Science for Sale

Meet the ‘rented white coats’ who defend toxic chemicals

How corporate-funded research is corrupting America’s courts and regulatory agencies

By David Heath

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BELLEVUE, Ohio — At 2:15 in the morning, an insomniac corporate defense lawyer in San Francisco finished crafting a “revolutionary” scientific theory.

Now Evan Nelson of the law firm Tucker Ellis & West needed a scientist willing to publish it in a medical journal. If his theory were given scientific validity, Nelson could use it to win lawsuits.

Nelson defended companies that had exposed people to asbestos, a heat-resistant, fibrous mineral. Asbestos causes several deadly diseases, including mesothelioma, a rare cancer that often drowns the lungs in fluid.

Nelson had expressed frustration with the argument that asbestos is the only

About ‘Science for Sale’

Science and opinion have become increasingly conflated, in large part because of corporate influence. As we explain in “Science for Sale,” an investigative series by the Center for Public Integrity and co-published with Vice.com, industry-backed research has exploded — often with the aim of obscuring the truth — as government-funded science dwindles. Read more.
known cause of mesothelioma. After scouring the scientific literature and applying his own logic, Nelson came up with a new culprit: tobacco.

Nelson sent a typo-ridden email to Peter Valberg of Cambridge, Massachusetts. A former professor at the Harvard School of Public Health, Valberg was by then a principal at the environmental consulting firm Gradient Corporation, with offices in Harvard Square.

“We can collaborate to publish several key, revolutionary articles that you will see unfold as I present this stuff to you,” the lawyer wrote in the 2008 email.

Citing a few scientific articles, Nelson drew a hypothetical link between the fact that cigarette smoke contains radioactive particles and limited evidence that people exposed to radiation had higher rates of mesothelioma.

“It is amazing that no one has pout [sic] this together before me, but I am confident that you will agree it is solid science that proves tobacco smoke causes mesothelioma — you just have to look at the tissue [sic] through the proper lense [sic].”

There was an obvious problem with Nelson’s “science.” Researchers for decades have exhaustively analyzed data on the health of hundreds of thousands of smokers. Since 1964, the U.S. Surgeon General has summarized the findings of study after study, none of which shows evidence that tobacco causes mesothelioma.

Valberg wrote back within hours, calling Nelson’s scientific theory “very intriguing.” He was game to try to disseminate it in peer-reviewed journals. He later sent Nelson a contract agreeing to write the first of three articles and even offered him a 10-percent discount. In the meantime, Valberg would adopt Nelson’s theory as an expert witness in lawsuits, using it against mesothelioma victims such as Pam Collins of Bellevue, Ohio.

The emails offer a rare glimpse into a world where corporate interests can dictate their own science and scientists for hire willingly oblige. It’s a phenomenon that’s grown in recent decades as government-funded science dwindles. Its effects are felt not only in courtrooms but also in regulatory agencies that issue rules to try to prevent disease.
The National Institutes of Health's budget for research grants has fallen 14 percent since its peak in 2004, according to the American Association for the Advancement of Science. With scarce resources, there's little money for academics to study chemicals that most already deem to be toxic. Yet regulatory officials and attorneys say companies have a strong financial interest in continuing to publish research favorable to industry.

Gradient belongs to a breed of scientific consulting firms that defends the products of its corporate clients beyond credulity, even exhaustively studied substances whose dangers are not in doubt, such as asbestos, lead and arsenic.

Gradient's scientists rarely acknowledge that a chemical poses a serious public health risk. The Center for Public Integrity analyzed 149 scientific articles and letters published by the firm's most prolific principal scientists. Ninety-eight percent of the time, they found that the substance in question was harmless at levels to which people are typically exposed.

“They truly are the epitome of rented white coats,” said Bruce Lanphear, a Simon Fraser University professor whose own research showing that even tiny amounts of lead could harm children has been called into question by Gradient scientists. A panel of experts convened by the Centers for Disease Control and Prevention concluded in 2012 that there is no reliable evidence for a safe level of lead.

Valberg and other scientists at Gradient declined to be interviewed for this story, as did the firm's president, Teresa Bowers. On its website, Gradient says it “has applied sound science and rigorous data analysis to help our clients resolve challenging environmental problems.”

Nelson, now 51, lost his job in 2013 after his new law firm learned of the Valberg emails. Three years later, he is still unemployed and living with his in-laws.

“I get that trying to say that radiation from tobacco smoke causes mesothelioma, that's on the fringe,” he said in a recent interview. “In all my conversations with Gradient, I was always very clear that I wanted them to look at the science and I didn’t want them to do anything that the science didn't support.”
The techniques of consulting firms like Gradient evoke the tobacco industry's strategy of creating doubt about science. Gradient doesn't do its own animal or human studies. Often, it criticizes the work of others.

Douglas Dockery, chairman of the environmental health department at the Harvard School of Public Health whose work on air pollution is a frequent target of Gradient scientists, described their critiques as “lame.”

“For the academic, there's no value in going back and trying to refute these low-quality or poor-quality studies,” he said. “You want to make real advances.”

He noted that Gradient sometimes attacks others' work through letters to journals, which don't go through peer review but have the air of authority. Thirty of the 149 publications the Center analyzed were letters.

**Stalling regulations**

Nearly half of Gradient's articles that are peer-reviewed are published in two journals with strong ties to industry, *Critical Reviews in Toxicology* and *Regulatory Toxicology and Pharmacology*, the Center's analysis found.

These articles are often aimed directly at regulators. The Department of Health and Human Services' National Toxicology Program, for example, listed styrene, used to make foam cups, as “reasonably anticipated to be a human carcinogen.” Scientists at Gradient responded with an article paid for by the styrene industry saying the government finding was wrong.

Besides publishing articles, Gradient also routinely submits comments and attends hearings when the U.S. Environmental Protection Agency is reviewing a chemical to determine its toxicity. The firm is one of several that the chemical industry relies on to stall regulations.

Those efforts have been enormously successful, especially during the Obama administration. While there are more than 80,000 chemicals available for commercial use, the EPA over the past 30 years has assessed the health risks of only 570. These scientific assessments are necessary before any new regulation can be enacted. So the EPA's chemical research office has become a bottleneck that the chemical industry has targeted.

Industry and Congress pounced on criticisms of the EPA's chemical assessment process from the National Academy of Sciences, prompting the
agency to **start dozens of reviews** of toxic chemicals all over again. Many, like its reviews of formaldehyde, arsenic and hexavalent chromium, had been in the works for years.

During the Bush administration, the EPA said it needed to assess at least 50 chemicals a year to keep pace. But in the past five years, the agency’s Integrated Risk Information System has completed only six reviews — an all-time low. Last year, it failed to complete a single one.

![EPA chemical assessments halt in 2015](source: Environmental Protection Agency's Integrated Risk Information System)

Activity at the Environmental Protection Agency office that issues scientific reports on the toxicity of chemicals has nearly ground to a halt in recent years. These assessments are needed before any new regulations on chemicals can be issued. The agency faces intense pressure from Congress and industry whenever it determines that a chemical poses a greater risk to public health than previously thought. Industry hires scientists who argue that known carcinogens such as arsenic, formaldehyde and hexavalent chromium are generally safe at currently allowable levels. The scrutiny has made it difficult for the EPA to update chemical regulations.

The reviews rely heavily on published literature. The industry has argued that its research tends to be dismissed, putting pressure on the EPA to explain how much weight it gives each article. The EPA also has responded to criticisms that its chemical reviews have been cloaked in secrecy by holding more public meetings, which are dominated by industry scientists.

Gradient scientists have played an active role in trying to prevent tighter regulations.
In 2010, they helped delay for years the EPA's review of arsenic, a substance most Americans regularly consume in water, rice, fruit juices and other foods. Agency scientists were about to report that arsenic posed a much greater health risk than previously thought, even at the amount the EPA currently allows in drinking water. They determined that for every 10,000 women exposed daily to the highest amounts of arsenic allowed by law, 73 eventually would get lung or bladder cancer.

Gradient scientists argued that the EPA left out the most recent research on arsenic and should redo the analysis. The omission was due mostly to delays by the Bush administration's Office of Management and Budget, which had to approve all EPA scientific reviews. Some members of Congress latched on to Gradient's argument to accuse the EPA of cherry-picking data. They twisted the agency's arm to start the analysis over again.

The EPA was going to ban most uses of pesticides containing arsenic at the end of 2013. But without a scientific review, it had to postpone the ban indefinitely.

Gradient also helped persuade the Food and Drug Administration to declare another ubiquitous chemical, bisphenol A, harmless. That controversial decision was made in 2008. Nearly all Americans are routinely exposed to BPA in canned food, plastic bottles and cash-register receipts.

Hundreds of articles by academic scientists have linked BPA to health problems in humans, including infertility, diabetes, cancer and heart disease. In 2006, Gradient scientists published an article attacking dozens of academic studies that had reported reproductive problems in rats and mice fed BPA. The FDA cited Gradient's article and a few industry studies in its decision.

Gradient maintained that humans are exposed to far less BPA than the animals in those studies. Frederick vom Saal, a University of Missouri professor who has investigated BPA for more than two decades, called that argument “complete nonsense.”

“You create a false statement of fact, and then you discount a whole literature,” vom Saal said.

A group of academic researchers were so outraged by an article on BPA written by Gradient's Julie Goodman and Lorenz Rhomberg that they wrote a lengthy response with a table listing all the “false statements” in it.

“In this article, there is nothing that is true,” vom Saal said. “It's ridiculous.
And that’s how they operate.”

Rhomberg, who once worked at the EPA, now sits on a panel that reviews all of the agency’s toxic chemical assessments before they become final.

Adam Finkel, a senior fellow at the University of Pennsylvania Law School and a former official at the U.S. Occupational Safety and Health Administration, was close friends with Rhomberg for many years. He says he’s perplexed by how his friend seems to have changed since he joined Gradient.

“In 1997, Dr. Rhomberg submitted brilliant comments to our OSHA regulation on [the solvent] methylene chloride, in which he skewered a half-baked industry theory that the cancers it caused in animals were irrelevant to humans,” Finkel said. “Nowadays, I see him routinely cheerleading for some of the same sorts of unconvincing arguments designed to make substances seem less risky.”

Asked to respond, Rhomberg said, “Open discussion about the evidence and how it is to be appropriately interpreted is essential to the scientific process, and any claims that paint as illegitimate the making of critical comments is destructive of the scientific process.”

Finkel is especially upset with arguments Gradient made in trying to prevent the EPA from listing a little-known chemical called n-propyl bromide as a hazardous air pollutant under the Clean Air Act. Gradient’s Goodman wrote a lengthy public comment in 2014 paid for by a maker of n-propyl bromide. In it, Goodman argued that a government study showing high rates of cancer among rats exposed to the chemical had no relevance for humans.

Finkel said Goodman offered no proof to support this but was “just making stuff up.” He said he found the document offensive because hundreds of workers are exposed to the chemical and some have suffered serious disabilities. In 2013, The New York Times told the stories of furniture workers in North Carolina who found it difficult to walk after being exposed to n-propyl bromide for only a few weeks.

Defending such a product, Finkel said, “is not your finest hour when you’re talking about something we know is killing people.”

Harvard ties

Gradient was founded in 1985, about the same time as two of its biggest competitors: Environ and ChemRisk. When the company was bought in 1996
by The IT Group, a hazardous-waste-disposal company, it was reporting annual revenues of $5 million. But Gradient was sold back to its founders in 1999 and no longer reveals its finances.

The company often touts its ties to Harvard. Several of its scientists used to be on faculty at the Harvard T.H. Chan School of Public Health. Some continue to teach there as adjunct faculty.

Gradient’s clients include two of the most powerful lobby groups in Washington, the American Petroleum Institute and the American Chemistry Council. Other frequent clients include Navistar, a diesel truck manufacturer, and the Texas Commission on Environmental Quality, a regulatory agency that has a history of aligning with industry.

Gradient has become a leading scientific voice in trying to prevent further regulation of air pollution. That puts its scientists at odds with former colleagues at the Harvard School of Public Health, such as Dockery.

Dockery was among a team of scientists at Harvard who after the Arab oil embargo in 1973 set out to evaluate the health effects of burning domestic coal instead of foreign oil to generate power. With funding from the National Institutes of Health, the Harvard scientists recruited more than 8,000 volunteers in six cities living near coal-burning power plants. Monitors were used in each city to measure soot and smog.

After collecting data for 15 years, the researchers themselves couldn’t believe what they were finding. People who lived in communities with the dirtiest air died on average two years younger than those who breathed cleaner air. That meant that eliminating air pollution could increase life expectancy in some cities to the same degree as if scientists had found a cure for cancer.

The results of the Six Cities Study were so dramatic that researchers decided they couldn’t publish them without corroboration, Dockery said. The Harvard scientists were able to convince the American Cancer Society to share data on the health of 1.2 million volunteers tracked since 1982. The researchers matched it to EPA data on soot and came up with similar results.

For a while, the studies attracted little attention. But that changed in 1997 when the EPA — under pressure from courts to enforce the Clean Air Act — used the studies as the basis for new air-pollution rules.

According to the EPA, none of its regulations saves as many lives as the Clean Air Act. The agency estimates that in 2010, rules on soot and smog kept
164,000 Americans from dying prematurely, mostly from heart attacks. By 2020, it expects the number of lives saved annually to rise to 237,000.

But the regulations are expensive. The EPA estimates that industry will have spent a total of $65 billion on pollution controls by 2020.

### Costs and benefits of the Clean Air Act

The EPA estimates that meeting regulations under the Clean Air Act will cost $65 billion from 1990 to 2020, but the savings realized from fewer premature deaths, lower health costs and increased productivity will add up to $2 trillion.

<table>
<thead>
<tr>
<th>Cases prevented by clean-air rules</th>
<th>By the year 2010</th>
<th>By the year 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult deaths — soot</td>
<td>160,000</td>
<td>230,000</td>
</tr>
<tr>
<td>Infant deaths — soot</td>
<td>230</td>
<td>280</td>
</tr>
<tr>
<td>Deaths — smog</td>
<td>4,300</td>
<td>7,100</td>
</tr>
<tr>
<td>Chronic bronchitis</td>
<td>54,000</td>
<td>75,000</td>
</tr>
<tr>
<td>Heart disease</td>
<td>130,000</td>
<td>200,000</td>
</tr>
<tr>
<td>Asthma exacerbation</td>
<td>1,700,000</td>
<td>2,400,000</td>
</tr>
<tr>
<td>Emergency room visits</td>
<td>86,000</td>
<td>120,000</td>
</tr>
<tr>
<td>Lost school days</td>
<td>3,200,000</td>
<td>5,400,000</td>
</tr>
<tr>
<td>Lost work days</td>
<td>13,000,000</td>
<td>17,000,000</td>
</tr>
</tbody>
</table>

*Source: EPA*

Facing intense criticism from industry, the Harvard researchers agreed to have a third party reanalyze the data. It was given to the Health Effects Institute, a respected scientific firm funded by both the automotive industry and the EPA.

The three-year wait for the institute's results was nerve-wracking, Dockery said. But the reanalysis ultimately confirmed the findings of the Harvard researchers.

“After that was released we thought the issue was settled,” Dockery said.

Since then, however, Gradient scientists have taken a leading role in trying to cast doubt on the studies' findings. Gradient has published 37 articles on the costs and benefits of the Clean Air Act.
different aspects of air pollution, funded by the American Petroleum Institute, Navistar and the International Carbon Black Association, whose members are subject to clean-air regulations.

In congressional testimony in 2012, Goodman accused the EPA of being biased by giving too much weight to the Harvard and American Cancer Society studies while ignoring “dozens of other epidemiology studies,” including many that found no health problems caused by current levels of air pollution.

In her testimony, Goodman cited only six studies that she said show no harmful effects from soot. But two of those studies were funded by industry. And authors of the other four say their findings supports those of the Six Cities Study.

“It would be wrong for her to say that we didn't find an effect,” said Dr. Bill McDonnell, a former EPA scientist whose work was cited by Goodman. “We did find a relationship. It just seems like you can just make up your own facts now.”

“Mrs. Goodman and the company she works for have a reputation of misrepresenting the science consistently,” said Bert Brunekreef, director of the Institute for Risk Assessment Sciences at Universiteit Utrecht in the Netherlands and co-author of two of the articles.

A team of European researchers led by Brunekreef combined the results of more than 20 studies done in the United States, Europe and Asia and found that as people are exposed to more fine-particle soot, they are more likely to die prematurely, especially from heart disease. In Dockery's mind, the question of whether soot is linked to early deaths is beyond dispute.

“One of the disappointments about Gradient is they tend to go over these same arguments that have been thoughtfully discussed previously,” Dockery said. “It doesn’t advance the science very much.”

Since 2013, the Texas Commission on Environmental Quality, a regulatory agency, has paid Gradient $1.65 million to challenge the EPA's scientific analysis of the benefits of reducing ground-level ozone, also called smog. Gradient already had been doing similar work for the American Petroleum Institute.
Goodman has criticized a U.S.-government-funded study led by a group of public-health scientists at the University of California, Berkeley. The study explored whether smog was linked to deaths.

Michael Jerrett, the lead author of the ozone study, explained that researchers analyzed health records of 448,850 people in the American Cancer Society database for a period of 18 years. The volunteers lived in 96 cities.

The researchers found that, just as with soot, people in the smoggiest cities die prematurely.

It remains the only study to find “a long-term effect on mortality from ozone,” Jerrett said.

In a 2011 letter published in Environmental Health Perspectives, Goodman described the work as “an uncorroborated study that likely misinterpreted the findings regarding ozone effects.” Jerrett was not given the opportunity to respond.

“I felt that that letter was not following the normal conventions that we would use for scientific debate in the literature,” he said.

The ozone study was published in 2009 in the venerable New England Journal of Medicine. Jerrett said it went through two rounds of peer review with more than 50 pages of questions and another 40 pages of responses.

“I don't think we've misinterpreted the findings at all,” he said.

Gradient in the courts

Gradient doesn't just take on high-profile targets like Harvard researchers. It also helps companies defend themselves against ordinary people like Pam Collins, a high-school graduate from Bellevue, Ohio.

In 1965, at age 21, Collins landed a good-paying job at the General Electric light-bulb plant in Bellevue.
“She was a hard worker. Didn’t take any shortcuts,” recalled Gail Veith, who worked alongside Pam Collins.

For 14 years, Collins’ job was to stamp the GE monogram on the tops of quartz light bulbs used in projectors. Every 15 minutes, she would tug on a pair of gray, fuzzy gloves and push trays of the bulbs into an industrial-grade oven so the ink would dry.

The gloves were dusty. “When we would throw them off, over on the table, you could see little stuff coming off of them,” she said years later.

A recession in the early 1980s hit factories in Ohio especially hard. By 1985, GE had shut down the light-bulb plant.

Years later Collins suffered from fluid buildup in her lungs, one of which collapsed. On October 1, 2007, Collins’s doctor told her she had mesothelioma; her right lung was removed not long afterward at the Cleveland Clinic.

Collins was miserable at that point, said her brother, Tom Smith. She couldn’t catch her breath. She was always tired.

“I don’t think she ever recovered from that surgery,” recalled her youngest son, Jason. “She just whittled away.”

Jason had his mother move in with him for a while. She weighed only 98 pounds and needed help just to stand in the shower. Eventually, Jason felt he had no choice but to put her in a nursing home. He teared up talking about it.

As it turns out, the dusty gloves Collins had used at the GE plant were made of asbestos. She knew that at the time but trusted the company not to expose her to anything that could make her sick. Her son says she would get emotional thinking about how she was betrayed. She sought out a law firm in Cleveland for help with the bills. One of the lawyers on the case was Shawn Acton, who had been trying mesothelioma cases for years.

Collins’ lawsuit started out routinely. But it quickly became like no other case Acton had tried. He remembers reading a report from a scientist hired by the
law firm defending the manufacturer of the gloves. The report, written by Valberg, said:

*First, to a reasonable degree of scientific certainty, Ms. Pamela Collins’ described use of asbestos gloves most likely did not cause or contribute to her developing pleural mesothelioma.*

*Second, to a reasonable degree of scientific certainty, Ms. Collins’ carcinogen and radiation dose from her exposure to tobacco smoke most likely did increase her risk for developing pleural mesothelioma.*

“I almost fell out of my chair,” Acton said in a recent interview. “I’ve cross-examined some of the best defense experts in the country. And I’ve never heard even the most hardcore advocate for the defense ever claim that smoking causes mesothelioma. Nobody has ever gone that far before Peter Valberg.”

Acton did a little research and discovered that Valberg had just co-authored an article in the *Journal of Environmental Radioactivity* saying that cigarette smoke emits radiation. And he noticed that the article was funded by the law firm representing the maker of the gloves.

Acton had no idea that months earlier a lawyer at the firm, Evan Nelson, had concocted the scientific theory that Valberg was using against Collins. Or that Valberg and colleague Goodman had emailed drafts of the article in advance to the lawyer, as their contract required.

Acton flew to Boston in April 2009 and deposed Valberg under oath, asking why he had written the article and why the defense firm had paid for it.

_Valberg: So because I’m interested in the risk factors of radioactivity, and Julie Goodman is a molecular biologist ... we both felt this was a useful piece of work to put out there and see what the rest of the scientific community might say about it. ..._

_Generally, these articles require more time than we actually bill to a company. So Gradient contributes to these as an encouragement for people to do professional development. ..._

_Acton: Who asked Tucker Ellis & West to contribute, as you put it, to the funding of this article?_

_Valberg: We said, ‘This is work we can do.’ So we asked them to contribute. ...
Acton: Did you discuss aspects of the article with anyone at Tucker Ellis & West before it was published?

Valberg: No. I mean, they knew we were working on it. They didn't have drafts. They didn't make comments, scientific comments, and so forth.

Q. So you never sent a document to Tucker Ellis & West in draft form before that article identified as Plaintiff's Exhibit 24 was published?

A. Not to my knowledge, no.

Acton would not learn until years later that what Valberg said was not true.

Damning emails

A few days after that testimony, David Durham, a 67-year-old retired electrician in Louisville, Kentucky, would be diagnosed with mesothelioma. Durham had been exposed to asbestos through work he did at some of Louisville's biggest factories, his lawyers alleged in a lawsuit.

But a physician testifying on behalf the companies blamed Durham's
mesothelioma in part on radiation treatments he received for cancer in 1967.
The doctor relied on a few articles recently published in scientific journals,
including one in *Cancer Causes and Control*. The authors of that review
included Goodman and Valberg.

When Durham's lawyers, Hans Poppe and Joseph Satterley, realized that this
article was funded by Tucker Ellis & West, one of the law firms for the defense,
they decided to subpoena all records the firm had about that article.

They were stunned when they started reading the 498 pages of emails
between Nelson, Valberg and Goodman.

“This is not the way real science works. It doesn't start with a lawyer coming
up with a theory,” Poppe said.

Nelson told the Center that his former law firm should not have released the
emails because they were confidential under attorney-client privilege. He is
suing Tucker Ellis & West for damages. He said the firm didn't release other
emails showing he didn't want Gradient to publish anything unsupported by
science.

Nelson acknowledges that the science used in asbestos lawsuits can be
twisted.

“In one way I'm glad that I'm out of asbestos litigation because I think there's
a lot of corruption in it,” including on the part of lawyers working for
mesothelioma victims, he said. “I've heard other attorneys telling experts
‘This is the opinion I'd want you to have.' ”

Nelson said he never did such a thing, and doesn't think Gradient did
anything improper in the Collins case. Still, he said, no law firm wants to hire
him because opposing counsel could always say, “Look what Nelson did over
here, and he's trying to do the same thing here.”

The emails revealed that Valberg and Goodman had trouble getting the three
Nelson-commissioned articles published in journals. Two of the three
eventually were accepted. But the article linking cigarette smoking to
mesothelioma never made it into print.

The first sentence of that article said, “Cigarette smoking may increase
mesothelioma risk in individuals not exposed to asbestos.”

In a deposition, Goodman tried to distance herself from the notion that she
simply agreed to publish Nelson's scientific theory. A lawyer for a mesothelioma victim asked Goodman if the source of the funding had had any influence on the article.

Goodman: No, and that should be obvious by the fact that our opinions are different than those of Evan Nelson in many cases.

Poppe: In what way?

Goodman: Well, for example, he believed that the epidemiology evidence showed an association between smoking and mesothelioma, and we did not conclude that.

The manuscript Goodman and Valberg wrote concluded there was data suggesting that cigarette smoking causes mesothelioma, in keeping with Nelson's theory. Goodman and Valberg conceded that no study of smokers had ever shown the link, but said such studies were statistically weak because they didn't include enough smokers.

One of the scientists asked to review the manuscript for the journal *Human and Ecological Risk Assessment* didn't buy this explanation. "NOT TRUE," the reviewer wrote in all caps.

As a standard practice, peer-reviewed journals send manuscripts to other scientists, who comment anonymously and recommend for or against publication. In this case, all three reviewers gave the article a thumbs-down.

Another reviewer said, "The logic in this paper is very fuzzy."

And the final reviewer said, "This paper presents what I consider a highly biased review of the evidence that tobacco exposure is associated with an increased risk of mesothelioma. I strongly suspect the authors must work with someone with a strong financial interest in this subject. ... The evidence that tobacco smoke is associated with mesothelioma is if anything extremely weak, and hardly convincing."

Even Nelson questioned Goodman's commitment to getting the paper published. "I don't know how hard she tried," he said.

Goodman continues to testify in mesothelioma lawsuits and write articles exonerating asbestos. Citing other industry-funded research, she wrote in 2013 that the most common form of asbestos — chrysotile — wasn't responsible for higher rates of mesothelioma and lung cancer in electricians.
This has become a standard defense in asbestos cases. The position is rejected, however, by most of the scientific community. In 2012, the International Agency for Research on Cancer, part of the World Health Organization, concluded that all forms of asbestos cause mesothelioma. That same year, a coalition of nine epidemiological organizations issued a joint statement calling for a worldwide ban of asbestos.

“Numerous well-respected international and national scientific organisations, through an impartial and rigorous process of deliberation and evaluation, have concluded that all forms of asbestos are capable of inducing mesothelioma, lung cancer, asbestosis and other diseases,” the statement said.

At the time, Goodman served on the board of directors of one of the organizations, the American College of Epidemiology, which endorsed the statement. Behind the scenes, she tried to prevent it from being issued. After reviewing a draft, Goodman wrote:

“I do not think this document accurately reflects the science. Before I go on, I would like to mention that I am involved in asbestos litigation. While I understand that some may perceive my position as biased, I feel that it puts me in the position of being quite familiar with the most up-to-date science.”

Goodman went on to argue that there is a “safe dose” of asbestos.

She was outvoted by her colleagues on the board. The statement wound up being endorsed by 227 public-health organizations and experts.

The following year, citing other industry studies, Goodman again asserted in Regulatory Toxicology and Pharmacology that there is a safe dose of chrysotile asbestos. In the same article, she contradicted the work she did for Evan Nelson, writing that “smoking has not been associated with mesothelioma.”

Pam Collins’s lawyer said efforts by industry consultants to absolve asbestos of blame show they will say almost anything.

“Why are some of these companies putting so much money into research to be published in scientific and medical journals years and sometimes decades after they stop making the product?” Acton asked rhetorically. “Is its purpose for the advancement of medicine? Is its purpose to address a public health concern? Its purpose is for litigation. It’s science for sale.”