Ethics

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Book Reviews

Reviewed work(s): Carl Cranor, . *Toxic Torts*.
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Douglas MacLean

University of North Carolina at Chapel Hill

Tort or personal injury law is a part of civil law, which provides remedies to parties that are wronged in areas outside of contractual obligations. To establish that one has been wronged, a plaintiff has to show that he has been injured and (except in cases governed by strict liability rules) that another party caused the harm through negligence or by failing in other ways to meet a reasonable standard of care. Tort law thus serves two normative functions. By providing compensation to wrongly injured parties, it serves the ends of justice. And, with the help of punitive damages assessed against large, deep-pocketed wrongdoers, it provides an incentive to employers, manufacturers, and others to minimize the risk of harm. In this latter capacity tort law helps to fill in gaps left by a regulatory system that imperfectly manages to keep harmful products and practices off the market and out of the workplace, either by requiring firms to show that a product is safe before making it commercially available or by monitoring products, workplaces, and environments to make sure that dangerous products and processes are removed.

Toxic torts refer to claims arising from diseases or personal injuries that result from exposure to toxic chemicals. Because of the legal requirements for establishing the cause of harm, toxic tort claims tend to

focus on chemicals in the workplace and on pharmaceutical products. This is because workers may be exposed to toxic chemicals over long periods of time, and pharmaceutical products are typically used by scores of thousands of people. Causation in these cases is easier, but only somewhat easier, to establish. Some toxic torts also involve exposure to environmental contaminants, usually near the site of a plant that has improperly disposed of chemicals.

Those who do not follow the history of legal and judicial proceedings in this area might nevertheless be familiar with the story of Erin Brockovich, the subject of a popular movie starring Julia Roberts in an Oscar–winning performance. Her story illustrates some of the problems and controversy surrounding toxic tort cases. Between 1952 and 1966, the Pacific Gas & Electric Company (PG&E) used the chemical chromium 6 to fight corrosion in a cooling tower at a plant in Hinkley, California. The chromium 6 was then dissolved in wastewater in unlined ponds at the site of the plant, which leeched into the groundwater around Hinkley. Chromium 6 was known to be carcinogenic when inhaled but was thought to be less toxic when drunk in water. Nevertheless, the Environmental Protection Agency had regulated the permissible maximum contaminant level of chromium 6 in groundwater at 0.10 parts per million (ppm). The groundwater around Hinkley contained levels of chromium 6 measured at 0.58 ppm.

Working as a legal assistant nearby, Brockovich came across health records of Hinkley residents, whose higher–than–normal cancer rates she believed to be caused by chromium 6 in their water. She recruited 600 residents of Hinkley to join a class action suit against PG&E. Experts were divided on the merits of the case: some insisted that the level of exposure was too low to cause cancer, while others argued that the risk data on chromium 6 were insufficient to dismiss the defendants' claims. In the end, PG&E decided not to risk a jury trial and agreed in 1996 to settle the case for $333 million, which at the time was the largest settlement ever paid in a direct action lawsuit in the United States.

Some toxic substances are associated with "signature" diseases. Consider asbestos, surely one of the star substances in toxic tort history. Workers or others exposed to asbestos would inhale fibers, which lodge deep in the lungs, scarring the lung tissue and causing severe shortness of breath. Although the effects typically do not occur until years after exposure, their cause is so well established that the resulting disease is called asbestosis. Asbestos can also cause several different kinds of cancer, the most common of which is mesothelioma, a rare cancer for which asbestos is the only known cause. If someone suffers from

asbestosis or mesothelioma, we know the cause. But asbestos has also been linked to lung cancer, which of course has many different possible causes. If someone is a smoker, lives in a moderately polluted environment, and has been exposed to asbestos, it is far more difficult to establish the cause of his lung cancer or the likelihood and extent to which asbestos exposure was a contributing cause.

Many toxic tort cases involve cause–and–effect relationships more like asbestos to lung cancer than to mesothelioma. Causation may be difficult to establish statistically and impossible to prove with certainty in any individual case. Evidence may come from a variety of sources, including epidemiological studies, animal testing, chemical and genetic analysis, and historical data provided by case studies. The evidence is brought together by scientists or groups of scientists, inferences are made, theories are applied to justify extrapolations from laboratory contexts or animal studies to human environments, and conclusions are drawn. In this area, certainty is indeed rare and conclusions are often reported as judgments of likelihood framed within levels of confidence. This is how science works; it relies on expert judgment, and reasonable experts can disagree.

The stakes are large in toxic tort cases, and the evidence is typically complicated, often mixed, and usually difficult for a layperson to comprehend. But when toxic tort cases go to trial, the verdict and size of the awards are to a large extent in the hands of juries, which of course consist of laypeople. In this setting, the expert witnesses that plaintiffs and defendants call to the stand play an enormously influential role in determining what the juries will believe. It is not hard for both sides to find experts—often reputable, sometimes not—who can tell a convincing story. This is a problem. And if, as some people believe, the United States has become an overly litigious society to the point that tort judgments threaten innovation and significantly raise the cost of bringing new products to market, then we are indeed dealing here with a very significant social problem.

Carl Cranor's book discusses many aspects of this problem, but its focus is on one central issue: the role of science and scientists in toxic tort legal proceedings. *Toxic Torts* is not a long book, but it is thick with discussions of all the major topics one needs to understand about how science and law intersect in these cases. It includes discussions of the many ways science establishes toxicity to humans, it delves into issues in the philosophy of science about how inductive inferences are justified, and it is informed by (though it does not discuss in detail) a sense of rectificatory justice that is sympathetic to the goal of making

compensation more likely for ordinary people who have been harmed by the lack of due diligence of large and powerful corporate entities. But its central focus is on the way some recent court decisions have shaped the role of expert witnesses and significantly increased the power and responsibility of judges to determine who is a scientific expert and what kind of testimony will be admissible in tort proceedings. Cranor has been writing about ethics, risk, and law for many years. This book makes clear why he is the best–qualified philosopher to address the complex issues raised by toxic tort cases. I know of no other book that can match its scope and depth of treatment of the philosophical, scientific, and legal issues.

The legal issues about expert scientific testimony in toxic tort cases focus on the 1993 Supreme Court decision in *Daubert v. Merrell Dow Pharmaceutical* and some subsequent cases (*Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579 [1993], online at http://www.lectlaw.com/files/exp 06.htm; the most important *sequelae* are *General Elec. Co. v. Joiner*, 522 U.S. 136 [1997]; and *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 [1999]). For decades prior to these decisions, case law governing the admissibility of expert scientific testimony required that the evidence and the scientific methods used must have gained general acceptance in the relevant field. This meant that new techniques, which might perhaps be valid, were not admissible if they were not yet generally accepted.

The plaintiffs in *Daubert* sued Merrell Dow for damages for birth defects, which they claimed to be caused by one of its products, Bendectin, an antinausea drug used by pregnant women. Merrell Dow's experts submitted documents to show that no published scientific study had established a link between Bendectin and birth defects. The plaintiff's experts argued that there was such a link, but they relied on evidence based on in vitro and in vivo animal studies, chemical analysis, and reinterpretation of other studies. These methods, however respectable, could not yet claim general acceptance in the scientific community. The trial court refused to admit plaintiff's scientific testimony and granted summary judgment for defendants, a decision that was upheld on appeal. The Supreme Court, objecting especially to the lower courts' refusal to admit reanalysis of epidemiological studies, vacated the decision and remanded the case back to the trial court for reconsideration. The Court's opinion in *Daubert* and its *sequelae* called for changing the rules. The new procedures give trial judges a stronger role in determining the basis for admitting expert testimony. At the same time, they relax the requirement that evidence must be generally accepted by the scientific community before it can be admitted into trial. The

new standard requires that evidence must be "scientifically valid" and that the "reasoning or methodology properly can be applied to the facts in issue."

By overturning the "generally accepted" standard for admitting scientific testimony and replacing it with a "scientifically valid" standard, the Court's decisions place squarely with judges the enormous responsibility of determining what counts as good science in very complex areas like epidemiology and toxicology. As Cranor explains in great detail, one cannot predict a priori whether these changes, which establish a stronger gate–keeping role for trial judges, have the effect of making it easier or more difficult for plaintiffs who have been harmed to receive just compensation. Cranor's discussion of post–*Daubert* cases, however, makes clear that plaintiffs have been disadvantaged by the new rules and still encounter formidable hurdles in winning their cases. He believes the process can be fixed, and he has many detailed suggestions of ways to fix it.

Judges, like juries, are seldom scientific experts or philosophers of science with the kind of expertise that would give them informed views about scientific methods or the nature of scientific objectivity. One of Cranor's main goals in this book is to describe the elaborate, complicated task judges now face in determining what kind of expert testimony is scientifically respectable. His aim is largely constructive: he explains many considerations about scientific reasoning that judges ought to take into account, and he offers suggestions that would bring their decisions more in line with current thinking in science and philosophy.

But a reader may nevertheless come away from this book with a sense of despair. There is no doubt a large gulf between the stories scientists tell each other to justify their inferences about toxicity and the ability of laypeople to make reasonable judgments about which of those stories to believe. Juries certainly need help in this area, but after reading Cranor's detailed account of the kinds of help they need, I have little confidence that many judges have the kind of expertise that well equips them to carry out their roles as gatekeepers to determine which experts and what kinds of testimony will effectively help juries to make the crucial inferences that determine guilt or innocence in toxic tort cases.

the scholarly record and to advance research and teaching in sustainable ways.