11 (1997): 1214-1215 (deriving two new compounds using a fungus obtained from Gaultheria procumbens; both are toxic to spruce budworm); C. Bergeron; A. Marston; R. Gauthier; K. Hostettmann, "Screening of Plants used by North American Indians for Antifungal, Bactericidal, Larvicidal and Molluscicidal Activities," *Pharmaceutical Biology* 34, 4(October 1996): 233-242; Antonov, A. Stewart, and M. Walter, "Inhibition of Condium Germination and Mycelial Growtih of Botrytis Cinereaby by Natural Products," *Biological Control,* Proc. 50th N.Z. Plant Protection Conf. 1997 (1997): 159-164 (testing the effectiveness of plant extracts against fungal infection of plants); Aletta C. Schnitzler, Linda L. Nolan, and R. Labbe, "Screening of Medicinal Plants for Antileishmanial and AntiMicrobial Activity," *International Society for Horticultural Science Acta Horticulturae* 426 (Aug 1996): 235-241. (extracts of six plants were screened for inhibition to *Leishmania mexicana*, a protozoal parasite responsible for a disfiguring disease; effects were also tested on two mammalian cell lines, CEM T4 and HeLa. Gaultheria procumbens and other plants show some ability to inhibit the cell lines); Letitia M. McCune and Timothy Johns, "Antioxidant Activity in Medicinal Plants Associated with the Symptoms of Diabetes Mellitus used by the Indigenous Peoples of the North American Boreal Forest," *Journal of Ethnopharmacology* 82, 2-3 (October, 2002): 197-205. C. D. Wu, I. A. Darout, N. Skaug, "Chewing Sticks: Timeless Natural Toothbrushes for Oral Cleansing," *Journal of Periodontal Research* 36, 5(October 2001): 275–284.

92. *See American Druggist and Pharmaceutical Record, Volume 30 (*January to June 1897), 287.

93. Ibid.

94. *E.g.* Patent 5437991, Issued August 1, 1994, estimated expiration date: May 2, 2010. This patent is on a process to use enzymes to esterify natural anthranilic acid, cinnamic acid and salicylic acid to form natural methyl anthranilate, methyl cinnamate and methyl salicylate, respectively.

Mayapple (American Mandrake), Vepesid and Beyond (Patents)

The mayapple, also known as American mandrake, Podophyflum peltatum, has proved one of the most widely used medicinal plants colonists learned of from American Indians.[95] The plant grows in the shady, humid forests from Massachusetts south to northern Florida and as far west as Texas and Oklahoma. [96] The plant is a perennial about two feet tall. It grows a one stem bearing a broad lobed leaf and small yellow fruit.

The plant was widely used by American Indians as a purgative, as a liver tonic, and an escharotic agent used externally for the removal of warts or the treatment of sores. The sap of this plant has antimitotic properties—that is, it interferes with cell division. Documented medicinal uses include:

- The Iroquois used it as laxative and to improve strength.[97]
- The Wyandottes used it as laxative.
- The Delaware used roots to make spring tonic.
- The Ani-Yun-Wiya (Cherokee) nibbled the roots to use it as a laxative, and made pills of root syrup for same purpose. They used drops of resin from the rhizomes to improve hearing, and used the roots in a powdered form on skin ulcers and sores.
- The Meskwaki used a preparation of the roots to treat rheumatism.
- The Penobscot used it to treat cancer. [98]
- Several groups use it as an antidote for snakebite.

The plant was best known to American colonists as a laxative. But some compounds in the plant are very toxic, and the FDA ultimately declared it unsafe for this use. Nineteenth century uses included treatment of "the liver and kidneys and for scrofula, syphilis, gonorrhea, obstructed menstruation, and coughs."[99] In the 1860s, the plant was identified as a treatment for cancer.[100] This was confirmed in 1946.[101] Use of a derivative as a cancer remedy began in 1971.[102]

The compound in the sap identified as a cancer-fighting agent is podophyllotoxin. Interestingly, a European plant containing a variant of this compound was listed

95. Varro E. Tyler. "North American Indian Drugs, Fact and Fiction," in *Proceedings Int. Symp. Medicinal and Aromatic Plants*, edited by L.E. Craker, L. Nolan, K. Shetty, *International Society for Horticultural Science Acta Horticulturae* 426 (1996): 139-146.

96. Arnold Krochrnal, Leon Wilkins, David Van Lear and Millie Chien, "The Mayapple," USDA Forest Service Research Paper NE-296 (1973), 1.

97. Stephen Foster and Rebecca L. Johnson, *National Geographic Desk Reference to Nature's Medicine* (National Geographic Society, 2008), 248-249.

98. Ibid.

99. Maurice L. Slevin, "The Clinical Pharmacology of Etoposide," *Cancer* 67, January I Supplement (1991): 319-329, 319. See also Tyler, *supra* n. 96, "Indian Drugs."

100. Ibid. See also L. Shachter, "Etoposide Phosphate: What, Why, Where, and How?" Semin Oncol. 23 (6 Suppl. 13)(December, 1996): 1-7.

101. Slevin, "Clinical Pharmacology," *supra* n. 100, 319; Camilo Canela, Rita M. Moraesb, Franck E. Dayan, and Daneel Ferreirab, "Molecules of Interest: Podophyllotoxin," *Phytochemistry* 54 (2000): 115-120, 116.

102. Slevin, "Clinical Pharmacology," *supra* n. 100, 320.

as a cancer remedy in medieval times.[103] The chemical was modified to create etoposide (sold under the trade name Vepesid) and teniposide (Vumon), anti-cancer agents used to treat tumors in the testicles and small-cell lung cancer, as well as leukemia. [104] Today a new derivative of podophyllotoxin, CPH 82, is being tested for the treatment of rheumatoid arthritis in Europe. Other derivatives are being tested for the treatment of malaria and psoriasis. Podophyllotoxin preparations are also on the market for dermatological use to treat genital warts. Podophyllotoxin is also reported to stimulate the immune system.[105]

Many compounds derived from podophyllotoxin, include etoposide, were patentable. The patent on the use of etoposide to treat the original set of cancers expired in 1995. Many trials have been held to explore other uses of the drug.[106] Etoposide is used today to treat a cancer associated with AIDS.[107] Another problem amenable to patenting was the search for forms of podophyllotoxin that are readily used as medicines. Some forms of etoposide, for example, are awkward to use because they are not soluble in water. Patents may be obtained on other methods of preparing the drug.[108] Etopophos, or etoposide phosphate, is soluble in water and more readily used in medicine.[109]

"The problems of the scarcity of the raw materials used to make medicines derived from phodophyllotoxin has also been addressed by patentable research."

The problems of the scarcity of the raw materials used to make medicines derived from phodophyllotoxin has also been addressed by patentable research. Most podophyllotoxin used for commercial purposes was made from the roots and rhizomes of an Asian relative of the American mayapple. This relative, *Podophyllum emodi*, grows in the Himalayas. Over-collection of the plants in India resulted in its being classified as endangered.[110] However, methods were developed to extract phodophyllotoxin from the leaves of the American mayapple instead. Researchers also explored how to cultivate the mayapple commercially.[111] Sufficiently effective and novel processes for extracting podophyllotoxin from the mayapple may be patentable and researchers have

103. Ibid, 319 ("From 900 to 950, an early medieval English book, the Leech Book of Bald, recorded the treatment of cancer with the roots of wild chervil, which contain deoxypodophyllotoxin.").

104. Ebru Bedir, Ikhlas Khan, and Rita M. Moraes. "Bioprospecting for Podophyllotoxin" in *Trends in New Crops and New Uses,* edited by J. Janick and A. Whipkey (Alexandria, VA: ASHS Press, 2002) 545–549. See *also* Tyler, "Indian Drugs" *supra* n. 96; David Mantle, Thomas W. J. Lennard, and Anne T. Pickering, "Therapeutic Applications of Medicinal Plants in the Treatment of Breast Cancer: A Review of their Pharmacology, Efficacy and Tolerability," *Adverse Drug Reactions and Toxicological Reviews* 19 (3) (2000): 223-240 (describing use for breast cancer).

105. Bedir et al, "Bioprospecting," *supra* n. 105, 545–549.

106. Ibid.

107. Slevin, "Clinical Pharmacology," *supra* n. 100, 320.

108. *See* U.S.Patent 4734284, issued on March 29, 1988.

109. Process of Preparing Etoposide Phosphate and Etoposide, Patent 5459248, issued October 17, 1994; Shachter, "Etoposide Phosphate," *supra* n. 101, 1-7.

110. "Mayapple's Cancer-Fighting Precursor," *Agricultural Research Magazine*, July 2000.

111. Bedir et al, "Bioprospecting," supra n. 105, 545–549; see e.g. Rita M. Moraes, Charles Burandt, Markus Ganzera, Xingli LI, Ikhlas Khan and Camilo Canel, "The American Mayapple Revisited—Podophyllum Peltatum—Still a Potential Cash Crop?" *Economic Botany* 54, 4(2000): 471-476; Jim Chamberlain and A.L. Hammett, "Medicinal and Dietary Supplements: Specialty Forest Products With a Long Tradition," (paper presented at the North American Conference On Enterprise Development Through Agroforestry: Farming the Agroforest for Specialty Products, Minneapolis, MN, October 4-7, 1998); In 1969, the U.S. Forest Service investigated the plant "as part of a program to determine the cultural requirements of wild plants that have recognized medicinal value." Krochnal, et al "The Mayapple," supra n. 96, 1.

shown keen interest in such patents. [112] Research has begun to produce the compound from root cell cultures; some methods of doing so may also be patentable.[113]

Pacific Yew, Taxol and Beyond (Government contracts, Patents)

Bark of Pacific Yew
©2005 W. Siegmund

The Pacific yew or western yew, Taxus brevifolia, is a slow-growing coniferous evergreen tree that grows on forested sites in Western North America from Alaska to California. It prefers moist soil and is most common in dense conifer forests along with species such as Douglas Fir, Hemlock, and Ponderosa Pine.[114] The tree bears dark green needles and oval fruit.

American Indians used the Pacific Yew in a variety of medicines:

- By the Bella Coola and Quinalt, the bark was used to treat lung ailments.
- By the Tsimshian, to treat cancer.
- By the Karok and Yurok, who used the bark to make a mixture to strengthen the blood.[115]

In 1960, the National Cancer Institute (NCI) and the U.S. Department of Agriculture began a project to test plants for new anti-cancer compounds. Over 100,000 compounds were extracted from over 35,000 plant species.[116] (This project was terminated in 1981 because it had not yielded a significant number of remedies. Later analysts concluded that the program would have been far more effective if the NCI had targeted plants used in traditional medicine).[117] A complex molecule in Pacific Yew bark, Taxol, was identified as a potential anti-cancer agent in 1963, and the discovery announced in 1967.[118] Progress was very slow, reportedly due to NCI's overwhelming work load and budget problems. Work began on turning Taxol into a drug for testing on animals in 1977, and in 1984, the FDA cleared Taxol for clinical trials in humans.

112. Franck Dayan, Jeanne Kuhajek, Camillo Canel, Susan Watson, Rita Moraes, "Podophyllum Peltatum Possesses a Beta-Glucosidase with High Substrate Specificity for the Aryltetralin Lignan Podophyllotoxin" *Biochimica et Biophysica Acta* 1646, 1-2 (March 21, 2003): 157-63. (U.S. patent 6,143,304 on a method for enhancing the yield of podophyllotoxim from mayapple is strengthened by the discovery of an enzyme that helps the plant detoxify and store podophyllotoxin).

113. V. R. Anbazhagan, C. H. Ahn, E. Harada, Y. S. Kim and Y. E. Choi, "Podophyllotoxin Production via Cell and Adventitious Root Cultures of Podophyllum peltatum," *In Vitro Cellular* & *Developmental Biology – Plant* 44, 6 (2008): 494-501; Hemant Lata, Rita M. Moraes, Bianca Bertoni and Ana M. S. Pereira,"In Vitro Germplasm Conservation of Podophyllum peltatum L. Under Slow Growth Conditions," *In Vitro Cellular* & *Developmental Biology-Plant* 46, 1 (2010): 22-27.

114. See generally Charles L. Bolsinger and Annabelle E. Jaramillo, "Pacific Yew," accessed November 10, 2010, http://www.na.fs.fed.us/pubs/silvics_manual/Volume_1/taxus/brevifolia.htm.

115. Foster and Johnson, Desk Reference, *supra* n. 98, 266.

116. Ibid, 123.

117. Congressional Research Service Report for Congress, "Biotechnology, Indigenous Peoples, and Intellectual Property Rights," April 16, 1993, p. 11.

118. Frank Stephenson, "A Tale of Taxol," Research in Review, Fall 2002, accessed November 10, 2010, http://www.rinr.fsu.edu/fall2002/taxol.html.

Before it could be turned into a marketable product, however, researchers needed to solve a key problem. Making Taxol from the bark of Pacific Yew trees was expensive and likely to quickly lead to the extinction of the plant, as stripping the bark killed the trees. Production of Taxol for testing was costing NCI more than $250,000 a pound.[119] NCI arranged for more yew trees to be planted, but realized it was essential for chemists to develop a method of making synthetic Taxol.

"Making Taxol from the bark of Pacific Yew trees was expensive and likely to quickly lead to the extinction of the plant, as stripping the bark killed the trees."

In 1980, a team of French scientists began to work on making artificial Taxol using the needles of other species of yew trees, which were plentiful and could be collected without killing the trees. After six years, they succeeded in making Taxol, but at first the process did not yield enough Taxol to make it worthwhile.[120] The patents on the French process were held by the firm Rhone-Poulenc. Ultimately, the firm was able to develop and market a cancer medicine known as Docetaxel, sold under the trade name Taxotere, a variant of Taxol made from the European Yew, protected by U.S. patent 4814470 and patents in other nations.

NCI officials also contacted Robert Holton, a researcher at Florida State University interested in Taxol, to continue work on synthesizing Taxol. But NCI could no longer afford to develop Taxol; by the time NCI involvement came to an end, developing the drug had cost NCI $32 million.[121] In 1989, the agency advertised for a private firm to take over production. Because Taxol had been developed by a federal agency, Taxol was not patented. To entice investors, NCI offered private firms the exclusive right to harvest yew bark on federal forest lands. Four firms applied. The agreement went to New Jersey-based pharmaceutical company Bristol-Myers (which soon merged with another firm, Squibb, to become Bristol-Myers-Squibb (BMS)). The deal was controversial, but Bristol-Myers did have a good track record and detailed plans for solving the yew bark supply problem.

BMS approached Holton at FSU to continue work on methods of making Taxol using plentiful needles instead of rare bark. In 1980, Congress had passed the University and Small Business Patent Procedures Act (also known as the Bayh–Dole Act), which helped universities commercialize their research, even when it was federally funded. [122] This made it easier for Holton to patent his discoveries. Holton gave BMS an exclusive license on the patent he had already received, and any related patents he might obtain over the next five years. FSU would get royalties from the Taxol patents, and a $1.7 million collaboration contract. Holton immediately patented a vastly improved method of using needles to make Taxol, known as the metal alkoxide process. BMS quickly entered production and released Taxol drug product in 1993, under the name Paclitaxel. It was used primarily to treat ovarian cancer and breast cancer.

Though the drug did not work in every case and had troublesome side effects, it was better than the alternatives. By 1994, one gram of the new drug was selling for $5,846; by 1995 it was the best-selling cancer medicine in the world, with half a billion dollars in revenue. Sales grew at 38 percent per year for seven years, peaking in 2000 at nearly $1.6 billion. [123]

Researchers at FSU, meanwhile, continued to work on the next generation of medicines related to Taxol, developing a method of synthesizing the drug from scratch and several Taxol derivatives. FSU patented its Taxol spinoffs. When FSU's five-year agreement with BMS expired, collaboration between the two organizations ended. BMS claimed the rights to the metal-alkoxide method for synthesizing Taxol, at first

119. Ibid.

120. Ibid.

121. Ibid.

122. 35 U.S.C. § 200-212.

123. Stephenson, "Tale of Taxol," *supra* n. 119.

refusing to allow the university to use it. The FSU researchers prepared for a legal battle. Ultimately, BMS and FSU reached an agreement under which FSU could use the metal-alkoxide process if it split the royalties derived from licensing the process with BMS.

By the end of the 1980s, Florida State University had received over $200 million in Taxol royalties.[124] The university founded the FSU Research Foundation to advance further research and develop Taxol analogs through a spinoff, Taxalog. One of the analogs developed at Taxolog, TL-139, described by one researchers as "the most powerful anti-tumor agent he'd ever seen," is now in clinical testing on humans.[125] It is produced under the trade name Milataxel. FSU signed a collaboration agreement with Wyeth Pharmaceuticals to help with the early stages of production.

BMS's exclusive right to market Taxol under its agreement with NCI expired in 1997. Technically, this opened the market to generics. BMS held off the introduction of generics until 2001. Ultimately, 29 states sued BMS, charging the firm with fraudulent patent filings to keep generics off the market. BMS settled the lawsuit for $62.5 million, making refunds available to some patients.[126]

Some scholars have suggested that problems with the patent system could be avoided by offering prizes or government funding to support innovation, including medical research.[127] The history of publicly funded Taxol research suggests that such an institutional change could potentially cause as many or more problems than it would solve.[128]

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124. Ibid.

125. Ibid.

126. *See* Iowa Attorney General, "Miller: Cancer-Drug Refunds Available in "Taxol" Case," Press Release, July 24, 2003, accessed November 11, 2010, http://www.state.ia.us/government/ag/latest_news/releases/july_2003/Taxol.html.

127. *See, e.g.* Joseph E. Stiglitz, "Give Prizes Not Patents," *The New Scientist,* Sept 16, 2006, 21; Michael Abramowicz, Perfecting Patent Prizes, *Vand. L. Rev.* 56 (2003): 115 (describing an optimal reward system to support innovation); Steven Shavell and Tanguy van Ypersele, Rewards Versus Intellectual Property Rights, *J. L.* & *Econ*. 44 (2001): 525 (arguing that a reward system should be used in addition to existing intellectual property protection); see also Rebecca S. Eisenberg, Proprietary Rights and the Norms of Science in Biotechnology Research, *Yale L.J.* 97 (1987): 177 (describing how reputation provides rewards to support innovation in science).

128. *See* further discussion below at page 37.

Tomato Ketchup (Trade Secrets and Patents)

www.Heinz.com

Ketchup, a kind of sauce, may be made from many ingredients, including walnuts, fish or mushrooms. Such sauces were probably of Chinese origin, spreading to Malaysia and eventually coming to the attention of Europeans. In the United States, people seem to have a particular fondness for tomato ketchup. Recipes for the tomato-based variant began to appear in nineteenth century cookbooks, include the* Sugar House Book *and* The Virginia Housewife.[129] *The dominant American brand, Heinz Ketchup, was launched in 1876.[130] But new recipes continue to be propagated by new means today.[131]

Recipes are not patentable. Heinz, therefore, protects its recipe as a trade secret, as do other purveyors of tomato ketchup.[132] Over the years, however, some of Heinz's early recipes have been released. "Its first blend included cloves, cayenne pepper, mace, cinnamon and allspice. The second had black and white pepper, ginger, mustard seed, horseradish, celery seed and brown sugar. Vinegar and salt were added to taste."[133] Dozens of other recipes are available in various cookbooks.

"In the United States, plant varieties can qualify for patent protection under general patent laws, or similar rights through the Plant Patent Act."

While recipes are not patentable, tomatoes, however, can be.[134] In Europe, attempts to patent a tomato that would have a low water content and be better for making ketchup were controversial. In the United States, plant varieties can qualify for patent protection under general patent laws, or similar rights through the Plant Variety Protection Act.[135]

H.J. Heinz & Co., the makers of Heinz Ketchup, has long been involved in breeding tomatoes, including varieties that resist disease, and advertised their commitment to sustainable farming methods in their breeding programs.[136] Presently Heinz is putting its efforts into breeding tomatoes with a higher sugar content. Heinz sweetens its ketchup with corn syrup, which is relatively costly. Developing a sweeter tomato would enable the ketchup to be produced at lower cost. Thus far, Heinz is developing its tomato varieties by traditional breeding methods, without using genetic engineering.[137] The firm applied for a patent in 1994 for a method to use DNA markers to help select for higher yield tomatoes.[138] The firm has no plans to share the new variety with competitors, and it can be anticipated that some form of plant variety protection or trade secret protection will be employed to safeguard the results of the research.

129. Andrew F. Smith, *The Tomato in America: Early History, Culture, and Cookery* (Columbia: University of Illinois Press, 2001), 99-100.

130. Jane Black, "Ketchup: DIY Not?," *The Washington Post*, August 25, 2010, accessed November 11, 2011, http://www.mercurynews.com/food-wine/ci_15868013?source=rss.

131. *E.g.* Jesse and Melanie Senko, "Field Trip: Canning Tomatoes," August 18, 2010, accessed November 11, 2010, http://life.nationalpost.com/tag/ketchup/.

132. *E.g.* "June Taylor Ketchup," accessed November 11, 2010, http://www.gourmetnourishment.com/june-taylor-ketchup-p/con-02.htm ("June's ketchup is an old fashioned favorite made with organic dry farmed tomatoes, organic sugar, white wine vinegar, and a mélange of spices that June keeps as a trade secret.").

133. Black, "Ketchup," *supra* n. 131.

134. Taylor Wessing, "When Are Biological Processes for the Production of Plants excluded from Patentability?" accessed November 11, 2010, http://reaction.taylorwessing.com/reaction/Newsletters/InFocus/2010_07_03.html.

135. *See generally* Foley and Lardner, "Protection," *supra* n. 33.

136. H. J. Heinz Company, "Cultivating a Sustainable Commitment," accessed November 11, 2010, http://www.heinz.com/data/pdf/Tomato_Sustainability_Report.pdf.

137. Scott Horsley, "Heinz on a Quest for Sweeter Tomatoes," *National Public Radio*, May 15, 2008, accessed November 11, 2010, http://www.npr.org/templates/story/story.php?storyId=90277097.

138. Andrew F. Smith, *Pure Ketchup: A History of America's National Condiment, with Recipes* (Columbia: University of Southern Carolina Press, 1996), 123.

Grapes and Wine-making (Trade Secrets and Patents)

Making liquor is in essence an ancient biotechnology, which uses plants and microbes to yield its final product. Agricultural technologies are involved as well as production processes. Many are traditional and, like recipes, would not be patentable. These aspects of wine-making have usually been protected as trade secrets. Patent law plays a growing role.

Early on, many grape-growing ventures were publicly funded; the information produced as a consequence is publicly available, protected by neither trade secrets nor by patents. There is increasing interest, however, in patent protection for nontraditional aspects of wine-making, such as the creation of new types of disease resistant grapes.[139] Growers feel that patent protection will be helpful in supporting the necessary investment, particularly as agriculture has become more commercialized it is seen as less necessary to direct public funding to support basic research. In the United States, new varieties of grapes are often protected under the Plant Patent Act, because they are propagated asexually, from rootstock not from seeds.[140] Patent law can play a role in protecting newly engineered microbes for use in fermentations, as well.

Trade secret protection more often plays a role in protecting investments in the core process of making the wine itself.[141] These trade secrets relate to the type of grapes to be used, the time of fermentation, the temperature, the sugar content, the type of yeast used in fermentation, and the composition of the wood barrel in which it takes place. The results of the method used will not be known for years, thus competitors are likely to find it particularly difficult to replicate a successful process.

"Once the secret is out it is no longer protected."

Trade secret law can also be used to protect grapes. To succeed in doing so, the grower must prevent the plants from being produced by anyone else. Once the secret is out it is no longer protected. Contract law facilitates the preservation of trade secrets; nurseries' agreements with growers stipulate that the grower will not reproduce the plants on his own.[142] Rights known as *geographical indications* also play an important role in wine-making. These certify that a consumer product like wine was made in a particular place, embodying characteristics of the locale such as soil conditions and climate, or that it satisfies quality standards associated with the area's reputation.

139. Melané A.Vivier and Isak S. Pretorius, "Genetically Tailored Grapevines for the Wine Industry," *Trends in Biotechnology* 20, 11 (November, 2002): 472.

140. Deborah A. Golino, "Trade in Grapevine Plant Materials: Local, National, and Worldwide Perspectives," (proceedings of the ASEV 50th Anniversary Meeting, Seattle, Washington June 19-23, 2000), 216, accessed November 11, 2010, http://fps.ucdavis.edu/WebSitePDFs/Articles/IntlGrapeTradePerspectArticle.pdf.

141. *Heublein Inc. v. E.&J. Gallo Winery Inc.*, No. 94 Civ. 1955, 1995 WL 168846, at 1*-2* (S.D.N.Y. April 7, 1995) (the ingredients of an alcoholic beverage are a trade secret but can be discovered under a protective court order).

142. Golino, "Trade in Grapevine Plant Materials," *supra* n. 141, 217.

The number of small wineries in the United States has grown phenomenally. Since 1980,the number of wineries has quadrupled, from 919 to 3,726 in 2004. The vast majority of these are small, family run businesses that produce less than 25,000 cases per year; most of these produce less than 10,000 cases per year.[143] Small wineries are considered to play an important role in rural economies. Most of the wine that is consumed, however, is produced by the larger firms that can support the business expense of advertising and that enjoy wider distribution.

Storybase and The Tulalip Tribes (Trade Secrets)

Tulalip women carding & spinning wool, 1898
Edward S. Curtis Collection No. 484
University of Washington

The Tulalip group of tribes in Washington State is developing a digital collection of their tradition knowledge concerning the local environment called "Storybase."[144] The group lives in the Puget Sound Region, and includes the Snohomish, Snoqualmie, Skagit, Suiattle, Samish and Stillaguamish Tribes and allied bands.[145]

Under the proposal, the goal is to review the collection to determine which information is to be released, and to whom, ultimately granting access only to those under nondisclosure agreements. [146] Ultimately, some of it will be disclosed to patent examiners or firms for consideration as "prior art," in patent review. Some will be made available to the general public. Other information will be identified for exclusive use within the Tulalip community, protected as undisclosed information under nondisclosure agreements and/or customary law.[147] The most sensitive information would be described without detail, but would identify the holders of the knowledge and how to access more detailed accounts.[148]

Note that a key feature of this repository of information is that it remains under the control of the tribes themselves. The Tulalip experience as a "ward" of the United States government was felt to be unsatisfactory. As they hope to make progress towards recognition as a sovereign nation, control of the traditional knowledge and resources outside the tribe was not felt to be desirable.

"…a key feature of this repository of information is that it remains under the control of the tribes themselves."

143. Brief for WineAmerica, Coalition for Free Trade, Family Winemakers of California, State Vintners Associations and Grape Growing Associations as Amici Curiae in Support of Respondents, Granhold, et al. and Michigan Beer & Wine Wholesalers Ass'n. v. Eleanor Heald, et al., Case Nos. 03-1116 and 03-1120, On Writ of Certiorari To The United States Court of Appeals for the Sixth Circuit, Sept. 23, 2004, 5-6.

144. As of this writing, it is not clear from existing sources whether "Storybase" exists only as a proposal, whether work on the project has begun, or whether it has been developed and renamed. The author would be grateful for further information concerning the project.

145. WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge, and Folklore, "Update on Technical Standards and Issues Concerning Recorded or Registered Traditional Knowledge," WIPO/GRTKF/IC/8/7, May 27, 2005, 2-3.

146. Preston Hardison, "The Report on Traditional Knowledge Registers (TKRs) and Related Traditional Knowledge Databases (TKDBs)," Prepared for the Secretariat of the Convention on Biological Diversity, UNEP/CBD/WG8J/4/INF/9, 21 December 2005, 18.

147. WIPO, "Intellectual Property," *supra* n. 2, 20.

148. WIPO Committee, "Update on Technical Standards," *supra* n. 146, 3.

Observation and Analysis

This section makes some broad observations about the intersection of traditional knowledge with the intellectual property system, drawing on the case histories above.

- The first subsection below looks at the big picture, describing long run trends in markets for products supported by intellectual property rights. These observations are pertinent to concerns about competition, pricing, overuse of resources, revenue distribution, and the question of respect and recognition.
- The second goes down a level of detail to consider how particular public and private institutions and substantive legal principles shape outcomes. This section is particularly pertinent to discussions of the implications of IP for research, competition policy, and special problems of compensation and cultural appropriation.

"…the intersection of traditional knowledge and intellectual property has had positive results."

Despite the intensity with which some constituencies have expressed their skepticism of conventional intellectual property, the paper's real-world case studies suggests that the intersection of traditional knowledge and intellectual property has had positive results.[149] Where problems are likely to arise, the real-world experience of the United States suggests some solutions.

The Big Picture: Dynamic Competitive Trends in Markets Supported by Intellectual Property

Competition, Pricing, and Innovation

The case studies show that over time, markets supported by IP rights tend to ease shortages and improve access to products and raw materials. Arguments that IP will support "monopolies" and higher prices seem to have been greatly exaggerated. Where do the critics go wrong? They tend to take a short run "static" view of prices, and often ignore the perspective of consumers in their zeal to serve as advocates for sympathetic producers.[150]

- **Patents and copyrights are sometimes criticized as giving the owner a "monopoly" on ideas.** But these "monopolies" are so narrow that they do not often give rise to real power to raise prices or reduce production in the long run. Furthermore, the protection of IP lets new competitors enter the market**.**

If copyright is a monopoly, it is a very narrow one indeed. Many versions of a story can exist at the same time. Similarly, several coffee-shops can serve the same city block, even if one has a "monopoly" on particularly good location right on the busy corner. One might say, therefore, that copyright creates a sort of monopoly,

149. *See generally* Gilles Saint-Paul, "To What Extent Should Less-Developed Countries Enforce Intellectual Property?" World Economics, 6, 3 (2005): 175-196 (describing benefits to developing countries from enforcing intellectual property rights).

150. For further discussion of the problem of a static versus dynamic outlook in policy, see Geoffrey Manne and Joshua Wright, "Regulating Innovation: Competition Policy and Patent Law under Uncertainty," in Regulating Innovation: Competition Policy and Patent Law under Uncertainty, eds. Geoffrey Manne and Joshua Wright Cambridge University Press, forthcoming 2010).

or that ordinary property rights do[151]—but from an economic standpoint, these "monopolies" are not likely to be very pernicious.

This observation extends to trade secrets and to patents as well.[152] The patent system is broader than copyright and trade secret protection in that it blocks the use of an invention even by someone who has invented it independently. But here too, the resulting "monopolies" tend to be narrow and short-lived. For example, patents on products that use methyl salicylate do not even begin to resemble patents on wintergreen itself, or on methyl salicylate itself, or on the chemical processes for synthesizing esters more broadly. Patent holders can block those who replicate their patented product or process exactly, but can do little beyond that.

The case studies show that IP law does not ordinarily enable firms to force suppliers of traditional remedies out of business, to interfere with research, or otherwise prevent competitors from offering alternatives, though such problems may arise in rare cases. Intellectual property supports competition by supporting investments in innovation; these innovations in turn offer consumers a growing array of alternatives to existing products.[153] The public disclosure function of patents helps competitors avoid wasteful duplication of other's research and focuses their efforts on designing around the patented product, leading to new innovation.[154] Consistent with this, informed by decades of economic literature, the United States Supreme Court has backed away from its old rule that it should be assumed that the holders of a patent always have "market power" likely to harm consumers.[155]

Large firms certainly have arisen and will tend to arise in sectors like pharmaceuticals, which have high research and entry costs. Policymakers do sometimes tend to fear that "big is bad." But large firms can serve consumers as well or better than small ones, especially in sectors with economics of scale and scope. The controversy among economists over when, if ever, consumers are helped by policies that aimed at reducing the power of dominant firms, suggests it is premature to condemn IP or patents more particularly when large firms appear in an IP-protected sector.[156] The growth of large firms will often prove to be triumphs that developing nations should wish to emulate, not avoid. Large firms can employ thousands of people with benefits such as sick leave and paid vacations, pay significant tax revenues, and are well positioned to engage in international trade and investment. Intellectual property law can help support such growth when it makes economic sense. In those very few cases where real problems with large firms seem to persist, the courts or the patent office are available to address problems with patent fraud or overreaching, which might be giving large firms (or anyone else) an unfair advantage. Antitrust remedies are available to address particularly difficult problems (though some scholars tend towards the view

"The growth of large firms will often prove to be triumphs that developing nations should wish to emulate, not avoid."

151. *See* Richard A. Epstein, "The Structural Unity of Physical and Intellectual Property," *Progress on Point* 13.4, October 2006, 9.

152. *See* Edmund W. Kitch, "Elementary and Persistent Errors in the Economic Analysis of Intellectual Property," Vand. L. Rev. 53 (2000): 1727, 1730.

153. *See* François Lévêque and Yann Ménière, "Patents and Innovation: Friends or Foes?" CERNA (2006), available at SSRN: http://ssrn.com/abstract=958830 (An overview of empirical studies shows that patents help create incentives to innovate, increase the information available to innovators, and help technology spread; small firms and the high tech sector benefit most).

154. Stephen M. Maurer and Suzanne Scotchmer, The Independent-Invention Defense in Intellectual Property, *Economica* 69 (2002): 535-547.

155. *Illinois Tool Works Inc. v. Independent Ink, Inc.*, 2006 WL 468729 (March 1, 2006).

156. *See, e.g.* Thomas Lambert and Joshua Wright, "Anti Antitrust (Over-?) Confidence," *Loyola Consumer Law Review* 20, 2 (2008): 219-231; David S. Evans and Jorge Padilla, "Designing Antitrust Rules for Assessing Unilateral Practices: A Neo-Chicago Approach," *University of Chicago Law Review* 72 (Winter 2005): 73; Geoffrey Manne and Joshua Wright, "A First Principles Approach to Antitrust Enforcement in the Agricultural Industry," *Antitrust Chronicle* 4, 2 (April 29, 2010).

that measures that weaken intellectual property right to promote competition have done more harm than good).[157]

Some theorists warn of a "substitution effect," more subtle than monopoly. That is, not that traditional knowledge will be forced out by legal action, but that consumers will tend to substitute conventional commercial products for traditional ones.[158] Insofar as consumers may make these choices for sensible reasons—if they value compounds subjected to clinical testing, or if the patented products are lower in price—it would be hard to justify public policies opposing these choices. The case studies, do suggest that consumers in the niches will continue to value the more traditional products, and the Internet has made it far easier for them to find them. Trademark law can help avoid fraudulent substitutions and support niche markets. Finally, relinquishing traditional knowledge is not always bad; it would be hard to argue that the belief that tiger testicles or rhino horn can cure impotence ought to be preserved until it leads to the extinction of tigers and rhinos.

- **Products protected by the intellectual property system are not generally less accessible or more expensive than before they were commercialized.** Over time, they will tend to become more widely available and less expensive as supply responds to demand.

Our case studies survey products at a wide range of price points. Some, like wintergreen, books, maize seed, wine, or ketchup, are generally sold at a fairly low price point. Others, particularly cancer medicines, are typically sold at a much higher price point. IP-supported products derived from traditional knowledge will not always be cheap.

Several observations may be made about high-priced patented products like medicines. High prices result from a confluence of interrelated factors. Strong demand and high development costs and risks play a role; the patent system plays a role, for investors would be much less willing to bear high costs and risks if they expected copycats to immediately begin offering the same product at a drastically lower price point. But note that even in the short run, there is evidence that firms are under pressure from market forces to keep the prices of IP-protected products down.[159] And in the medium to long run, high prices tend to attract more and better supply in response to demand. High prices serve as a vital signal to consumers and producers.[160] Consumers look for substitutes or bargains; producers are spurred to enter markets to provide alternatives. More researchers and more firms are enticed to enter the competition in the hope of capturing a share of the revenue stream, their investments protected in turn by intellectual property rights. From a consumer standpoint, the high price problem is a short run problem, eroded over time by competition.

"From a consumer standpoint, the high price problem is a short run problem, eroded over time by competition."

The intellectual property system cannot guarantee that prices will not rise, or that newly developed products will be inexpensive if demand is high. But in the wider context of a market system, shortages will be short term, not long term, phenomena. This is not entirely comforting to someone who goes to the market one day and cannot find the usual supplies of a needed herb at an affordable price. But from a

157. Ibid.

158. *See* Hanns Ullrich, "Traditional Knowledge, Biodiversity, Benefit Sharing and the Patent System: Romantics vs. Economics?" *EU Law Working Paper Law* No. 2005/07, 10-11.

159. *See* Damien Geradin, Anne Layne-Farrar and Jorge A. Padilla, "The Complements Problem within Standard Setting: Assessing the Evidence on Royalty Stacking," *Boston University Journal of Science and Technology Law,* 14, 2 (2008): 144 (patent holders are under pressure to license their patents widely at a reasonable rate before they expire; there is little evidence that patent holders are holding out for high license fees).

160. F. A. Hayek, "The Use of Knowledge in Society," *American Economic Review* 35, 4 (1945): 519-530 (describing how prices serve as signals).

policy standpoint, it directs us towards a range of solutions: these can be short-term measures, targeted to respond to harsh or inhumane circumstances until the crisis is past. There is no evidence that the ordinary operation of the intellectual property system in the context of a market economy will yield shortages for consumers. The examples from the United States suggest that the converse is true.

•IP helps support efforts to resolve shortages of raw materials and to conserve endangered species.

The profit motive, supported by the promise of IP protection, also spurs effective efforts to address shortages of raw materials. The cases from the United States show that the higher demand for a product used as a raw material for a commercial product is likely to result in efforts to increase the supply. With the mayapple, researchers will begin to explore the idea of cultivating a wild plant commercially. In the case of raw materials whose nature makes them less than amenable to deliberate cultivation, like the Pacific Yew, a scarcity of the raw material in nature will lead to an inexorable drive to discover a cheaper way to get to the desired product by synthesis. Once (patentable) methods of synthesizing the scarce compound have been developed, the pressure is off the natural source of supply and the scarcity will be alleviated. Shortages there may be, but the higher prices entice new suppliers in to the market and new innovation.

"… from a consumer standpoint, the high price problem is a short run problem, eroded over time by competition."

This also helps address the problem of endangered species. When a resource has been over-harvested, the shield for investors and the promise of profits offered by intellectual property protection helps ensure that investments are made to develop alternatives. The threat to the endangered species is alleviated by the development of synthetic alternatives.

How IP-Supported Markets Benefit Consumers

Generalizing from the case studies, note that revenues from the sale of IP-protected products tend to go to those involved in commercial development, particularly the late stages of commercial development. Persons who play a role in the development of the technology more removed from commercialization are less likely to share in the revenue stream unless they have a contractual relationship with those who do. The paragraphs below explore the implications of this for consumers.

•The pattern of revenue distribution from products embodying traditional knowledge in the United States helps ensure that IP-supported markets generate real results for consumers.

In the case studies, we observe that *products based on traditional knowledge have often (not always) been developed without any part of the revenue stream being reserved for the original holders of traditional knowledge or their representatives* (Br'er Rabbit, Pocahontas, wintergreen, Pacific Yew, mayapple, wine, ketchup). Note that this is true also of market more generally; profits and revenues do not always go to the wisest or the most hardworking producer. Sometimes, they reward luck.

"… the reason that intellectual property continues to produces benefits for consumers is because it is results*, not effort, wisdom, or virtue, that the system rewards."*

Some might argue that this is not fair. But nonetheless this feature of markets is critical to ensuring that markets continue to be a powerful engine for serving consumers. Like markets generally, the reason that intellectual property continues to produce benefits for consumers is because it is *results*, not effort, wisdom, or virtue, that the system rewards.[161]

Consider the case of two researchers, one a fine person who avails himself of traditional knowledge in seeking to develop a new medicine, as well as putting in hours of

161. For a related argument describing the market's tendency to reward success or results rather than intentions, *see* F. A. Hayek, *Constitution of Liberty* (Chicago: University of Chicago Press, 1960) 85.

hard work and making many scientific breakthroughs along the way. But he fails to come up with a coherent business plan, and no product appears on the shelves. The second researcher happens upon a medical breakthrough purely by chance; he is lucky enough to attract funding because his cousin is a venture capitalist. His product makes it to the shelves and he grows rich as a result (his mother, who devoted long hours to coaching him in calculus, gets nothing). What is the justification for a system that allows such a result? It is very simple. However virtuous the first researcher, he failed consumers. The second researcher may be undeserving in some sense, but he brought a product to the shelf and in this crucial sense served consumers well. Consumers do not benefit from abstract understanding, from raw materials, or from traditional knowledge as such. All the hard work in the world, all the wisdom, all the inspiration, is of no use to consumers if it does not yield a product on the shelves.

A system in which the bulk of the revenues goes to those at the commercialization end makes sense from a policy standpoint. It is not that early-stage contributions of wisdom or inspiration are not necessary—but they are neither sufficient nor always necessary to serve consumers. Whereas successful late-stage commercialization is necessary and may be sufficient.

Note, however, that the illustration of the two researchers is misleading in that the case of the second researcher is somewhat unlikely. Thus we observe that

- **Turning traditional knowledge into commercial products is not particularly easy, and is rarely a matter of luck. The revenues that result cannot fairly be thought of as a windfall.**

Our case studies show that, with patented products, difficult technological and scientific problems are involved, from figuring out molecular mechanisms to mundane problems like toxicity, shelf life, and solubility. Not every product tested is likely to lead to a commercial success, and some might succeed for a time and then be withdrawn.[162]

Producing copyrighted products from traditional knowledge is not always so difficult as a technical matter, nor is expensive clinical testing required. Even in this case, however, it would be an oversimplification to describe the copyright owner as unfairly exploiting a "free" resource. Consider the case of Pocahontas. First, current works about Pocahontas draw on other copyrighted works as well as the domain of unprotected facts and ideas. Second, using the public domain or traditional knowledge does not "take" from it; in the long run, it adds to it, as works on which copyright expires go into the public domain. In the short run, using the public domain and/or traditional knowledge does not move any of it "off limits" even temporarily; it is the *new work* that is copyrighted and protected, not the original source material. Third, the interest in a created work that enables the copyright owner to generate a profit is due to elements in the story that were not present before. While all creators build on the shoulder of giants, they do build *something*. Whatever one might think of Disney's Pocahontas, certainly it adds elements not present in earlier sources. The idea that Disney has appropriated value that properly belongs elsewhere is not fair.

"While all creators build on the shoulder of giants, they do build something."

And for any IP-supported product, an important aspect of serving consumers is also innovation on the business side. Even much-despised marketing adds value for consumers, for consumers cannot avail themselves of a product they have never heard

162. Two traditional remedies long used in many products have been discovered by the FDA to be unsafe. One of these is bloodroot, from which sanguiarine is derived. Another is Bearberry, used to produce Cascara Sagrada. American Indians used this plant as a laxative. It was the main ingredient in many commercial laxatives until 2002, when its use was banned by the Food and Drug Administration.

of.[163] Lack of respect for traditional knowledge has been a problem in the United States, though this problem is being resolved. The question of respect, however, does run both ways. Those with little experience in business may not understand that the business infrastructure that enables firms to profit from intellectual property is itself a valuable contribution to society.

- **The concentration of benefits to commercial actors involved in turning traditional knowledge into goods on shelves also helps these actors bear risk; they are in a position to take the blame if something goes wrong.**

The zeal of onlookers to share in revenue streams from products developed from traditional knowledge sometimes seems to lead them to overlook certain duties that typically go along with the right to share in the revenue stream. That is the duty to bear risk in the case of failure. Suppose a medicine were developed, derived from a medicinal plant known to traditional medicine. This medicine passes clinical testing, but when it is actually launched and sold, it emerges after a time that the medicinal compound causes severe birth defects when taken for more than a certain number of months. Victims sue the firm, which is bankrupted. Would it make sense to also allow the victims to sue the indigenous nations to whom the traditional knowledge is attributed, on the grounds that the traditional knowledge spurred the development of the remedy? Very few people would take the idea that the practitioners of traditional knowledge would deserve the blame in such a case so far. But it is difficult to argue consistently that the firm should take all the blame when things go wrong, but that it should not deserve as much credit when things go right.

The bullet points listed above help to explain how conventional IP rights make sense even if they do not guarantee compensation to holders of traditional knowledge not in a position to bargain for it. Note, however, that for many these arguments do not entirely answer the sense that policies supporting compensation are worth striving for, a sense that tends to arise from humanitarian concerns. We take up the topic of compensation again later in this paper.

"…conventional IP rights make sense even if they do not guarantee compensation to holders of traditional knowledge not in a position to bargain for it."

Changing Attitudes to Traditional Knowledge: Overall trends.

The observation that the originators of traditional knowledge had failed to be recognized for their contributions to agriculture, medicine, and other useful pursuits was a dominant theme of the twentieth century. The tide has now turned, however. Today, researchers often look to traditional knowledge in choosing a direction for their efforts, and recognition of the value of traditional knowledge to science is widespread.

- **Over the past fifty years, formal research efforts supported in part by the patent system have played a key role in drawing attention to the value of traditional knowledge in medicine, agriculture, and beyond.**

This is a trend in markets supported by conventional patent rights, not a direct legislative command. It is a reality nonetheless. While the law may command obedience it is likely to have little direct effect on attitudes. The legal system, however, including formal IP rights, provides a framework within which individuals can explore and exchange information and ideas, an information market of sorts for reputation and respect.

163. *See generally* John E. Calfee, Fear of Persuasion: Advertising and Regulation (Washington, D.C: AEI Press, 1997).

The role of intellectual property in the evolution of the reputation of traditional knowledge is not straightforward. The mere fact that patent rights are available does little. The patent medicines of the nineteenth century, many of which purported to be traditional remedies but which were in fact not, usually had little real medicinal value and did nothing to improve the respect in which traditional medicines were held. (The exceptions, such as the cures of Dr. Thompson or Lydia Pinkham's Vegetable Compound, often inspired the bogus "snake oil" sales). Trademark law played a key role, preventing false claims about a product's origin or value. Perhaps the most important factor is the role of clinical testing, which showed beyond a doubt that some traditional remedies worked well.

"The clear trend in this market is to correct failures of recognition and respect, as copyright law protects new works that answer and improve on older works."

•Copyright supports a thriving and varied marketplace of ideas. Our case studies of copyrighted works based in folklore or traditional arts show that over time, the trend is to increasing and restored respect for traditional knowledge.

Copyright law supports a thriving market for published works. The clear trend in this market is to correct failures of recognition and respect, as copyright law protects new works that answer and improve on older works.

Copyright law can directly preserve the integrity of particular copyrighted works to a limited extent; for example, ordinary fan fiction (often of inferior quality to the original) is technically a copyright violation.[164] But copyright concepts do not protect the integrity of folklore that is not actually expressed in any particular copyrighted work. Folklore often has no identifiable "author" and much of it is not copyrighted or copyrightable at all. Like patent law, copyright law does not guarantee that no one will ever use folklore in ways that its originators find offensive. But copyright coupled with the American tradition of free speech has often yielded a powerful and persuasive response to "offensive" uses of folklore. Creators offended by one copyrighted work offer others to correct the balance.

Some scholars have argued that speech markets cannot cure the prejudices of the majority, because that speech is likely to reflect and support the views of the majority.[165] This is overly simplistic, however. Most authors of copyrighted works tend to be more knowledgeable about their topic than the public as a whole. Many try to distinguish themselves by saying something new. If an author is an apologist for the status quo, his work supplies a fine target to those who are not. The works following B'rer Rabbit's early appearance in *Uncle Remus* take advantage of the publicity given to the latter to draw attention to more serious issues. The case study of Pocohontas supports this point as well. Many of the uncountable[166] works about Pocahontas try to represent the history accurately, or explore the question of the relationship between colonists and American Indians seriously. This has been particularly true of works produced after Disney's movie. Thus the market for more speech might not be a panacea, but does very well in the long run.

This tendency of markets to correct for early failures of respect is supported by copyright law. Other laws play a supporting role here as well. These laws include lines

164. In Europe, the law protects the "droit de l'auteur," the moral rights of the author. Even after a work is sold, the author may prevent its being destroyed or used in a certain offensive context. These rights may not be waived. In the United States, however, while the author has moral rights he may sell or waive them, and typically in the U.S. authors do not retain the right to police later uses of a work for compliance with their "moral rights"..

165. *See* Richard Delgado and Jean Stefanic, "Symposium: Images of the Outsider in American Law and Culture: Can Free Expression Remedy Systemic Social Ills, Cornell L. Rev. 77 (1992): 1258 (free speech ideas benefit the majority, not the minority, because racism is part of the dominant narrative and determines our ideas).

166. The author can attest that these are uncountable, having made efforts to count them, surveying works with "Pocahontas" in the title for sale on Amazon.com, Barnes & Noble's web site, on online bibliographies, and in the Library of Congress listings.

of defense for the integrity of American Indian culture in the form of statutes adapting ordinary property rights in physical artifacts, as opposed to intellectual property rights. Property law in the United States protects works from looting and collectors, and may require the return of work taken by earlier generations. Some laws go beyond barring naked theft, in supporting recognition of tribal customs prohibiting commercial trade in some artifacts.[167] These broader laws raise the problematic prospect of stiff sentences for nonviolent conduct that in other contexts would be hard to condemn, like selling artwork; however, their reach is fairly narrow. Another key legal institution is trademark law; as most American Indian groups have a recognized identity, trademark law can help avoiding fraud as to origin of artistic works.[168]

The Design of Intellectual Property Institutions: A Closer Look at Issues of Law and Governance

This section considers more closely how specific legal principles and institutions shape the outcomes we see in our case studies of the commercialization of traditional knowledge. Here the paper considers questions of access to intellectual property protection, competition, litigation, and special legal problems, such as the question of compensation and "cultural appropriation."

Private Supporting Institutions Play a Key Role

Small economic actors and individuals are often able to avail themselves of the protection of IP rights. Private institutions such as performing rights societies and universities can play a helpful role in this process.

- **Private organizations like performing rights societies are important to supporting individuals and other small economic actors seeking to benefit from copyright protection.**

Our case studies show that both trade secret and copyright are readily accessible to individual artists and authors, and small firms. Neither require formal registration or fees, though registration can ease enforcement.[169] Recall that some have expressed concern that intellectual property systems will benefit people and firms from wealthy nations rather than the residents of developing nations. Within the United States, however, there are also inventors and creators who begin with few resources. Our case studies suggest that these small players can benefit from the protection of intellectual property rights as well as large firms.

But enforcement is an increasingly difficult aspect of copyright protection, given that digital technologies have made copying so easy and cheap. The development of private

167. *See, e.g. Richard N. Corrow v. United States of America, United States v. Corrow,* 941 F.Supp. 1553, 1562 (D.N.M.1996); *aff'd* 119 F. 3d 796 (10th Cir. 1997) (Requiring the return of a medicine bundle used in the Nightway ceremony). The Native American Graves Protection and Repatriation Act, enacted in 1990, can be found at 25 U.S.C. §§ 3001-3013 (NAGPRA).

168. *See* 18 U.S.C. § 1158 (imitating or knowingly and willfully copying "any Government trade mark used or devised by the Indian Arts and Crafts Board in the Department of the Interior" is punishable by fines and other sanctions); see also § 1159(a) ("It is unlawful to offer or display for sale or sell any good, with or without a Government trademark, in a manner that falsely suggests it is Indian produced, an Indian product, or the product of a particular Indian or Indian tribe or Indian arts and crafts organization, resident within the United States.").

169. *See, e.g.* Indian Arts and Crafts Board, U.S. Department of the Interior, and the United States Patent and Trademark Office, "Introduction to Intellectual Property for American Indian and Alaskan Native Artists," accessed November 11, 2010, http://www.iacb.doi.gov/pdf/IACB%20Intellectual%20Property%20Brochure%20July%202010.pdf.

organizations that reduce the enforcement burden on small economic actors played a key role in expanding the benefits of copyright in the United States. These include the organizations that represent musicians and composers, ASCAP and BMI, and which collect royalties on their behalf. Our music case study showed that competition between such private organizations can help spur improvements in accessibility.

- **Patent protection requires the payment of fees[170] and compliance with other requirements.[171] The participation of universities in patenting tends to make patent protection more widely accessible to small economic actors such as researchers.**

In the United States, patent law provisions enabling universities and researchers affiliated with universities to file for patents, often even when they are engaged in publicly funded research. Other institutions also play a role in ensuring that small economic actors benefit from patent protection. Financial institutions and venture capitalists give small firms and startups access to capital. Individual access to a reasonably sound educational system, including access to graduate education, also plays a role in maintaining access to patent protection.

Note that the intense concerns expressed in some quarters that patent law will tend to benefit large firms more than small economic actors would be very surprising to the many independent inventors who have long considered patent protection in the United States vital to their interests. Without patent protection, inventors might well hesitate before demonstrating their invention to anyone else, particularly a representative of a large firm, for fear that the firm will simply devote its enormous resources to copying the invention without bothering to license it. The availability of an injunction to stop a would-be copycat from profiting from another's idea is an important element of patent law in the United States; it gives small economic actors much more bargaining power than the availability of a damages remedy alone.

As a general matter, individuals and small firms within the United States have been able to avail themselves of the benefits of IP even if starting with few resources.

- **The case studies suggest that private institutions will be more nimble in leading commercialization efforts than public ones; public institutions play a supporting role.**

Federal and local governments in the United States can play important roles in educating developers about traditional knowledge and to facilitate use of IP rights. National governments can certainly help with these educational efforts. Local and regional governments, however, may be more likely to tailor their efforts to the needs of particular groups. For example, "the Mississippi Band of Choctaw holds annual seminars for tribal government and tribal industry managers on intellectual property. The tribe is engaged in manufacturing enterprises and wants to be able to avail itself of relevant intellectual property rights."[172] Furthermore indigenous groups may not feel themselves always well represented by national governments, which must also accommodate many other concerns. (This helps explain the difficulty of trying to negotiate compensation mechanisms at the treaty level; national governments, rather than local indigenous governments, will naturally be the signatories).

170. Discounts are available for small businesses.

171. Patents are granted and issued through the U.S. Patent and Trademark Office (USPTO). The application procedures are set out from 35 U.S.C. §§ 1-26. Among other things, the patent must properly describing the innovation, a requirement known as "enablement." 35 U.S.C. § 112.

172. Holden, "Genetic Resources, Traditional Knowledge, and Folkore," *supra* n. 13.

Some might be tempted to propose public funding or management of research[173] as an alternative to adopting conventional IP rules, which are supposedly so problematic. Our case study of the development of cancer medications from Pacific Yew suggests that governments, which do not face competition and which are not spurred on to greater efforts by the profit motive, are not likely to prove as effective in leading the development of innovation as the private sector. The development of Taxol before the involvement of private firms seems to have involved substantial delays and expense. Under any system, the reward to innovators must be sufficient to attract innovators in the face of substantial risk and enormous costs. From the standpoint of a developing nation, if one fears that judges will not have the expertise they need to decide patent cases, there is no reason to be confident that other government officials will magically acquire the expertise they would need to administer a plan to fund innovation using subsidies or rewards. It is not that no one can dream up a possible substitute for the patent system, but devising a whole new policy system is likely to have pitfalls and unintended consequences as yet unforeseen by its advocates.

The Details Matter: Legal Principles, Legal Process, and the Courts Help Play a Key Role in Resolving Problems Likely to Arise in IP-Supported Markets

Conventional IP rights include legal principles such as the concept of "obviousness" in patent law that serve as "safety valves" that help courts adjust the protection in individual cases or industry sectors.[174] Other institutions, like reexamination, enable the correction of errors. Legal principles outside of IP, from attention to the need for certainty in law, and respect for freedom of speech to freedom of contract, should not be neglected.

- **Clear boundaries and experienced courts can avoid problems with IP litigation.**

A number of prominent critics of intellectual property law in the United States have portrayed the system as being fraught with perplexing problems of overreach and opportunistic litigation, and so on. But our case studies of traditional knowledge in the United States above uncovered little vexatious litigation or evidence of investors unable to pursue the goal of commercializing a product because the law did not adequately protect their investment. These problems would arise from the system's being too uncertain, from its empowering lawyers more than investors, from its being too broad, or too narrow. This is reassuring, but presents something of a puzzle; why is there such a gap between the academic literature on IP, and the realities of commercialization?

"This focus on lawsuits as opposed to general business trends may have the effect of distorting overall perceptions of the system."

Perception errors may be partly responsible. By definition, a case that makes its way to the courts of appeals is a case in which something has gone wrong. Legal academics tend to watch these forums closely; humdrum transactions in which nothing goes wrong do not result in interesting lawsuits. This focus on lawsuits as opposed to general business trends may have the effect of distorting overall perceptions of the system. At its core, if one selects examples of intellectual property without regard to whether they have given rise to interesting court cases, one seems much less likely to encounter these problems that are supposedly so overwhelming.

173. *See* n. 127 above.

174. *See, e.g.* Nisvan Erkal and Suzanne Scotchmer, "Scarcity of Ideas and R&D Options: Use it, Lose it, or Bank it," paper presented at Toulouse Network for Information Technology Annual Conference (2009)(argues that courts should use the "nonobviousness" doctrine in patent law to give key players a larger reward when there is a long delay between ideas); Dan L. Burk and Mark A. Lemley, "Policy Levers in Patent Law," Virginia Law Review 89 (2003): 1575 (describing how courts can use different concepts in patent law to ensure that the general principles are a good fit across different sectors such as software, pharmaceuticals, biotechnology, and others).

Even if one takes the arguments of skeptics with a grain of salt, however, it is worth setting out some particular factors that explain why systemic problems with litigation make little appearance in some of our case studies. In the case of patents, our case studies almost all involve chemical or biological patents, which rarely generate vexatious litigation. Chemical formulas can establish the boundaries of a patent with great clarity; the boundaries of biological patents are likewise fairly clear. Also, because of the expense of producing these compounds, especially the expense of running clinical trials, pharmaceuticals are dominated by a few large firms, which facilitates negotiations over infringement when necessary. Occasionally, as with BMS's alleged attempts to use fraudulent patent claims to hold off competition, problems arise. But the courts and other institutions offer opportunities such as reexamination to correct these problems in individual cases.

Disputes over rights to some copyrighted works are avoided by several developments. Perhaps the most important of that the outer bounds of copyright are narrow, not broad. Facts and ideas cannot be copyrighted. The concept of "fair use" allows the use of snippets and bits of copyrighted works in contexts when negotiating a license is likely to be burdensome to both parties. Another factor is the use of blanket licensing and, sometimes, compulsory licensing, which entails rate-setting by government fiat. (Compulsory licensing, however, can also give rise to litigation as well as avoid it, leading more than one court to remark on "the highly litigious copyright-owner subculture."[175] Critics such as the respected scholar Robert Merges support a more market-based system instead).[176]

Also, as we noted above in discussing competition law, United States courts and counsel have substantial experience dealing with the intellectual property system and in applying the "safety valve" principles that tend to limit the breadth of ideas impacted by copyright, patents or trade secrets. This is not true in most developing countries, and will be very difficult to replicate.

"Studies of deterrence…suggest that it is not the severity of the penalty that deters, it is primarily the probability of being caught."

Attention to two policies may help developing nations ameliorate the possible impact of inexperience. One of these is "fee shifting," also known as the "loser pays" rule. United States copyright law includes provisions that allow judges to use "fee shifting" to discourage weak suits by requiring the loser to pay the attorney's fees of the winner; these are not always used.[177] The impact of "loser pays" rules seems to be to encourage defendants with a strong case to litigate rather than settling with overreaching plaintiffs simply to avoid litigation costs.[178] This rule is available only in a few patent cases.[179]

A second principle, derived from studies of deterrence, might also be helpful to observe. Studies of deterrence in a wide range of contexts suggest that it is not the

175. *NAB v. CRT*, 772 F.2d 922, 940. (D.C. Cir. 1985).

176. See, e.g. Robert P. Merges, "Compulsory Licensing vs. the Three 'Golden Oldies' Property Rights, Contracts, and Markets," Cato Policy Analysis No. 508, Jan. 15, 2004.

177. 17 U.S.C. 505 (1976); Lieb v. Topstone Indus., 788 F.2d 151, 156 (3d Cir. 1986); Fogerty v. Fantasy, Inc., 510 U.S. 517 (1994).

178. Some argue that fee shifting fails to discourage plaintiffs from suing, because plaintiffs are too optimistic. This argument fails to consider the impact on defendants or attorneys, and ignores evidence of loser pays' impact in other countries. See Walter Olson, "Civil Suits: Loser-Pays Makes Lawsuits Fairer in Europe. It Could Work Here, Too," Reason Magazine, June, 1995, accessed November 11, 2010, http://reason.com/9506/Olson.jun.shtml (citing interviews with businesses and counsel in Europe and Canada).

179. 35 U.S.C. 285. Cambridge Prods. Ltd. v. Perm Nutrients, Inc., 962 F.2d 1048, 1050-51 (Fed. Cir. 1992) ("In the case of awards to prevailing accused infringers . . . exceptional cases are normally those of bad faith litigation or those involving fraud or inequitable conduct by the patentee in procuring the patent."); Brasseler, U.S.A. I, L.P. v. Stryker Sales Corp., 267 F.3d 1370, 1386 (Fed. Cir. 2001) (plaintiff was required to pay attorney's fees to defendant in a patent infringement action when plaintiff's attorneys failed to investigate a notice of on-sale bar).

severity of the penalty that deters, it is primarily the probability of being caught.[180] Attention to these studies could help developing nations avoid problems of perceived unfairness likely to arise if IP enforcement is uneven and arbitrary, with most infringers going unpunished while a few hapless people are singled are out for harsh punishments. Evenhanded enforcement is better for deterrence, and overly harsh penalties are not necessary.

- **Freedom of contract will be helpful in enabling economic actors to tailor IP rights to their particular situation. This is of particular relevance in addressing issues with compensation.**

Above we note that IP-supported markets tend to reward the results of commercialization; compensation will not automatically flow to holders of traditional knowledge that played some role in commercialization, if they are not in a position to bargain for it. Because rewarding results serves consumers well, policymakers should proceed with caution before seeking to alter this incentive mechanism.

This observation is not entirely satisfying, however, at an emotional level, to some observers.[181] For humanitarian reasons, many are likely to try to negotiate compensation for indigenous populations when traditional knowledge is commercialized. Today, the National Cancer Institute has reportedly "developed agreements with indigenous peoples to allow plants to be collected from indigenous lands on condition that a portion of the profits from the eventual manufacture of anti-cancer drugs derived from these plants will be returned to the indigenous peoples."[182] In the United States, government-funded institutions promise to play a larger role in setting the ground rules for basic research they direct to arrange for revenue-sharing or other forms of compensation. This is a comparatively new development not significantly affecting the cases considered in this paper. It remains to be seen whether revenue-sharing will become a reality in the United States, and how this will effect consumers and investment.

But great care should be taken not to throw the baby out with the bathwater. Insisting that the intellectual property system itself serve as a mechanism by which resources are channeled to those in need might tend to result in incorporating inconsistent goals within the system, or result in long delays that would harm consumers.[183] If the product under development is a new kind of tea or toy, some delay might be tolerable. If it is the next effective treatment for AIDs, delay in commercialization could quite literally mean the deaths of thousands of people.

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180. Empirical studies generally show that more severe punishments are less effective deterrents than increasing the likelihood that violator will be caught. A severe punishment will not deter if the probability of being caught falls below a certain threshold. See Criminal Law And Its Processes 117, Sanford H. Kadish & Stephen J. Schulhofer, eds., 6th ed. (New York: Little Brown & Co Law & Business, 1995); Anne D. Witte, "Economic Theories," in S. H. Kadish (ed.), Encyclopedia of Crime and Justice (New York: The Free Press, 1983); see also Dick J. Hessing et al., "Does Deterrence Deter? Measuring the Effect of Deterrence on Tax Compliance in Field Studies and Experimental Studies," in Why People Pay Taxes: Tax Compliance and Enforcement, ed. Joel Slemrod (Ann Arbor: University of Michigan Press, 1992) 291-92; see also Brian Erard, "The Influence of Tax Audits on Reporting Behavior," in Why People Pay Taxes, at 95, 113-14 (studies of tax compliance).

181. *See, e.g.* James Boyle, *Shamans, Software, and Spleens: Law and the Construction of the Information Society* (Cambridge: Harvard University Press, 1996), 126-127.

182. Cross, "Justifying Property," *supra* n. 14, 488.

183. *See also* Ullrich, "Traditional Knowledge," *supra* n. 159, 21 ("[W]hat is really needed is a thorough economic investigation into the question of how much of an extra load can be carried by the patent system without deterring its use. Such an investigation should be extended to examining the question of whether the instrumentalization of the patent system for additional if not extraneous purposes really is efficient in view of the actual and legitimate benefit sharing that may reasonably be expected . . . With respect to . . . commercially successful inventions, evidence of [illegitimate] acts of tapping genetic resources, if necessary at all, may be easier to gather ex post from general sources of information than ex ante via a Kafkaesque system of global bureaucratic control.").

Our analysis of the value of the profit motive in encouraging innovation, competition, and entrepreneurship suggests that the details of any compensation mechanisms that are established do matter. Those that automatically pay compensation to any and all members of a group might reduce incentives to involve oneself closely with research. Why study to become a scientist or an entrepreneur when one can claim a share of the credit with much less effort and no student loans, simply by claiming an affiliation with a group?

Furthermore the United States cases remind us that traditional knowledge is turned into commercial products under an astonishingly wide array of circumstances. Often, a key factor in determining whether a group can negotiate compensation is whether the group retains control over the information, either because they have physical property rights in key resources, or for some other reason. If the paths through the wilderness and the uses of its plants are secrets, those who hold those secrets are in a good position to insist that they will not share them until some form of compensation has been negotiated. Both secrecy and existing property rights in land and artifacts support negotiations for compensation by local populations.

"Traditional knowledge sometimes blurs into the public domain of common knowledge."

When it does not, however, it would not only be extremely difficult to negotiate compensation, but much more difficult to justify. Traditional knowledge sometimes blurs into the public domain of common knowledge. In the United States, the uses of many medicinal plants first came to the attention to early natural historians and physicians or to ordinary settlers. Researchers began to try to document these remedies more formally in the eighteenth and nineteenth century.[184] Thus as commercial markets evolved further in the twentieth century, the properties of many of these compounds were already known to researchers. By the time modern researchers were turned loose on these compounds, some knowledge of their properties was already common knowledge. At this point, it is extremely difficult to separate indigenous traditional knowledge from the public domain. It is hard to imagine that consumers would be well served by attempts to regulate in this area. Likewise, it is hard to make the case for guaranteed top-down rules supporting compensation, in the case of parallel discovery. The traditional knowledge that a compound is useful is sometimes disregarded or not given great weight, as with Pacific Yew. Much later, researchers discover the usefulness of the compound by chance.

Because of the wide range of circumstances under which traditional knowledge is commercialized, it should not be surprising that contracts, not statutes, are the main legal device for arranging compensation. Contracts can be tailored to suit individual circumstances; statutes are usually not. Treaties must be even more general; it should not be surprising that efforts to address the compensation issue by treaty have been felt to be unsatisfactory.

184. In the eighteenth century, for example, botanist John Bartram and his illustrator son William recorded and published information about medicinal plants including wintergreen, mayapple, and others known to traditional medicine in North America, as well as cultivating plants specimens in their garden. William in particular was driven by concern that the knowledge would be lost:

> Building upon the ante-ethnographical literature of 17th-century explorers, missionaries, and travelers, Bartram "studied Indian cultures systematically and described them accurately, always distinguishing observed fact from hearsay."

Laura E. Ray, "Podophyllum Peltatum and Observations on the Creek and Cherokee Indians: William Bartram's Preservation of Native American Pharmacology," Yale J. Biol. Med. 82, 1 (March, 2009): 25-36.

Policymakers should proceed with caution in trying to regulate the content of speech, even with the goal of protecting the integrity of traditional culture.

Some observers suggest creating a new species of intellectual property rights that would serve as an obstacle to "cultural appropriation"[185] of folklore by commercial entities. Most such proposals are still pure theory. But the Tulalip tribe has contracted with the Bureau of Indian Affairs to draft a statute to protect resources and traditional knowledge under customary law. The resulting tribal code would "regulate the use of collective cultural heritage, including areas, such as research, publications, arts, crafts, music, stories and dance, business practices, secured transactions, and genetic resources and associated TK."[186] The code limits the rights of member of the tribe to use collective intangible property in certain ways. The rules include "regulation of their use in commerce and the ability to incorporate elements of traditional stories, songs, dances, symbols and similar traditional expressions in derivative works. Tribal members may be forbidden to sell or commercialize certain aspects of collective intangible property or be limited to use them in ways compatible with customary law."[187] On other occasions, American Indian groups in the United States have sought to use tribal law to command more respect for their traditions, such as a in a lawsuit to bar a brewing company from using the name of a historic leader on its labels.[188] Tribal norms, however, do not generally govern the conduct of actors off of tribal lands and have not been a major factor in constraining use of American Indian culture in the United States.

Rules against cultural appropriation would be almost certainly impossible to describe or administer in the case of folklore such as B'rer Rabbit, when the tales' origins are so murky and the group descended from its originators is broad and hard to define. American Indian nations are somewhat better defined, although hard questions still arise in individual cases as to who is and who is not a member.

But one significant question about the creation of such rights would be its real effect. Good intentions do not make good laws. Here, the United States experience with the regulation known as the "Fairness Doctrine" might be instructive. This was a regulation originally promulgated to ensure that television and radio broadcasters aired both sides of controversial issues. Politicians took advantage of the rule to entangle critics in red tape, and there is evidence that the overall impact of the rule was to encourage broadcasters to avoid controversy.[189]

As a thought experiment, consider how a rule against cultural appropriation would affect the Pendleton Company, which makes fine woolen articles, including blankets with designs derived from traditional American Indian themes. Should the Pendleton

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185. *See* Rebecca Tsosi, "Reclaiming Native Stories: An Essay on Cultural Appropriation and Cultural Rights," Ariz. St. L.J. 34 (2002): 299; see also Kendall and Meddin, "Accessorising Aboriginality," supra n. 8, 166.

186. Terry Williams, "WIPO Panel on 'Indigenous and Local Communities' Concerns and Experiences in Promoting, Sustaining and Safeguarding Their Traditional Knowledge, Traditional Cultural Expressions and Genetic Resources: Experiences from the United States of America," WIPO/GRTKF/IC/14/INF/5(a), June 29, 2009, 4-6 (reporting efforts of Tulalip tribes to develop tribal law).

187. Ibid, 5.

188. The Lakota tribe initially filed suit to prevent the use of the name of historic leader Crazy Horse on a the label of an alcoholic drink under tribal law. The suit failed on the grounds that tribal law did not bind those outside the tribe's jurisdiction. Hornell Brewing Co. v. Rosebud Sioux Tribal Court, 133 F.3d 1087, 45 U.S.P.Q.2d (BNA) 1458 (8th Cir. 1998). Congress next passed a law forbidding the label, which was found to violate free speech rights. Hornell Brewing Co., Inc. v. Brady, 819 F. Supp. 1227 (E.D.N.Y. 1993). The Lakota tribe had more success with state law, successfully urging states to revoke the trademark registration for the labels. R.P. Gough, "Minnesota Judge Recommends Revocation of 'Crazy Horse Malt Liquor' Label, September 15, 1995, accessed November 11, 2010, http://www.yvwiiusdinvnohii.net/political/mnrevoke.htm.

189. Thomas W. Hazlett and David W. Sosa, ""Was the Fairness Doctrine a "Chilling Effect"? Evidence from the Postderegulation Radio Market," *Journal of Legal Studies* 26, 1 (January 1997): 279-301.

Company be required to stop producing its blankets with traditional American Indian themes without permission from various American Indians nations whose traditions are represented? If the firm is only inspired by, and not making exact copies of, a traditional decoration, must it still apply for permission to use the theme? How is it to know who to ask for permission, if it is not actually copying a work of known origin? How much can it change a design to avoid the obligation to ask permission? Would unlicensed production be permitted to continue only when the firm employs American Indian designers? Could such designers work for Pendleton without the permission of their tribe? Foreseeable difficulties would include the question of how such rights would affect American Indian artists seeking to commercialize their own created works. Is a ceramist incorporating traditional themes in decorating ceramic works for sale appropriating revenue that ought to be claimed by the entire group? Suppose the artist was not, technically speaking, an official member of the tribe?

The reality of a rule against cultural appropriation might well be to substantially reduce the access of the public to a range of works in which traditional ideas are recognizably included at all. Firms might have more of an incentive to distort traditional themes beyond recognition, not less. Traditional artists might find their livelihood threatened by overzealous litigants—controversial artists might be particularly vulnerable. And part of what keeps a cultural tradition alive and vital is its capacity for change, to be transformed and recreated in the face of new influences and new experiences. Legislating the degree of change permitted in using traditional themes might be most likely to doom the culture to irrelevance.

Inherently recognizing the difficulties of regulating information, most legal systems, including traditional ones, proceed from the assumption that knowledge and information are free for all to use.[190] Patents, copyrights, trade secrets and a few other concepts create exceptions to that general rule, but these tend to be narrow. Copyright in particular supports markets that generally make ideas more widely available, not less, like the property rights it resembles. And IP is not generally motivated by a content-specific concern for ensuring that speech is truthful or inoffensive. Thus rules against cultural appropriation in the United States would certainly be closely scrutinized by the courts as a restraint on free speech.

"The proposal to create of a new type of legal right to protect the integrity of traditional art and folklore might strike some as particularly ironic."

The proposal to create of a new type of legal right to protect the integrity of traditional art and folklore might strike some as particularly ironic. Would one be, in essence, abandoning traditional law for the sake of preserving traditional art? Traditional cultures often place a high value on persuasion as opposed to coercion, and on individual freedom. Charles Mann has suggested that the strength of the respect for freedom and individual rights in the United States partly grew from the influence of American Indian nations on the more uptight Puritan colonials.[191]

In general the difficulties likely to be posed by a broad rule against cultural appropriation and its potential abuse for political purposes, coupled with the real gains in appreciation and respect for traditional cultures that have been made without the rule, overall, the United States examples suggest that one should proceed with caution in attempting to legislate respect more directly.

190. Cross, "Justifying Property," *supra* n. 14, 259-260.

191. Mann, *1491*, *supra* n. 6, 374-376.

Conclusion

Our case studies support an optimistic view of the development of traditional knowledge into commercial products under a regime of conventional intellectual property rights. The studies show that:

- IP rights support the growth of long-run competition; market forces of supply and demand address short-run scarcities of raw materials or finished products.
- In markets generally and in markets supported by IP rights in particular, substantial revenues will tend to flow to those involved in the late stages of commercialization, in actually putting a real product on the shelves where it is available to consumers. This pattern of revenue distribution tends to reinforce the broad benefits of markets to consumers. Care should be taken to avoid undermining this incentive mechanism.
- Over time, markets for both copyrighted works and patented products show a trend towards increasing recognition of the value of traditional knowledge and respect for the holders of that knowledge. Legislating greater respect would require legal rules that target certain content, and is likely to cause as many or more problems than it solves.
- Small economic actors and individuals are often able to avail themselves of the protection of IP rights. Private institutions such as performing rights societies and universities can play a helpful role in this process.
- Both private and public institutions play a role in commercializing traditional knowledge. Encouraging public institutions to dominate the process, however, risks delays and waste of resources, as one loses the benefits of involving the more efficient, competitive private sector in problem-solving. Local or indigenous governments are likely to have advantages in addressing local problems.
- Conventional IP rights include legal principles such as the concept of "obviousness" in patent law that serve as "safety valves," generally keeping these rights narrow enough to allow competition but wide enough to protect investments. Other institutions enable the correction of errors.
- Because of the wide variety of circumstances under which traditional knowledge is held, it would often be harmful to impose a top-down general principle as to who and how holders of traditional knowledge should be compensated for their contributions. Contracts that can be tailored to suit different circumstances are a better legal vehicle for working towards this goal when it is appropriate.

This study suggests that many of the concerns about the impact of adopting intellectual property rights in developing countries are overly inspired by alarmist headlines rather than by the careful examination of real-world trends.

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