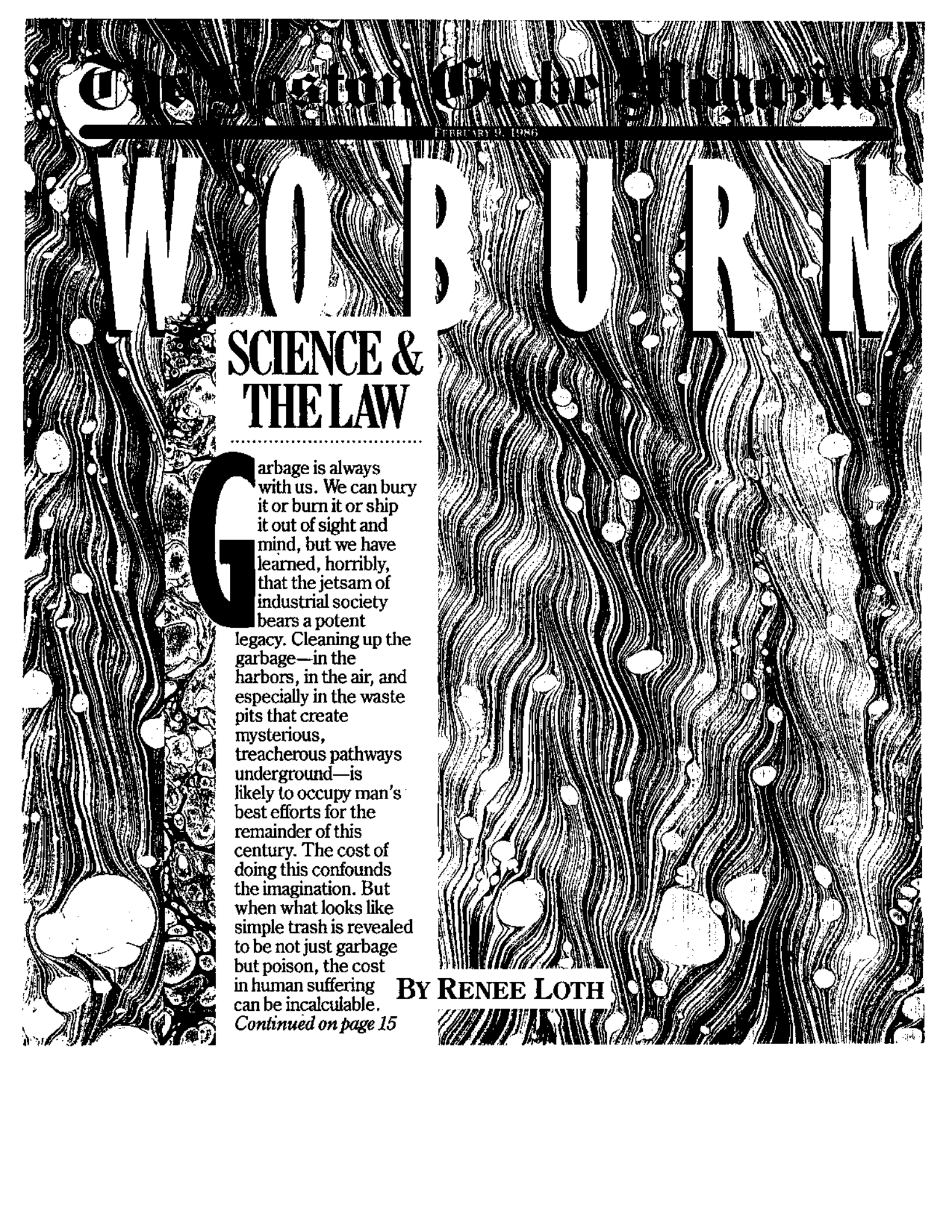




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WOBURIN

SCIENCE & THE LAW

Garbage is always with us. We can bury it or burn it or ship it out of sight and mind, but we have learned, horribly, that the jetsam of industrial society bears a potent

legacy. Cleaning up the garbage—in the harbors, in the air, and especially in the waste pits that create mysterious, treacherous pathways underground—is likely to occupy man's best efforts for the remainder of this century. The cost of doing this confounds the imagination. But when what looks like simple trash is revealed to be not just garbage but poison, the cost in human suffering can be incalculable.

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BY RENEE LOTH

Anne Anderson, whose youngest son died of leukemia at the age of 12, with her son Chuck and daughter, Christine. "The only way to make [corporations] sit up and take notice," she says, "is to bring suit."



Photograph by David L. Ryan, *The Boston Globe*

WOBURN, SCIENCE, and the LAW

BY RENEE LOTH

(Continued from the cover) In Woburn, Massachusetts, eight families believe the cost has been the lives of children stricken with cancers and birth defects that could only have been caused by the mutative properties of toxic chemicals. They have sued two industrial companies in Woburn for polluting the well water serving their homes, and thus for denying them, according to their court complaint, "the quiet enjoyment of their property," and for causing them to suffer "direct adverse physical effect and an increased risk of . . . illness and disease." And, the families allege, the chemicals from the companies caused five of their children, Jimmy Anderson, age 12, and his neighbors Jarrod, 3, Michael, 8, Carl, 9, and Patrick, 11, to "consciously suffer pain and mental anguish" — and death.

The case of *Anderson et al. v. Cryovac et al.* (Cryovac is a Woburn-based division of W. R. Grace & Co., an international conglomerate headquartered in New York) is scheduled to go to trial February 18 in United States District Court in Boston. It is a case dense with implications, not just for the eight families involved, but for science, business, politics, and the law. As society lurches toward evolving fair solutions to ever-more complicated problems, the law is a willing, if cumbersome, partner. Indeed, in the attempt to make some sense of their tragedy, the Woburn families have already tested the limits of science and politics. For them, the law may be the only remaining avenue to determine who or what is accountable for their suffering, and to deliver justice.

THE VICTIMS

The issue of toxic waste insinuated its way into the national consciousness in 1978, when a deadly soup of chemicals was discovered beneath the homes of fam-

ilies in Love Canal, New York. Since that time, official response has varied from state to state. In Massachusetts, legislators created a three-tiered defense against future contamination: a hazardous waste transportation act, designed to eliminate illegal dumping by tracking the waste "from cradle to grave"; a facilities siting act, designed to depoliticize the process by which someone's back yard is chosen for waste storage and treatment; and the Massachusetts superfund, a \$25 million cousin to the \$1.6 billion national superfund, designed to eliminate the most pressing threats to the public health and, eventually, restore the state's 16 priority hazardous-waste sites (and hundreds of others whose toxicity has not yet been rated) to something approaching normalcy.

The system has only partially worked: Treatment site proposals are still vigorously rejected by potential host communities across the state, and cleanup efforts have been retarded both by engineering problems and

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bureaucratic timidity. Now, at least in part because of those failures, a fourth frontier is being forged, not by elected leaders, but by toxic-waste victims themselves. Their campaign goes beyond containment or cleanup of the waste to compensation: to hold the responsible parties accountable for what happened to their homes and families, and to make them pay. "I hope what will come out of this case is that industry will understand that citizens won't stand to be harmed and see children sickened, that they can no longer undertake their business without a conscience," says Jimmy Anderson's mother, Anne. "The only way to make them sit up and take notice is to bring suit."

Like other victims'-rights movements, be they Mothers Against Drunk Driving or the wives of seemingly forgotten POWs, the campaign to compensate victims of "toxic torts" is a grass-roots effort, made up of housewives and pastors and other nonprofessionals operating with a shoestring budget out of kitchens and storefronts. But unlike those other, relatively limited crusades, victims of chemical exposure number conceivably into the millions. "The thing we're discovering with this pollution business is that the potential loss is unbelievable," says John W. Purkis, a vice president of the Liberty Mutual Insurance Company, one of the few companies still writing a limited number of policies to protect against toxic torts. With some 66,000 chemicals currently in use in American industry, the notion of Woburn-scale lawsuits percolating at even a fraction of the Environmental Protection Agency's 850 priority waste sites has the corporate community thoroughly alarmed.

On the other hand, unlike car crashes or other accidents, it is exceedingly difficult to pinpoint the cause — and therefore, in a legal sense at least, the "responsible party" — of a toxic injury. The effects of chemical exposure sometimes take years to develop, most chemicals metabolize quickly and leave no traces in the body, and very few people recall with any precision their living habits from years past. Epidemiology (the study of the causes and control of epidemics) is "a very inexact science," says Dr. John Cutler, who was assigned to the Woburn case from the national Centers for Disease Control in Atlanta. "We're all exposed to many chemicals, so it's difficult to isolate one probable cause." This is particularly true in a heavily industrialized city like Woburn.

The Grace company, which has been accused in the suit of dumping toxic solvents behind its Cryovac manufacturing plant on Washington Street in Woburn, hopes to use these empirical uncertainties to its advantage. The plaintiffs charge that Grace's solvents contributed to an excess of childhood leukemia and other diseases in Woburn, but according to documents filed in United States District Court, Grace is staking its defense in part on convincing the jury that "there is no scientific basis for concluding that the alleged exposure of the plaintiffs [to the chemicals] caused any harm."

Still, the potential liability for industry and the government is enormous. In 1983, when federal officials were mulling whether to amend the superfund law to include some provisions for compensating victims, an administrator for the Office of Management and Budget told *Forbes* magazine that there was "no greater fiscal threat for the '90s than the whole question of toxic torts and victims' compensation." The official urged restraint.

THE EVIDENCE

The poisoning of Woburn was a documented fact more than a century ago. The 1876 annual report of the state Board of Health noted that in Woburn, "the little mill pond was full of dead fish, some floating, some



Courtesy of the T. A. Smith Collection



David L. Ryan, *The Boston Globe*

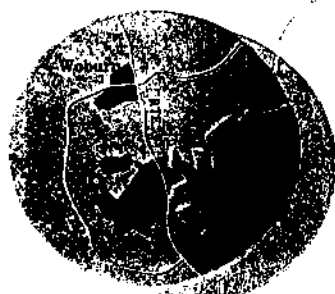
"I hope what will come out of this case," says Anne Anderson, "is that industry will understand that citizens won't stand to be harmed and see children sickened, that they can no longer undertake their business without a conscience."

Clockwise from right: Rev. Bruce Young of Woburn's Trinity Church and cofounder of FACE (For a Cleaner Environment); circles on map indicating "cluster" of leukemia cases; a monitoring device at a toxic-waste site in Woburn; inside a Woburn tannery at the turn of the century.



David L. Ryan, *The Boston Globe*

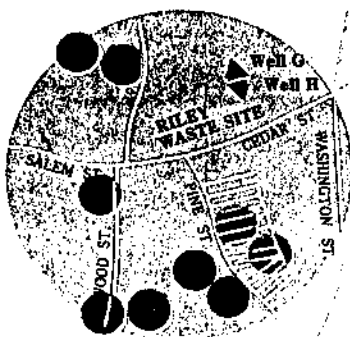
Richard Baker and Deborah Perugi



Woburn

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sunken." The report continued, stating that "the industry which thus poisons this valuable stream is the washing of hair scraped from hides . . . also the manufacture of glue from the refuse of the slaughterhouses." Woburn, now a city of 35,000 located 12 miles northwest of Boston, has long been an industrial center, producing leather hides, pesticides, even carnations. Woburn State Representative Nicholas Paleologos, whose grandfather emigrated from Greece and worked in a Woburn tannery, says, "It's ironic, but the very industry that nourished the grandparents may now be poisoning the children."

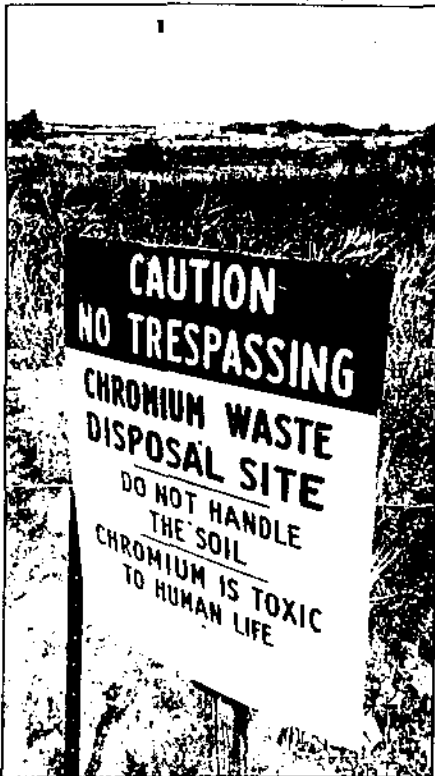
Almost exactly a century after the Board of Health report, construction workers grading the old site of the tannery to develop an industrial park unearthed ancient pits of dried arsenic and chromium (chemicals used in the tanning process that are now known to be carcinogens) and open lagoons of arsenic and lead. The EPA has placed the complex, called Industri-plex, on its national priority list, giving it a hazard rating of 72.4 (out of a possible 100), which makes it the most dangerous site in New England and the fifth-highest priority nationwide.

As threatening to the public health as the Industri-plex site appeared, another discovery would soon redirect attention to two municipal wells that had been providing drinking water to different sections of Woburn. Eventually, residents would accuse two manufacturing companies unrelated to Industri-plex with poisoning the wells. In the spring of 1979, workers at the MBTA commuter rail station in Woburn came upon 184 metal barrels mysteriously dumped beside the tracks. They asked the state's Department of Environmental Quality Engineering to investigate. DEQE tested the contents of the barrels and found that they contained polyurethane. Because the barrels had been dumped near the Aberjona River, which was believed to feed into municipal wells G and H, the DEQE quickly began testing these wells. It found no traces of polyurethane in the well water, but it did find a terrible concoction of even more sickening chemicals, including trichloroethylene (TCE), a chemical solvent. TCE is known to cause cancer in laboratory animals, and it can also cause liver damage, cell mutations, and neurological disorders. It was found in concentrations five times the level recommended by the EPA to guard against chronic illness. The wells were ordered closed immediately.

For Anne Anderson, a mother of three who had been living on nearby Orange Street in Woburn for 14 years, the two discoveries gave palpable weight to her deepest fears. Her 10-year-old son Jimmy had been suffering from leukemia since 1972, when he was 3 years old. (He died of the leukemia in 1981.) But there was an even more frightening coincidence: She had started to notice women whose children were being treated at the same hospital unit as Jimmy around her neighborhood — at the supermarket, in the bank. One mother's house was visible across Walker Pond from her own home. That same year, Jimmy's physician, Dr. John Truman of Massachusetts General Hospital, reported to the Centers for Disease Control that he had treated six cases of childhood leukemia in one six-block area of Woburn, near Walker Pond, during the previous five years.

What Anne Anderson was seeing in Woburn was in fact an epidemic. From the Greek words meaning "on top of the people," an epidemic is any medical condition increasing at a rate of 5 percent or more a year. And these leukemia cases were located in a "cluster" in a relatively small geographic area. In 1980, CDC's Cutler began an investigation of the Woburn leukemia cluster. Working with the Massachusetts Department of Public Health, Cutler

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Sign warns of hazards at an abandoned toxic-waste disposal site in northern Woburn.

Woburn

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directed by two outstanding researchers, Dr. Marvin Zelen, chairman of the epidemiology department at the Sidney Farber Cancer Institute, and Dr. Stephen Lagakos, a professor at Harvard's School of Public Health. But the Harvard study was attacked by other researchers because it used untrained volunteers to conduct the interviews, and because it relied too heavily on individual memories. Rev. Bruce Young of Woburn's Trinity Church, who with Anne Anderson founded FACE, believes the Harvard study could be the families' best evidence in the courtroom, as close as their side can come to convincing the jury that the wells were responsible for the leukemia. "If we have to show the smoking gun we will not be able to find it," Young says. He predicts that when the trial begins, "there will be a great effort to discredit the Harvard study."

It wasn't until 1982, after exhaustive ground-water engineering studies by EPA and DEQE, that residents felt they had sufficient evidence to accuse Grace and the John J. Riley tannery (a division of Chicago-based Beatrice Foods that is un-

related to the 19th-century tannery on the Industri-plex site) with poisoning the wells. The studies traced the path of Woburn's ground water past Grace's Cryovac plant and the Beatrice-owned tannery, where residents believe it was polluted with a variety of contaminants that eventually seeped into wells G and H. On the strength of this evidence, residents filed suit against Grace and Beatrice. (A third company, Unifirst, settled out of court for an undisclosed amount late last year.) Although the Industri-plex site is not mentioned in the Woburn suit, lawyers for Grace and Beatrice may use Industri-plex in their defense, arguing that the earth around wells G and H is so saturated with chemicals from so many businesses that it is impossible to know where the ground water picked up the contaminants.

Further complications in the evidence arose last year, when newly collected data revealed that childhood leukemia rates were still higher than average in Woburn, even though wells G and H had been shut down for five years. According to Richard Clapp at the state Department of Public Health's cancer

conducted a "case-controlled" study, comparing the habits of 12 families with leukemia victims with 24 healthy families. The study confirmed a significantly higher number of leukemia cases in Woburn than would normally be expected for a town of its size — the number was seven times greater in East Woburn, where Anne Anderson lives.

The study also confirmed that wells G and H were pumping water to the affected households during the mid to late 1960s, which the study noted was probably the "critical exposure period" for the leukemia cases. But because the wells weren't tested until 1979, Cutler and his associates couldn't know whether the drinking water had been contaminated during that critical exposure period, so they couldn't establish a scientific association between the disease and the wells. Ultimately, the study results were frustratingly inconclusive. "We can't rule anything in or out," says Cutler.

A second study conducted in 1982 by the Harvard School of Public Health did show an association between the wells and disease — and not just leukemia, but lung and kidney disorders and birth defects such as cleft palate as well. With the help of volunteers from the Woburn citizens' group FACE (For a Cleaner Environment), the Harvard researchers interviewed 3,200 Woburn families about their medical histories and living habits and related the responses to the locations of Woburn's municipal wells and water system in general.

The study carried some weight, since it was

registry, there were two newly reported cases of childhood leukemia in 1982, three in 1983, and one in 1985. Some experts think the new cancers undermine the argument that the drinking water in wells G and H caused the initial leukemias. Zena Stein, professor of epidemiology at Columbia University, headed a specially commissioned advisory panel that made long-term recommendations to the Department of Public Health last June. In her report, Stein advised continued monitoring of new leukemia cases to test the theory of the wells. "In the event that the excess of cases of childhood leukemia continues," she wrote, "the hypothesis would be weakened."

Mark Stoler, assistant counsel for W. R. Grace, stresses that the issue to be put before the jury in the Anderson case will not be merely whether the wells were contaminated, but whether they were sufficiently contaminated to have caused the particular leukemias alleged in the complaint, and — equally as important — whether the activities of Grace and Beatrice caused the damaging contamination. "The EPA laws are public health laws," says Stoler,

"They take the most conservative look at safety standards. Their question is, 'At what [contamination] level can we guarantee there will be no harm?' That's not the issue in this case. The question here is, did those exposures cause these particular illnesses?"

Epidemiology is an old science, but it has only recently been applied to chronic (long-term) diseases, and it has not yet succeeded in proving that childhood leukemia can be caused by poisons in the ground water. Between the mysterious pathways taken by the chemicals through the earth to create contaminated drinking water and the mysterious pathways taken by the contamination through the body to create disease, what the law calls "the train of evidence" is not very clear at all.

"The scientific community has been very limited in its ability to handle the Woburn situation," says Ken Geiser, professor of environmental policy at Tufts University. "There is a certain arrogance to science that it has all the answers. It is bound by its discipline to proof. These citizens don't want proof, they want justice."

THE LAW

Some actions are illegal, others are not. Though it may seem a black-and-white discipline, the law is actually an organic, even creative art that can be manipulated to respond to society's needs. In civil cases, litigation is situational; it deals not with proof but with probability. Case by case over the last several years, the law has been shaped to recognize new complications arising out of toxic-waste suits. Massachusetts courts are particularly liberal in their interpretation of some fine points of the law, which could help the eight families prove their case. "Massachusetts has a more enlightened view of latent-disease cases than other jurisdictions," says Neil Leifer, an associate with Thornton & Early, a law firm that deals primarily with toxic-tort litigation, mostly for people exposed to asbestos.

For example, in most civil cases in Massachusetts, the statute of limitations (the window of time in which a claim remains "alive") doesn't start running until a plaintiff has discovered he has been injured. In New York, the statute starts running from the moment of exposure, which can be years before a victim discovers he has been harmed. At Love Canal, 52 cases against the Hooker Chemical Company were thrown out of court because the statute of limitations had expired.

Ultimately, the defendants in the Woburn case are still innocent until proven guilty, and the burden is on the eight families to prove an association between their suffering and the actions of the two companies. Unlike a criminal case, however, where one must prove guilt "beyond a reasonable doubt," there is a different standard of proof for civil complaints like *Anderson v. Cryovac*. In a civil case, the plaintiffs must only prove, through a preponderance of the evidence, that "it is more likely than not" that the association exists. In other words, though a criminal defendant must be proved 100 percent guilty without even 1 percent of reasonable doubt, a civil defendant can be held liable as soon as the scales tip into the realm of "more likely than not," which is at roughly 51 percent.

In this case, the eight families are seeking compensatory damages for their actual health-care costs and other financial losses, and also general damages for pain and suffering. They have charged Grace and Beatrice with the "wrongful death" of the five children and with causing the diseases of two others. And the fam-

ilies are also seeking protection against future harm that could come to them from having drunk the contaminated well water; they want to be compensated for their increased risk of developing cancer or other diseases later on in life. Finally, the eight families are claiming that they have suffered particular mental anguish over their fear of getting sick at some later time, and they want to be compensated for that as well.

As unorthodox as they might appear, those last two claims do have precedents. In 1983 in Jackson Township, New Jersey, a court awarded \$17 million to 97 families that had been exposed to toxic chemicals, and it set aside half of that to pay for an elaborate system of annual health screenings as a protection against future medical conditions. In 1982 a Massachusetts case known as *Payton v. Abbott Labs*, involving women exposed to the pregnancy drug DES, determined that if a plaintiff shows a demonstrable symptom that could form a "reasonable basis" for fear, the plaintiff could be compensated for that anticipatory distress.

ute of limitation for wrongful-death claims had expired. The judge also ruled that the plaintiffs couldn't seek damages for the emotional distress they suffered as a result of seeing their children become sick, only for the distress inflicted by their own illnesses. And in October, lawyers for the Grace company (from the esteemed Boston firm Foley Hoag & Eliot) convinced the court to place a gag order on all parties associated with the suit, prohibiting them from speaking about specifics with the press. The Grace lawyers, who prefer to call the gag a "protective order," are concerned about undue pre-trial publicity that might prejudice a jury. Plaintiffs, lawyers, and potential witnesses interviewed for this article limited their comments to general discussion with no direct bearing on the trial.

Most companies vulnerable to charges of product liability or malpractice rely upon insurance for protection in case of a suit. Malpractice insurance has become such a growing burden to the casualty industry, however, that many companies are trying to get out of that business. Beginning last June and culminat-



Sanford Lewis, counsel to the National Campaign Against Toxic Hazards, believes the courts eventually will get around to responding to people exposed to the hazards of toxic waste, but he fears it will "take the lifetime of some of these victims."

But the defendants have had their victories as well. Last month, federal district court judge Walter J. Skinner ruled that the family of Carl Robbins, who died from his leukemia in August 1981, could not be in-

cluded among the Woburn plaintiffs because the last possible day of his exposure to the chemicals (the day the wells were closed in May 1979) was more than two years before his death, and so the two-year stat-

ing at the end of the year, member companies in the Alliance of American Insurers refused to write any new policies for pollution coverage. In Massachusetts, the boycott precipitated a crisis, since transporters and other handlers of hazardous wastes are required to carry insurance here in order to be licensed. "The insurance industry is not in a position to assume the liabilities that will arise [out of toxic tort suits]," says Liberty Mutual's John Purkis. "The potential for growth is tremendous, and the individual cost structures [for each suit] are great."

The insurance companies want to reform the whole body of tort law in an attempt to reduce the number of suits against their clients. Particularly egregious to the Alliance is a legal standard known as strict liability, which eliminates the old notion that a defendant must be found negligent in order to be held liable. Also troubling is the area of punitive damages, which compensate victims above their actual costs and are intended both to punish and deter the guilty parties. "Punitive damages provide windfalls to plaintiffs and their

attorneys," reads an Alliance report on recommended reforms in the civil justice system.

But advocates for toxic-waste victims think the insurance industry's complaint should be with companies that handle chemicals irresponsibly, not with the laws. Jan Schlichtmann, the lawyer representing the eight Woburn families, is voluble on the subject. "They're asking for a fundamental change in our system of justice," he says. "It's very much a well-planned — I don't want to say conspiracy — but a plan by the insurance industry to induce selected crises in the hopes that society . . . will say, 'We have to bring down the cost of insurance, so let's give up our rights.' The genius of our system of civil justice is that we have accountability. You have to give the corporations an incentive not to engage in this kind of [irresponsible] activity."

POLITICS

The Woburn case has attracted intense national attention. In addition to countless stories in the local press, *The New York Times* has written extensively