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Beans, Beans, the Patented Fruit: The Growing International Conflict over the Ownership of Life

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I. INTRODUCTION

Seeds are at the center of the conflict between developing nations and corporations over the expansion of intellectual property rights (IPRs) to genetic material.[1] This property dispute, instigated by globalization and the increasing influence of biotechnology, "reaches far beyond agriculture into nearly every corner of human experience."[2] The rush for IPRs not only endangers the world's collection of seeds and other plant germplasm,[3] but also ignores the sovereign right of states to control the genetic material located within their borders.[4]

In recent years, corporations in the developed world have claimed ownership of many genetic resources including basmati

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1. Vandana Shiva, *GATT, Agriculture and Third World Women, in* ECOFEMINISM 231, 241 (1996) [hereinafter Shiva, *Third World Women*].

2. Fred Powledge, *Patenting, Piracy, and the Global Commons*, 51 BIOSCIENCE, Apr. 1, 2001, at 273.

3. *Id.* Germplasm in plants is a seed or any part of a plant that can be used for reproduction. Timothy Pratt, *Patent on Small Yellow Bean Provokes Cry of Biopiracy*, N.Y. TIMES, Mar. 20, 2001, at F5.

4. United Nations Conference on Environment and Development: Convention on Biological Diversity, June 5, 1992, art. 4, 31 I.L.M. 818, 822, 824 [hereinafter CBD]. In the Preamble of the CBD, the contracting parties (157 countries and the European Economic Community) reaffirmed that states have sovereign rights over their own biological resources including genetic resources, organisms or parts thereof, populations, and any other biotic component of ecosystems with actual or potential use or value for humanity. *Id.* at 823. The CBD also recognized biological and genetic resources are the sovereign property of the country of origin and indigenous communities who contribute their knowledge to these resources must be reimbursed. *See* Meetali Jain, Note, *Global Trade and the New Millennium: Defining the Scope of Intellectual Property Protection of Plant Genetic Resources and Traditional Knowledge in India*, 22 HASTINGS INT'L & COMP. L. REV. 777, 784 (1999). The CBD, however, is only enforceable if each country creates domestic legislation to protect the objectives of the CBD. *Id.* The United States has refused to sign the CBD because many issues regarding IPRs remain unresolved. *Id.* at 782 n.22.

rice,[5] mayocoba beans[6] and even the DNA of indigenous people.[7] The recent controversies surrounding corporate ownership of genetic resources illustrate the fine line between biotechnology[8] and biopiracy.[9] In response to the growing corporate domination of genetic resources, as many as one hundred nations have asserted national sovereignty over the germplasm living within their borders.[10] Unless the developed world and developing nations resolve the dispute over the patenting of life forms, crops such as basmati rice and mayocoba beans will become the intellectual property of the corporate world, rather than the sustenance of farmers in the developing world.

Part II of this Comment will discuss the background of the Enola patent and it treatment under U.S. patent law. Part II will also discuss how U.S. patent law limits the manner in which

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5. *See, e.g.*, Rekha Balu, *Against the Grain: The Rice of India Sprouts in Texas*, WALL ST. J., Apr. 6, 1998, at A1. RiceTec, Inc., a Texas based company, developed a hybrid seed combining Texas long-grain rice with basmati rice, which originates in India and Pakistan. In 1997, the company received a patent for their creation. *See id.* After India challenged the patent, the U.S. Patent and Trademark Office restricted the patent to three specific rice strains that are unrelated to any variety grown in India. *Order Can't Block Basmati Exports*, THE TIMES OF INDIA, Aug. 22, 2001, *available at* LEXIS, News Library, WTIN file [hereinafter *Order Can't Block Basmati Exports*].

6. *See, e.g.*, Pratt, *supra* note 3.

7. *See, e.g.*, Powledge, *supra* note 2. U.S. researchers took blood samples from a member of the Guayami tribe in Panama who had contracted hairy-cell leukemia. The researchers patented the cultivated cell line derived from the twenty-six-year-old Guayami woman's blood, listing Dr. Jonathan Kaplan of the Centers for Disease Control as the inventor of the cell line. Keith Aoki, *Sovereignty and the Globalization of Intellectual Property: Neocolonialism, Anticommons Property, and Biopiracy in the (Not-So-Brave) New World Order of International Property Protection*, 6 IND. J. GLOBAL LEGAL STUD. 11, 53 (1998).

8. The CBD defines biotechnology as "any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use." CBD, art. II, *supra* note 4, at 823.

9. Biopiracy is defined as the theft of invaluable biological and cultural resources. These resources flow out of developing nations as "raw materials" and into developed nations, where pharmaceutical or agricultural corporations transform them into protected intellectual property whose value is then underwritten by provisions of multilateral agreements such as Trade-Related Aspects of Intellectual Property Rights (TRIPS). Aoki, *supra* note 7, at 49; *see also* VANDANA SHIVA, BIOPIRACY: THE PLUNDER OF NATURE AND KNOWLEDGE (1997) [hereinafter SHIVA, BIOPIRACY].

10. Powledge, *supra* note 2. In the Philippines, a presidential executive order regulates prospecting for biological and genetic resources. In addition, the Andean Community, comprised of Bolivia, Ecuador, Peru and Venezuela, established regional rules for IPRs by adopting Decision 486, which recognized the traditional knowledge of the indigenous communities, proclaimed that life forms shall not be considered inventions, and outlawed patents on plants, animals and biological processes used for the production of other animals. *Id.*

foreign evidence can be used to invalidate a U.S. patent. This Comment will conclude the Enola patent fails to pass the statutory requirements of U.S. patent law.

Part III will explore the fine line between biopiracy and the legitimate patenting of biological resources. Part III will also examine how multilateral agreements, such as Trade-Related Aspects of Intellectual Property Rights (TRIPS) and the Convention of Biological Diversity (CBD), pressure developing countries into adopting a patent system that protects foreign patents even though it may be against the best interest of the developing nation. Part III will also examine the views of the developing world and the developed world on the issue of patenting life.

In Part IV, this Comment will recommend the U.S. Patent and Trademark Office invalidate the Enola patent. In addition, this Comment will recommend the U.S. Patent and Trademark Office expand its use of traditional foreign evidence to invalidate patents, instead of the current practice of invalidating a U.S. patent only when there is published foreign evidence. Lastly, this Comment will conclude the current state of IPRs and patents on life are "the ultimate expression of capitalist patriarchy's impulse to control all that is living and free."[11]

II. THE ENOLA PATENT: PLAGIARISM OR INNOVATION

A. Enola, Mayocoba: One in the Same?

The patent controversy over the Enola bean, also known as the mayocoba bean in Mexico, is the "most recent example of companies abusing the U.S. patent system for commercial advantage."[12] In particular, this controversy illustrates the potential conflicts between intellectual property protection under U.S. law and the rights of traditional farmers in foreign countries.[13] This dispute also illustrates the international disagreement between the industrialized world and the developing world over the patenting of organic life.[14] Several recent patent disputes

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11. Shiva, *Third World Women*, *supra* note 1, at 243.

12. Pratt, *supra* note 3 (quoting Dr. Joachim Voss, Director of the International Center for Tropical Agriculture (CIAT)).

13. Neil D. Hamilton, *Legal Issues Shaping Society's Acceptance of Biotechnology and Genetically Modified Organisms*, 6 DRAKE J. AGRIC. L. 81, 106 (2001).

14. *See id.*

involving foreign commodities, such as basmati rice and the neem tree,[15] also demonstrate how the attempt to patent the resources of the developing world invades the sovereignty of these nations and redefines the meaning of property rights.[16]

Environmental activists have called the Enola patent a "textbook case of biopiracy."[17] Patents, like the Enola patent, disregard the same genetic results achieved by developing nations through centuries of breeding and cross-fertilization.[18] The underlying issue in this controversy is whether the international public should own genetic material as a common good, or conversely, whether life forms should become the intellectual property of the corporate world, which can afford to develop and patent them, and subsequently market them at a higher price to the developing world.[19]

In Patent 5,894,079,[20] inventor Larry Proctor claimed he created a new, useful and nonobvious[21] product by breeding a new field bean variety that produced a distinctly yellow-colored seed,

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15. Over the past seventeen years, more than a dozen patents for formulas for stable neem-based solutions have been granted to U.S. and Japanese firms. Neem-based biopesticides and medicines have been used in India for over 2,000 years. SHIVA, BIOPIRACY, *supra* note 9, at 70–71.

16. *See* Powledge, *supra* note 2.

17. Pratt, *supra* note 3. The Rural Advancement Foundation International (RAFI), an international civil society organization dedicated to the sustainable use of biodiversity and concerned with the loss of agricultural biodiversity and the impact of intellectual property on farmers and food security, denounced the Enola bean patent as "Mexican bean biopiracy" and demanded its revocation. RAFI, *Enola Bean Patent Challenged*, *at* http://www.rafi.org/documents/news_enolabean.pdf (Jan. 5, 2001) [hereinafter *Enola Bean Patent Challenged*].

18. *US Firm in Bean Patent Row: NGOs Accuse Firm of 'Bio-piracy'*, LATIN AMERICAN REGIONAL REPORTS: MEXICO & NAFTA REPORT, Nov. 28, 2000, at 2 [hereinafter *US Firm in Bean Patent Row*].

19. *See* Emily Marden, *The Neem Tree Patent: International Conflict over the Commodification of Life*, 22 B.C. INT'L & COMP. L. REV. 279, 292 (1999). Like the dispute over the neem tree extract, the Enola bean patent also implicates the philosophical divide between those who argue that genetic resources of the planet should remain a shared commons and those who insist these resources should be transferred to corporations that can develop them for the common good.

20. CIAT requested a re-examination of this patent on December 20, 2000. Laura Carlsen, *Little, Yellow...Different?*, LATIN TRADE, Aug. 2001, at 60. The re-examination number is 90/005,892. Pod-Ners also filed regarding this patent in the U.S. District Court for the Central District of California. Pod-Ners, L.L.C. v. Tutuli Produce Corp., Doc. No. 99-10172. U.S. Patent. No. 5,894,079 (issued Apr. 13, 1999).

21. "A patent may not be obtained . . . [if] the subject matter as a whole would have been obvious . . . to a person having ordinary skill in the art." 35 U.S.C. § 103 (2000).

which remained relatively unchanged by the season.[22] According to the patent, Proctor found yellow field beans in a package of dry and edible beans purchased in Mexico and brought them to the United States in 1994.[23] Proctor selected the yellow beans from the package, planted them in Montrose, Colorado and allowed them to self-pollinate.[24]

The resulting plants had abnormally large leaves and produced pods containing yellow seeds.[25] Proctor harvested seeds from plants that exhibited desirable characteristics, such as smaller leaves, strong adherence of the pod to the branch and resistance to pod shattering.[26] The seeds were planted and allowed to self-pollinate in 1995 and again in 1996.[27] Proctor's patent claims the characteristics of the field bean cultivar Enola surpass similar field bean cultivars.[28] In addition, the patent also claims that the Enola bean possesses a unique shade of yellow as defined by the Munsell Book of Color.[29]

In addition to the utility patent on the "improved" variety of bean, the United States also granted Proctor a Plant Variety Protection (PVP) certificate, which gave Proctor and his company, Pod-Ners, the sole right to commercialize the Enola bean.[30] He

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22. U.S. Patent. No. 5,894,079 (issued Apr. 13, 1999).

23. *Id.* Proctor now claims that he brought the beans to the United States in 1990 and not 1994 as the patent states. Jonathan Friedland, *As Two Men Vie to Sell Yellow Beans, Litigation Sprouts*, WALL ST. J., Mar. 20, 2000, at A1. He filed for the patent in 1996. The date discrepancy is extremely significant because Proctor could not have bred a new variety in two years. *See* Pratt, *supra* note 3. A new variety generally takes a decade to breed. Friedland, *supra*.

24. U.S. Patent No. 5,894,079 (issued Apr. 13, 1999).

25. *Id.* According to the patent, the leaves produced were almost twice the size of the leaves of the original seed. *Id.*

26. *Id.*

27. *Id.*

28. *Id.* The patent claims the pods produced by the cultivar Enola strongly adhere to the branches. Thus, minimal dropping occurs under both normal and adverse climatic conditions, a significant problem with other field bean varieties. Additionally, the beans absorb more water when soaked prior to cooking and seem to cook faster than other dry field beans. The patent, however, compares the cooking time of the yellow beans to pinto beans, another variety of field beans. *Id.*

29. *Id.* The yellow color of the Enola bean matches most closely to 7.5 Y 8.5/4 to 7.5 Y 8.5/6 in the Munsell Book of Color. *Id.* The patent's reliance on a particular shade of yellow has been severely criticized because the bean's color was defined by the use of a palette chart instead of the use of a spectrometer, a scientific procedure. Friedland, *supra* note 23.

30. Hamilton, *supra* note 13, at 106; *see also* Friedland, *supra* note 23. After three years of consideration, the U.S. Department of Agriculture issued the certificate to Pod-

used both the patent and the PVP certificate to have the U.S. Custom Service block the import of similar seeds from Mexico.[31]

In October 1999, Proctor sued two U.S. importers for patent infringement for the importation and sale of yellow beans that resembled the patented Enola bean.[32] A countersuit, filed by Tutuli Produce, a U.S. importer of mayocoba beans,[33] claims the patent is invalid and unenforceable because Tutuli Produce has imported the same beans under the names "peruano" and "mayocoba" from Mexico since 1994.[34]

Mexican mayocoba bean farmers will face severe consequences if the Enola patent is not invalidated. For example, Tutuli Produce, in addition to other importers and bean growers, will owe Proctor six cents a pound for beans sold on either side of the border.[35] Since mayocoba beans sell for twenty-seven cents a pound in Los Angeles, the six cents a pound royalty drives Mexican farmers out of the market.[36] Consequently, most bean farmers have either shifted to other crops or confined their mayocoba crop sales to regional markets because of the royalties demanded by Proctor.[37] Last year, yellow bean production in Mexico fell from 250,000 tons to 96,000 tons.[38]

Ners L.L.C., Proctor's company, in 1999. Gregg Moss & Emily Narvaes, *Pod-Ners Knows Beans*, DENVER POST, Dec. 2, 2001, at K-02.

31. Hamilton, *supra* note 13, at 106.

32. Carlsen, *supra* note 20, at 58. According to Tutuli President Rebecca Gilliland, Pod-Ners also informed customers of Tutuli Produce that buying beans from Sinaloa was illegal. *Id.* Furthermore, after a request from Pod-Ners, the U.S. Custom Service began to stop loads of yellow beans at the U.S.-Mexican border to search for any bean that matched the protected yellow hue. The mayocoba beans, which are shaped like kidney or pinto beans, range in color from pale straw to mustard. Friedland, *supra* note 23.

33. Carlsen, *supra* note 20, at 58. Mexican farmers believe the bean that Proctor patented is a variety of the mayocoba bean released in 1978. Some records indicate the mayocoba bean may have been grown in Mexico since the 1930s. *Id.*

34. *Id.* The countersuit requests punitive damages, citing trade libel and intentional interference with contractual relationships and prospective economic advantage. Even Mexico's Agricultural Ministry has declared "the defense of the mayocoba bean a matter of 'national interest.'" *Id.* at 60.

35. *Id.* at 58. In December 2001, Proctor filed another suit against sixteen bean processors and growers in Greenley, Colorado. The complaint alleged several companies had arranged to have the Enola bean grown and processed in the United States. *See* Moss, *supra* note 30.

36. Friedland, *supra* note 23.

37. In the 2000–01 season, the amount of acreage sowed fell seventy-six percent. All of the yellow beans were sold on the domestic market in Mexico. Carlsen, *supra* note 20, at 58–60.

38. *Id.*

As a result of this controversy, several entities have challenged the validity of the Enola patent. In December 2000, the International Center for Tropical Agriculture (CIAT),[39] an agricultural research center, sought re-examination of the Enola patent, claiming the patent violates the 1994 United Nations Agreement, which states that plant varieties held in trust cannot be patented.[40] CIAT is the first agricultural research center in the developing world to challenge a U.S. patent on a crop.[41] In addition to CIAT's challenge, the Mexican government has pledged to spend $200,000 to fight the patent[42] because its tests demonstrate the Enola bean is genetically identical to a bean that was registered in Sinaloa in 1978.[43] Despite Mexico's pledge to fight the patent, environmentalists argue Mexico should not have to use scarce financial resources defending a patent that should not have been granted to Proctor in the first place.[44] If the U.S. Patent and Trademark Office invalidates Proctor's patent, any lawsuit relating to the enforcement of the Enola patent will be declared moot.[45] The U.S. Patent and Trademark Office admits the patent challenge is meritorious; however, the reexamination process could take months.[46]

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39. CIAT is one of sixteen international research centers supported by the Consultative Group on International Agricultural Research (CGIAR). The CIAT gene bank holds more than 28,000 samples of Phaseolus (dry bean) seeds. CIAT combats famine by collecting and improving varieties of the world's basic foods. *See* Pratt, *supra* note 3. Founded in 1971, CGIAR is supported by public funds in both the developed and developing world. Powledge, *supra* note 2. The gene banks collect seeds and plant tissue, catalogue them, and then conserve them. Not only has center-held germplasm been used to grow crops in the developing world such as rice, wheat and maize, the CGIAR's plant breeders also use their expertise and vast collection of plant tissue to breed improvements in crops widely ignored by transnational seed companies, but valued by poorer countries as a means of survival. *Id.*

40. CIAT holds 260 varieties of the yellow bean, including six that appear to be covered by the Enola patent. Since CIAT collects and improves varieties of basic foods, they need assurance their materials will remain in the public domain. Carlsen, *supra* note 20, at 60.

41. Pratt, *supra* note 3.

42. *US Firm in Bean Patent Row*, *supra* note 18.

43. Pratt, *supra* note 3. The granting of the patent and the searching of loads of yellow beans at the border are an attack on Mexico's heritage as the cradle of bean civilization, according to Jose Antonio Mendoza, Mexico's Deputy Agriculture Secretary. Friedland, *supra* note 23. Mexican officials contend that Proctor's Enola bean is actually a traditional variety of bean, which Mexican farmers have grown and exported for years. Hamilton, *supra* note 13, at 106.

44. *US Firm in Bean Patent Row, supra* note 18.

45. Pratt, *supra* note 3.

46. *Id.*

B. Application of U.S. Patent Law to the Enola Patent

The landmark U.S. case of *Diamond v. Chakrabarty*[47] overturned the traditional legal rule in the United States that "'products of nature' such as life-forms were not patentable subject matter."[48] In *Chakrabarty*, the Supreme Court upheld a patent of a genetically engineered oil-eating bacteria developed by microbiologist Dr. Ananda Chakrabarty.[49] Prior to *Chakrabarty*, the U.S. Plant Patent Act of 1930 afforded patent protection to asexually reproduced plants.[50] Moreover, the U.S. Plant Variety Protection Act of 1970 (PVPA) protected certain sexually reproduced plants, but excluded bacteria such as the genetically engineered oil-eating bacteria developed by Dr. Chakrabarty.[51] The five-to-four decision in *Chakrabarty*, however, interpreted the language in 35 U.S.C. § 101 to include plant life.[52] The Supreme Court explained that because the statute contains expansive terms such as "manufacture" and "composition of matter" modified by "any," Congress contemplated the patent laws would be interpreted broadly as technology advanced.[53] Thus, living things are patentable subject matter under 35 U.S.C. § 101.[54] Several years later, *In re Hibberd* extended patentable subject matter to plants.[55] As a result of those cases, a utility patent may be granted to a plant and its products as long as the statutory requirements of novelty, utility and nonobviousness are met.[56]

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47. 447 U.S. 303 (1980).

48. Aoki, *supra* note 7, at 52.

49. 447 U.S. at 303–10.

50. *Id.* at 310–11.

51. *Id. See generally* Plant Patent Act of 1930, 35 U.S.C. § 161 (2000); Plant Variety Protection Act of 1970, 7 U.S.C. § 2402(a) (2000). The PVPA established a new form of protection for new varieties of seed-grown and tuber propagated plants. A breeder of any sexually reproduced or tuber propagated plant variety is entitled to plant variety protection if the plant is: (1) new, (2) distinct, (3) uniform, and (4) stable. Unlike the patent system, the PVPA does not require extensive examination of the proposed variety. Pioneer Hi-Bred Int'l Inc. v. J.E.M. AG Supply, Inc., 200 F.3d 1374, 1377 (2000).

52. The disputed language in 35 U.S.C. § 101 (2000) states: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title." *Chakrabarty*, 447 U.S. at 307.

53. *See id.* at 308.

54. *See id.* at 306–09.

55. 227 U.S.P.Q. (BNA) 443, 444 (1985).

56. 35 U.S.C. §§ 101–103 (2000); *see also* J.E.M. AG Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc., 534 U.S. 124, 131 (2001).

Under the codification of U.S. patent law, 35 U.S.C. §§ 101, 102 and 103, a patent will be granted if the invention (1) is new and has utility; (2) is novel; and (3) is nonobvious from the "prior art."[57] In addition, a detailed written description of the plant must be provided and the seed must be deposited where it is publicly accessible.[58] In this case, the request for reexamination of the Enola patent would invalidate all of the patent's fifteen claims under U.S. patent law.[59] Specifically, the patent challengers argue the Enola patent fails to meet the statutory requirements of novelty and nonobviousness.[60]

1. Is the Enola bean a novel invention?

Under 35 U.S.C. § 102(a), a utility patent will not be granted if the invention is "known or used by others in this country, or patented or described in a printed publication in this or a foreign country."[61] Although Proctor acknowledges his Enola bean originates in Mexico, he claims the Enola bean is novel because it has never been grown in the United States, and it has a distinctive yellow color.[62] According to the patent challengers, including CIAT and Rural Advancement Foundation International (RAFI), the Enola patent fails the test of novelty for several reasons.

First, Mexican farmers have grown the Enola bean, known regionally as the mayocoba, for generations.[63] Mexico argues the Enola bean is genetically identical to a bean registered in Sinaloa, Mexico in 1978. [64] In addition, there is published evidence that farmers have grown yellow beans, similar to the Enola bean, in the United States since the 1930s.[65] Second, Proctor did not have

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57. 35 U.S.C. §§ 101–103.

58. 35 U.S.C. § 112 (2000); *see also* J.E.M. AG Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc., 534 U.S. at 131.

59. *Enola Bean Patent Challenged, supra* note 17. Some of the Enola patent's fifteen claims include the seed, the plant, the pollen, the method of producing the Enola bean plant and a field bean variety that produces a seed with a specific shade of yellow. U.S. Patent No. 5,894,079 (issued Apr. 13, 1999).

60. *Enola Bean Patent Challenged, supra* note 17.

61. 35 U.S.C. § 102(a) (2000).

62. RAFI, *Mexican Bean Biopiracy: US-Mexico Legal Battle Erupts over Patented "Enola" Bean, at* http://www.rafi.org/documents/geno_mexicanbean.pdf (Jan. 15, 2000) [hereinafter *Mexican Bean Biopiracy*].

63. *The Right to Good Ideas: Patents and the Poor*, ECONOMIST, June 23, 2001, at 21.

64. Pratt, *supra* note *3*.

65. *Mexican Bean Biopiracy*, *supra* note 62. Professor James Kelly provides documentation from Beans of New York, vol. 1. – Part II of the Vegetables of New York,

enough time to develop a new bean. In the patent, Proctor admits he purchased the beans in Mexico and then brought them to the United States in 1994.[66] Two years later, Proctor applied for the patent.[67] A new variety generally takes a decade to breed in order to develop genetic uniqueness.[68] Therefore, Proctor could not have created a new variety of bean in only two years. Third, the patent challengers criticize the patent's claim on any Phaseolus vulgaris (dry bean) having a seed color of a particular shade of yellow.[69] CIAT, which holds 260 varieties of yellow beans in its gene bank, has at least six beans that are substantially identical to the traits described in the Enola patent.[70] Thus, the Enola bean's novelty cannot be based solely on its yellow color. For the aforementioned reasons, the Enola patent fails the statutory requirement of novelty and should be invalidated under U.S. patent law.

2. Was the creation of the Enola bean obvious?

Obvious inventions are not patentable.[71] Under 35 U.S.C. § 103, a patent may not be obtained if the invention "would have been obvious at the time the invention was made to a person having ordinary skill in the art."[72] This requirement posits whether the invention would have been "readily apparent to a skilled worker in the particular field."[73] In this case, a skilled

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which was published in 1931 by J.B. Lyon Company, Printers, Albany, New York. According to Kelly, this book is a valid and accurate catalogue of beans grown and consumed in the United States in the 1930s. *Id.* at n.16.

66. U.S. Patent No. 5,894,079 (issued Apr. 13, 1999). Proctor now claims he bought the beans in 1990 and started breeding them immediately. Friedland, *supra* note 23. However, even that date is disputed because Proctor's lawyer admits Proctor brought the beans to the United States in 1991. Pratt, *supra* note 3. Proctor has requested the U.S. Patent and Trademark Office change his patent to reflect the correct date. Friedland, *supra* note 23.

67. U.S. Patent. No. 5,894,079 (issued Apr. 13, 1999). Proctor filed the patent on November 15, 1996. *Id.*

68. Friedland, *supra* note 23. Some activists have suggested Proctor is a "botanical bandit." For example, Professor James Kelly, a professor of soil and crop science at Michigan State University, believes Proctor is a botanical bandit because "he clearly did not have enough time to develop uniqueness in genetic terms." *Id.*

69. *Id.* CIAT explained the patenting of a particular color, like the specific yellow in this case, will make a mockery of the patent system. *Id.*

70. *Enola Bean Patent Challenged, supra* note 17.

71. Brian C. Cannon, Note, *Toward a Clear Standard of Obviousness for Biotechnology Patents*, 79 CORNELL L. REV. 735, 736 (1994).

72. 35 U.S.C. § 103 (2000).

73. Cannon, *supra* note 71, at 745.

worker would be an ordinary bean farmer, including a Mexican bean farmer, who has been improving these seeds through breeding for generations.[74] Proctor did not invent a new bean; instead, he intensively bred the seeds for a few years.[75] Therefore, it is probable that Proctor's invention is obvious to a ordinarily skilled bean farmer. As a result, the Enola patent fails the nonobvious requirement.

C. Novelty and the Necessity of Published Foreign Evidence

The application of U.S. patent law to the Enola patent raises another issue. Specifically, the narrow U.S. definition of "novelty" often precludes other countries from preventing companies like Pod-Ners from patenting indigenous life forms such as the Enola bean. For example, a party may invalidate a U.S. patent for lack of novelty only if there has been prior knowledge, use, or invention in the United States.[76]

Similar activity outside the United States cannot be used to invalidate a U.S. patent.[77] In the case of the Enola bean, the growth of identical beans in Mexico will not invalidate Proctor's patent because mere use in a foreign country is not sufficient evidence to negate novelty according to 35 U.S.C § 102(a). However, farming identical beans in the United States prior to Proctor's application for the patent would have been sufficient evidence to invalidate Proctor's patent. Hence, an actual patent of a known or used invention, or an invention that was described in a printed publication, is the only foreign evidence that can invalidate

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74. Pratt, *supra* note 3. "There has been no breeding or improvement in this bean, and newness is the first feature for claiming an invention under U.S. patent law," said Daniel Debouck. Debouck, a genetic resources specialist who presides over the collection of seeds at CIAT's gene bank, also said at least 260 of the 28,182 seeds in the bank are similar to the Enola bean. *Id.*

75. *US Firm in Bean Patent Row*, *supra* note 18. The technical validity of Proctor's invention has also been questioned. Professor James Kelly stated:

> On a scientific level, I would challenge the procedure [the inventors] used as not being unique since beans are highly self-pollinating and [the inventors] simply grew pure homozygous seed of yellow beans from a seed mixture which self pollinated to reproduce itself. Nothing unique was invented, and this is a routine procedure used by bean breeders to maintain purity of genetic stocks and varieties.

Mexican Bean Biopiracy, *supra* note 62.

76. A patent may not be granted if it is "known or used by others in this country, or patented or described in a printed publication in this or a foreign country." 35 U.S.C § 102 (2000); *see also* Jain, *supra* note 4, at 815.

77. Jain, *supra* note 4, at 815.

a U.S. patent.[78] Therefore, if a foreign country chooses not to patent a particular item for any reason, including moral opposition to the patenting of life forms, the "invention" will be patentable in the United States because it is still considered novel under U.S. patent law.

This narrow definition of novelty in U.S. patent law has been defined as the "ignorance of the West."[79] If patents intend to protect innovation, U.S. patent law must respect the innovation that occurs in the global community and prevent domestic inventors from free-riding on foreign invention. For this reason, the legal community must consider expanding the type of foreign evidence that can be used to invalidate a U.S. patent. Unfortunately, neither the U.S. courts nor the legal community has addressed this issue.

D. Without Any Debate: The Patenting of Life Forms in the United States

Twenty years after *Chakrabarty*, the issue of patenting plant life has reemerged. In February 2001, the U.S. Supreme Court granted certiorari in *Pioneer Hi-Bred International, Inc. v. J.E.M. AG Supply, Inc.* to decide whether the U.S. Congress intended the PVPA to be the exclusive way to obtain intellectual property rights for a plant variety.[80] In *Pioneer*, a local agricultural supply company challenged the validity of a major seed company's corn seed patent.[81] Under the PVPA, farmers can save the seed for replanting, and an exemption is given for research.[82] Neither of these rights currently exists under a traditional utility patent.[83] In December 2001, the Supreme Court decided *Pioneer,* affirming

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78. *Id.*

79. SHIVA, BIOPIRACY, *supra* note 9, at 71. For example, W.R. Grace & Co., an agricultural chemical company, patented the neem extract from India's neem tree as a pesticide. Even though Indians in India have been using neem-based pesticides for 2,000 years, the fact that the improvement was "obvious" to them did not defeat the novelty requirement under U.S. patent law. *Id.* at 69–71; *see also* Marden, *supra* note 19, at 284. "For many activists, it is inconceivable that those who merely 'tinkered' with neem seeds should retain all economic benefit." *Id.* at 287.

80. *See* 200 F.3d 1374 (Fed. Cir. 2000), *cert. granted*, 121 S. Ct. 1007 (2001).

81. *See id.* The Court rejected the defendants' claim that patents on plant varieties conflict with the provisions of the Plant Variety Protection Act and are illegal under U.S. law. *Id.*

82. Hamilton, *supra* note 13, at 89.

83. *Id.*

that utility patents can be issued for plants.[84] *Pioneer* and recent cases in both the United States and Europe have substantiated the notion that utility patents can protect seeds and plant varieties.[85] Unlike other countries, however, the United States has never engaged in a social or political debate about the extension of patents to living materials.[86] Thus, the economic and legal basis for the biotechnology sector rests on the Supreme Court's five-to-four decision in *Diamond v. Chakrabarty*.[87] This lack of debate sets U.S. public policy on biotechnology apart from that of other nations, such as India, where policy has been shaped by fundamental moral and ethical issues concerning an individual's ability to own living materials.[88]

III. THE FINE LINE BETWEEN PATENTING AND PIRACY: THE EFFECTS OF PATENTS ON DEVELOPING COUNTRIES

Until the creation of the World Trade Organization (WTO), IPRs were mainly a domestic issue with each country determining its own level of legal protection and enforcement.[89] When WTO members signed TRIPS, an international agreement that determined the minimum standards for the legal protection of intellectual property, IPRs became an international issue.[90] Now, most developing nations complain TRIPS demands the creation of an IPR enforcement system modeled after the Western system at an enormous expense to developing nations without affording a corresponding benefit.[91] Moreover, the Western patent system, which assigns specific property rights to individuals or corporations for well-defined developments, does not incorporate concepts from developing countries, such as traditional knowledge or collective ownership where inventions develop through generations of trial and error.[92]

Recently, a disagreement over the inclusion of agricultural practices, cell lines and seed plasm in the category of "property"

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84. *J.E.M. AG Supply, Inc.*, 534 U.S. at 127
85. Hamilton, *supra* note 13, at 88.
86. *Id.* at 89.
87. *Id.*
88. *Id.* at 89–90.
89. *The Right to Good Ideas: Patents and the Poor*, *supra* note 63, at 21.
90. *See id.*
91. *Id.*
92. *See id.* at 23.

has pitted the United States against the developing world.[93] With the proper system in place, either locally or globally, IPRs can be a valuable international opportunity and not just a threat to the developing world.[94]

A. To Patent or Not to Patent: The Debate over Patenting in Developing Nations

1. Pro-patent arguments

Along with free trade and democracy, intellectual property protection has been categorized as "part of the gospel of modern economic growth."[95] Patent proponents argue intellectual property protection encourages domestic industry, boosts foreign investment, and improves access to new technologies.[96] In addition, a few cases demonstrate how the absence of intellectual property protection can freeze the growth of local talent and ingenuity. For example, in Mexico, international record companies frequently refuse to sign local musicians because two-thirds of the cassettes and compact discs sold in the country are pirated due to lax enforcement of copyright protection.[97] In India, biotech entrepreneurs sell their products to foreign markets because Indian patent law does not protect pharmaceutical products, which have become targets for domestic copycats.[98] Thus, in these situations, patents may prevent free-riding on the inventions of others, and promote innovation.[99]

Patent supporters additionally argue the economic incentive for private involvement in biotechnology will disappear without the ability to claim legal protection for inventions.[100] For instance, without patent protection, biotech companies will not have profit margins sufficient to fund new research.[101] Any decrease in

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93. *See* Aoki, *supra* note 7, at 46.
94. *The Right to Good Ideas: Patents and the Poor*, *supra* note 63, at 23.
95. *Id.* at 21.
96. *Id.*
97. *Id.*
98. *Id.* According to TRIPs, India does not have to provide patent protection in technical areas, such as drugs and pharmaceuticals, until January 1, 2005. Jain, *supra* note 4, at 778–79.
99. *See* Jain, *supra* note 4, at 787.
100. Hamilton, *supra* note 13, at 88.
101. *Id.*

funding may limit research and development, resulting in a decline in product quality and societal benefits.[102]

The United States adheres to a "utilitarian, fruits of one's labor" approach to justify patent protection of living things.[103] This approach promotes innovation by granting property rights where the investment of labor and capital results in the creation of a useful product.[104] For example, in *Moore v. Regents of the University of California,* the California Supreme Court held that a patient did not have any property rights over his cells after his doctor patented the patient's diseased cell line.[105] This U.S. approach towards IPRs suggests the economic incentive for innovation will disappear without an ability to claim legal protection for inventions.[106] Furthermore, society may lose the opportunity to gain the benefits associated with the development of new products and innovations.[107]

2. Anti-patent arguments

Patents have been criticized for allowing transnational corporations (TNCs) to establish monopolies, drive out local competition, and then raise prices for everything from seeds to software.[108] Dr. Vandana Shiva argues "patent protection transforms farmers into suppliers of free raw material, displaces them as competitors, and makes them totally dependent on industrial supplies for vital inputs such as seed."[109] Shiva has labeled the developed world's frantic cry for patent protection, especially in agriculture, as a ruse to control all biological resources.[110]

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102. *See* Jain, *supra* note 4, at 788.

103. Marden, *supra* note 19, at 291; *see also* Ned Hettinger, *Patenting Life: Biotechnology, Intellectual Property, and Environmental Ethics*, 22 B.C. ENVTL. AFF. L. REV. 267, 279 (1995).

104. *See* Marden, *supra* note 19, at 291.

105. 793 P.2d 479, 493 (Cal. 1990).

106. Hamilton, *supra* note 13, at 88.

107. *Id.*

108. *The Right to Good Ideas: Patents and the Poor*, *supra* note 63, at 21.

109. SHIVA, BIOPIRACY, *supra* note 9, at 54. Although it is argued that patent protection is essential for innovation, Shiva suggests IPRs are only essential for innovation that creates profit for corporate business. Farmers and public institutions, on the other hand, do not need patents because they have been making innovations for decades without IPRs or patent protection. *Id.*

110. *Id.*

In addition to the above criticism, patent critics offer several reasons why the developing world opposes IPR enforcement systems. First, intellectual property-rich countries push for patent protection to avoid the piracy of their innovations and inventions, including computer programs, videos, compact discs, movies and other technologies by developing nations.[111] This fear of piracy actually masks the amount of piracy that occurs in the opposite direction as invaluable biological and cultural resources flow out of developing nations as "raw materials" and into the developed nations.[112] Those "raw materials" are then magically transformed into valuable intellectual property by pharmaceutical and agricultural conglomerates.[113] Multilateral agreements, such as TRIPS, underwrite the new value of those intellectual properties.[114]

Second, developing countries cannot create patent systems that mirror the developed world. The U.S. Patent and Trademark Office has an annual budget of $1 billion and a staff of nearly 3,000 highly trained scientists, engineers and legal experts to examine claims.[115] In addition, 600 judges preside over patent disputes.[116] The least-developed countries, in comparison, have no more than six patent examiners each.[117] Additionally, those countries do not have any additional structure to support patent litigation.[118] For a poor country to build a bare-bones infrastructure to implement TRIPS, it will take at least $1.5 million.[119] In the developing world, scarce financial resources can be better spent. Furthermore, if the developing world rushes to patent every plant

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111. Aoki, *supra* note 7, at 49.
112. *Id.*
113. *Id.* For example, Vandana Shiva writes:

> The United States has accused the Third World of piracy. The estimates for royalties lost are $202 million per year for agricultural chemicals and $2.5 billion annually for pharmaceuticals. In a 1986 U.S. Department of Commerce survey, U.S. companies claimed they lost $23.8 billion yearly due to inadequate or ineffective protection of intellectual property . . . [However], if the contributions of Third World peasants and tribespeople are taken into account, the roles are dramatically reversed: the United States would owe Third World countries $302 million in agricultural royalties and $5.1 billion for pharmaceuticals.

SHIVA, BIOPIRACY, *supra* note 9, at 56.
114. Aoki, *supra* note 7, at 49.
115. *The Right to Good Ideas: Patents and the Poor*, *supra* note 63, at 22.
116. *Id.*
117. *Id.*
118. *Id.*
119. *Id.*

and indigenous life form, it will create the "same predatory" intellectual property regime that "threatens food security" and undercuts the "rights of farmers to save seeds [and] promote genetic uniformity."[120]

Third, in many developing countries, a patent system simply will not work.[121] Local farmers fear broad patent protection will raise the price of resources, including seeds, and also make them dependent on varieties developed by corporations instead of allowing them to save and replant their seeds.[122]

Fourth, exclusive rights may negate the beneficial effects of increased foreign investment.[123] For example, after conducting a study on the possible impact of TRIPS, the United Nations Conference on Trade and Development (UNCTAD) concluded that although TRIPS may positively impact developing nations in regards to technology transfer and local innovation, TRIPS may also cause an increase in prices and reduce access to diverse products in many developing countries.[124] Therefore, "simply enacting [western-style] intellectual property laws in a cultural, economic and political vacuum is shortsighted and futile."[125]

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120. *Mexican Bean Biopiracy*, *supra* note 62.

121. Jain, *supra* note 4, at 789.

122. *Id.* For example, in 1971, Robert Larson imported neem seeds to the United States from India to develop a pesticide. Aoki, *supra* note 7, at 51. Larson later patented this pesticide made from neem extract and sold it to W.R. Grace & Co. ("Grace"). Grace and several other companies have received over a dozen patents on neem-based solutions and emulsions. Although Grace has built a plant to process the seeds locally, the price of neem seeds has risen from 300 rupees per ton to 3,000 to 4,000 rupees per ton. Grace and similar companies have turned this mostly free resource into an exorbitantly priced one. Since local farmers cannot afford the same price as the new neem industry, the seed is quickly being diverted from the community where its oil is used for toothpaste and soap to an industry where a handful of companies armed with patents control all access to the production of neem as a raw material. *Id.* at 51–52.

123. Jain, *supra* note 4, at 789.

124. *Id.* at 789–90; *see also* U.N. CONF. ON TRADE & DEV., THE TRIPS AGREEMENT AND DEVELOPING COUNTRIES, U.N. Dec. UNCTAD/ITE/1, U.N. Sales No. 96.II.D.10 (1996). Many of the world's poorest countries are still waiting for the flood of foreign investment, technology transfer and domestic innovation, which was promised as a benefit of creating stronger domestic patent protection. *The Right to Good Ideas: Patents and the Poor*, *supra* note 63, at 22.

125. Aoki, *supra* note 7, at 49 (quoting Ruth L. Gana, *The Myth of Development, The Progress of Rights: Human Rights to Intellectual Property and Development*, 18 LAW & POL'Y 315, 339 (1996)). A patent system modeled after versions in developed nations will trivialize "the contributions of pre-industrial peoples to the wealth of the world's resources in inventions, literature, music and the arts, despite the fact that some of this contribution continues to supply the industrialized world with answers to modern plagues." *Id.*

Additionally, many patent critics believe life forms should not be patented at all.[126] In contrast to the utilitarian approach adopted by the United States, some nations view property, life and patenting from a holistic perspective.[127] According to this view, "an intellectual property right is only created if the object *in toto* would not have existed but for the individual's investment of labor."[128] Accordingly, living organisms, by their nature, have an essential quality that prevents them from ever being "invented."[129] Patents should preserve the innovation of information rather than grant monopolies for the ownership of life.[130] Unfortunately, the United States extended patent protection to living materials before debating the moral and ethical concerns surrounding the ownership of life.[131]

B. Global Patent Enforcement: Taking Advantage of Developing Countries Under the TRIPS Agreement

TRIPS intended to harmonize differing national laws on IPRs,[132] but failed to create a single, universal patent system.[133] Under TRIPS, each country decides how to afford protection to IPRs.[134] Thus, TNCs seeking protection of their intellectual property depend on the patent office in each country to grant IPRs and then enforce them.[135] TRIPS, however, did establish a new arena of trade regulation by: (1) establishing minimum substantive standards of IPRs protection that all WTO members must implement; (2) requiring each member to maintain adequate measures for securing and enforcing IPRs; and (3) subjecting

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126. Jain, *supra* note 4, at 791.
127. *See* Marden, *supra* note 19, at 292.
128. *Id.*
129. *Id.*
130. Jain, *supra* note 4, at 791.
131. Hamilton, *supra* note 13, at 89. In other countries, such as India, where fundamental moral and ethical issues concerning man's ability to own and market living materials are shaping public policy regarding the extension of IPRs to agriculture and biotechnology, the extension of patent protection to living material in the United States rests on the Supreme Court's narrow decision in *Diamond v. Chakrabarty*. Since discourse over this extension has never taken place in the United States, Hamilton suggests it may be impossible for the courts or even Congress "to put the 'gene patent' genie back in the bottle." *Id.* at 89–90.
132. Jain, *supra* note 4, at 780.
133. *The Right to Good Ideas: Patents and the Poor*, *supra* note 63, at 21.
134. *Id.* at 22.
135. *Id.*

TRIPS-related controversies to dispute settlement under the direction of the WTO's Dispute Settlement Understanding.[136]

TRIPS also extended patent protection to computer programs, integrated circuits, plant varieties and pharmaceuticals, which were largely unprotected before the implementation of the agreement.[137] As long as a product or technological process is new, inventive and has an industrial application, a patent lasting twenty years can be granted.[138]

TRIPS also contained a loophole, allowing members to exclude some plants, animals and biological processes from the scope of patentable subject matter.[139] To take advantage of this exception, each member country must provide "for the protection of plant varieties either by patents or by an effective sui generis system or by any combination thereof."[140]

Critics of TRIPS view the agreement as weighted in favor of TNCs and against citizens in general, and peasants in developing countries in particular.[141] TRIPS imposes limitations to the ownership of IPRs, which operate on several levels.[142] First, TRIPS recognizes IPRs only as private rights.[143] This excludes all kinds of knowledge, ideas and innovations that take place in the public sphere, including those in the villages among farmers, and even those in the universities among scientists.[144] By privatizing the intellectual commons, TRIPS de-intellectualizes civil society, creating a corporate monopoly over the existence of knowledge and the mind.[145]

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136. Frederick Abbott, *TRIPS in Seattle: The Not-So-Surprising Failure and the Future of the TRIPS Agenda*, 18 BERKELEY J. INT'L L. 165, 167 (2000).

137. *The Right to Good Ideas: Patents and the Poor*, *supra* note 63, at 22.

138. *Id.*

139. Powledge, *supra* note 2; *see also* Abbott, *supra* note 136, at 169.

140. Jain, *supra* note 4, at 781. *Sui generis*, which means "of its own kind" in Latin, is not defined under the TRIPS agreement. Therefore, individual countries are free to create a system that meets their own needs, as long as it also meets the minimum TRIPS standards. Powledge, *supra* note 2.

141. Shiva, *Third World Women*, *supra* note 1, at 238.

142. *Id.*

143. *Id.*

144. *Id.*

145. *Id.* at 238–39. Shiva explains the universalization of the U.S. patent regime will inevitably lead to intellectual and cultural impoverishment because IPRs, which are recognized as private rights by TRIPS, will displace communal knowledge. See SHIVA, BIOPIRACY, *supra* note 9, at 9–10. In essence, knowledge will become a private right instead of a shared resource.

Second, TRIPS only recognizes IPRs "when knowledge and innovation generate profits, not when they meet social needs."[146] This limitation on intellectual property protection to inventions that produce capital depreciates the social good that can arise from creativity.[147] "In fact, the poorest have to be the most innovative, since they have to create their means of survival while it is daily threatened."[148] Consequently, by only recognizing creativity that results in economic gain, TRIPS falsely assumes that without IPR protection, creativity will not occur.[149]

Third, TRIPS' most significant limitation is that it simply tacks on the prefix, "trade-related."[150] TRIPS states that "patents shall be available for any inventions . . . capable of industrial application."[151] Innovation in developing nations, however, is generally for domestic, local, or public use.[152] As such, that innovation is not protected by TRIPS because it is not related to trade or capable of industrial application. TNCs, on the other hand, innovate to increase their share in the global market.[153] Therefore, TRIPS will protect such innovation because it is "trade-related" and capable of industrial application. As a consequence, the innovation of developing nations remains unprotected while TRIPS enforces TNCs' rights to monopolize innovation, production, distribution and profits.[154]

In addition, the freedom TNCs claim through IPR protection, underwritten in TRIPS, is the same freedom European colonizers have claimed since 1492.[155] When Christopher Columbus treated the license to conquer non-European peoples as a natural right, he

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146. Shiva, *Third World Women*, *supra* note 1, at 239.
147. *Id.*
148. *Id.* at 238.
149. *See* SHIVA, BIOPIRACY, *supra* note 9, at 10–11.
150. Shiva, *Third World Women*, *supra* note 1, at 239.
151. *Id.*
152. *Id.*
153. *Id.*
154. *Id.*
155. SHIVA, BIOPIRACY, *supra* note 9, at 2. Five hundred years after Columbus landed in America, colonization continues through patents and IPRs. In the middle ages, Christian princes conquered land and its people for their king and queen. Today, however, TNCs target life forms and species to be manipulated by biotechnology for their stockholders. The effective occupation of TNCs, supported by modern day rulers, has replaced the past effective occupation by Christian princes. Thus, "the creation of property through piracy of other's wealth remains the same as 500 years ago." *Id.*; *see also* Aoki, *supra* note 7, at 47–48.

set an alarming precedent.[156] Today, patents and genetic engineering are carving new colonies.[157]

C. Intellectual Property Rights: Investment in Developing Countries or Theft of Resources?

1. The IPR debate

Opponents of IPRs argue the industrialized world is using IPRs to exploit developing nations. For example, corporations have freely taken seeds and plants from farmers in developing nations, cultivated them and then sold them back to the farmers as patented material.[158] Since multinational corporations reap huge benefits from the "uncompensated harvesting" of biological resources from developing nations, this practice has been criticized as an "insidious new form of colonialism."[159]

This corporate rush for property rights threatens the global collection of seeds and other plant germplasm. Scholars suggest a "Tragedy of the Anticommons" may occur if too many owners hold rights of exclusion for biological resources.[160] For example, if corporations hold the right to exclude farmers from using a resource like a seed or a plant, farmers will choose to plant another crop as mayocoba bean farmers did in order to avoid paying royalties to Proctor. This creates an under-use of patented biological resources, and possibly leads to less plant diversity in the global community.[161]

Proponents of global protection of IPRs, however, argue IPRs encourage domestic industry, increase foreign investment and improve access to new technology in developing nations.[162]

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156. SHIVA, BIOPIRACY, *supra* note 9, at 2–3.

157. *Id.* at 5.

158. *See* Shiva, *Third World Women*, *supra* note 1, at 240–41.

159. Marden, *supra* note 19, at 280; *see also* SHIVA, BIOPIRACY, *supra* note 9, at 1–5.

160. Aoki, *supra* note 7, at 28. This phenomenon contrasts Garrett Hardin's "Tragedy of the Commons" where too many people have a privilege to use a resource and no one person has a legal right to exclude. The result is over-consumption and depletion of the resource. Heller's Anticommons analysis explains how the expansion of patentable subject matter to include basic biomedical research may actually lead to the development of fewer pharmaceutical products. *See generally* Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 11 HARV. L. REV. 621 (1998).

161. To farmers, plant diversity is a weapon against future pests and pathogens. Powledge, *supra* note 2, at 273.

162. *The Right to Good Ideas: Patents and the Poor*, *supra* note 63, at 21.

Without IPRs, the economic incentive for corporate involvement in biotechnology will disappear, as well as the products that technology creates.[163]

2. Biopiracy: The abuse of IPRs in the global marketplace

In 1999, the Erosion, Technology and Concentration group (ETC), formerly known as RAFI, reported 147 suspected cases of institutional "biopiracy" in which companies in developed nations claim IPRs to traditional materials.[164] ETC claimed industrialized countries are "'knowingly granting plant variety monopolies to plant breeders for cultivars actually bred by farmers in at least [forty-three] Third World countries.'"[165] Like the recently narrowed patent involving basmati rice, the current dispute over Proctor's Enola patent illustrates the abuses of IPRs in the global marketplace. In this dispute, Mexican bean growers and small seed companies are restricted from growing, selling, importing or using yellow bean seeds that resemble the patented Enola bean.[166]

Civil society organizations and farmers have denounced the Enola patent as a "textbook case of biopiracy" for several reasons.[167] First, Proctor admits his proprietary bean seed originated from a bag of dry and edible beans bought in Mexico.[168] Even the Enola patent explains that "the yellow bean, 'Enola' variety is most likely a landrace from the azufrado-type varieties," a variety which originates in Mexico.[169] By acquiring a U.S. patent, Proctor claims ownership of an "improved" variety of a Mexican bean.[170] This is a clear example of "biopiracy" because Pod-Ners, a company in a developed nation, has claimed

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163. Hamilton, *supra* note 13, at 88.

164. Powledge, *supra* note 2, at 273; *see also* Hamilton, *supra* note 13, at 105–06.

165. Powledge, *supra* note 2, at 273 (quoting RAFI, *Plant Breeders Wrongs: 147 Reasons to Cancel the WTO's Requirement for Intellectual Property on Plant Varieties*, *at* http://www.rafi.org/documents/occ_plant.pdf (Sept. 16, 2001)).

166. *See* ETC GROUP, *Proctor's Gamble: Yellow Bean Patent Owner Sues 16 Farmers and Processors in the US*, *at* http://www.rafi.org/documents/ProctorGamblefin.pdf (Dec. 17, 2001) [hereinafter *Proctor's Gamble*]. Proctor, who holds both a U.S. Patent and a U.S. Plant Variety Protection certificate, recently filed a second lawsuit against sixteen small Colorado bean seed companies and farmers. In his complaint, Proctor claims the defendants are violating his patent by illegally growing and selling his Enola bean. *Id.*

167. *Id.* ETC issued a news release calling the Enola patent a "textbook case of biopiracy" because Mexican farmers have grown the yellow beans for centuries. *Id.*

168. *Id.*

169. *Id.*; *see also* U.S. Patent No. 5,894,079 (issued Apr. 13, 1999).

170. *See* Hamilton, *supra* note 13, at 106; *see also* Powledge, *supra* note 2.

intellectual property rights over the mayocoba bean, a traditional material.[171]

Second, Proctor did not breed this seed long enough to genetically create a new variety.[172] The absence of sufficient time to generate a new breed has caused some organizations, including ETC, to label Proctor a "botanical bandit," while others have criticized his patent as an attempt to control an established bean market.[173] Third, CIAT's legal challenge also argues Proctor "misappropriated" the bean, thereby violating Mexico's sovereign rights over its genetic resources as recognized by the CBD.[174]

The patent dispute over basmati rice also demonstrates the international legal conflict concerning the genetic alteration of germplasm and the anger generated when an "impostor" is placed on the market.[175] The U.S. Patent and Trademark Office restricted the wide-scoped patent granted to RiceTec, a U.S. company, to three specific rice grains, none of which are related to any basmati variety grown in India.[176] The original patent claims encompassed ninety percent of rice germplasm and traditional rice lines.[177] The implications of the order from the U.S. Patent and Trademark Office allow RiceTec to sell the rice varieties that it developed previously, but it cannot challenge the sale of imported Basmati rice as an infringement on its patent. Pod-Ners, unlike RiceTec, can still challenge the import and sale of any yellow bean that is similar to the Enola bean and collect royalties on all beans sold in the United States that infringe on the Enola patent.

The Enola bean and basmati rice are not the only commodities involved in an international dispute over alleged

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171. *See id.*

172. Friedland, *supra* note 23.

173. *Id.*; *see also* Carlsen, *supra* note 20. Ricardo Hernandez, Mexico's director of foreign trade and agriculture ministry, said the bean dispute is about money. Pod-Ners interests were not based on patenting a seed, but on conquering the bean market. *Id.* at 60.

174. *Proctor's Gamble, supra* note 166. Article 15 of the CBD governs access to genetic resources. Paragraph one recognizes "the sovereign rights of states over their natural resources," and also states the authority to determine access to genetic resources belongs to national governments. CBD, *supra* note 4, at 828.

175. *See* Balu, *supra* note 5. As the U.S. appetite for ethnic and exotic food grows, entrepreneurs are producing and packaging these goods in the United States. Basmati, the gold standard of rice, is distinctively shaped due to the water of the Himalayan streams. India and Pakistan argue basmati rice can only come from a certain region in the two countries near the Himalayas. *Id.*

176. *Id.*

177. *See Order Can't Block Basmati Exports, supra* note 5.

biopiracy. At least twenty-two plant genetic resources from India alone have been patented in the United States after slight modification, including the neem, turmeric, and mustard plants.[178] Ironically, even though most plant diversity originates in the developing world, most seeds and plant materials are under the control of the developed world and its corporations.[179] Originally, they were taken freely from peasants and farmers.[180] Now, they are sold back as patented materials.[181] IPRs and patents have become the sophisticated names for modern piracy.[182] Unfortunately, corporations in the developed world will continue to carve out new colonies through patents until "[t]he land, the forests, the rivers, the oceans, and the atmosphere have all been colonized, eroded, and polluted."[183] Thus, biopiracy will thrive in the international community until there is no more capital to gain.

IV. CONCLUSION

Seeds—like water and air—must remain the common property of farmers, and not the exclusive property of corporations. Scientists today have discovered how to modify plants in ways unknown to nature. Many of these genetic alterations have helped the developed world conquer modern plagues like disease and famine. These technological advances, however, also threaten the global diversity of seeds and other plant germplasm. For example, plant breeders and farmers need diversity in germplasm to evade the pests and pathogens of the next generation.[184] Exclusive ownership of biological resources will reduce biodiversity because too many will hold the privilege to exclude.[185] Consequently, these resources will become underused and underdeveloped. The recent push by TNCs to broaden the regime of IPRs and solidify global free trade endangers the welfare of the developing nations who depend on biological resources for food, health, energy and housing. Moreover, it also

178. Jain, *supra* note 4, at 816.
179. Shiva, *Third World Women*, *supra* note 1, at 240.
180. *Id.*
181. *Id.*
182. SHIVA, BIOPIRACY, *supra* note 9, at 122.
183. *Id.* at 5.
184. Powledge, *supra* note 2, at 273.
185. *See* Aoki, *supra* note 7, at 28.

endangers the diversity of food on which the entire world population depends.

Therefore, the U.S. Patent and Trademark Office must revoke Pod-Ners' Enola patent because the patent fails to meet the statutory requirements of novelty and non-obviousness. In effect, the Enola bean is not a novel variety that merits a patent.

The U.S. Patent and Trademark Office must also expand its use of traditional foreign evidence to invalidate patents. Although prior knowledge, use or invention in the United States can be used to challenge the novelty of a U.S. patent, the only foreign evidence that qualifies to invalidate a U.S. patent is a foreign patent or a description of the invention in a foreign publication.[186] In the Enola bean controversy, the growth of mayocoba beans in Mexico is not sufficient to refute the Enola patent because there is no published evidence of their existence or use. If the beans had been grown on the U.S. side of the border, however, the Enola patent could be refuted without any published evidence. The current U.S. requirement, which only allows published evidence to invalidate a U.S. patent, ignores the vast discrepancy between the patent enforcement systems in the developed and developing nations. In addition, it skews access to IPRs towards developed nations whose TNCs already possess the majority of IPRs.

Finally, the international community must determine how to regulate the massive and generally uncompensated flow of cultural and biological resources out of the developing world. At a U.N. Conference on the Environment and Development in Brazil, President Ali Hassan Mwinyi of Tanzania said:

> Most of us in developing countries find it difficult to accept the notion that biodiversity should flow freely to industrial countries while the flow of biological products from the industrial countries is patented, expensive and considered the private property of the firms that produce them. This asymmetry reflects the inequality of opportunity and is unjust.[187]

If developed nations continue to implement TRIPS, the transfer of funds from poor to rich countries will dramatically

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186. 35 U.S.C. § 102 (2000); *see also* Jain, *supra* note 4, at 815.

187. *See* Craig D. Jacoby & Charles Weiss, *Recognizing Property Rights in Traditional Biocultural Contribution*, 16 STAN. ENVTL. L.J. 74, 89 (1997). President Mwinyi made this statement at the U.N. Conference on the Environment and Development in Brazil, also known as the Earth Summit. *See* Marden, *supra* note 19, at 288.

increase the debt of the developing world.[188] The international community must rapidly decide how expansively to define IPRs before all traditional materials, like the Enola bean, become the property of corporate entities instead of the seeds and sustenance of farmers.

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188. SHIVA, BIOPIRACY, *supra* note 9, at 56.

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