that the system of incentives set up under the current author-centered vision of intellectual property will actually *impede* innovation and scientific progress, diminish the availability of our cultural heritage, inhibit artistic innovation, and restrict public debate and free speech.

The Intellectual Land Grab

First let us begin with the conventional distributional criticism. Why should we assume that expansion and strengthening of the international intellectual property regime benefits the developed world at the expense of the developing world? The conventional response assumes that the advantage of the developed world comes entirely from its technological lead. The analogy is the resources of the deep-sea bed. During the 1970s it became apparent that there were significant mineral resources on the deep-sea bed. These resources were owned by no one. If the first nations with the technology to exploit these resources are given sole title to them, the developed world will benefit disproportionately. If all nations can commodify innovation, then those who have the GNP, the scientific base, and the most developed cultural production industries will be able to commodify more. Clearly, this has a huge measure of truth to it. But an overemphasis on the *material* causes of tilt in the international regime, leads us to underestimate the way in which the conceptual structure of the regime is linked to, and is an aggravating part of, underlying disparities. I have tried to show that the basic assumptions of the regime mean that certain kinds of contributions to culture and scientific progress are validated, authorized and thus rewarded, while others are made invisible.

The author concept stands as a gate through which one must pass in order to acquire intellectual property rights. At the moment, this is a gate that tends disproportionately to favor the developed countries' contributions to world science and culture. Curare, batik, myths, and the dance "lambada" flow out of developing countries, unprotected by intellectual property rights, while Prozac, Levis, Grisham, and the movie *Lambada!* flow in—protected by a suite of intellectual property laws, which in turn are backed by the threat of trade sanctions. There are, of course, many reasons for this imbalance. It is not simply the design of an intellectual property system around an author figure that explains such results. Disparities in technology

and wealth would mean that, *whatever* the intellectual property system adopted, the developed countries would better be able to exploit, market, and profit from the objects of intellectual property. *But an intellectual property system centered on the ideal of the transformative and original creator compounds these tendencies. It does so because the traditional competitive advantage of the developing countries has been in supplying raw materials and an authorial regime values the raw materials for the production of intellectual property at zero.*

Examples are legion. Centuries of cultivation by Third World farmers produces wheat and rice strains with valuable qualities—in the resistance of disease, say, or in the ability to give good yields at high altitudes. The biologists, agronomists, and genetic engineers of a Western chemical company take samples of these strains and engineer them a little to add a greater resistance to fungus or a thinner husk. It seems to me that, even here, the author analysis adds something to the story. The chemical company's scientists fit the paradigm of authorship. The farmers are everything authors should not be—their contribution comes from a community rather than an individual, from tradition rather than innovation, from evolution rather than transformation. Guess who gets the intellectual property right? Next year, the farmers may need a license to resow the grain from their crops. Calling this practice "the great seed ripoff," Representative John Porter actually introduced a resolution into Congress that would have called for the United States not to proceed with intellectual property negotiations under the GATT until there has been a study on "protecting the rights of those in the Third World." A news article on the resolution immediately follows this observation by offering a view of this issue from the other side, that is to say, from within the author-centered view of intellectual property. "The 'industrial world' view on the issue is that poor countries pirate drug recipes or high-yield seeds, violating the patent laws of industrial countries to avoid paying royalties on the order of $3 billion a year to U.S., Japanese and European firms."[14]

At the moment that I finished this book, international concern about this issue seemed slowly to be awakening. On September 25, 1995, *Time* carried a story called "Seeds of Conflict" describing the controversy surrounding W. R. Grace's patent on a pesticide derived from the seeds of the Indian neem tree. The problem is that the neem tree's seeds have been used by Indian farmers as a pesticide for cen-

turies. Grace's pesticide is a clear improvement over the traditional version; its shelf life is longer. For this and other reasons, *Time* was skeptical about the claims that the use of the seeds constituted "genetic colonialism."

> Labeling Grace's actions a rip-off, though, requires something of a stretch. The company didn't steal away with the seeds and market them; it built a plant in Tumkur, near Bangalore, to process them, providing jobs for 60 Indians and contributing to the local economy. Some critics charge that demand from Grace's plant is the cause of a recent jump in neem seed prices that has driven some small farmers out of business, but that is difficult to prove. And while India [which currently does not permit the patenting of agricultural products] will eventually have to change its patent laws as a member of the World Trade Organization under the General Agreement on Tariffs and Trade, that still wouldn't keep farmers from using neem seeds in traditional ways.[15]

The article concluded, however, with an approving quote by an attorney who spoke of the need to "share benefits" and "to create some kind of compensation . . . to promote development of biological resources in a sustainable way." This article and others like it are not the only sign that the problem has been recognized. Darrell Posey and Graham Dutfield's handbook, *Beyond Intellectual Property Rights: Towards Traditional Resource Rights for Indigenous and Local Communities*, provided indigenous communities with the first accessible summary of the existing intellectual property, human rights, indigenous rights, biodiversity, and environmental rules that bear on the issue.[16] But if things are changing, they are changing all too slowly. And even countries, such as India, which have taken a stand against the patenting of life forms, will soon be forced by the GATT to change their position and their intellectual property laws—all in the name of "free" trade.

So much for the linkage between distribution and conceptual structure. Whether I am right or wrong about the distributional effects, I think it can be convincingly demonstrated that an exclusively author-centered regime will have negative effects on efficiency. In many ways, this may be the more important point to make. To condemn a system as unfair is one thing; to argue that it does not work, that it may sometimes actually *impede* innovation, is another. Again, the key to the analysis is the blindness to "sources" produced by a system

that has as its paradigmatic case an individual artist making something *ex nihilo.*

Shamanic Sources and Periwinkle Effects

Shamans from the Amazon basin have generations of lore about the properties of herbs and flowers. Some of the these plants are placebos; others are extremely valuable. Drug companies have found that if they test the plants from the shamans' "black bag," they yield a high percentage of valuable drugs. As the *New York Times* reported, "While skeptics may argue that the lore of the native healers is mere superstition, the ethnobotanists see shamanic knowledge as the result of a trial and error process refined over thousands of years. Ethnobotanists hope to take a scientific short cut to discovering new uses for the tens of thousands of plants with which native peoples are intimately familiar." One of the most fascinating experiments reported by the *Times* involved the AIDS virus. In test tube trials, "of the twenty plants collected on the shaman's advice, five killed the AIDS virus but spared the T cells. But of eighteen plant species gathered randomly, just one did so."[17]

A more widely publicized example concerns vinca alkaloids from the rosy periwinkle, a native of Madagascar. The plant was used indigenously to treat diabetes, was investigated by the Lilly company, and forms the basis of a compound now used in chemotherapy treatment.[18] According to the British newspaper *The Independent,* the plant "has yielded a drug to cure Hodgkin's disease and a trade in the drug worth $100m a year."[19] The article goes on to quote the World Wide Fund for Nature to the effect that "if Madagascar had received a significant part of this income, it would have been one of the country's largest (if not the single largest) source of income." In the days of recombinant DNA techniques, genetic information may be one of the largest resources of the developing countries. "Madagascar is the unique home of perhaps 5 per cent of the world's species. It is the biological equivalent of an Arab oil sheikdom. Yet, without an income from its huge biological wealth, it has chopped down most of its forests to feed its people." Now *there's* a public goods problem. Precisely because they can find no place in a legal regime constructed around a vision of individual, transformative, original genius, the indigenous peoples are driven to deforestation or slash and burn farming. Who knows what other unique and potentially valuable