

PATENT ABSURDITIES

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Private interests are carving up our intellectual legacy--grabbing seeds, software and even the human genome

In June 1993, while flipping through his mail, Jack Singer noticed an envelope from an unfamiliar law firm. Singer, an eye surgeon in Vermont, knew of no outstanding complaints against him, but the hazards of unexpected malpractice claims always lurk for any physician. He quickly opened the letter.

Singer was indeed facing a lawsuit--not for some perceived failure but, ironically, because of his success. He had recently perfected a novel technique for removing cataracts, featuring a specially shaped incision that requires no stitches to heal. According to the letter, a surgeon in Sun City, Arizona, named Samuel Pallin had recently patented the same operation. Legalistic language notified Singer that if he continued to perform the no-stitch cataract operation, he would have to pay Pallin royalties of as much as \$10,000 a year.

Singer, who had already begun teaching the new procedure to his fellow ophthalmologists, was stunned as he skimmed the letter. What would the profession come to if practitioners could own the rights to medical procedures? Could such a seeming extortion possibly be legal? At first Singer thought the matter might be a mistake, a misunderstanding between two colleagues that could be cleared up by a personal response. He soon learned otherwise. The case would eventually cost Singer, his clinic and the supporters who contributed to his legal defense fund more than half a million dollars in legal fees.

Unfortunately, Singer's ordeal is far from being unique. In an era of unprecedented technological development, freely shared knowledge is becoming an endangered species. American politicians and pundits still spout platitudes about how public education and public access to information are the bedrock of a democratic society. But reality belies the rhetoric. These days, hospitals are battling with investigators over the right to control new treatments, universities are hauling faculty members into court to establish who will profit from their research, and genetic engineering firm are fighting over proprietary rights to techniques and materials. And private claims to formerly public information are appearing not only in medicine and biomedical science, but also in agriculture, software development and many other fields. Even Shakespearean scholars have gone to court over who owns the rights to a particular interpretation of Hamlet.

It used to be that only tangible innovations could be patented. Until 1870 the U.S. Patent Office required patent applicants to submit physical models of their inventions. That rule anchored the patent system in reality, by reflecting the standard that a patent should cover some thing that yields a material result. Today the patent system has moved so far away from such a concrete interpretation that the idea of requiring a model is almost unthinkable. The term intellectual property has emerged to describe the kinds of abstract ideas being patented. Rather than protecting a particular innovation, the current system often authorizes exclusive control of a broad concept. According to Wallace Judd, the manager of training development at Netscape Communications Corporation in Mountain View, California, it is the difference between a patent on a particular improved mousetrap and a monopoly on the idea of trapping mice.

When Agracetus, a biotechnology firm based in Middleton, Wisconsin, managed to insert genes into cotton in 1988, the company sought patent protection not for its modified cotton plant or for its novel process, but for all cotton genetically engineered by any means. The U.S. Patent and Trademark Office (the agency was renamed in 1975) initially said yes, then changed its mind after a chorus of objections from industry representatives and investigators at the Department of Agriculture, among others. The ensuing legal battle has yet to be resolved.

A team of investigators at the National Institutes of Health in Bethesda, Maryland, made medical history in 1990 by employing a new method to successfully treat two girls with a rare genetic disorder [see "Splice of Life," by Kenneth W. Culver, January/February 1993]. Soon afterward, they parlayed the experiment into a patent on all so-called ex vivo human gene therapy, a technique that holds untold promise for treating a panoply of medical conditions, from cystic fibrosis to cancer to AIDS. That patent has since changed hands, and physicians have watched, dumbstruck, as exclusive rights to an entire new field of medicine have been sold to the highest bidder--ultimately, the giant pharmaceutical firm Novartis in Basel, Switzerland.

The multibillion-dollar international effort to map the human genome puts the system to one of its most difficult tests: Should investigators be allowed to own the segments they decode? Even biologists who support the idea of patenting useful products derived from the human genome often denounce the patenting of the genes themselves. Many biologists envision a potentially ghastly scenario, in which large corporations literally own the rights to the genetic legacy of the human species.

Corporation, of course, have long registered their pithy slogans and catchy jingles as company trademarks--and threatened lawsuits to prevent others from using them. But such ownership claims have pressed into unprecedented realms. The Qualitex Company in Chicago managed to acquire exclusive rights to a

color: the "special shade of green-gold" dye for the pads they manufacture for dry-cleaning presses. Remarkably, the validity of the claim was tested and affirmed by the U.S. Supreme Court. How could the court rule otherwise, Justice Stephen G. Breyer asked in the decision, when companies had already been allowed to own sounds (such as the three chimes that accompany the peacock logo of the NBC television network) and even fragrances (such as the scent in which one company steeps its sewing thread)?

The examples may seem fanciful, but the climate they create is insidious. The Mattel Corporation in Mattel, California, for instance, has taken a publishing firm to court for creating a hobby magazine for Barbie enthusiasts. Mattel argues that its trademark-ownership claims on Barbie extend even to publications about the doll. The esteemed English mathematician Sir Roger Penrose of the University of Oxford, claiming rights to a nonrepeating geometric pattern he discovered, is suing the Kimberly-Clark Corporation in Irving, Texas, for putting the pattern on its Kleenex brand of quilted toilet paper. And in 1995 Richard Stallman, a computer programmer and a well-known critic of the patent system, testified in patent office hearings that, to test the system, a colleague of his managed to win a patent for one of Kirchhoff's laws, an observation about electric current first made in 1845 and now stated in virtually every textbook of elementary physics.

The overarching challenge is clear: society can improve public access to every kind of information, or it can let parochial private interests shape the future. The first task is to recognize that a confluence of forces is forging a new global economy based on the private capture of knowledge. And that new regime is swiftly being applied across many disparate fields, which are changing forever due to high technology. One such field is agriculture.

Denny and Becky Winterboer farm 800 acres of corn and soybeans in the northwest corner of Iowa. In addition to growing soybeans to sell for food and livestock feed, the couple sold part of their crop to neighbors for seed. Such sales are traditional; Denny's family has farmed that way in Iowa for four generations.

In December 1990, though, one of those neighborly seed sales reaped a lawsuit for the Winterboers, filed by the Asgrow Seed Company in Kalamazoo, Michigan, then a division of Upjohn. By selling the seeds, the company claimed, the Winterboers were stealing Asgrow's intellectual property: specifically, the registered seed varieties A1937 and A2234. Asgrow claimed proprietary rights not only over those seeds, but over all future soybean generations derived from them.

The ensuing legal battle between Asgrow and the Winterboers raised such thorny issues that it eventually made its way to the U.S. Supreme Court. Historically, the purveyors of agricultural goods such as seeds or plants have not been able to control how growers used the goods. Someone who sells you an apple tree, for instance, has no claim to the apples you harvest in the future, nor the right to prevent you from planting seeds from those apples to

grow more trees of your own. In the 1980s, though, as techniques of genetic engineering were applied to plant breeding, such long-held traditions began to be strained. Viewed for millennia as the means to a crop, seed is gradually coming to be seen as an embodiment of intellectual property--a blueprint, in other words, that carries value of its own.

Hope Shand, the research director at Rural Advancement Fund International-USA, a nonprofit farmers' advocacy organization based in Pittsboro, North Carolina, recalls just a few years ago hearing the chair of the House Agriculture Committee dismiss as a paranoid fantasy the idea that farmers would ever be prevented from saving their own seeds. But that is exactly what has taken place. The Supreme Court ruled against the *Winterboers*. Even more devastatingly, at around the same time, Congress amended the Plant Variety Protection Act to remove the so-called farmer's exemption. Now it has become illegal for American farmers to sell or save seeds from proprietary crop varieties without receiving permission from breeders and paying royalties.

In effect, the U.S. government has begun sanctioning a new form of sharecropping, as farmers become little more than renters of plant germ plasm. "What we're seeing," says Shand, "is nothing short of a new kind of `biosoerfdom.' Only this time, instead of controlling the land, the new feudal lords--the large agrochemical firms--gain their power and wealth by owning the information contained within the new high-tech seed varieties."

In medicine, information dispute can become questions of life and death. CellPro, Inc., a small firm in Bothell, Washington, developed a treatment, approved by the U.S. Food and Drug Administration in 1996, that could help arrest the progress of some of the most deadly cancers, including breast cancer and lymphoma. But another company, Baxter International, Inc., in Deerfield, Illinois, claimed it already owned a broad license on the relevant technology--a device for isolating particular cells that are key to a patient's recovery from a bone-marrow transplant. While shepherding its own comparable product through the lengthy FDA approval process, Baxter sought to block CellPro from marketing its lifesaving treatment. The courts have ruled against CellPro, which filed for bankruptcy last year.

Such cases highlight the problematic question of what in medicine should be patentable. Patent regulations once distinguished between devices such as catheters and X-ray machines, which were deemed eminently patentable, and procedures such as blood transfusions or cardiopulmonary resuscitation, which were not. That distinction began to erode as long ago as 1954, however, when a patent was awarded for a technique for treating hemorrhoids. By early 1996 the patent office was awarding as many as a hundred patents a month for medical procedures.

The irony is that what gets patented is often not even particularly novel or noteworthy. In the early 1990s, for instance, radiologists across the United States received letters demanding royalties on a common technique used to determine the sex of a fetus with ultrasound. The procedure, which enjoys

twenty years of patent protection, boils down to visually distinguishing male from female genitalia. Not surprisingly, the American College of Radiology has condemned the patent. Many in the field have publicly ridiculed it. As the radiologist Christopher R. Merritt of Thomas Jefferson University in Philadelphia says, "It's like saying you have a secret method for distinguishing the gender of patients when they take their clothes off for a physical. That's an invention?"

By 1995 a similar case--the one described earlier, involving the ophthalmologists Singer and Pallin--caught the attention of Greg Ganske, an Iowa physician and Republican member of Congress. To Ganske, the prospect of physicians suing one another over their procedures seemed obviously to contradict the ethical code that doctors have embraced since the days of Hippocrates: to share knowledge freely whenever it can benefit patients. Ganske introduced legislation limiting patents on medical procedures, but the measure failed after an outcry from biotechnology companies, which feared for their livelihoods. In 1996 a compromise was finally passed: physicians can still patent medical procedures, but they now cannot bring infringement cases against other physicians.

The compromise did nothing, however, to resolve the deeper underlying issues: Is the delivery of health care a public service or a business? Should patent owners and their lawyers be allowed to profit from carving up medical knowledge into privately held parcels? Which aspects of medicine must be held in common for the greater good?

In the spring of 1996 a small company calling itself E-data Corporation sent a letter to 25,000 firms, with a warning: If your firm was conducting business over the Internet, you were potentially infringing on a broad patent on Internet commerce held by E-data. According to the letter, the remedy was simple: Sign a licensing agreement--which included an annual royalty fee of as much as \$50,000--and you would be excused from past offenses. Refuse to sign, and you were courting a lawsuit.

How did E-data ever obtain a patent on something as broad as financial transactions on the Internet? The story begins in 1985, when the computer programmer Charles Freeny won a patent by outlining a system in which products, such as a magazine article or a piece of music, could be purchased online and delivered electronically. It was a prescient idea, but even Freeny could not have envisioned the patent's universal applicability to the mushrooming on-line commerce of the World-Wide Web. In 1989, unsure of what his patent might ever be worth, he sold it for \$200,000.

Freeny's patent resurfaced with a vengeance in 1994, when it was bought by a group of investors who hired a businessman named Arnold Freilich to run their new company, E-data. The investors also hired the patent lawyer David Fink, whom Freilich fondly describes as "the pit bull of patent infringement." Early on, Freilich and two associates were lampooned in the trade press as "three men and a patent." But the joking abruptly ceased when many financial analysts

recognized that E-data's strategy might well succeed in exacting royalties from every company that wanted to buy and sell in cyberspace. In a heady three weeks that year, E-data's stock price soared from \$1.63 to \$11 a share.

Presumably judging it easier (and cheaper) to pay than to fight, several firms, including IBM and Adobe Systems, Inc., agreed to license the patent. Meanwhile, though, the vast majority of firms opted to see whether E-data's patent would hold up in court. So far E-data has filed lawsuits against forty-three companies, including CompuServe Corporation, Dun and Bradstreet, Broderbund Software, Inc., Intuit, Inc., and Ziff-Davis, Inc. "Part of our marketing strategy was to sue everybody and get noticed," Freilich says.

The targeted firms have been forced to sink millions of dollars into fighting the case in court. At issue is not merely whether Freeny was the first person ever to think of online commerce--a highly dubious proposition. The broader question at stake is whether anyone should be able to own exclusive rights to such a sweeping concept.

Even a nation that champions private property can endorse a national park system that preserves some land for shared use. Zoning and antitrust laws--both direct curbs on unfettered private ownership--have also been essential and effective tools for fostering a more healthy and equitable system of private enterprise. But no analogous mechanisms yet exist in the knowledge market.

Unlike land or other forms of tangible property, knowledge is not depleted by use. On the contrary, books, software programs and medical procedures lose their value and utility when they are not used. The development of new knowledge often requires a significant initial investment of capital, and of course those costly efforts merit recompense. But unlike traditional assets, once a new piece of knowledge exists, it incurs virtually no marginal costs from its ongoing use and dissemination.

What is needed are guidelines, to determine where the analogy between the ownership of knowledge and the ownership of tangible property breaks down, and to define when the public interest should override free-market tactics. Vital knowledge resources must be shared whenever possible so they can benefit all, rather than enrich a select few. Unless society tackles the issue head-on, the privatization of knowledge assets will choke productivity, magnify inequities and erode our democratic institutions.

