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## **The Neem Tree Patent: International Conflict over the Commodification of Life**

by

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# The Neem Tree Patent: International Conflict over the Commodification of Life

Emily Marden\*

## INTRODUCTION

Biotechnology<sup>1</sup> has revolutionized the pace of innovation in the life sciences by allowing scientists efficient means of isolating and altering individual traits. For example, in agriculture, innovators have produced plants custom-designed for resistance to specific pests, bacteria altered to bypass growth-limiting natural soil cycles, and natural pesticides created to compete against the more toxic synthesized ones.<sup>2</sup> Scientists even claim to have formulated a tree with a higher cellulose content which will make future paper production more efficient. Biotechnology has had similarly spectacular effects in the pharmaceutical industry. There, researchers have already produced a raft of new drugs, promising to treat everything from cancer to hypertension.<sup>3</sup>

In large part, this wave of innovation has been fueled by material gathered from biologically diverse regions of the globe in a process generally known as "bio-prospecting." Bio-prospectors are the modern incarnation of earlier prospectors: they travel to "untapped" geographical regions with the aim of amassing either local knowledge of useful biological applications or genetic samples from plants, animals,

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<sup>1</sup> "Biotechnology" is not an easy term to define even for experts working within the industry. The Convention on Biological Diversity ("CBD") defines it as "any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use." Convention on Biological Diversity, June 5, 1992, art. 2, 31 I.L.M. 818, 823 [hereinafter CBD]. Following this usage, I am using the term herein to include any innovation that uses biological knowledge as its starting point. I realize that this usage is broader than common American usage which refers solely to practices using recombinant DNA techniques.

<sup>2</sup> See SHELDON KRIMSKY & ROGER P. WRUBEL, AGRICULTURAL BIOTECHNOLOGY AND THE ENVIRONMENT 167-68 (1996); see also *Don't Eat Your Veggies*, GRASS ROOTS & PUB. POL'Y (FOUND. ON ECON. TRENDS), Fall 1995, at 8; Michael Pollan, *Playing God*, N.Y. TIMES, Oct. 25, 1998.

<sup>3</sup> See generally CURTIS M. HORTON, *Protecting Biodiversity and Cultural Diversity Under Intellectual Property Law: Toward a New International System*, 10 J. ENVTL. L. & LITIG. 1 (1995).

and humans for later use in product research and development. By availing themselves of this wide spectrum of material, innovators gain an invaluable source of material and product possibilities.<sup>4</sup> Thus far, this practice has been enormously productive for American industry. At present, biotechnology is one of the fastest growing industries in the world with total product sales for the United States biotechnology industry of approximately \$4 billion in 1991, and a promise, by one estimate, of at least \$50 billion in sales in the year 2000.<sup>5</sup> No one doubts that access to the world's biodiversity is important for the industry's continued development.

At the same time, there are grave concerns about the manner in which biological resources are being appropriated from these biologically diverse—and generally “developing”—countries. The uncompensated “harvesting” of biological resources from developing states can be seen as an insidious new form of colonialism, since multinational companies reap huge benefits while none of the profits flow back to the states providing the resources.<sup>6</sup> In this sense, some observers refer to the Western innovators as “pirates”: they engage in an illegal and immoral operation of stealing indigenous knowledge and genes with the ultimate aim of making themselves richer while keeping the poorer nations poor.<sup>7</sup> According to Vandana Shiva, one of the world's most prominent activists on this issue, this practice of plundering the developing world's natural resources has a long history. For her, biological “strip-mining” is simply a continuation of the British Empire's efforts to take India's riches while oppressing her subjects. She points out that the West also used the promise of a “better life” to dupe developing nations into consenting to increased dependence on the industrial world in the Green Revolution—a revolution which, she asserts, ultimately resulted in more crop failure, poverty, and disease.<sup>8</sup>

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<sup>4</sup> See, e.g., Peter J. Goss, *Guiding the Hand that Feeds: Toward Socially Optimal Appropriability in Agricultural Biotechnology Innovation*, 84 CAL. L. REV. 1395, 1400–03 (1996).

<sup>5</sup> See J. Leslie Glick, *The Industrial Impact of the Biological Revolution*, in TECHNOLOGY AND THE FUTURE 364 (Albert H. Teich ed., 5th ed. 1990).

<sup>6</sup> This is a complaint shared by many leaders of developing countries. See Craig D. Jacoby & Charles Weiss, *Recognizing Property Rights in Traditional Biocultural Contribution*, 16 STAN. ENVTL. L.J. 74, 89–91 (1997). Activists also share this complaint. See generally VANDANA SHIVA, *BIOPIRACY: THE PLUNDER OF NATURE AND KNOWLEDGE* (1997) [hereinafter SHIVA, *BIOPIRACY*]; VANDANA SHIVA, *MONOCULTURES OF THE MIND* (1993) [hereinafter SHIVA, *MONOCULTURES*].

<sup>7</sup> See SHIVA, *BIOPIRACY*, *supra* note 6, at 81–84.

<sup>8</sup> See generally VANDANA SHIVA, *THE VIOLENCE OF THE GREEN REVOLUTION* (1991). Therein, she argues that the Green Revolution, like British colonial practices, was “sold to” India (and other nations) as a vehicle for improving the lives of natives, and that in actuality it destroyed ecologi-

Opposition to Western use of biological resources poses a very real threat to the continued development of the biotechnology industry. International law allows nations to prevent interference with property inside their borders.<sup>9</sup> Thus, nations that are unhappy with the property rights protection given to genetic resources have several possible options. One approach would be to nullify intellectual property rights given to commercial products that were developed from appropriated genetic resources.<sup>10</sup> Alternatively, a country could simply physically exclude researchers or corporations.<sup>11</sup> Depending on interpretation, the Convention on Biological Diversity ("CBD") appears to make these threats a real possibility. Article 15 of the CBD, for example, recognizes a limited sovereign property right in genetic material found within a nation's boundaries.<sup>12</sup> In addition, the CBD has been interpreted as requiring technology transfer to developing countries in exchange for the right to use biological resources.<sup>13</sup> Regardless of interpretation, many in the developing world are threatening to obstruct continued bio-prospecting until Western researchers and corporations make a fairer deal. To avoid these types of threats, it is in the best interest of the United States to understand what is at stake in international patent disputes and then to consider revising current practices.

This paper attempts to take a first step in this process by examining the issues underlying a single recent dispute. My subject is the uproar that came about after a U.S. company obtained a patent on an extract of the neem tree, a culturally significant Indian resource. My aim is to look beyond the heated rhetoric surrounding the controversy in order to reach an understanding of what is actually at stake for the various parties. I will begin by looking first at the background and unfolding

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cally sound agricultural practices, introduced new—more dreadful—agricultural plagues, and made Indian farmers wholly dependent on Western seed companies.

<sup>9</sup> See U.N. CHARTER OF ECONOMIC RIGHTS AND DUTIES OF STATES art. 29.

<sup>10</sup> See Christopher D. Stone, *What to Do About Biodiversity: Property Rights, Public Goods, and the Earth's Biological Riches*, 68 S. CAL. L. REV. 577, 601 (1995) (and following pages).

<sup>11</sup> See Richard Stone, *Proposed Global Network for Ecology Data Stirs Debate*, SCIENCE, NOV. 18, 1994, at 1155 ("[T]he African delegations [to the Biodiversity Convention] are expected to announce a temporary ban on commercial access to their biological resources until they and other countries can develop rules on 'fair and equitable sharing of benefits' . . ."). This shutting of borders is of global concern as well because of the fear that biodiversity will continue to decrease and opportunities for beneficial projects will be lost forever. See, e.g., Vandana Date, *Global "Development" and its Environmental Ramifications—the Interlinking of Ecologically Sustainable Development and Intellectual Property Rights*, 27 GOLDEN GATE U. L. REV. 631, 633–36 (1997).

<sup>12</sup> See CBD, *supra* note 1, art. 5.

<sup>13</sup> See Date, *supra* note 11, at 643–49.

of the controversy. Then, I will turn to its causes, in an effort to reach the heart of the dispute.<sup>14</sup>

A number of explanations have been offered in terms of other bio-prospecting disputes. Some have identified the problem behind such disputes as simply the lag in scientific ability between developed and developing countries. They claim that tensions will dissipate as these nations invest more money in science and revamp their patent processes so that they too produce valuable patents.<sup>15</sup> Others have located the cause in the unequal distribution of wealth and the failure by successful bio-prospectors to recognize source nations or groups as contributors to innovations.<sup>16</sup> Still others have maintained that controversies are the natural outgrowth of an unfair system of international intellectual property rights, including those in the Agreement on Trade Related Aspects of Intellectual Property Rights ("TRIPS"). They argue that because these laws only recognize individual innovations which were "scientifically" achieved, the typically communal, "folk" knowledge of developing countries are excluded, leading to unrest.

My analysis of the neem tree incident shows that all of these factors play a part. However, I also believe that at root the dispute is a philosophical one over the morality and desirability of commodifying life. Thus, like *Moore v. Regents of the University of California*, the dispute pits a utilitarian approach to intellectual property law against a more holistic, essentialist one.<sup>17</sup> Thus, in the end, this controversy cannot be easily resolved simply by compensating India or by rewriting laws. Rather, any solution will have to involve not only economic considerations, but also a serious discussion of closely held philosophical beliefs

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<sup>14</sup> My assumption here is that the debate operates on both a substantive and a symbolic level. Following anthropologist Clifford Geertz and historian Richard Darnton, I present the "meanings" implicit in the discussion. For an extensive discussion of this theoretical approach, see generally ROBERT DARNTON, *THE GREAT CAT MASSACRE* (1985); CLIFFORD GEERTZ, *THE INTERPRETATION OF CULTURES* (1973).

<sup>15</sup> See Ashok Sharma, *Tree Focuses Debate On Control of Resources*, L.A. TIMES, Nov. 19, 1995, at A6.

<sup>16</sup> See, e.g., Sandy Tolani, *Against the Grain: Multinational Corporations Peddling Patented Seed and Chemical Pesticides are Poised to Revolutionize India's Ancient Agricultural System. But at What Cost?*, L.A. TIMES, July 10, 1994, at 18. This position largely underlies the CBD. Also, the Merck-INBIO agreement takes this as its fundamental presumption, with payment going to Costa Rica for use of natural resources. See *The Merck-InBio Agreement* (visited Mar. 19, 1999) <<http://www.idrc.ca/books/725.differen.html>> (discussing the agreement). It should be noted, however, that this agreement has not been universally embraced. See *People, Plants, and Patents* (visited Mar. 9, 1999) <<http://www.idrc.ca/books/differen.html>> (discussing the agreement and perspective on it).

<sup>17</sup> See generally *Moore v. Regents of the Univ. of Cal.*, 793 P.2d 479 (Cal. 1990).

and the role they should play in harmonizing international intellectual property law.

### I. THE NEEM TREE CONTROVERSY

The neem tree, *azadirachta indica*, is known in Sanskrit as "sarva-roga nivarini" or "curer of all ailments."<sup>18</sup> The tree is tightly interwoven with the fabric of Indian culture: in some regions, the new year begins with eating the tender shoots of the neem tree while in other areas, the tree is worshipped as sacred.<sup>19</sup> In addition, the tree has long been known as an amazing resource. Ordinary Indians use neem tree bark to clean their teeth.<sup>20</sup> Neem-leaf juice is used to prevent psoriasis and other skin disorders and to control parasitic infections.<sup>21</sup> Neem extract is applied as an antidote to malaria.<sup>22</sup> Neem tree seeds are valued as a spermicide and an insecticide.<sup>23</sup> Neem oil is currently even being tested as a female contraceptive.<sup>24</sup>

The West was alerted to the tree's wonders in 1959, when a German entomologist reported that neem trees were spared during a locust swarm that devoured all other foliage.<sup>25</sup> Since then, researchers in India and elsewhere have identified azadirachtin, a powerful insecticide that is not harmful to humans, as one of the seed's active substances. Long before any official discovery, farmers in India had been applying this knowledge. The usual practice was to break up the seeds, soak them in water or alcohol, and then use the resulting emulsion on crops. For the farmers, application of neem as a pesticide was only limited by the rapid degradation of the chemical solution.<sup>26</sup>

In the early 1990s, a group of American researchers innovated on this knowledge and found a way to alter the active ingredient to create a storage-stable version of the extract.<sup>27</sup> As a result, in June 1992 the

<sup>18</sup> See Lori Wolfgang, *Patents on Native Technology Challenged*, SCIENCE, Sept. 15, 1995, at 1506; see also SIR MONIER MONIER-WILLIAMS, A SANSKRIT-ENGLISH DICTIONARY 888 (1970).

<sup>19</sup> See SHIVA, *BIOPIRACY*, *supra* note 6, at 69.

<sup>20</sup> See Clair Wood, *'Miracle tree' Has Promise*, BANGOR DAILY NEWS, Dec. 5, 1997, at A1; see also *A Cure All!* (visited Mar. 19, 1999) <<http://www.ajts.com/neemtree>>.

<sup>21</sup> See Marilitz Dizon, *Panacea for a Hundred and One Ailments*, BUS. DAILY, Jan. 13, 1997, at A1.

<sup>22</sup> See *id.*

<sup>23</sup> See *id.*; see also *A Cure All!*, *supra* note 20.

<sup>24</sup> See Wood, *supra* note 20, at A1; *A Cure All!*, *supra* note 20.

<sup>25</sup> See Paul Hoversten, *Legal Battle Takes Root over "Miracle Tree"*, USA TODAY, Oct. 18, 1995, at 8A.

<sup>26</sup> See Jacoby & Weiss, *supra* note 6, at 75-76.

<sup>27</sup> See U.S. Patent No. 5,124,349, available in LEXIS, Patent Library, All File.

United States Patent Office issued Patent No. 5,124,349 to W.R. Grace & Co. ("Grace"), an agricultural chemical company based in Boca Raton, Florida, on this particular derivative of the neem tree.<sup>28</sup> The Grace patent covers both a method of creating a stabilized azadirachtin in solution and the stabilized azadirachtin solution itself,<sup>29</sup> processes which make the extract both more valuable to the pesticide industry and more useful to farmers.<sup>30</sup> In March 1994, the Environmental Protection Agency registered Neemix, Grace's stabilized azadirachtin solution, for use on food crops. Neemix is the first product derived from the neem tree approved for such use in the United States.<sup>31</sup>

On its face, the Grace patent appears to be an unexceptional example of American discovery, innovation, and commercialization. According to U.S. law, purification or modification of a naturally occurring compound can result in the award of a patent with claims to the purified substance.<sup>32</sup> Further, the Grace patent appears to satisfy 35 U.S.C. sections 101, 102, and 103 requirements that the invention (1) has some practical usefulness, (2) is novel in relation to the "prior art," (3) is not obvious from the "prior art" to a person of ordinary skill in the art at the time the invention was made, and (4) provides a description that is adequate to enable a knowledgeable person to practice the invention in the best mode.<sup>33</sup> The fact that some contend that the improvement was "obvious" in India to Indian farmers does not itself defeat patentability in the United States.<sup>34</sup> As it stands, section 102(a) and (b) provide that foreign knowledge can only defeat a U.S. patent's novelty claim if that foreign knowledge appeared in a printed publication before the invention or application by the U.S. applicant.<sup>35</sup>

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<sup>28</sup> See *id.*

<sup>29</sup> See *id.*

<sup>30</sup> See Richard H. Kjeldgaard & David R. Marsh, *A Biotech Battle Brewing*, LEGAL TIMES, Dec. 11, 1995, at 16.

<sup>31</sup> See John F. Burns, *Tradition in India vs. a Patent in the United States*, N.Y. TIMES, Sept. 15, 1995, at D4; Wolfgang, *supra* note 18, at 269.

<sup>32</sup> See, e.g., *In re Kratz*, 592 F.2d 1169 (C.C.P.A. 1979) (compound purified from strawberries can receive a patent even though that compound existed, in a non-purified form, in strawberries); see also *Diamond v. Chakrabarty*, 447 U.S. 303 (1980).

<sup>33</sup> 35 U.S.C. §§ 101-103 (1997).

<sup>34</sup> See Shayana Kadidal, *Subject-Matter Imperialism? Biodiversity, Foreign Prior Art and the Neem Patent Controversy*, 37 IDEA 371, 373 (1997) ("Vandana Shiva, one of many activists opposing Grace's patent . . . [claims that] 'novelty exists mainly in the context of the ignorance of the West.'").

<sup>35</sup> 35 U.S.C. § 102. For a very good analysis of the effect of these provisions on the neem controversy, see generally Kadidal, *supra* note 34.

Further, it is not clear that the Grace patent will have any actual economic or social effect in India. Indian farmers continue to be free to use their own neem extractions in whatever manner they desire, and Indian patent law historically has forbidden ownership of agricultural and medicinal products.<sup>36</sup> Even more, Grace claims that the company will not seek an analogous patent in India, even post-TRIPS implementation, because the Indian patent process operates too slowly to make it useful.<sup>37</sup> In any case, it is doubtful that India will implement so-called "pipeline" protection, which would extend patent status to products already under patent elsewhere when their subject matter first becomes available in India. Pipeline protection is explicitly not required under TRIPS for applications preceding the entry-into-force, though it is required for subsequent applications.<sup>38</sup> Also, the argument has been made that the Grace patent may actually benefit Indian farmers. Grace is processing its seeds in India, and therefore in addition to harvesting neem for personal use, Indian farmers may gain the opportunity to sell the product to processors.<sup>39</sup> Neem may become India's new cash crop.

Nonetheless, to activists around the world, the Grace patent has become a rallying point against the Western imperial appropriation of developing countries' biological knowledge and resources.<sup>40</sup> Among other complaints, activists contend that the W.R. Grace patent is illegal because it fails to recognize Indian knowledge and therefore is not novel.<sup>41</sup> In this sense, they view the patent as an example of how those "who have the muscle power . . . will snatch whatever [they] can."<sup>42</sup> They also object to the neem patent on moral grounds, complaining that the plant is sacred and that the patent is therefore a "violation of

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<sup>36</sup> See *Group Challenges W.R. Grace Pesticide Patent*, REUT. BUS. REP., Sept. 13, 1995, available in LEXIS, News library, Reubus file.

<sup>37</sup> See *Grace Issues Statement about Patent for Neem Pesticide*, UNIVERSAL NEWS SERVICES, Sept. 15, 1995, available in LEXIS, News Library, Wires File.

<sup>38</sup> See General Agreement on Tariffs and Trade: Multilateral Trade Negotiations Final Act Embodying the Result of the Uruguay Round of Multilateral Trade Negotiations, Apr. 15, 1994, Annex 1C: Agreement on Trade-Related Aspects of Intellectual Property Rights, art. 70.1, 70.8, 33 I.L.M. 1197. Without pipeline protection, Grace's U.S. patent would presumably constitute prior art for a parallel Indian application, even if it was not found *per se* obvious in light of prior use or knowledge within India.

<sup>39</sup> See Kathleen R. Terry & Warren D. Woessner, *Bring Them Back Alive! Patents on 'Products of Nature'*, (visited Mar. 19, 1999), <<http://www.slwk.com/paper9.html>>; see also Wolfgang, *supra* note 18, at 1506.

<sup>40</sup> See Burns, *supra* note 31, at D4.

<sup>41</sup> See Wolfgang, *supra* note 18, at 1506. See also *Group Challenges W.R. Grace Pesticide Patent*, *supra* note 36.

<sup>42</sup> Burns, *supra* note 31, at D4, quoting Dr. Vaidya Satyaa Pal, an Indian physician.



[Indian] identity."<sup>43</sup> Ultimately, in September 1995, a coalition of 225 agricultural, scientific, and trade groups as well as over 100,000 individual Indian farmers, led by the organization the Foundation on Economic Trends, filed a legal petition with the U.S. Patent and Trademark office. The petition argued that the patent should be revoked on grounds that it lacked novelty, and in addition, was immoral.<sup>44</sup> The coalition vowed that it would make the W.R. Grace patent a watershed in international intellectual property disputes, in which it would convince the world that the West was guilty of rampant intellectual piracy.<sup>45</sup>

## II. ANALYSIS

### A. *Economic and Legal Concerns*

Lurking behind the neem dispute is a sense of anger and fear at the power of multinational corporations to transform India. In India, activists commonly portray the multinational corporations as an evil force destroying the delicate fabric of Indian life.<sup>46</sup> Grace is thus invoked as the pillager of a beloved Indian tradition and the destroyer of Indian farmers' agricultural rights.<sup>47</sup> In this sense, it is important to recognize that the battle over the Grace patent is in part the latest installment of a longer effort to thwart the development process from transforming India into just another industrialized economy modeled on the West.<sup>48</sup> This sentiment is evident throughout bio-prospecting discussions:

<sup>43</sup> Sinikka Tarvainen, *Indigenous Peoples Protest Against "Biocolonialism,"* DEUTSCHE PRESSE-AGENTUR, Nov. 29, 1997, available in LEXIS, World Library, Allnws file; see also Burns, *supra* note 31, at D4, quoting Jeremy Rifkin ("What many Americans have not realized is . . . the anger, frustration, and resentment in the developing countries against what they regard as piracy of their heritage . . .").

<sup>44</sup> See Burns, *supra* note 31, at D4; see also Kurt Kleiner, *Pesticide Tree Ends Up in Court*, NEW SCIENTIST, Sept. 16, 1995, at 7; Michael D. Lemonick, *Seeds of Conflict: Critics Say a U.S. Company's Patent on a Pesticide from an Indian Tree is "Genetic Colonialism,"* TIME, Sept. 25, 1995, at 50.

<sup>45</sup> See Burns, *supra* note 31, at D4.

<sup>46</sup> See *Bioprospecting/Biopiracy and Indigenous Peoples*, RURAL ADVANCEMENT FOUND. INT'L (RAFI) COMMUNIQUE, Nov./Dec. 1997 (visited Mar. 22, 1999) available in <<http://www.latin-synergy.org/bioprospecting.html>>. See also SHIVA, *BIOPIRACY*, *supra* note 6, at 81 (specifically accusing transnational corporations of hijacking the TRIPS agreement to their own ends).

<sup>47</sup> See, e.g., Tarvainen, *supra* note 43; Wolfgang, *supra* note 18, at 1506; *Group Challenges W.R. Grace Pesticide Patent*, *supra* note 36. This perspective is also vividly illustrated by the violent demonstrations against the GATT that took place in India. In one incident, activists stormed into Cargill's Indian headquarters, destroyed seed stocks, and burned corporate records, all in an effort to stop the corporation from manipulating India into further agricultural dependence. See Tolan, *supra* note 16, at 18.

<sup>48</sup> See John F. Burns, *Ancient Hindu Festival Thrives in Computer-Age India*, N.Y. TIMES, Apr. 16,

Development is a beautiful word, suggesting evolution from within. . . . But the ideology of development has implied the globalization of the priorities, patterns, and prejudices of the West. Instead of being self-generated, development is imposed. Instead of coming from within, it is externally guided. Instead of contributing to the maintenance of diversity, development has created homogeneity . . . .<sup>49</sup>

For many, the neem tree controversy is more specifically about the inequitable distribution of Grace's economic gain. For many activists, it is inconceivable that those who merely "tinkered" with neem seeds should retain all economic benefit. They maintain that Indians provided the raw material—an assiduously cultivated understanding of the neem tree's properties—and that therefore they are the rightful beneficiaries of any commercial development.<sup>50</sup> Indeed, there is a substantial amount of money at stake in these types of disputes. One report estimates that the developing world would gain \$5.4 billion per year if multinational food, seed, and pharmaceutical firms paid royalties for local knowledge and plant varieties.<sup>51</sup> Examples of one-way flow are numerous. For example, the native Indian plant *rauwolfina serpentina* provides raw material for a hypertension drug with \$260 million in U.S. sales annually, yet none of the profits flows back to India.<sup>52</sup>

Concerns about this economic phenomenon are widely shared. Indian activist Vandana Shiva maintains that the economic inequality between the affluent industrialized countries and the poor Third World ones was produced by 500 years of colonialism and the continued creation of mechanisms for draining wealth out of the Third World. Moreover, she accuses the industrialized world of using contemporary intellectual property regimes to further this kind of exploitation.<sup>53</sup> For Shiva and others, India stands only to lose when multinational corporations come seeking short-term monetary gain.<sup>54</sup> Similarly, at the

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1998, at A10. For example, millions of Indians celebrate the ancient tradition of the *mela* despite India's entrance into the computer age. *See id.*

<sup>49</sup> SHIVA, *BIOPIRACY*, *supra* note 6, at 107.

<sup>50</sup> *See id.* at 69.

<sup>51</sup> *See SEEDS AND SOVEREIGNTY* (J. Kloppenburg ed., 1988); Office of Technology Assessment, *Biotechnology in a Global Economy*, OTA-BA-494 (1991).

<sup>52</sup> *See* K.S. Jayaraman, *India Set to End Gene Robbery*, *NATURE*, Aug. 25, 1994, at 587.

<sup>53</sup> *See* SHIVA, *BIOPIRACY*, *supra* note 6, at 11–16. *See generally* SUSAN K. SELL, *POWER AND IDEAS: NORTH-SOUTH POLITICS OF INTELLECTUAL PROPERTY AND ANTITRUST* (1998) (describing how this mistrust has historically led India to resist Western intellectual property regimes in general).

<sup>54</sup> *See* SHIVA, *BIOPIRACY*, *supra* note 6, at 11–16. *See generally* NICANOR PERLAS, *OVERCOMING*

United Nations Conference on the Environment and Development in Brazil ("Earth Summit"), President Ali Hassan Mwinyi of Tanzania revealed his own fears:

[M]ost 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.<sup>55</sup>

Others argue that the neem patent exemplifies how unfair international intellectual property regimes are to communal or traditional forms of knowledge. They contend that because intellectual property regimes have no mechanism for providing intellectual property protection to cultural or communal knowledge, that knowledge is susceptible to theft. As Professor Naomi Roht-Arriaza, a scholar of international law, explains, the fundamental presumptions of most intellectual property regimes exclude indigenous and local knowledge and thus allow injustices to take place:

Most . . . local knowledge is collective and is passed down from generation to generation. It builds on prior knowledge in an organic, accretive way that makes it difficult to single out a certain individual inventor or inventive origin in time . . . . Indigenous and traditional communities that had no practical opportunity to participate in the development of world intellectual property systems and that are only now beginning to . . . demand a place in those systems . . . are frozen out.<sup>56</sup>

Her analysis goes on to explain how the novelty, non-obviousness, and subject matter requirements of U.S. patent law *a priori* exclude recognition of traditional or communal knowledge as knowledge capable of being protected.<sup>57</sup> Thus, for Roht-Arriaza, the laws determine that

ILLUSIONS ABOUT BIOTECHNOLOGY (1994) (arguing that the spread of biotechnology is less about improving social and environmental problems and more about corporate profits).

<sup>55</sup> Jacoby & Weiss, *supra* note 6, at 89.

<sup>56</sup> Naomi Roht-Arriaza, *Of Seeds and Shamans: The Appropriation of the Scientific and Technical Knowledge of Indigenous and Local Communities*, 17 MICH. J. INT'L L. 919, 936-37 (1996).

<sup>57</sup> See *id.* at 936 (and following pages). It is interesting to note that this sense of exclusion from existing intellectual property regimes led to the incorporation of a number of vague local/national property rights provisions in the CBD. See CBD, *supra* note 1, art. 5. To many, the inclusion

innovations in communal cultures will always be regarded by the West as "obvious" knowledge and thus free for the taking.<sup>58</sup> Scholar Shayana Kadidal makes this contention real. She demonstrates that the section 102(a) and (b) foreign knowledge publication requirements have the effect of excluding most community-based knowledge in non-Western countries.<sup>59</sup> Ultimately, Kadidal concludes that the foreign patent prior art requirements will defeat most "biodiversity patents" and that therefore, in the interest of international comity, they should be eliminated.<sup>60</sup>

The petition for reexamination of Grace's patent explicitly makes this argument about neem.<sup>61</sup> The petition maintains that neem's pesticidal properties have been known in India for years, that communal cultures in India had already discovered storage-stable concoctions of the pesticide, and that Grace's patent is therefore obvious.<sup>62</sup> According to one Indian, the patent on neem extract makes about as much sense as patenting fire.<sup>63</sup> A press release issued by the Foundation on Economic Trends supporting the petition argues that the format of the law demonstrates that Western intellectual property law is designed to keep traditional cultures in a subordinated, always impoverished position.<sup>64</sup>

In the wake of the neem tree controversy, Indian authorities are scrambling to make traditional Indian knowledge less available for easy appropriation by foreign companies by organizing repositories of local lore.<sup>65</sup> In addition, there are renewed discussions within India of how the nation might reorder national patent protection to assure that

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of this biological resources debate in the CBD derailed the treaty from its primary object. See Kal Raustiala & David G. Victor, *Biodiversity Since Rio*, ENVIRONMENT, May 1996, at 31.

<sup>58</sup> See Roht-Arriaza, *supra* note 56, at 936-40.

<sup>59</sup> See Kadidal, *supra* note 34, at 373.

<sup>60</sup> See *id.*

<sup>61</sup> See Request for Reexamination of Patent No. 5,124,349, requested by the Foundation on Economic Trends, c/o Jeremy Rifkin, Reexamination No. 90/004050 (Off. Gaz. Pat. Office Jan. 16, 1996) Ex. Gp.:1205, available in LEXIS, Patent Library, All File [hereinafter Reexamination].

<sup>62</sup> See *id.*

<sup>63</sup> See Burns, *supra* note 31, at D4.

<sup>64</sup> See *More Than 200 Organizations From 35 Nations Mount Unprecedented Legal Challenge at the U.S. Patent and Trademark Office Against W.R. Grace Company*, FOUND. ON ECON. TRENDS, Sept. 14, 1995.

<sup>65</sup> See Anil Agarwal & Sunita Narain, *Pirates in the Garden of India*, NEW SCIENTIST, Oct. 26, 1996, at 14; see also A. Surya Prakash, *India Patently Upset Over Threat to Ancient Remedy*, ASIA TIMES, Aug. 6, 1996, at 6.

traditional and communal knowledge is granted national protection and thereby not drained from the country.<sup>66</sup>

At the same time, the neem challenge is also motivated to some degree by common misperceptions about what the Grace patent actually means. Many of the participants in the debate appear to fear that a patent on an extract somehow confers a property right on the original entity itself.<sup>67</sup> For example, anti-Grace activists publicly state that Grace's patent may have the insidious effect of forcing them to pay for the use of their own knowledge.<sup>68</sup> They speculate that instead of being able to make their own neem pesticide extracts, they will be forced to pay Grace for the processed analogue. They point to currently rising prices for the neem seed<sup>69</sup> and forecasts that prices will rise even higher.<sup>70</sup> Further, they voice concern that while only three percent of the Indian neem seed harvest is purchased by Grace now, analysts have acknowledged that Grace's share eventually could be much greater.<sup>71</sup>

## B. *Commodification of Life*

Thus, on its face, the controversy over the Grace patent stems from a combination of political, economic and legal factors. At the same time, the controversy is also motivated by broader philosophical issues which are more difficult to resolve. The neem dispute is at root an argument over whether patents on life, or living extracts, should exist at all. The American position on so-called life patents stems from utilitarian concerns about promoting a steady stream of innovation. Meanwhile, the position of the Grace challengers stems from an essentialist view that life cannot and should not be owned.<sup>72</sup> The neem

<sup>66</sup> See Agarwal & Narain, *supra* note 65, at 14; *India: Enviro Minister Calls for Neem Research Center*, GREENWIRE, Jan. 11, 1996, available in LEXIS, News Library, Grnwre File (noting that "Environment and Forests Secretary N.R. Krishnan said the foremost question of today is how to prevent drain of biowealth from the country.").

<sup>67</sup> This is noted by some observers of the debate. See electronic mail letter from Anil Gupta, Professor, Society for Research and Initiative for Sustainable Technologies and Institutions, to Institute for Agriculture and Trade Policy (Sept. 21, 1995) (on file with author).

<sup>68</sup> See, e.g., Sharma, *supra* note 15, at A6 (stating that "the products they create . . . come back with a price tag.").

<sup>69</sup> See Lemonick, *supra* note 44, at 50.

<sup>70</sup> See Mara Bovsun, *FET Challenges U.S. Patent on India's Natural Pesticide*, BIOTECHNOLOGY NEWSWATCH, Sept. 18, 1995, available in LEXIS, News Library, Biotec File; *Biodiversity: Groups Sue to Invalidate Pesticide Patent*, GREENWIRE, Sept. 13, 1995, available in LEXIS, News Library, Grnwre File.

<sup>71</sup> See *Grace Issues Statement about Patent for Neem Pesticide*, *supra* note 37.

<sup>72</sup> The ownership of plants has generally been a less contentious issue. However, it is important

controversy must also be understood therefore, as an entry in the long, contentious debate over how patents and life should interact.

The United States tends to adhere to a utilitarian, "fruits of one's labor" justification for patent protection of living things.<sup>73</sup> Indeed, the constitutional justification for patents—"to promote the progress of science and the useful arts"—is itself utilitarian.<sup>74</sup> This approach reasons that promoting the creation of valuable intellectual innovations requires that companies and researchers be granted property rights in their creations. Without patent protection, the argument goes, adequate incentives for creating the socially optimal output of innovations would not exist. Moreover, if competitors could simply use one another's inventions, there would be no incentive for inventors to spend the vast amounts of time, energy, and money necessary to develop new products. In the United States, this approach has been applied to creations involving new variations on life forms,<sup>75</sup> and, more recently, to "inventions" involving the extraction of some portion of living tissue.<sup>76</sup> The Grace patent is in keeping with this approach. It rewards the company for expending the resources to add a useful product to the global marketplace.

The utilitarian justification claims that society at large benefits from extending exclusive rights to the innovators. That is, we take on the cost of granting exclusive rights in exchange for obtaining socially useful products created by the inventor. With respect to the Grace patent, a utilitarian might argue that the global community benefits from extending Grace temporary rights to the stable azadirachtin pesticide, for we all now have access to a non-toxic pesticide. The utilitarian might point out that Indian farmers also benefit, for they too can now use the solution, freeing labor for other pursuits. Further, they might argue that India should invest in its own research, for under the TRIPS agreement it could thereby secure recognition of innovations created by Indian scientists.<sup>77</sup> In this vein, one expert exhorts, "[i]t is in the interest of developing countries to intensify efforts in the

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to realize that in India, neem is not just another plant. Rather, it is a plant with a long history, religious significance, and personal meaning for a large number of individuals.

<sup>73</sup> See Ned Hettinger, *Patenting Life: Biotechnology, Intellectual Property, and Environmental Ethics*, 22 B.C. ENVTL. AFF. L. REV. 267, 278 (1995). See also *Moore v. Regents of the Univ. of Cal.*, 793 P.2d 479, 479 (Cal. 1990) (elucidating the argument).

<sup>74</sup> U.S. CONST. art. I, § 8, cl. 8.

<sup>75</sup> See *Diamond v. Chakrabarty*, 447 U.S. 303 (1980).

<sup>76</sup> See *Moore*, 793 P.2d at 479.

<sup>77</sup> See, e.g., Terry & Woessner, *supra* note 39; Tolan, *supra* note 16, at 23.

application of modern science rather than preventing others from doing what they are not doing themselves."<sup>78</sup>

This perspective contrasts sharply with the holistic view of property and life expressed by those challenging Grace. In their 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. A living organism has an essential quality which prevents it from ever being considered "invented" by someone else. On this basis, even a genetically altered organism has morally considerable interests that prevent it from being treated as a mere resource that people are naturally entitled to own.<sup>79</sup> Thus, patent protection of a machine or a method of production creates a natural property right in that item, but the manipulation of living organisms does not.<sup>80</sup> Vandana Shiva claims that the roots of this essentialist view lie in the distinctive features of living-systems to self-organize. She adds that "[s]elf-organizing systems are autonomous and self-referential . . . [Our aim should be] in keeping the self-organization of living systems free—free of technological manipulations that destroy the self-healing and self-organizational capacity of organisms."<sup>81</sup>

At the press conference announcing the neem tree challenge, Jeremy Rifkin expressed the global implications of this philosophical divide, noting that, "[t]he real battle is whether the genetic resources of the planet will be maintained as a shared commons or whether this common inheritance will be commercially enclosed and become the intellectual property of a few big corporations."<sup>82</sup>

This essentialist challenge to intellectual property protection has particularly deep roots in India, where religious and cultural traditions have infused both flora and fauna with symbolic meanings.<sup>83</sup> Indeed, within the predominant Hindu religion, most animals and trees as well as rivers, lakes and hills, are treated as sacred representations of God. The international demand to commodify these entities thus flies in the face of these deeply rooted, culturally important traditions. Shiva makes the significance of this challenge clear, writing that to recognize

<sup>78</sup> Sharma, *supra* note 15, at A6, quoting S. Anand Kumar, Professor at SUNY-Albany.

<sup>79</sup> See Hettinger, *supra* note 73, at 283.

<sup>80</sup> See THE CRUCIBLE GROUP, PEOPLE, PLANTS AND PATENTS 15 (1994); SHIVA, MONOCULTURES, *supra* note 6, at 14–18, 122–25. This idea is developed fully by Hettinger, *supra* note 73, *passim*.

<sup>81</sup> SHIVA, BIOPIRACY, *supra* note 6, at 32–39.

<sup>82</sup> Burns, *supra* note 31, at D4, quoting Jeremy Rifkin.

<sup>83</sup> See THE CAMBRIDGE ENCYCLOPEDIA OF INDIA 338 (Francis Robinson ed., 1989).

patents on life will "undermine [the Indian] cultural and ethical fabric [which is] based on agriculture, in which the fundamental life processes are treated as sacred, not as commodities to be bought and sold on the market."<sup>84</sup> Her position has been enshrined in Indian patent law which thus far has refused to grant patents on living entities.<sup>85</sup>

The neem tree is much more than just a plant in India and to many Indians is fundamentally non-commodifiable. Indeed, the tree has both religious and cultural significance throughout India. Communities have invested centuries of care, respect, and knowledge in using neem in fields, homes, and for health. If ownership could be claimed, the Grace challengers maintain, it would go first to the community which nurtured and developed uses for neem trees over the centuries.<sup>86</sup> They insist that in any case, this "ownership" would be non-exclusionary, because ownership of life is fundamentally immoral and contrary to tradition. Some maintain that patenting the neem is analogous to patenting an egg, or some other symbol of common life, ritual, and celebration.<sup>87</sup>

The neem challengers also object to the presumption that patent protection is necessary for continued innovation.<sup>88</sup> They note that in India innovation has occurred continually on a local level, with farmers and breeders sharing knowledge about qualities and uses of plants, animals, and microorganisms.<sup>89</sup> Indians point to the fact that "traditional knowledge" is highly valued by the West as proof that this form of innovation has been productive. Activists maintain further that these traditional forms of innovation are preferable because they are generally in tune with local ecology and because they always provide mutual benefit and mutual advancement for innovators and users.<sup>90</sup> Ultimately, an Indian official suggests that industrialized countries would benefit by mimicking this tradition. He offers an alternative approach to global knowledge production and development: "If the Western scientists and multinational [companies] really want to help developing countries

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<sup>84</sup> SHIVA, MONOCULTURES, *supra* note 6, at 122.

<sup>85</sup> See *Group Challenges W.R. Grace Pesticide Patent*, *supra* note 36; see also SHIVA, BIOPIRACY, *supra* note 6, at 19–40.

<sup>86</sup> See Reexamination, *supra* note 61; Burns, *supra* note 31, at D4.

<sup>87</sup> See Discussion with Kathleen Hiltzley, Program Assistant, Institute for Agriculture and Trade Policy, Minneapolis, Minn. (Mar. 16, 1998).

<sup>88</sup> This presumption has been challenged in international discussions. See THE CRUCIBLE GROUP, *supra* note 80, at 55–60.

<sup>89</sup> See Roht-Arriaza, *supra* note 56, at 931–35.

<sup>90</sup> See *id.* at 934.



such as India, they should share their knowledge and shouldn't patent material derived from the genetic resources which these countries possess."<sup>91</sup> The challenge to the U.S. intellectual property regime is clear: the holistic perspective rejects the commodification of life and prefers community-based innovation rather than privatized incentives.

### CONCLUSION

The neem tree controversy is composed of a number of different facets. On an instinctive level, many Indians simply distrust any action taken by multinational companies. With their history of colonial exploitation and recent large-scale industrial accidents, Indians tend to see multinational companies as the enemy of Indian freedom.<sup>92</sup> Moreover, many Indians are angry at the fact that the multinational companies seem continually to reap tremendous economic benefits from India, while the country as a whole remains very poor. Activist organizations express outrage that Grace can use knowledge that is so commonplace in India to achieve million dollar international profits. This fact only serves to intensify the sense that the international intellectual property regimes are rigged against developing countries such as India. Indians maintain that India suffers net losses at the hands of these regimes, not because India lacks innovations, but because most of their valuable innovations are classified as "folk" knowledge and are therefore excluded from international intellectual property protection.

At the same time, the Grace challengers express a fundamental disagreement with the American philosophy for intellectual property protection of life. They reject the idea that these protections are necessary for continued innovation. Instead, they maintain that life cannot be commodified and must remain common property. To do otherwise would destroy entire cultures and upset ethical norms. Based on their own history, they insist that healthy innovation is possible—and proven—even without regimented intellectual property systems.

A number of lessons can be taken from this analysis in order to avoid the consequences of ongoing international intellectual property disputes. Most of all, it is important to recognize the complexity of the issues. There is no doubt that innovations like the one in the Grace

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<sup>91</sup> Sharma, *supra* note 15, at A6, quoting Ashish Kothari, Professor at the Indian Institute of Public Administration.

<sup>92</sup> Union Carbide's Bhopal disaster is perhaps the most prominent of these accidents. The incident has not been forgotten in India. See, e.g., *Union Carbide: Ten Years After the Disaster, Still Dealing with the Fall-Out* (visited Mar. 9, 1999) <<http://www.Prcentral.com/rmjf95bhop.htm>>.

patent are public goods: reduced reliance on toxic pesticides can benefit human health worldwide. At the same time, cultural traditions should not be blindly sacrificed in the pursuit of profits.

Various steps can be taken. The United States—and Western countries generally—must realize that while developing countries continue to perceive the distribution of economic benefits of intellectual property protections as skewed, there will be resistance to sharing biological resources. To make developing countries willing partners in exploiting the promise of biodiversity, we should consider devices for sharing benefits. In addition, international intellectual property regimes should beware of an overly narrow focus on Western forms of knowledge. Policy makers should carefully consider contentions that the prevalent intellectual property laws exclude a variety of forms of knowledge. We are likely to see a much richer exchange of ideas if communities can benefit from revealing their age-old traditions. Further, if individuals or communities in developing nations feel that their knowledge is consistently being “ripped off,” they are unlikely to reciprocate enforcement of intellectual property laws. Finally, and perhaps most importantly, we must explicitly address the philosophical differences over the issue of patenting life, as this debate is likely to continue in new forms. I would hope that representatives from the United States, India, and other interested parties could develop a productive dialog about the scope and significance of their very different approaches to life. Perhaps they can achieve a compromise in which patent protections will take hold in some nations, while cultural traditions will prevent enforcement in others.