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Fixing the Biodiversity Convention: Toward a Special Protocol for Related Intellectual Property

ABSTRACT

The trade dispute over intellectual property protection descended on the 1992 World Conference on Environment and Development in Brazil at an awkward time; like an unwanted house guest, no amount of ignoring it could make it go away. Persistent and intractable, the controversy confounded negotiations on the 1992 Convention on Biological Diversity to such an extent that it left the treaty little more than an impotent desideratum. The treaty attempts to promote diversity of species by encouraging developing countries to preserve their diminishing rain forests, wilderness areas, and wetlands. Yet it also calls for the "equitable sharing" of the economic benefits from patented processes using rare plant and animal species found in developing countries.¹ These two goals are not necessarily irreconcilable, but the way diplomats attempted to combine them in the treaty set the bloc of less-developed countries at loggerheads with the United States, which refused to sign the agreement on the grounds that it did not go far enough in guaranteeing patent rights affected by the treaty.²

Because negotiations got mired in old economic disputes between rich and poor nations, the parties' specific obligations under the Biodiversity Convention are actually minimal. More directly, however, the failure of the negotiators to find a compromise on the issue of

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1. United Nations Conf. Env't & Dev.: Convention on Biological Diversity, 1992, 31 I.L.M. 818 (1992) [hereinafter Biodiversity Convention]. "The objectives of this Convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding." *Id.* at 823, art. 1.

2. United States: Declaration Made at the United Nations Environment Programme Conference for the Adoption of the Agreed Text of the Convention on Biological Diversity, 31 I.L.M. 848 (1992).

intellectual property protection constitutes a missed opportunity. Real market forces make intellectual property an important trade issue, and rather than ignoring them, the Biodiversity Convention could have positively harnessed these market forces for the purpose of preserving species diversity. This missed opportunity is the main concern of this article.

With the advent of a new administration, the United States has signed the treaty; officials anticipate ratification by the United States Senate sometime in 1994.³ But the change in United States policy makes no substantial impact on the biological diversity debate. Not only do the fundamental problems with the treaty remain, the Clinton administration intends to include an interpretive statement with its instrument of ratification that essentially preserves the original United States position.⁴ As this article will show, there is a constructive logic behind what the Clinton administration is trying to do, but qualified ratification by itself will not be enough to fix what is wrong with the treaty.

Diplomats came to Rio de Janeiro in 1992 to negotiate environmental agreements, not trade issues, and the Biodiversity Convention was to be one of the crowning accomplishments of the Earth Summit. But patent protection is normally a trade issue—and a very contentious one. Thus it is not altogether surprising that the negotiators were able to address the issue of intellectual property rights in only a superficial way. The difficulty that arose underscores both the intrinsic links between environmental and trade issues, and how little the relationship is understood by advocates on either side. The longer this intellectual estrangement continues, the longer it will take to realize the goal of sustainable development, which was the theme of the Earth Summit.

Sustainable development means that current generations must leave future generations an environment and a stock of natural resources that is as good and as plentiful as those it received from past generations.⁵ The philosophy also says that technology and social organization affect the capacity of the biosphere to meet the economic demands placed

3. *Remarks on Earth Day*, 29 Weekly Comp. Pres. Doc. 630 (Apr. 21 1993); Wirth Predicts Biodiversity Treaty Will Be Ratified By Senate Within One Year, *Chemical Reg. Rep.*, June 11, 1993, at 604.

4. Wirth Says Test for IPR Protections will be Ratification of Biodiversity Pact, *International Trade Reporter*, Sept. 15, 1993. The European Community Commission recommended attaching a similar interpretive statement to the EC's ratification of the treaty, but the European Parliament voted to delete it. The issue was to be resolved by the EC's Council of Ministers prior to ratification, which as of this writing was expected by the end of 1993. *Parliament Opposes ECC Plan to Link Action on U.N. Treaty to Property Rights Statement*, *Int'l Env't Daily*, July 9, 1993.

5. For a comprehensive exposition of the theory of intergenerational equity, see E. Weiss, *In Fairness to Future Generations* (1988).

on it.⁶ International trade is one of the most important forms of social organization by which natural resources are transformed into economic prosperity, but there has been little progress in clarifying the environment-related aspects of trade or the trade-related aspects of environmental protection.⁷ Intellectual property rights, already a contentious trade issue even without taking environmental arguments into account, is one piece of the sustainable development puzzle that needs deliberate and careful attention. Instead, the biodiversity convention deals with the issue in the worst possible manner: by equivocation in hopes that the controversy will simply go away.

What is needed to repair the Biodiversity Convention is a determined international effort to agree on core principles around which some consensus may be built. This article introduces one possible approach: the development of a new category of intellectual property rights that would be distinct from normal commercial patents and more relevant to the special circumstances and goals the Biodiversity Convention seeks to address.

The article begins with a discussion of the cultural, legal, and ethical issues that affect intellectual property rights generally. After defining relevant terms, the discussion will focus on the ethical issues affecting policy towards intellectual property—first from the perspective of European-based political cultures and then in the context of other cultures. The aim of this section is to show that no sound philosophical rationale exists for assuming that European-based traditions are superior to other views as a basis for an international regime of intellectual property rights. It will also be shown that a government's deliberate decision not to protect intellectual property rights can raise issues similar to those involved with nationalization. In fact, one can persuasively argue that a state is nationalizing an intangible form of property when it adopts an intentionally weak intellectual property regime.

The second section discusses the economic dynamics of intellectual property rights. The purpose of patents and other intellectual property

6. World Comm'n on Env't & Dev., *Our Common Future* 43 (1987).

7. In a 1991 case involving U.S. import restrictions on Mexican tuna, a trade arbitration panel explicitly said that existing rules offered inadequate guidance in cases where trade and environmental laws conflicted. The panel said the issue should be addressed by the contracting parties to the General Agreement on Tariffs and Trade rather than leaving arbitration panels to extrapolate rules from too little precedent. See GATT: Dispute Settlement Panel Report on United States Restrictions on Imports of Tuna (Mexico v. United States), 30 I.L.M. 1594, 1622-23, at § 6 (1991). During the 12 months prior to the Earth Summit in Rio, both the GATT and the Organization for Economic Cooperation and Development began to investigate the environmental aspects of international trade, largely from the standpoint of trade policies. See U.S. International Trade Comm'n, Pub. 2554, *The Year in Trade: Operations of the Trade Agreements Program* 13-14 (Aug. 1992).

is to create monopoly rent for the benefit of those whose inventions may have social benefit.⁸ The question of political economy is whether it is worth it to society to pay that rent. The discussion will also show how the economic benefits of patent protection can bypass the people on whom the burden of biodiversity falls.

After describing the general legal and economic issues, the paper will look at how the Biodiversity Convention deals with intellectual property. It will be apparent that the treaty as currently worded opens a proverbial Pandora's box; it demonstrates little cognizance of the difficulty surrounding intellectual property protection, yet puts forward a sweeping but simplistic criterion for making policy decisions. By not addressing the issue of intellectual property in a manner that does justice to its complexity, the treaty actually hinders more than it furthers the goal of biological diversity.

Finally, this paper will suggest the outline of a protocol in which the issue of intellectual property may be addressed in a way that is relevant to the goal of biological diversity. Some of the principles incorporated in the proposed protocol are drawn from previous successful environmental treaties such as the 1987 Montreal Protocol to eliminate ozone-depleting substances. The proposed biodiversity technology protocol seeks to balance the social needs of both developing and industrially advanced countries in a way that supports the objectives of the Biodiversity Convention.⁹

Different Cultures, Conflicting Ethics

Patents and other types of intellectual property rights are intended to prevent people from commercially exploiting ideas or

8. Monopoly rents are additional producer earnings that exist because of barriers to competition, and are thus conceptually different from profits that derive from successful market competition. The term is defined and explained in detail later in this article. *Infra* notes 29-33.

9. "Industrially advanced" refers to countries that have high levels of per-capita income and a diverse industrial sector. Thus Germany is an industrially advanced country; Saudi Arabia is not. "Developing" refers to countries that not only have low levels of income, but also have to deal with significant social problems (illiteracy, high infant mortality, and malnutrition, for example) that keep incomes low and unevenly distributed. Industrialization may or may not be the best way for a developing country to address its problems, hence terms such as "less-industrialized" and "industrially backward" are neither appropriate nor useful. In addition, a developing country may have a diverse industrial base and still have low incomes and significant social problems; India, Brazil, Argentina, and China are such countries. The use of the terms "industrially advanced" and "developing" is intended to distinguish between two classes of countries in a way that is relevant to the topic at hand.

inventions without fair compensation to the originators.¹⁰ The concept comprises two competing social objectives: the need to encourage technical innovation and the need to disperse the benefits of that innovation throughout society. These objectives compete because the market forces that encourage one discourage the other. Decreasing a good's price tends to increase its dispersion.¹¹ But if the price of acquiring the innovation includes only the cost of raw material (that is, if the idea itself costs nothing), then the inventor gets no market compensation for his or her effort. If inventors have no economic incentive to invent, those who are motivated by profit will come up with fewer innovations to be dispersed. Conversely, as inventors are able to obtain more monopoly rent through their patents, their ideas will cost society more. As the monopoly rent increases, the innovations will be less widely dispersed and the social benefits will diminish.

As in many other political cultures, the way Europeans dealt with intellectual property in particular was shaped by the way they thought of property in general. Hegel, Locke, and other European political philosophers wrote that property was one of the rights defining individual liberty. Hegel's conception of property is perhaps most directly applicable to the narrower notion of intellectual property: he wrote that property is, among other things, the means by which an individual could objectively express a personal, singular will. "In property," he noted, "a person exists for the first time as reason."¹² Hegel's civil society is an environment in which an individual aspires to establish a unique place, and property is the vehicle by which one's self-identity is acknowledged by others who are similarly striving for self-identity.

Locke wrote that in a primitive society where all resources are initially held in common, objects become property through an individual's labor: *gathering* the acorns, *killing* the deer, *tilling* the land.¹³ As society matures, money becomes an expedient surrogate for the value of an individual's labor. Still, the essence of property rests not with an

10. The issues raised by the biodiversity treaty deal almost exclusively with patent rights, therefore the terms "intellectual property" and "patents" will be used interchangeably throughout this paper. Technically, patents protect novel products and processes, copyrights protect literary or recorded material, and trademarks protect symbols or names that uniquely identify the maker of a product. Trade secrets are another kind of intellectual property. The unique circumstances of high-technology industries has led to yet another kind of intellectual property category for the design of semiconductor computer chips. See generally R. Sherwood, *Intellectual Property and Economic Development* (1990).

11. It can also be dispersed by increasing its value-added potential, thus making it worth more relative to the price.

12. G. Hegel, *Philosophy of Right* 235-6 (1967).

13. J. Locke, *Second Treatise of Government* 303-320 (1967).

object's material characteristics, but in the thought and effort exerted by the individual upon that object to make it useful.

Two aspects of Hegel and Locke are pertinent to understanding the European traditions behind intellectual property. First is the importance given to individual human will in justifying and defining property. The "quiddity" of property is an intellectual phenomenon that arises from the way individuals conceive of themselves in their material environment. Property may therefore be the exertion of will over the transformation of material things, or it may be the exertion of intellect to create new ideas. Either would contribute to the Hegelian sense of self-identity, so a society that values individual liberty would seek to protect both.

Secondly, the European tradition places the individual and society in a relationship that is at least partially adversarial. Both Hegel and Locke envision civil society as a constraining environment for individuals aspiring to establish unique moral meaning. The marketplace is the arbiter through which an individual tries to establish and protect self-identity through voluntary exchange of property representing the individual's will. Society is thus very limited in its right to prevent an individual's fair accumulation, holding, and dispensation of property. The needs of society *per se* would not justify taking an individual's property—including property in the form of ideas—without fair compensation.

European lawmakers recognized early the social utility of intellectual property rights; the evolution of intellectual property rights lagged only slightly behind the evolution of tangible property rights in European legal traditions. During the Renaissance, patent rights were bestowed by royalty or, as in the case of Italian city-states, by the ruling aristocracy.¹⁴ In the 18th and 19th centuries, the European trading powers entered into compacts providing for the mutual recognition of each others' patents. This culminated in 1883 with the International Convention for the Protection of Industrial Property, which included not only the major European trading powers but their colonies as well.

The European tradition of honoring patents was internationalized through the institutions of colonialism. That is, intellectual property rights were honored in Europe and by the Europeans who were governing Africa, Asia, and the Americas. But what about the post-colonial era, from 1945 to the present? It does not necessarily follow that the now-empowered indigenous political cultures of the developing world regard the ownership of ideas in the same way as their former colonial rulers. Indeed, some have attitudes toward *tangible* property that are squarely at

14. Sherwood, *supra* note 10, at 24.

odds with the views of Hegel, Locke, and other European political thinkers.

Many non-European political cultures do not assume an adversarial relationship between individual and society. Islamic and some African cultures go so far as to define self-identity not according to individual liberty but according to the individual's relationship with and contribution to society.¹⁵ What exists in many parts of the world is a non-utilitarian social paradigm in which "right" is not a function of individual good. Concepts of property are therefore different; if individual liberty is not the basis for self-identity, then the moral foundations of property must rest somewhere else.

In Ghana and other African countries, many indigenous societies considered tribal land and other economic resources the property of the tribe's ancestors.¹⁶ The symbol of this communal ownership was the stool on which the tribal chief sat; the chief was the personification of the living generation who had a fiduciary trust for future generations. Extended families and sometimes individuals could obtain a right of usufruct for tribal property such as land. A tribe member could then engage in agriculture and other economic activities that would benefit the user's extended family in particular and the tribe in general. Returning benefits to the tribe was the moral rationale behind the right of usufruct.

Intellectual property was not a particularly relevant concept for the Africans themselves because their traditions had no need for it. European patent law was introduced in Ghana and the rest of west Africa at the end of the 19th century largely in the interests of European gold mining companies.¹⁷ After independence in the 1960s and 1970s, Nigeria and other African countries discarded their inherited British-style patent laws and adopted new ones based on principles more consistent with their traditional values and more expedient to development. Nigeria's patent law, adopted in the 1970s, specifically excludes biological products and processes from patent protection and further says that other specific kinds of products can be deemed not patentable by decree in the interest of society as a whole.¹⁸

In India, the cultural underpinnings of property have been chaotically shaped by conquest, feudalism, and colonialism. The *moghul* invasion of northern India brought with it a wholesale rearrangement of

15. For a concise Islamic perspective, see A. Shariati, *On the Sociology of Islam* (1979). An African perspective will be discussed later in this section. *Infra* notes 16-18.

16. For an excellent description of the history of property rights in Ghana, see S.K.B. Asante, *Property Law and Social Goals in Ghana, 1844-1966* (1975).

17. G. Sipa-Adjah Yankey, *International Patents and Technology Transfer to Less Developed Countries* 104-106 (1987).

18. *Id.* at 210-14.

land ownership.¹⁹ The Muslim conquerors parceled out land to a system of feudal military lords who were to provide troops to the emperor if needed. As the Muslim conquerors were absorbed into the fabric of Hindu society, the institutions of feudalism were continued by the *zamindars*—the privileged landowners' class. When the British came in the 17th century, they found it expedient to allow the feudal system to remain largely intact. They consolidated their colonial domination in 1793 by recognizing the legal validity of the *zamindars'* holdings. *Zamindars* were responsible for paying taxes on their land, which was usually being cultivated and made productive by tenant farmers. At the same time, the *zamindars* were able to call on British forces to enforce their claims against challenges from outside their class.²⁰

With its traditions of land ownership so broken throughout its history, India has had to rely on political dialogue to shape its philosophy of property. Throughout the first half of the twentieth century and up through independence in 1947, three distinct ideologies struggled against one another to define the economic relationship between the individual and the state in India: Western-style market liberalism, advocated by Sardar Vallabhbhai Patel; Soviet-style centrally planned socialism, advocated by Pandit Jawaharlal Nehru; and Mahatma Gandhi's vision of decentralized village-based social reform. Both Gandhi and Nehru believed that social reform leading to economic self-sufficiency and the alleviation of poverty was more important than the individual right of property, although Gandhi's political methods attempted to co-opt the propertied classes so that they would voluntarily participate in social reform.

Patel's political strength after Gandhi's death in 1948 enabled him to make economic liberalism the guiding philosophy behind the constitution that was drafted in 1949.²¹ When Patel died in 1950, Nehru attempted to institute both Gandhian social reforms and socialist economic planning but found himself constrained by the constitution and the propertied interests that dominated party politics and the civil service in many states.

Independent India has never offered strong protection for many kinds of patents, trademarks, and copyrights. Its rationale has been that alleviating the country's poverty is more important than any individual's

19. For a discussion of the evolution of intellectual property rights in India, see A. Gandhi, *Right to Property* 19-37 (1985).

20. *Id.*

21. The constitution not only guaranteed the right to "acquire, hold and dispose of property," it also limited the power of the central government over the state governments. See F. Frankel, *India's Political Economy, 1947-1977*, at 77-84 (1978).

right to derive monopoly rent from an idea.²² Pharmaceuticals in particular are freely copied in India with the result that medicines are available for as little as 7 to 20 percent of the cost of comparable drugs in the United States. Considering that its gross domestic product per capita in 1991 was \$340 compared to \$21,000 in the United States, India's economic incentive to maintain this price difference is substantial.²³

Because many of the world's political cultures differ so widely from European norms, and because concepts of property are shaped by the political cultures out of which they arise, one cannot assume that intellectual property laws will or should be the same from one country to another. Which social goal is to take precedence: rewarding pharmaceutical firms that come up with new medications or distributing the medications as widely as possible by keeping the prices low? Is it more important to reward biotechnology firms for developing high-yield varieties of crops and hardy livestock or to maximize the nation's agricultural productivity by enabling farmers to obtain the new seed and animal varieties as cheaply as possible? The way a country chooses to balance these conflicting goals is reflected in its domestic patent regime. Different political cultures make different choices, and sometimes there is no unanimity even among industrially advanced countries. Table 1 lists the countries that exclude pharmaceuticals, pharmaceutical processes, and plant and animal varieties (for the most part, new strains of livestock and crops) from patent protection.

The relevant point is not that the European philosophy of intellectual property is correct and everyone else in the world is wrong—or vice versa. What the foregoing discussion shows is more basic: that there are many different historic and cultural assumptions about the ownership of ideas. Were it not for trade, international law would be unconcerned with so many different national regimes for intellectual property because each would be strictly a matter of domestic policy. But the fact is that nations *do* trade, so the differences matter.

Fair participation in the global market depends on rules that bind each nation equally, otherwise market distortions will place some nations at a disadvantage. If the European individual-rights philosophy were to be the international norm for intellectual property rights, many pharmaceuticals and other new products would not be widely dispersed in the world's poorest countries where a great need for those products exists. On the other hand, if the socially oriented philosophy of many non-European cultures were the norm, then inventors (primarily European and American firms) would be deprived of some amount of compensa-

22. *Id.*

23. World Bank, World Tables 1991 (1992).

tion for their research and development. The choice may be distilled to an even more basic level: should individual rights or social well-being be the basic principle behind an international regime of intellectual property?

Regardless of whether the forum is domestic or global, the choice between individual rights and social welfare is irreconcilable. One may glibly say that protecting individual rights always leads to the highest social welfare, but only if one trusts in some metaphysical hokus-pokus supposedly inherent in the market that magically directs a chaotic mass of individuals to an inevitably harmonious outcome. Not only is such reasoning ingenuous, it avoids the basic question. Even though the exercise of individual rights might not compromise the common good all the time, eventually the two will come into conflict, and when that happens, one *must* have priority over the other in order for a decision to be taken. The choice made by each political culture would have domestic legitimacy, but in no case would the moral foundations of the choice be so compelling as to render another political culture's decision illegitimate. That would require invalidating an entire set of social assumptions about what is right and what is good, which would be morally possible only if there were a shared body of higher principles by which such a judgment could be made. Lacking any relevant supracultural criteria, it is virtually impossible to resolve the question of whose domestic values "should" prevail in an international regime.

Disagreements between nations are more often resolved on the basis of "can" rather than "should," however.²⁴ The rule of law is absent unless and until the countries in question agree by treaty to abide by a certain set of principles.²⁵ Even so, advanced industrial countries can wield enormous economic or military power to decide issues in their favor in spite of international law.²⁶

But the blade cuts the other way, too. At various times throughout the 20th century, developing countries such as Mexico, Iran, Saudi Arabia, and Chile nationalized the holdings of multinational firms pumping oil or mining minerals within their borders. Usually the

24. This is why advocates of the European view are on less than solid ground when they contend that protecting individual rights is the best way to ensure economic prosperity and, ultimately, social welfare. European colonial interests could overpower indigenous cultures in the New World, and they did. Thus history does not resolve the question of whether the chain of causation leads from individual rights to social welfare or vice versa.

25. Vienna Convention on the Law of Treaties, 1969, art. 34, 8 I.L.M. 679.

26. The quintessential example is the U.S. decision to ignore a ruling by the International Court of Justice that U.S. mining of Nicaraguan harbors was illegal. *Military and Paramilitary Activities In and Against Nicaragua (Nicar. v. U.S.)*, Jurisdiction and Admissibility, 1984 I.C.J. Rep. 392 (Judgment of Nov. 26); Dep't St. Bull., No. 2096, Mar. 1985, at 64.

industrially advanced countries had no choice but to acquiesce to nationalization because of the political and logistical difficulty of taking any retaliatory measures. As former United States Secretary of State Dean Acheson characterized Saudi Arabia's nationalization of United States oil companies' facilities and equipment shortly after World War II, the United States determined that its interests were best served by "graciously granting what it no longer had the power to withhold."²⁷

When sanctioned or encouraged by a government, the piracy of intellectual property obtained through trade with other countries is analogous to nationalization of foreign assets. The difference is that instead of tangible property such as oil field equipment or copper mines, the value being taken is monopoly rent created by a patent or copyright. The rent that would have been repatriated to the foreign inventor had the patent or copyright been protected is instead kept in the economy of the pirating country. Domestic patent royalties are similarly affected.

The factors that make intellectual property nationalization possible are virtually the same as those that make other kinds of nationalization possible. Only a sovereign government can create the administrative infrastructure necessary to enforce an intellectual property regime. If the government deliberately chooses not to do so, there is little any outside government can do. Even trade sanctions might cost the industrially advanced countries more than their affected industries would lose in patent rent.

Nationalizing tangible foreign property such as oil rigs has the immediate effect of adding to a country's domestic capital stock without any national savings having been invested. The net capital stock increases by government fiat, thus freeing a certain portion of national savings for investment in other productive processes elsewhere in the domestic economy. Like capital equipment, a patented idea is an input to a productive process, and the rent created by a patent constitutes a specific bundle of value that is normally part of the final price. By not protecting a foreign patent, however, the bundle of value that constituted the patent's monopoly rent does not show up in the final price; it stays in the pockets of consumers and thereby adds to the net wealth in the domestic economy. Nationalized monopoly rents, by taking the form of lower consumer prices, thus result in a net increase in social benefit in the economy without any domestic savings having been used. The increased social benefit is essentially the same as what results from nationalizing foreign-owned capital equipment: an increase in productive capacity—or

27. D. Acheson, *Present at the Creation* 505 (1969).

similarly, a reduction in production costs—that otherwise would have been stimulated only by the investment of domestic savings.²⁸

The real policy question, therefore, is whether a developing country can get away with pirating intellectual property—or, to turn the question around, whether rich industrial countries can force poor countries to pay monopoly prices for goods protected by patent and copyright laws that exist in the rich countries but not in the poor ones. Moral arguments are inconclusive, so policy will largely be determined by who has the strongest economic leverage: the pirating country, or the country seeking to extract the monopoly rent offered by intellectual property protection.

Economic Effects

The Biodiversity Convention raises two types of economic issues: the effect on the economy of a developing country of monopoly rent created by a patent, and the need to pay for environmental costs that are external to normal market forces.

Strictly speaking, rent is "payment for the use of a resource."²⁹ The rent for labor is wages; for capital, it is interest. For ideas and innovations, rent takes the form of royalties on patents or copyrights. When patents are protected, the royalties create monopoly rent that will last until the expiration of the patent or until the development of slightly modified imitations and alternatives.

Because competitors are barred from entering the market,³⁰ the monopolist need not set prices and output levels according to market demand. If the goal is to maximize profit, the monopolist instead will choose a level of output such that marginal revenue is equal to marginal cost of production.³¹ Figure 1 shows the effect: the profit-maximizing

28. The economic rationale for this argument is explained in the next section of this article. *Infra* notes 29-38.

29. The difference between rent and profit is often obscure. Sometimes the two terms are used interchangeably, while other economists equate profit with interest on capital. The *New Palgrave: A Dictionary of Economics*, vol. 3 at 1014-1018 and vol. 4 at 141 (J. Eatwell et al. eds., 1987). In any case, for the present purpose it will serve to leave the discussion of profits to one side and consider patent royalties as rent—that is, the cost of using an idea or innovation.

30. Barriers to entry may be due to prohibitive start-up costs, or they may be established by the state.

31. This means that the cost of producing one more unit of output is the same as the revenue that will come from that additional unit, thereby making the additional increment of profit zero. Beyond this point, additional output will yield revenues less than the additional cost, so total profits will diminish.

monopolist will reduce output to q^* , prices will go up, and the surplus benefit to consumers will decrease.³²

The rationale for creating monopoly rent is that the firm may have necessary expenses that are in addition to the typical opportunity costs of capital and labor it has to pay to produce a certain level of output. Research and development, for example, often involve spending money on many research failures prior to the discovery of a marketable new product. The resources spent on the failures do not increase the firm's output nor do they add to productivity, yet they are an unavoidable part of the risk involved in research and development. The idea is that the monopoly rent created by a patent will compensate the firm for these nonproductive expenses.

On the other hand, monopoly rent also creates a net welfare loss to consumers.³³ In deciding its intellectual property regime, the state has to decide whether the benefit of creating rents from royalties adequately offsets the loss to consumers.

The magnitude of the social loss may affect the diligence with which a country protects intellectual property through domestic policies. A government will have an incentive to encourage piracy of productive foreign technology if its people are too poor to pay the "legitimate" price and if it has no indigenous expertise to develop similar competing technologies of its own. Table 2 compares the prices of selected drugs in the United States (which protects pharmaceutical patents) with prices of the same drugs in India (which does not). Patent rent accounts for much of the difference.

On the other side of the debate, patent holders often incur significant costs in bringing their new products to market. The United States pharmaceutical industry says it spent 16 percent of its total sales in 1991 on research and development—nearly \$10 billion out of \$60 billion in sales.³⁴ Money for research and development comes from the higher prices made possible by product and process patents; this rent makes up a large part of the industry's total sales. The industry estimates that about 60 percent of the drugs on the market now never would have

32. Consumer surplus is the total benefit consumers enjoy from a good minus what they pay in order to get it.

33. This loss may be understood as the additional benefit society would have gotten had prices been lower and output higher, up to the point at which the price would have been equal to the marginal cost of production. In the figure, the rectangle below the consumers' welfare loss represents unused resources that can still be employed elsewhere. Conservation of these resources is not considered a loss.

34. Intellectual Property Rights Protection under Special 301: Hearings on S. 722 Before the Subcomm. on Int'l Trade of the Senate Comm. on Finance, 102 Cong., 2d Sess. 37 (1992) 37 (1992) [hereinafter Special 301 Hearing].

been developed had firms not been able to recoup their expenses through patent rent.³⁵

The United States International Trade Commission and the United States Trade Representative's office estimate that patent piracy cost United States pharmaceutical makers about \$5 billion in lost sales worldwide in 1991, or 8 to 9 percent of total sales.³⁶ The industry estimates that losses from India alone costs its members about \$200 million a year in lost sales.³⁷ But this may be overestimating the loss. Recalling the two basic facts that patented drugs cost significantly more than pirated drugs (as shown in table 2) and that demand falls as prices increase (figure 1), it is possible that multinational pharmaceutical firms would realize little or no new sales in a developing country that adopted new patent protection policies. Only the richest in these low-income countries would be able to afford the drugs at patent-protected prices. Everyone else would have to do without. In the worst-case scenario, the only significant welfare change would take place in the developing country: the poor would buy fewer medications.

The incentive for pharmaceutical techno-piracy in a developing country is great because the patent accounts for a large portion of the price, and because including the patent rent in the price would prevent a large number of people from acquiring medications for which a demand exists.³⁸ International trade adds another significant reason: little if any of the monopoly rent from the patent would be transferred to the economy of the pirating country if patents were protected. It would all be repatriated to the country of manufacture, depleting foreign exchange reserves and possibly adding to the country's debt burden.

In addition to the controversy over patents, the Biodiversity Convention also raises the issue of who pays for environmental protection. Policy interventions to encourage pollution abatement typically attempt to change the economics of production decisions. The ideal hypothetical policy is to tax emissions and waste discharges equal to the marginal damage of the polluting activity.³⁹ The external costs, which might include increased illness, aesthetic loss, damage to recreation, and other nonmarket effects, would be estimated by a regulatory agency that would then set the tax rate. Most policies attempt to achieve this ideal

35. *Id.*

36. *Id.* at 35-36.

37. *Id.* at 37.

38. For more on the effects of patent protection on technology importing countries, see A. Subramian, *The International Economics of Intellectual Property Right Protection: A Welfare-Theoretic Trade Policy Analysis*, 19 *World Dev.* 945 (1991).

39. For a textbook discussion, see W. Baumol & W. Oates, *The Theory of Environmental Policy* 14-35 (1988). For a comprehensive review of the literature, see M. Cropper & W. Oates, *Environmental Economics: A Survey*, 30 *J. Econ. Lit.* 675 (1992).

either through market incentives, permits, performance requirements, or a combination of approaches. By "internalizing" external environmental effects by taxes, fines, or subsidies, firms will have an incentive to invest in pollution control technologies.

Protecting pristine ecosystems requires a similar effort. The difference is that instead of paying for pollution abatement, society has to give up alternative uses of areas that are to be conserved. People living near the preserved wilderness area, rain forest, or wetland may need the land for cultivation, or they may need its trees for firewood and shelter. They may need to cut ground vegetation for livestock fodder, or they may need to dam a river to produce hydroelectricity. Protecting the ecosystem may require prohibiting all these activities, which would involve some additional cost to society as alternatives were sought.

The social costs of conserving an ecosystem present two problems. First, the nearest cost that would be "counted" by the market price of biotechnology products would be the accounting cost of hiring labor to harvest and process the raw material. In effect, the *habitat* from which biota are taken is treated as a public good when in fact it is not. In other words, the implicit economic assumptions are that anyone can use the ecosystem, and that one person's use does not preclude any other's use. But land—especially land that is potentially arable—by its very nature can never be a true public good.⁴⁰ Once a tract is put to one use or conserved, all other alternative uses are precluded.

The second problem, related to the first, is the definition of "society." Normally, microeconomic players include those who produce economic goods and those who consume them. If society is defined only as producers and consumers, then the costs borne by people near the preserved area will not be taken into account. The problem is especially acute when the pristine ecosystem is in a developing country, and both producers and consumers are in industrially advanced countries.

To equitably account for all costs, the conceptual boundaries of society must be expanded to include the people who could have used the preserved area for more farmland, timber, or some other local purpose. Costs which otherwise would have been ignored must then be incorporated somehow into the product price, as happens with pollution abatement. The additional revenue could then be used to compensate residents near the preserved area for doing without whatever it is they would have otherwise done with the land.

What the foregoing analysis shows is that with biodiversity technology patents, (a) a sizable monopoly rent would be created for the

40. Land can be a common good if its use is non-competitive, as in the case of a national park that is open to everyone. It is a private good if its use is competitive and exclusive.

patent holder, (b) the rent normally would not find its way to those who bear the social costs of preserving the ecosystem that makes the technology economically viable, and (c) developing countries would have a strong economic incentive to ignore the patents and pirate the technologies. A middle path does suggest itself amid these three conflicting points, one that might have been apparent to the negotiators of the Biodiversity Convention had they taken a more studied approach to the issue of intellectual property rights.

The next section takes a closer look at how the treaty *does* address intellectual property rights. The key points of the previous two sections (the absence of any compelling moral argument for either side and the strength of the economic incentives in developing countries to nationalize patent rent) will illuminate how inadequately the Biodiversity Convention addresses this crucial issue.

The Biodiversity Convention and Intellectual Property Rights

Article 16 of the Biodiversity Convention says that

The Contracting Parties, recognizing that patents and other intellectual property rights may have an influence on the implementation of this Convention, shall cooperate in this regard subject to *national legislation and international law* in order to ensure that such rights *are supportive of and do not run counter to its objectives*.⁴¹

The reference to "national legislation and international law" in regard to intellectual property rights raises a nettlesome question: which set of international laws? Currently a system of international principles is administered by the World Intellectual Property Organization (WIPO), a United Nations-affiliated body charged with facilitating compliance with a system of bilateral treaties and multilateral conventions on intellectual property rights. The principles that have been incorporated within the WIPO regime are generally consistent with the national patent laws of developing countries.⁴²

The WIPO treaties,⁴³ which include the Paris Convention on

41. Biodiversity Convention, *supra* note 1, at art. 16, para. 5 [emphasis added].

42. GATT or WIPO: New Ways in the International Protection of Intellectual Property 224 (F. Beier & G. Schriker eds., 1989) [hereinafter GATT or WIPO].

43. Among the agreements administered by WIPO are the 1883 Paris Convention for the Protection of Industrial Property, 1967 Stockholm Revisions, 828 U.N.T.S. 305; the Berne Convention for the Protection of Literary and Artistic Works, 1971 Paris Revisions, 216 U.N.T.S. 133; the Madrid Agreement on Marks, WIPO doc. 260; the Madrid Agreement for the Repression of False or Deceptive Indications of Source on Goods, 828 U.N.T.S. 162; the Lisbon Agreement for the Protection of Appellations of Origin and their International

patents, the Berne Convention on copyrights, and a number of other specialized instruments, gives member states significant latitude in excluding products and processes from patentability. Pharmaceutical products and processes, plant and animal varieties as well as biological processes for producing them, medical treatments for humans or animals, food products, chemical products, computer programs, fertilizers, agricultural machines, cosmetics, and nuclear inventions are among the items that various countries are entitled to exclude from patentability under the Paris Convention.⁴⁴ The excluded items can thus be easily copied and widely distributed without regard to royalty payments to the inventor. The WIPO regime also recognizes the right of a country to impose compulsory licensing to ensure that patented products and processes are made available to the public.⁴⁵ Developing countries often rely on patent exclusions and compulsory licensing to ensure the dissemination of new technologies in their domestic economies.

The United States has not ratified a number of WIPO instruments, nor have some members of the European Community.⁴⁶ The industrially advanced countries favor an intellectual property regime through the General Agreement on Tariffs and Trade (GATT). Such a regime would have more "teeth" than WIPO because it would provide the basis for a technology-exporting country to impose trade sanctions against a technology-importing country if the latter fails to protect the patent rights of the former's nationals.⁴⁷

Registration, revised 1969, WIPO doc. 264; the Rome Convention on Broadcasting, 496 U.N.T.S. 43; and the Phonograms Convention, WIPO doc. no. 288.

44. World Intellectual Property Organization, *Existence, Scope and Form of Generally Accepted and Applied Standards/Norms for the Protection of Intellectual Property, Document Prepared by the International Bureau of WIPO*, WIPO-Doc. WO/INF/29 (Sept. 1988), at pt. I § 1.

45. Compulsory licensing laws require firms with patents to grant licenses to domestic franchises if the patented processes are interdependent with other processes, or if the government deems that it is in the public interest for a larger number of firms to work the patents. Other countries have laws which allow the state to appropriate patents for its own use without the consent of the patent holder. Both of these principles are incorporated in WIPO documents and model laws. *Id.* at pt. I § 7.

46. In 1988, the United States was party only to the Paris Convention, the Patent Cooperation Treaty, and the Phonograms Convention. Neither Germany nor France were party to the Lisbon Agreement. The United Kingdom was not party to the Madrid Agreement on Marks or the Lisbon Agreement. Japan was not party to the Madrid Agreement on Marks, the Lisbon Agreement, or the Rome Convention. *Id.* at Annexes I, III, VII-XIV.

47. By comparison, international disputes mechanisms within the existing WIPO regime are weak and difficult to invoke. The International Court of Justice has competence to adjudicate official disagreements over intellectual property protection between some—but not all—WIPO member states. Yet many experts believe it is unlikely that a state would ever take a patent dispute to the court. GATT or WIPO, *supra* note 42, at 35, 227.

Perhaps the most significant features of a GATT regime would be the standards of national treatment and most-favored-nation treatment. That is, domestic laws would not treat foreign nationals any differently than domestic interests, and each country would extend favorable treatment to all other countries equally. GATT proponents believe that international standards based on these two principles would reduce the chance that domestic policies regarding intellectual property protection could be used as disguised barriers to trade. Developing countries, on the other hand, generally favor the principle of reciprocity, by which a country would afford foreign nationals treatment similar to that enjoyed by its own nationals in other countries on a case-by-case basis. Unlike the national treatment and most-favored-nation principles, reciprocity allows for wide variations between domestic patent regimes, which tends either to reduce trade or encourage weaker domestic patent laws in all trading countries. Such a variation would favor technology-importing countries who afford even their own domestic firms little patent protection. Many developing countries are opposed to a GATT-based regime because they fear it will limit their access to new technology, increase the leverage of multinational corporations, and raise domestic consumer prices.⁴⁸

The main problem with the GATT approach to intellectual property rights is that no principles have actually been adopted. A draft of new amendments to the GATT includes an annex that sets forth principles on the trade-related aspects of intellectual property.⁴⁹ The annex attempts to strike a compromise between the interests of industrial and developing countries, but strong objections have been raised on virtually all sides.⁵⁰ The draft principles would permit parties to exclude from patentability "plants and animals other than microorganisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes."⁵¹ A partial concession to developing countries with agriculturally based economies, this provision does not extend to pharmaceuticals or other processes that

48. For a polemic discussion of intellectual property issues in current world trade talks from the perspective of developing countries, see C. Raghavan, *Recolonization: GATT, the Uruguay Round and the Third World* 114-141 (1990).

49. The draft was written by GATT Director General Arthur Dunkel in an attempt to consolidate what he believed to be the issues on which some working consensus had been reached, separate from the yet-unresolved issues of agricultural subsidies and trade in services. Trade-related intellectual property standards (TRIPS) are dealt with in Annex III. *Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations*, GATT Doc. MTN.TNC/W/FA (Dec. 20, 1991) [hereinafter "Dunkel Text"].

50. A number of GATT officials observed that the 1992 draft "satisfied virtually no one but was probably the best compromise that could be obtained." World Intellectual Property Report, Feb. 1992, at 41.

51. Dunkel Text, *supra* note 49, at Annex III, art. 27, para. 3(b).

may use natural plant and animal species as inputs. The proposed revisions thus do not go as far as developing countries would like. Even so, United States pharmaceutical firms are concerned about the weakening of United States laws that provide for trade sanctions against countries that do not protect United States patents, and they object to a provision that would allow developing countries a 10-year grace period before having to comply with the new GATT norms.⁵² On the other hand, the draft would limit the use of compulsory licensing and would limit a government's ability to take a product or process without the authorization of the patent holder.⁵³

Adoption of the proposed GATT principles on the trade-related aspects of intellectual property would create a situation in which many domestic laws differ from GATT norms yet are consistent with the WIPO regime.⁵⁴ Developing countries in general would have broader compulsory licensing laws and would exclude a wider range of products and processes from patentability than would be allowed under the draft GATT principles. Industrial countries—the United States in particular—would probably find it more difficult to use trade sanctions to retaliate against widespread infringement of patents and copyrights abroad. Even though GATT dispute resolution procedures are relatively transparent, nondiscriminatory, and permit effective trade sanctions, United States lawmakers are especially troubled by the prospects of letting a GATT arbitration panel decide whether United States retaliation is justified. According to Senator Max Baucus, chairman of the United States Senate's subcommittee on international trade, "The reality is that we may have no alternative but to win intellectual property protection country-by-country."⁵⁵

In short, the call for cooperation in protecting intellectual property "subject to national legislation and international law" in Article 16 of the Biodiversity Convention invokes either (a) a weak WIPO regime or (b) a contentious and yet-unratified GATT regime that would attempt to curb practices by developing countries that are now permissible under WIPO. The first case resolves to a *de facto* null regime that would represent little actual change in intellectual property protection. The world would be no worse off than before, but the cause of biological diversity would not be furthered in any way. The second case would lead to serious contradictions between GATT and WIPO, and between GATT

52. Special 301 Hearing, *supra* note 34.

53. Dunkel Text, *supra* note 49, at Annex III, art. 31.

54. Final adoption of the draft GATT principles on intellectual property depends on the successful conclusion of the current round of global trade negotiations, which as of this writing was uncertain.

55. Special 301 Hearing, *supra* note 34, at 4.

norms and domestic patent laws in many developing countries. Although the WIPO regime would still be in force and could be invoked by developing countries, the power of trade sanctions would lie with the GATT regime, which has yet to come to terms with the environmental effects of trade.⁵⁶

Another problem with the above provision in Article 16 is contained in the phrase that calls for the parties to ensure that principles of intellectual property rights (whichever system one may use to define them) "are supportive of and do not run counter to [the Biodiversity Convention's] objectives." In other words, if there is any conflict between protection of intellectual property rights and the objectives of the treaty, then intellectual property rights must give way. One may argue persuasively that the ecological objective of biological diversity should indeed take precedence over intellectual property rights. But the treaty also aims to achieve an economic goal: the "fair and equitable sharing of the benefits arising out of the utilization of genetic resources."⁵⁷ Even though the ecological and the economic goals both may be worthy, the two are different in nature and provide different contexts for weighing the social need to protect intellectual property rights.

The public trust doctrine provides a rationale and legal precedent for placing ecological protection above private property rights.⁵⁸ But customary law does not support a similar canonical ordering between the *redistribution of wealth* and private property rights. If one is to infer such a link, it must be done on the basis of economic theory and not on the basis of customary law. And if one looks to neoclassical economics for a heuristic to determine how to achieve the "fair and equitable sharing" of benefits, the answer provided by theory is straightforward: let the concerned parties negotiate on the basis of their willingness to pay, and the market will reach an outcome that will be fair and equitable.⁵⁹ No

56. *Supra* note 7.

57. Biodiversity Convention, *supra* note 1, at art. 1. The reference to rights over technologies is essentially meaningless in the absence of mutually recognized principles defining those rights.

58. Courts have repeatedly invoked this doctrine to affirm "the duty of the state to protect the people's common heritage of streams, lakes, marshlands and tidelands, surrendering that right of protection only in rare cases when the abandonment of that right is consistent with the purposes of the trust." *National Audubon Soc'y v. Superior Court of Alpine County*, 658 P.2d 709 (Cal. 1983). *See also* *Kootenai Envtl. Alliance v. Panhandle Yacht Club*, 671 P.2d 1085 (Idaho 1983) and *Marks v. Whitney*, 491 P.2d 374 (Cal. 1971).

59. This is a restatement of what has come to be known as Coase's Theorem, first put forward by Nobel laureate economist Ronald Coase in 1960: "It is always possible to modify by transactions on the market the initial legal delimitation of rights. And, of course, if such market transactions are costless, such a rearrangement of rights will always take place if it would lead to an increase in the value of production." R. Coase, *The Problem of Social Cost*, J.L. & Econ. (1960).

legislative, administrative, or policy measures by a government would be necessary other than to minimize transaction costs.

Many economists outside the neoclassical school, however, have advanced equally cogent theories that explain how equity between trading nations can in fact diminish over time if market forces are left to themselves. Economists of the dependency school, a group largely identified with developing countries, argue that the path of successive market equilibria creates structural imbalances that leave developing countries at an unfair disadvantage in the international trading system.⁶⁰ The structural disadvantage would necessarily increase over time if market forces were to continue unchecked by positive trade policies by both industrial and developing countries.

The details of the economic debate are not directly pertinent here. The issue at hand is how the redistributive issue resolves under the Biodiversity Convention. Lacking any precedent in customary law and lacking any unequivocal basis in economic theory, no compelling justification exists for rearranging intellectual property rights for the purpose of redistributing income. Even if one were to argue the environmental benefits of income redistribution, one would still have to leave the safe harbor of the public trust doctrine for the murky waters of a still-nascent economic theory of sustainable development. Foreign aid programs and contractual trade preferences may be in order and are certainly not excluded, but that is not the same as establishing a legal entitlement that would permit the rearrangement of intellectual property rights without the consent of those who hold those rights.

What the Biodiversity Convention does, therefore, is to mistakenly aggregate two fundamentally different principles that could potentially affect intellectual property: a party is required to accept a questionable goal of income redistribution along with the legally supportable ecological goal of maintaining biological diversity. One thus sees the logic behind the Clinton Administration's decision to ratify the Biodiversity Convention while at the same time attaching an interpretive statement that drives a wedge between these two different objectives. The current United States position clearly sees biodiversity and income redistribution as separable issues, and that while the former would unequivocally justify the rearrangement of private property rights if it were at stake, the

60. R. Prebisch, for example, says that a country's capacity to industrialize is affected by imbalances in that country's terms of trade. Developing countries find themselves exporting mostly cheap labor-intensive primary goods and importing most of their expensive capital-intensive manufactures. The path of successive market equilibria over time therefore increases a developing country's dependence on the advanced industrial countries for needed capital goods. R. Prebisch, *Five Stages in My Thinking on Development*, in *Pioneers in Development* (G. Meier & D. Seers eds., 1984).

latter depends on case-by-case consent between governments and between the public and private sectors.⁶¹

A less-critical problem with the Biodiversity Convention's treatment of intellectual property rights is that the role of the private sector is obscured. Article 16 generally considers technology patents as privileges granted by the state, and as such, the state has the right to direct the distribution of patented technologies that are held by individuals and firms in its private sector. Paragraph 3 states that

Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, with the aim that Contracting Parties, in particular those that are developing countries, which provide genetic resources are provided access to and transfer of technology which makes use of those resources, on mutually agreed terms, including technology protected by patents and other intellectual property rights⁶²

Here, "mutually agreed terms" refers to deals between governments. The role of private firms and individuals who hold the relevant patents is clarified in the next paragraph:

Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, with the aim that the private sector facilitates access to, joint development and transfer of [biotechnology] for the benefit of both governmental institutions and the private sector of developing countries⁶³

To a market-oriented government, appropriate measures might extend only so far as sponsoring industry conferences on biotechnology transfer to developing countries. A socialist or statist government could conceivably adopt a broader interpretation: compelling a patent holder to license the product or process to the state with the purpose of making it available to a developing country.⁶⁴ Recalling the previous discussion

61. *Supra* note 3

62. Biodiversity Convention, *supra* note 1, at art. 16, para. 3.

63. *Id.* at para. 4. Paragraph 2 of this article states that "[i]n the case of technology subject to patents and other intellectual property rights, such access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights." It further says, however, that the parties must treat intellectual property rights in a way consistent with the two paragraphs cited here and with paragraph 5. *Id.* at para. 5. One may discern throughout article 16 the philosophical tension between industrial and developing countries discussed earlier in this paper.

64. This would be an application of compulsory licensing, which is not only current practice in many developing countries but is also allowed under the Paris Convention. *Supra*

about how different political cultures regard intellectual property, one can see how legitimate interpretations of these two paragraphs could vary so widely that the provisions would have no real effect at all.

The ambiguity with which the Biodiversity Convention deals with the private sector in Article 16 is somewhat offset by Article 10, in which the contracting parties pledge to cooperate with the private sector in "developing methods for sustainable use of biological resources."⁶⁵ A cooperative agreement between a country and a firm that wants access to that country's biological resources can do what the Biodiversity Convention currently does not do: (a) recognize that the immediate payoff from biological resources depends on the rent the derived products obtain in the world market and (b) ensure that the country supplying the resources gets a proportional share of that rent.

An example of such cooperation that pre-dates the Biodiversity Convention by about a year is the agreement between Costa Rica and Merck & Co., the world's largest pharmaceutical manufacturer. In this agreement, Merck paid Costa Rica's Instituto Nacional de Biodiversidad (INBio) \$1 million in cash and \$180,000 in equipment for a two-year exclusive right to research and develop pharmaceuticals and agricultural products from biological samples supplied to Merck by the institute. In addition, Merck has trained numerous Costa Rican technical personnel. If any marketable products are obtained from the biological specimens it provides, Costa Rica will get a share of the royalties.⁶⁶

Costa Rican officials say that, so far, the agreement has been satisfactory.⁶⁷ The \$1 million provided by Merck is equivalent to more than half of the Costa Rican institute's \$1.8 million 1993 annual operating budget, and the cash has facilitated efforts to catalogue the many plant and animal species in the country's rain forests and protected areas.

Ironically, the agreement between Costa Rica and Merck underscores the dilemma in which the Biodiversity Convention leaves developing countries. One aim put forward by developing countries themselves was to establish a precedent of using some of the revenues from pharmaceuticals and other products made with biota originating in their pristine ecosystems to offset the social costs of preserving rain forests, wetlands,

note 44, at pt. I § 7.

65. Biodiversity Convention, *supra* note 1, at art. 10, para. (e).

66. Communications from K. Colgan, Manager of Media Relations, Merck & Co. (Sept. 20, 1993), and N. Martín, Biodiversity Prospecting Field Manager, Instituto Nacional Biodiversidad (Oct. 5, 1993), to the author (on file with author). Neither Merck nor INBio would specify a figure for the royalties, but Martín said that typical royalties in agreements of this nature range from 1 percent to 5 percent of net sales.

67. Telephone interview with A. Sittenfeld, Director of Biodiversity Prospecting, INBio (Oct. 4, 1993).

and wilderness areas. Any such payment, however, would have to come from the same rent developing countries are not inclined to protect. Instead, developing countries sought direct financial transfers from industrial countries⁶⁸ while at the same time seeking to preserve a regime of weak intellectual property protection.

Biological diversity, the fair sharing of economic benefits, the fair protection of intellectual property rights, and free trade are not irreconcilable despite the complexity of the issues. The real tragedy in this story, however, is not the harm to intellectual property rights but rather the missed opportunity to further the ecological goal of biological diversity. The economic forces that make intellectual property so controversial a trade issue can be used as a potent tool to promote the diversity of species, but the treaty as it stands fails to do that. Had it followed the precedent of the ozone protection treaties,⁶⁹ the Convention on Biological Diversity would have identified intellectual property rights as an issue to be researched by a special working group that would recommend a specific protocol at the next meeting of the parties. Such a protocol is still feasible; the next section sketches what it might look like.

A Protocol for Products Made with Biota from Pristine Ecosystems

The international community needs to develop and accept a special new category of intellectual property principles for products made with biota from pristine ecosystems.⁷⁰ Such patents should be treated differently from normal patents on commercial products and processes, and should take account of the special situation and needs of developing countries.⁷¹

Although other issues could be addressed, the four main points of the proposed protocol would be as follows.

1. *All contracting parties—rich and poor—must agree to protect the patents of technologies for pharmaceuticals and other products made from the biota*

68. Biodiversity Convention, *supra* note 1, at arts. 20-21.

69. See the Vienna Convention for the Protection of the Ozone Layer, 1985, 26 I.L.M. 1516 (1987), and the Montreal Protocol on Substances that Deplete the Ozone Layer, 1987, 26 I.L.M. 1541.

70. For a precedent, one may look to the 1989 treaty on integrated circuits, which created a new category of intellectual property to cover the topography of integrated circuits. Treaty on Intellectual Property in Respect of Integrated Circuits, 1989, 28 I.L.M. 1484.

71. The Generalized System of Preferences, which evolved out of negotiations within the UN Conference on Trade and Development from 1964 to 1971, established a precedent for giving developing countries preferential tariff treatment on a nondiscriminatory basis. UNCTAD, *Review of the Schemes of Generalized Preferences*, TD/B/C, 5/9, 1973, and TD/B/C, 5/22, 1974. See also B. Södersten, *International Economics* 243-58 (2d ed., 1980). The Montreal Protocol includes special provisions for developing countries. Montreal Protocol, *supra* note 68, at art. 5.

of pristine ecosystems in developing countries. The provisions of this article would apply only to those particular products that arise from national efforts to preserve biological diversity. Patents that use genetically engineered species or common species not protected by a conservation program would be excluded from this provision; protection of those patents would be left to WIPO and the GATT. The patents covered in this protocol would be protected according to the standards of national treatment and most-favored-nation treatment. In other words, all parties would be required to protect this class of product equally, regardless of whether the biota were taken from their own protected areas or those of another party.

Conceivably, trade sanctions could be legally used against a contracting party that did not uphold its commitment to protect these patents. The parties may choose to establish enforcement and dispute resolution procedures in the protocol, but these matters could be adequately handled under the GATT.⁷² In fact, the acceptance of this protocol would provide GATT parties and dispute arbitration panels with a clear and welcome decisionmaking rule.

The legal scope of this provision would depend on the depth of consensus behind it. Initially, the rule would bind only those countries that were contracting parties to the biodiversity technology protocol. A country not party to the protocol could allow piracy of the relevant technologies and conceivably get away with it. If, on the other hand, a large number of countries accede—including an overwhelming number of developing countries—then it may be possible to interpret this provision as a principle of international law applicable to all countries regardless of whether they ratify the protocol themselves.⁷³

2. *A share of the revenues from the sale of pharmaceuticals and other products made from the biota of pristine ecosystems in developing countries must be returned to the countries from which the biota are taken.* If developing countries are to be required to guarantee the monopoly rent included in the price of products made from their biota, then equity requires that they receive a share of that rent. Such a transfer would substantially support the objective of "fair and equitable sharing of the benefits arising out of the utilization of genetic resources."⁷⁴

72. This assumes disputes would be between parties who are also parties to the GATT.

73. D. Hurlbut, *Beyond the Montreal Protocol: Effects on Non-Party Developing Countries and Future Environmental Treaties*, 4 *Colo. J. Int'l Env. L. & Pol'y* 344. See also D. Arrow, *Seabeds, Sovereignty and Objective Regimes*, 7 *Fordham Int'l L.J.* 169, 209 (1984).

74. Biodiversity Convention, *supra* note 1, at art. 1.

Not only would developing countries receive a share of the economic benefits, market dynamics would become part of the effort to protect biological diversity. Countries with rain forests, wetlands, and wilderness areas that contain the largest diversity of plant and animal species would be at a comparative advantage; there would be a greater probability of developing profitable products from their biota. The more successful the product and the greater the revenue stream, the greater the payoff would be to the country from which the biota were taken.

The resource transfer to developing countries would be open-ended. That is, it would last as long as there was a demand for the products. This fits neatly with the open-ended nature of resource transfers called for in the Biodiversity Convention. Open-ended transfers are tenable as a share of a given product's revenue stream. They are *not* tenable as official direct assistance, which the Biodiversity Convention now calls for. Official aid introduces the possibility of sovereignty disputes—the questionable right of a developing country to claim part of an industrially advanced country's tax revenues, and the questionable right of the latter to attach "strings" to the aid it gives.

With patent protection assured by the previous article, the private sector would have a role that would be both voluntary and competitive. The protocol therefore should not attempt to determine the host developing country's share of royalties, because in any given case competition between bidding firms could increase what the country could get. A minimum royalty share could be established as a benchmark, but setting the level too high might result in some countries losing deals they otherwise would have had.

3. *The contracting parties must establish a multilateral fund to help developing countries acquire and distribute life-saving pharmaceuticals made from the biota of pristine ecosystems.* An annex would list the kinds of drugs to be covered by the fund: heart medications, malaria medications, and inoculations against HIV, to name a few possibilities. The annex would include both existing specific drugs and those types of drugs that may be developed in the future. Criteria for the scheduled drugs would be agreed upon by the contracting parties, and could include yardsticks such as efficacy of treatment, communicability of disease, or elasticity of demand.

For the fund to work, the contributions of industrially advanced parties cannot be voluntary as is the case now. The Montreal Protocol assesses contracting parties on a scale based on countries' general financial obligations to the United Nations, a formula that would be easily adapted to a biodiversity technology protocol. Unlike the revenues derived from product sales addressed in the previous section, however, the multilateral

fund would not be open-ended. It would be identifiably limited to the products listed in the annex, which would require developing countries to ration their demands under the fund. Yet it would not preclude or prejudice efforts by developing countries in obtaining aid from other sources for the same purposes.

The multilateral fund would significantly strengthen the legitimacy and impact of the Biodiversity Convention by recognizing the special situation of developing countries in a clear, meaningful way. The treaty already asserts this distinction.

4. *The obligation of contracting parties to protect patent rights for technologies to make products from the biota of pristine ecosystems must be without prejudice to any kind of intellectual property not covered by the biodiversity technology protocol.* It is not the purpose of the Biodiversity Convention to resolve the long-running controversy over international protection of intellectual property. Different issues are involved here—issues that are more time-sensitive than purely trade issues. These issues are such that they provide a rationale for recognizing the special situation of developing countries. The broader disagreement over the trade-related aspects of intellectual property should not be allowed to delay agreement on the narrower category of patents covered by a biodiversity technology protocol.

Because the Biodiversity Convention is in the form of a framework convention, it is anticipated that the details of the regime would evolve as scientific knowledge, cooperation, and institutions evolve. The treaty calls for the parties to meet regularly so that the agreement's specific measures can be reviewed and renegotiated as circumstances change.⁷⁵ Issues such as monitoring, enforcement, criteria for defining developing country parties, and a minimum share of royalties that should go to the developing country providing the plant and animal species are all items that would be negotiated *after* the four general principles were accepted.

If these four points are incorporated in a biodiversity technology protocol, both developing and industrially advanced countries would stand to gain. Industrially advanced countries would get assurances that patents related to the Biodiversity Convention will be respected by all parties. In exchange, developing countries would be guaranteed a share of the rent created by the patents, compensating them for their efforts to maintain biological diversity in territories within their national jurisdiction. The special multilateral fund would ensure that higher prices would not put related life-saving pharmaceuticals out of the reach of people in developing

75. Biodiversity Convention, *supra* note 1, at art. 23.

countries who may need them. In short, a protocol based on these elements would strike a workable balance between the individual rights sought by industrially advanced countries and the social welfare sought by developing countries. Moreover, it would achieve this philosophical balance in a way that would not place the burden entirely on either side.

CONCLUSION

Biological diversity is a good idea burdened by a bad treaty. The 1992 Convention on Biological Diversity will remain largely ineffective if the United States ratifies it without pushing for changes to fix its shortcomings. Now that the Clinton administration has signed the agreement, the United States can participate in future protocols and revisions as a party rather than as an outsider.⁷⁶ The protocol outlined in this paper is a possible starting point; it attempts to redirect the otherwise insuperable political and economic dynamics of intellectual property rights so that they support rather than prevent consensus.

Despite the volumes of arguments for and against a strong international regime of intellectual property protection, neither side can claim the moral high ground. Underlying the divergence over intellectual property protection, however, is the more fundamental question of whether a society holds individual rights or the common good as supreme. Absent a set of supracultural values to mediate their differences, nations will have to make a conscious effort to agree on common principles that will enable them to deal with each other as moral equals if they are to address environmental challenges in a cooperative way.

A core of such principles seems to be emerging in international law, and some of them can be discerned from the rocky experience of the Biodiversity Convention. An ecological imperative can supersede free trade objectives, individual rights, and on occasion state sovereignty. But there are limitations: the ecological imperative is only as strong as the scientific research program that is attempting to explain it, one cannot "piggyback" onto an ecological imperative non-ecological objectives of limited consensus, and there needs to be a clear and nonprejudicial separation between trade issues that have direct environmental implications and those that do not.

1. *Ecological imperatives supersede individual rights.* Even in such a Lockean, pro-individual political environment as the United States, judicial

76. This assumes ratification of the treaty by the Senate.

applications of the public trust doctrine have reaffirmed the underlying and inalienable prerogative of the state to rearrange individual rights within its jurisdiction—including rights of property—if common-heritage resources are threatened. If and when the GATT begins to deal with the environment-related aspects of trade in an international context, even the most hallowed principles of free trade will have to bow down to the greater common need to protect common ecological resources. On occasion, the ecological imperative may even justify limits on state sovereignty. The International Court of Justice has stated that it is possible for certain special obligations to be so compelling as to warrant their application *erga omnes*,⁷⁷ and customary law suggests that one such obligation is to refrain from harming the environment of other states or of areas beyond national jurisdiction.⁷⁸ The question is how a valid ecological imperative is to be determined.

2. *Ecological imperatives must be scientifically based.* This is not to say that environmental threats must pass the impossible test of scientific certainty.⁷⁹ What it does mean, however, is that some methodologically credible attempt must have been made to ascertain the magnitude of the threat. Sheer speculation without any empirical or theoretical foundation in the relevant science does not make a moral imperative.⁸⁰ A comparison

77. Case Concerning the Barcelona Traction, Light and Power Co., Ltd. (Belg. v. Spain) 1970 I.C.J. 3 (Feb. 5). See also International Status of South-West Africa, 1950 I.C.J. 128 (Separate Opinion of July 11).

78. Restatement (Third) of the Law: The Foreign Relations Law of the United States § 601 (1987).

79. Any natural or social science that relies on statistical methods cannot attain certainty. Hypothesis testing, the most widely used method of statistical analysis, results in conclusions as to whether a parameter estimate is something other than zero within a 95 percent confidence interval. These conclusions are most often based on certain assumptions about the random distribution of individual observations' deviation from the mean, assumptions which themselves often involve guesswork. See A. Darnell, *The Limits of Econometrics* (1990).

80. The precautionary principle, invoked in Principle 15 of the Rio Declaration and referred to in the preamble of the Biodiversity Convention, states that "lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent" environmental threats. United Nations Conf. Env't & Dev.: Rio Declaration on Environment and Development, 1992, 31 I.L.M. 874, at 879 (1992); Biodiversity Convention, *supra* note 1, at pmb1. As I have argued elsewhere, one may accept the precautionary principle and yet still ask about the threshold of uncertainty at which the principle becomes relevant. Hurlbut, *supra* note 73, at 350-351. A liberal yet defensible delimitation of this principle would still give science an important role. That is, the precautionary principle would require preventive measures if there were a scientific rationale for not ruling out the possibility of environmental harm. See P. Gündling, *The Status of International Law of the Principle of Precautionary Action*, in *The North Sea: Perspectives on Regional Environmental Cooperation* 23, 26 (D. Freestone & T. Ijstra eds., 1990).

between the Convention on Biological Diversity and the successful Montreal Protocol shows the difference science makes. The Montreal Protocol enjoys a broad-based consensus behind a regime of substantive control measures largely because of the well-developed research program that quickly formed around the problem of ozone deterioration.⁸¹ Loss of species poses a tougher scientific problem, however, and the research program is still evolving. In fact, a large part of the Convention on Biological Diversity is devoted to developing the necessary research.⁸² But because no well-developed, policy-oriented research program *currently* exists, debate over the Convention on Biological Diversity was easily mired in older, non-ecological disagreements between industrial and developing countries.

3. *No piggybacking.* As the discussion in this paper shows, the legal weight of a valid ecological imperative cannot be imputed to non-ecological issues linked only in theory and for which consensus is limited. The Convention on Biological Diversity attempted to link the objective of biological diversity with the objective of income redistribution, which opened the door to confrontation between rich and poor states over intellectual property rights. International environmental policies need to avoid the error of misplaced aggregation. Ecological imperatives are readily grounded in customary law and are a solid basis for treaty law. Seemingly related non-ecological issues must be approached more circumspectly, relying on more structured and consensual approaches through multilateral institutions or direct bilateral agreements.

4. *Trade-related issues with direct environmental consequences are separable from other trade issues.* This paper demonstrates how the principle of separability might remedy one problem with the Convention on Biological Diversity. A corollary to the principle of "no piggybacking," separability means that legitimate ecological imperatives justify exceptions to normal trade rules, that the exceptions apply only to those cases that are proved to have direct environmental consequences, and that the exceptions in no way prejudice any other trade issue. The GATT already lays the foundation for this principle in Article XX, which says that any GATT contracting party can enforce domestic measures "necessary to protect human, animal or plant life or health" or "relating to the conservation of exhaustible natural resources" as long as such measures do not discriminate against imports and do not constitute disguised barriers to trade.

81. Hurlbut, *supra* note 73, at 346.

82. Biodiversity Convention, *supra* note 1, at arts. 7, 12.

Intellectual property rights will remain a contentious trade issue, and there is nothing any environmental treaty can do to change that fact. The gap between North and South is wide, and the economic forces are formidable. But the wider disagreement need not prevent progress on a biodiversity regime. Developing and industrially advanced countries can agree to disagree on the trade-related aspects of intellectual property and still reach a separate accord on a small list of products and processes related to biological diversity. If the Biodiversity Convention is to be successful, it must be something other than a money-grab by developing countries and something other than a vehicle by which multinational corporations exploit developing countries. Benefits and costs—like new rights and obligations—must be equitably shared by rich and poor countries alike.