Supreme Court Hears Argument on Patenting Life Forms

If a bacterium is patented, does it infringe the patent by reproducing? Does a person infected by it offend the patentee?

On Monday 17 March the Supreme Court of the United States heard argument about a matter of high relevance to philosophy and commerce alike. The marbled chamber on Capitol Hill was packed as the nation's highest court at last addressed itself to the question of whether forms of life can be patented.

How does one spell "inoculum," Mr. Justice Stewart wanted to know, having heard the unfamiliar phrase "an inoculum of bacteria" in the government attorney's address.

"I-n-o-c-o-l-u-m," the Deputy Solicitor General of the United States misinformed him.

"Does that mean innocuous?" the justice inquired.

The innocuous party in the case is a bacterium, known as *Pseudomonas*, which has been genetically engineered so as to digest oil slicks. General Electric wishes to patent the bug on behalf of its developer, Ananda Chakrabarty, who now works at the University of Illinois.

The case is important because the Patent Office is ignoring the growing file of patent applications of recombinant DNA techniques until the issue of the Chakrabarty case is resolved. The patent application was originally filed 8 years ago, on 7 June 1972, and has been wending its way through the courts almost ever since (*Science*, 9 November 1979, p. 664).

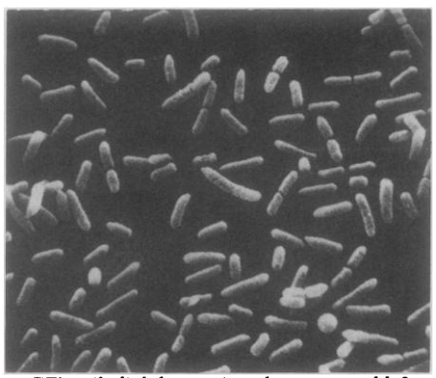
Some view the case as holding weighty implications for the nature of life, but be that as it may, the court will decide it on much drier grounds.

The nub of the legal issue is that the patent law says a patent may be granted to whoever invents anything new and useful. This obviously excludes products of nature, which are neither new nor inventible by man. The problem comes with entities that are products of both nature and man, such as plant varieties, and genetically engineered bacteria. Is the plant breeder inventing something new (and patentable) or merely rearranging what already exists in nature?

This question, albeit in somewhat muddied form, exercised the Chief Justice of the Supreme Court. "Before we had human beings," he demanded to know, "was not plant breeding a natural process?"

Before we had human beings, we had, alas, no plant breeders, but the counsel for General Electric, to whom the question was posed, replied otherwise. "Mutations," he said, in a gesture toward Darwin that fell somewhat short of a full embrace—"Mutations have been going on for millions of years, and some people think that all living things are mutations of one original parent."

The question of whether the joint products of man and nature are patentable subject matter is one that has been studiously skirted by both the Patent and Trademark Office and by the Congress. When faced in 1930 with the question of giving patent protection to plant varieties, Congress did not state whether they were covered under existing law but passed a special act, the Plant Patent Act. The scope of the act was extended to other plants by the Plant Variety Protection Act of 1970.



GE's oil-slick bugs: Are they patentable?

The case presented by the government to the Supreme Court was that Congress would not have needed to pass these two acts for plants if its intent in framing the original law had been to allow for the patenting of living things. "Our basic contention here is that claims [for patents] on living organisms themselves are not within the statutory categories established by Congress and therefore were properly rejected" by the Patent Office, Deputy Solicitor General Lawrence Wallace told the court.

Justice Rehnquist wasn't happy with the implication that all patent applications had to fall into categories pre-established by Congress. "Do you think that Congress foresaw television, radio, and that sort of thing when it passed the law? It was to reward inventors who saw things Congress didn't see that the patent laws were passed," Rehnquist observed.

Wallace was ready for that one. "We don't think we are talking here about an area unforeseen by Congress," he replied: it was because Congress had foreseen the problem of patenting forms of life that it had dealt specifically with plants. "Congress developed very carefully wrought statutes on the premise that these were the only ways in which one was authorized to get a patent on a living organism," Wallace contended.

The court heard a quite different story from Edward McKie, the attorney for General Electric. Rightly or wrongly, plants were not being patented prior to 1930, so Congress passed the plant variety act. But in the legislative history of the act, McKie assured the justices, "There is not a word to suggest that Congress thought patents could not be granted on living subject matter."

The government might claim that plants were the only living organisms that could be patented, by virtue of the plant variety acts, but McKie had discovered plenty of instances in which the Patent Office had granted claims on bacteria, starting with a patent awarded to one Louis Pasteur in 1873. "The government's policy has not been to deny patents on living things, but to deny patents on products of nature, whether they are living or not," McKie told the justices.

Between its written brief and oral argument, the government had shifted its position, McKie claimed. In the former it claimed that Patent Office policy was not to grant patents on living organisms, in the latter it switched to emphasizing the legislative history of the plant variety acts.

"Have you abandoned your argument that no living thing can be patented?" Justice White asked the government.

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"We have not abandoned it at all," Wallace replied. To grant patent rights on living organisms, he said, "would be an unprecedented extension of the patent law."

People using bacteria have indeed enjoyed patent protection, but the patents have been awarded not for the bacteria themselves but for the process in which they are used, the government claims. As for the few instances in which patents have been granted on bacteria themselves, these were just the "isolated actions of lower level employees," states the government's brief: "The policy of the Patent Office, however, is that living things themselves are not patentable."

In its written reply brief, the government has tried to impress upon the court just how unprecedented patenting of life would be. Theologians may enjoy debating questions about angels dancing on pinheads; here is the kind of speculation that lawyers get high on:

> [The] familiar terms and concepts of the patent law are not easily adapted to the patenting of living microorganisms that reproduce themselves. The microorganisms themselves presumably would not infringe the patent by reproducing (and thereby manufacturing themselves) without a license. And a human being who himself becomes infected, or whose plant or animal (or whose food, liquid, etc.) becomes infected, presumably also would not become an infringer merely by providing the medium in which the microorganisms propagate (at least if he does so unintentionally and takes reasonable measures to curb the growth of the infection—and does not use the microorganisms in any way). But the very fact that living organisms may reproduce in ways and places uncontrolled by the patentee or his licensees, and perhaps in profusion, suggests that patent grants on the organisms themselves would be unprecedented in scope.

While the government has warned against extending the scope of the patent law without express approval from Congress, General Electric has presented the argument's exact mirror image, that the scope of the law should not be restricted without a special act of Congress: "If the Government wishes to reverse its policy, it should address its desires to the Congress, which can legislate an exclusion, if that is found to be required by the public interest."

Several amicus briefs have been filed in the case. The Peoples Business Commission, supporting the government, contends that the granting of plant patents has harmed the genetic diversity of crop plants, and that the patenting of bacteria will lead to the patenting of higher forms of life. General Electric is supported by amicus briefs from the University of California, which stands to be granted a share of the fundamental patent on the recombinant DNA technique, and from Genentech, the leading gene splicing company. The Supreme Court is expected to hand down a decision some time before 16 June, when its current term ends.—NICHOLAS WADE

The Osage Oil Cover-up

Where the Osage Indians have 9970 oil wells pumping away, bureaucrats would have parks, reservoirs, and water-skiers

Pawhuska, Oklahoma. The policy of the Administration is to increase domestic oil production, but here in Osage County, the Corps of Engineers is trying to swamp 83,000 acres of oil-rich country with dams and reservoirs. The National Park Service wants to expropriate another 97,000 acres for a park. That these two bureaucratic giants have so far been slowed or stopped short of their goals is due to the spunk of the Osage Indians, who own the mineral rights in Osage County. After years of being exploited by white men seeking to do them good or otherwise, the Osage Indians have learned a basic rule of survival in white man's country: sue on sight.

The result is that the bureaucratic armies of the Great White Father have not been very successful in their attempts to cover the oil. In fact, the Osage are running circles around them.

"We've got 9970 pumping oil wells in the county right now," says Sylvester J. Tinker, 78, chief of the Osage. "Hell, we can't get enough rigs in here to drill the new ones. And still those sorry sons of bitches in Washington are telling us to cover it up."

The chief regularly flies to Washington to lobby on behalf of the tribe, and he gets results. A bill now before Congress to create a Tallgrass Prairie National Park has been amended so that the Osage will be able to continue producing oil and gas. Still not satisfied, the chief is out to kill the legislation. The chief and the tribal council also played a role in winning complete exemption for all Indian oil from the windfall profits tax—a feat the oil companies have failed to pull off. And with the help of the courts, the Osage have stopped or slowed work on two dams that have already run up construction bills of $49 million.

Just who the bad guys are in this tale out of the Wild West is not always clear. The Corps, for instance, claims the dams are needed not only for recreation but for controlling floods in nearby Tulsa, and that little Osage oil would be covered up. The Osage, of course, disagree. What is clear in all this is that the Osage have proved to be adept politicians, defending themselves in the face of a sprawling bureaucracy. It is also clear that the situation is filled with ironic twists from start to finish, and in that sense it perfectly mirrors the complex politics surrounding oil in the 1980's.

The dams in question, for instance, were authorized by Congress in 1962, when filling stations were pumping gas for 30 cents a gallon. And the Prairie Park, rather than being caught up by the tricks of time, is a classic case of ongoing bureaucratic schizophrenia. Two agencies within the Interior Department are fighting each other, the Bureau of Indian Affairs (BIA) to save the Osage lands and the National Park Service to take them away.

Not the least ironic are the Osage themselves. Unlike their brethren of the TV stereotype who battle only poverty and squalor, the Osage are the richest Indians in the world. In 1970, the income from leases to the mineral rights in Osage County amounted to $6.5 million. Today the high price of oil is turning once-marginal fields into money-makers. In 1979, the Osage took in $31 million.

And the Osage are fighting their way into the space age. Petroleum companies that lease the 160-acre tracts and that once sent royalty payments by mail must now do so through electronic-funds transfer. "We don't want to miss a day's interest," says David L. Baldwin, an Osage Indian and superintendent of

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