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Chemical Fallout:
Milwaukee Journal *Sentinel* and the BPA story

The Milwaukee Journal *Sentinel* reporting team was frustrated and angry. Three reporters had spent six months researching and writing what they considered an excellent investigative story about bisphenol A—a chemical also known as BPA—which was widely used in clear plastic products, including such household familiars as baby bottles, nail polish, dental sealants, eyeglasses, soda, beer and food cans. The reporters—Susanne Rust, Cary Spivak, and Meg Kissinger—had exhaustively chronicled the scientific debate over BPA. Many studies found it benign; others linked it to a dizzying array of health problems in animals, including breast, testicular and prostate cancer, hyperactivity, miscarriages and diabetes.

On September 18, 2007, they had submitted a draft to the assistant managing editor for projects and investigations, Mark Katches. In the draft, the team weighed the arguments on both sides and examined the role of the Environmental Protection Agency (EPA), revealing how lax the agency had been in testing a wide range of chemicals thought to cause abnormalities in wildlife, and possibly humans. But Katches, to their dismay, was asking for a rewrite. Rather than repeat the various claims made about the chemical, Katches wanted the team to find out for itself: just how dangerous was BPA?

This put the reporters into new and uncomfortable territory. Trained to present both sides of a story, they had little experience making a judgment call, especially where opaque scientific issues were concerned. Surely their job was to present the findings of the experts, rather than judge the experts for themselves? If the team adopted Katches' approach, Rust, in particular, would be on the hook. As the paper's leading science writer, it would be her job to determine the validity of the science on BPA. Eventually, and despite considerable doubts, the team agreed to take a second pass at the story.

Rust decided the best way to investigate the competing claims about BPA was to dive into existing scientific studies herself, rather than rely on information from interviews with experts.

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That in itself was daunting: after an initial search, she guessed there were at least 250 studies that she would have to review. But more frightening was the conclusion she found herself reaching the deeper she delved into the science. The preponderance of reputable studies did find BPA dangerous to humans. What's more, it looked as though the only studies which found it benign were funded by the chemical industry which produced BPA.

Rust brought her findings to the team. The implications of publishing what she had found were far----reaching. First, how could she be sure she was right? Although she was a former PhD candidate in biological anthropology, she had not completed her degree. Was she prepared to challenge highly trained professional scientists? Yes, there were studies which would support her conclusion that BPA was dangerous—but what might be the hidden agendas behind those supposedly independent inquiries? Finally, what about the public response if the team were to publish Rust's inferences? Did the paper risk generating needless panic among readers? Would they be charged with fear----mongering and sensational, tabloid----style journalism? How should the Journal Sentinel report this story?

The Milwaukee *Journal Sentinel*

Rust's employer, the Milwaukee *Journal Sentinel,* was in 2007 the largest newspaper in Wisconsin, and one of America's highest circulation dailies. It ranked first among the 50 largest---population metropolitan markets, with four daily editions and a fulltime staff of 300.[1] Still, it was a relative newcomer to the journalistic scene, the product of a merger 12 years earlier between the *Milwaukee Journa*l and *Milwaukee Sentinel*—both Journal Communications Inc.----owned papers.

The 1995 union had brought together two of the state's most established institutions. The *Sentinel*, the oldest continuously----operating business in Wisconsin, had been founded by Milwaukee mayor and former fur trader Solomon Juneau in 1837. The Hearst Corporation bought the paper in 1924, and sold it to the Journal Company in 1962. Meanwhile, the *Journal* had begun publishing in 1882. The paper won five Pulitzer prizes under famed Editor Lucius Nieman (who died in 1935).[2] It developed a liberal reputation during the 1950s, when it spoke out against Wisconsin Republican Senator Joseph McCarthy's anti----Communist "witch----hunts."

With the emergence of the Internet in the 1990s, newspapers like the *Journal Sentinel* found themselves struggling to compete. Declining readership and shrinking budgets only compounded their problems. One competitive advantage the paper felt it had in its local market was investigative journalism. "We have to focus on what sets us apart from other media," Managing Editor George Stanley says. We have to give our readers and our Internet users stories and journalism and data that they can't get anywhere else, or that we can deliver better than anybody else. We can do investigative enterprise, in----depth

[1] Scarborough Research 2005 multi-market project; Milwaukee *Journal Sentinel*, www.JSOnline.com

[2] Nieman made it his life's work to provide an alternative to salacious "yellow" journalism, and to keep special interests from influencing news reports.

journalism better than anyone else in the state, and so that's one thing we're going to base our future on.[3]

Investigative Reporting

The *Journal Sentinel* decided to back its words with actions. In November 2006, it hired Mark Katches as assistant managing editor for projects and investigations. Katches had been the senior team leader for watchdog journalism at California's *Orange County Register*, and had impressed *Journal Sentinel* Editor Martin Kaiser when they judged journalism awards together. Kaiser invited Katches to Milwaukee to discuss building an investigative team. The timing proved fortuitous: the *Orange County Register* was in the midst of cost cutting, and chose to trim its investigative reporting efforts just as the *Journal Sentinel* was planning to boost its own.

When Katches came on board, the paper had been without a special projects manager for six months. Editors had noticed a clear fall----off in communication among departments working on common projects, as well as a decline in quality. "We were getting stuff that wasn't even close to ready… Things were taking too much time as well, because people weren't getting the right kind of guidance," Stanley says. Katches made it a priority to reestablish a control center.

The paper also expanded its investigative capabilities. By early 2007, the paper had assigned eight reporters and one columnist to a "watchdog team" under Katches' supervision. There had been some misgivings about taking this direction. Managing Editor Stanley explains:

> We had kind of avoided the team approach in the past because we had seen how it could develop… They [team members] wouldn't really be part of the newsroom, and other people would be jealous of them… [Our experience had been that] when people are taken out of their areas of expertise and set aside to do all the investigative reporting, their sources dry up over time and they become less and less productive, until they really don't expect to do anything more than one project a year and they can just take victory laps the rest of the time.

Katches disagreed, and made a strong argument for a team approach. He had overseen numerous reporting teams during his work at the *Orange County Register*, including Pulitzer Prize---nominated efforts in 2003 and 2004.[4] But at the same time, he did see value in keeping team members active in regular newsroom life. "Mark [Katches] made some pretty compelling arguments about the need for people with skills that we could

[3] Author's interview with George Stanley on June 24, 2008, in Milwaukee, WI. All further quotes from Stanley, unless otherwise attributed, are from this interview.

[4] http://www.jsonline.com/watchdog/33283159.html

develop and we'd team them up, but who'd still be in their original areas, working alongside other journalists. That really fit in well with what we wanted to do," Stanley says.

Convinced by Katches' vision, the *Journal Sentinel* established the new investigative group and tasked it to "work to expose wrongdoing, dysfunction, inequity and injustice and strive to hold accountable those responsible through meticulous case building and compelling story telling." [5] As Katches recalls it:

> The culture here was more calibrated towards explanatory work. [Investigative work is] a matter of going out and beating the bushes, talking to the bureaus, letting [reporters] know, as a first matter of course, these are the kinds of stories we want people to be looking for… hard---edged watchdog stories that hold people accountable.[6]

The investigative team's playing field was broad, and included business, politics, the arts and science. One of the first projects it undertook was an investigation into the safety of a chemical compound found in hundreds of products people used every day. However, the project did not begin large. It began with a passing mention in another story.

Early Stirrings

On April 29, 2007, Susanne Rust, the paper's science reporter, co----wrote an article with investigative reporter Cary Spivak about the controversial rise of largely unregulated research organizations that worked both for the government and for various drug and medical manufacturers. In it, they briefly mentioned the chemical bisphenol A, which had long intrigued Rust. She first learned about it in 1996 during a graduate class on hormones and behavior. "It had always been something that I thought was really interesting and was sort of in the back of my head. And then when I became a reporter, I started seeing more and more of these kind of stories" about chemicals in the environment affecting health, she says.

Science reporter. Rust's background was in biological anthropology. She had been working toward a PhD at the University of Wisconsin until a family tragedy caused her to drop out of the program and turn instead to writing. In 2002, Rust applied for a Mass Media Fellowship from the American Association for the Advancement of Science (AAAS), which placed scientists in newsrooms and paid them a small stipend for a summer. Rust won a fellowship, which sent her to the *Journal Sentinel*, where the temporary position turned into a job the following year. Over the next few years, Rust wrote stories on a wide range of topics, from sleep apnea in children and human growth hormone in major league baseball to whale research and longer life expectancies for premature babies.

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[5] JSOnline, http://www.jsonline.com/story/index.aspx?id=566376#katches

[6] Author's interview with Mark Katches on June 23, 2008, in Milwaukee, WI. All further quotes from Katches, unless otherwise attributed, are from this interview.

But bisphenol A captured her interest and worried her in ways that some of the other scientific topics did not.

Bisphenol A

Rust knew from her graduate class that BPA had existed for over a century. Invented in the 1890s, the organic compound became widespread in the 1940s and 1950s when the chemical industry began using it as the main ingredient in hard, translucent plastic called polycarbonate, which is typically marked with the recycle symbol "7" or letters ""PC.""

BPA was also used in epoxy resins, the basis for protective linings in water supply pipes and a variety of metal food and beverage cans. It maintained the quality of the contents, extended shelf life and prevented metal from affecting the flavors of food and drinks. In the following decades, BPA use exploded, showing up as an ingredient in products as diverse as baby and drinking bottles, bicycle helmets, compact discs and eyeglasses. By 2004, bisphenol A was such an important and ubiquitous element in various goods that America produced approximately 2.3 billion pounds of the substance.[7]

As it permeated the marketplace, BPA also found its way into people's bodies: by 2004, 93 percent of the population over six years old had detectable levels of the chemical in their urine. The Food and Drug Administration and the EPA routinely pointed to 1980s studies by government regulators that found no serious effects from BPA.[8] But the proliferation of bisphenol A nonetheless triggered concerns about its safety. Opinions fell into two main camps: the first argued that BPA was safe for humans; the other that BPA was unsafe, both for humans and animals. This was because BPA, which mimicked the natural sex hormone estrogen, was an endocrine disruptor: a group of naturally occurring compounds or man----made chemicals that in animals interfered with hormone signals that regulated organ development, metabolism and other functions. Each side could point to scientific studies that buttressed its arguments.

After reading Rust and Spivak's April 2007 story, Managing Editor Stanley wanted Rust to take a preliminary look at these competing claims, and explore BPA's history, safety record, and anything else she could find to see if the chemical had the makings of an investigative project. "She's writing about this synthetic estrogen plastic that's in everything we eat practically, and I thought well, what kind of research has been done on this? Could this be a reason why breast and prostate cancers are rising so rapidly in human beings? And so that's when we started asking," Stanley says.

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[7] NTP Draft on bisphenol A, April 14, 2008. http://cerhr.niehs.nih.gov/chemicals/bisphenol/BPADraftBriefVF_04_14_08.pdf

[8] Source: National Health and Nutrition Examination Survey (NHANES III) of 2,500 Americans, conducted by the federally funded Centers for Disease Control and Prevention (CDC).

Sounding the ground. Rust, 36, had been toying with the idea of leaving the paper to spend more time with her young children. But Stanley's request sparked her interest and she decided to stay. She started with a survey of the existing literature on BPA. She turned first to PubMed, a free digital archive of biomedical and life sciences professional journals provided by the National Institutes of Health (NIH).[9] A quick scan revealed that there was "a lot of buzzing going on in certain parts of the scientific community that this is really bad stuff," says Rust.[10] But the subject seemed to have received relatively scant press coverage. That was enough for Rust to tell Stanley that there might be grounds for an investigative reporting project. With her encouragement, Stanley in early June approved the creation of a three----person investigative team that, besides Rust, included Spivak and Meg Kissinger, both 30----year veterans of newspapers.

Although Rust was not a member of Katches' "watchdog team," Spivak and Kissinger were. Their project was put under Katches' supervision.

The Team

Each team member had an area of expertise. Spivak, 52, the paper's investigative reporter for business, was known for his in----depth, non----judgmental approach and his ability to trawl meticulously through documents. "I like digging a little harder. I like it if somebody has a piece of information they don't want me to have, and figuring out a way to get to it, kind of the 'thrill of the chase' type stuff," he says.

Spivak knew that both he and Kissinger were "pretty much novices" when it came to science, but saw this new foray into a foreign topic as similar to past ventures into areas with which he was unfamiliar. He says:

> It wasn't that long ago that I knew nothing about bond deals. The job of reporting to me isn't so much the knowledge, although having background in the subject is always helpful. The job of reporting is to learn about the subject so that it's just another day at the office. It was just getting used to it. It's a different language, but it's still a lot of politics and a lot of business and a lot of money.[11] Kissinger, 50, was the health sciences investigative reporter, with experience working on large reporting projects, and "one of the best writers at the whole paper," according to Managing Editor Stanley. She was warier of treading on scientific turf. She appreciated the potential news interest in a substance which, as Stanley described it, had spooked some

[9] The archive was developed and managed by NIH's National Center for Biotechnology Information (NCBI) in the National Library of Medicine.

[10] Author's interview with Susanne Rust on June 24, 2008, in Milwaukee, WI. All further quotes from Rust, unless otherwise attributed, are from this interview.

[11] Author's interview with Cary Spivak on June 23, 2008, in Milwaukee, WI. All further quotes from Spivak, unless otherwise attributed, are from this interview.

> scientists researching it into banning plastic from their homes. "At the same time, I thought it cannot be that cut and dried," she says. "I was somewhat skeptical about it."[12] Rust, meanwhile, brought her scientific acumen to the mix.

The three reporters decided to start their research with a wide----ranging review of endocrine disruptors in general, and BPA in particular. As they quickly discovered, each approached the subject from a different starting point. Rust, most familiar with BPA, was most willing to believe that the chemical was dangerous—certainly to wildlife and likely to humans. Spivak insisted that the chemical industry be given an opportunity to articulate its viewpoint. Kissinger was agnostic on the dangers; she just wanted to be sure the story they produced was fair. "We all wanted to paint a balanced picture," she recalls. First, they had to find out what the picture was.

Background Research

The first few weeks went to background research, as Spivak and Kissinger came up to speed on the history of endocrine disruptors and what government had done to regulate it. The Environmental Protection Agency (EPA) was the government body charged with regulating chemicals in commercial use. The 1996 Food Quality Protection Act required EPA to screen the effects of pesticides on the human endocrine system, and to take actions as necessary if it found harmful effects. To do this, the reporters learned, the EPA in 1998 had established an Endocrine Disruptor Screening Program (EDSP).

Through the month of June, the *Journal Sentinel* team read systematically through minutes of EDSP meetings dating back a decade. They also analyzed the agency's budgets to see how its time and money were being spent. They discovered a treasure trove of data on a website maintained by the Endocrine Disruptor and Screening Testing Advisory Committee (EDSTAC), a federal committee formed in 1996 to recommend to EPA how to develop the screening and testing program.

Simultaneously, they started to contact government researchers, industry officials and scientists. They made phone calls both individually and as a team. This strategy allowed them to progress on separate tracks while also supporting one another as they gained expertise. "They [Spivak and Kissinger] were still trying to get on board and figure out what was going on, so it just seemed like we should all be together so that we could all hear what so----and----so was saying," recalls Rust. They had no particular system for deciding who would be in on which call, recalls Spivak: "It was more common sense." Spivak took the lead on business or political interviews; Rust on the science interviews; and Kissinger on the human----interest interviews.

[12] Author's interview with Meg Kissinger on June 23, 2008, in Milwaukee, WI. All further quotes from Kissinger, unless otherwise attributed, are from this interview.

At the EPA, for example, they reached spokesperson Enesta Jones. To speak for the industry, they turned to the American Chemical Council (ACC), the Arlington, VA---based trade group for the plastics industry. From both, they asked for references to studies they should consult. At first, recalls Spivak, "they were actually very innocent----type interviews. You know, give me your side and tell me what's going on here."

Spivak and Kissinger also read a landmark 1996 book by Theo Colburn, a zoologist and leading anti----BPA campaigner trained at the University of Wisconsin----Madison. In her book, *Our Stolen Future*, Colburn documented abnormalities in wildlife along the Great Lakes, such as female gulls nesting together and a frog with an eye growing in its mouth. She blamed endocrine disruptors in the environment. The book caused a tremendous stir. Some scientists branded it "junk science," but many regarded it as breakthrough research.

The team learned that Colburn's message had started to percolate through to lawmakers— but very slowly. A handful of states—Maine, Massachusetts and Minnesota, for example—had introduced legislation to prohibit the manufacture or sale of toys made with certain endocrine disruptors. But to date, no law had passed.

The reporters also looked into what other countries were doing. To their surprise, they learned that concern was widespread—in Europe, Japan, South America, the Middle East and Mexico. The European Union, for example, had banned from cosmetic products 1,100 chemicals thought to cause cancer or reproductive harm. In early 2007, the EU passed a law requiring chemical companies to prove that their products were safe before bringing them to market.[13]

By late June, the reporters were coming to suspect that EPA had done nothing, or very little, to screen endocrine disruptors. Then----EPA Administrator Carol Browner in 1998 had appointed a panel of scientists to build a framework for screening the chemicals, but she left with the change of presidential administration in early 2001. In subsequent years, the EPA had appointed two more committees of academic and industry scientists to tackle the issue. But it clearly was not a Bush Administration priority. Nine years later, little had changed.

Kissinger increasingly felt it important to talk to Colburn—in a sense the grandmother of the anti----BPA faction. So in early July, she arranged a trip to remote Paonia, Colorado, where the 82---year----old scientist lived. When Spivak heard about it, he decided to go along. Rust was happy to send them off—she had met Colburn several times over the years,

[13] In its risk assessment published in January 2007, the European Food Safety Authority (EFSA) set a Tolerable Daily Intake (TDI) of 0.05 milligram/kg body weight for BPA. EFSA found that intakes of infants and children were well below the TDI but did not explicitly mention whether there were relevant differences between infants and adults in their ability to clear BPA from the body. See: http://www.efsa.eu.int/EFSA/KeyTopics/efsa_locale1178620753812_BisphenolA.htm

and was sure the other two reporters would learn a great deal from her. Colburn might also help to dispel some of their skepticism over Rust's views. She explains:

> I knew Cary, at least, if he didn't believe that there was something actually going on with these chemicals, at least he would believe that there might be somewhat of a cover----up that was analogous to the tobacco situation.

Colburn interview

On July 16, 2007, Spivak and Kissinger traveled to Paonia to interview Colburn. To Kissinger, the trip was a refreshing throwback to the shoe----leather school of journalism which she practiced much of her career. She explains:

> I thought we should interview this lady… This is where the old police reporter in me came out… Susanne [Rust], who is a more modern gal, she does everything by email and on the Internet. I always think I want to smell the people I'm writing about. I want to see what's in their closet and… know whose picture they have on their desk.

The three----day trip yielded valuable information. Colburn described in detail the evolution of her view that, in humans as in animals, developing embryos exposed to endocrine disruptors through their mothers are at risk. "You need the right hormones in the right place at the right time sending out the right signals," Colburn said. "If that's fouled up prenatally, you're in trouble." But Colburn's basement proved as useful as her living room. That's where she kept more than 100 cartons of documents, the fruits of decades of work.

Basement. While Kissinger remained with Colburn, Spivak went to the basement to sift through the boxes. For seven hours, he examined papers. "You're just looking for anything that might be of value," he says. To his satisfaction, he found something significant: a 1998 press release from then----EPA Chief Browner. The press release announced fast----track EPA testing of 15,000 chemicals suspected as endocrine disruptors. This was an official statement of EPA intentions. Spivak was pleased because such a document would no longer have been on file at EPA. He could have filed a Freedom of Information Act (FOIA) request for the document, but that could have taken six months to produce results. Besides, "I wouldn't have known what I was looking for," he says. The team could use this.

Spivak also found numerous memos which "gave us a sense of how political and how intense the fight was" over endocrine disruptors. For example, a memo from a plastics industry trade group discussed how best to deal with the publication of Colburn's 1996 book. "It showed that it was a very aggressive fight," he recalls. Finally, he came across correspondence from activist groups that had brought suit to force the EPA to start screening: the National Resource Defense Council in 1999, and two other groups in 2001. In

response, the EPA had promised to start in 2003. Spivak and Kissinger returned to Milwaukee determined to interview Browner, among others.

They were also looking forward to an experiment the team had come up with—an audit of an ordinary home for plastics.

The Audit

As their story developed, all three reporters worried that it was too dry. Somehow, they needed to personalize the issue of endocrine disruptors, and demonstrate how it mattered to the reader. A friend of Rust's suggested the team audit her home for dangers from plastics just the way a housing inspector might search for radon or lead. The team liked the idea. But first, they had to find an auditor. Kissinger and Spivak had interviewed University of Missouri----Columbia biology Professor Frederick vom Saal in June. For more than a decade, vom Saal had been an outspoken opponent of BPA and the chemical industry that produced it. His studies in peer----reviewed journals, as well as in the popular press, warned that bisphenol A was probably dangerous, even at low doses.

In their interview, vom Saal repeated most of his findings—which were some of the most radical in the scientific community. For example, his data indicated that the acceptable daily dose for the compound should be at least 25,000 times lower than the prevailing government standard of 50 micrograms per kilogram of body weight.[14] He also claimed—in a view the industry rejected vehemently—that 90 percent of BPA studies proved the chemical to be harmful; the 10 percent that suggested otherwise, he said, had been funded by the chemical industry.[15]

The team was aware that vom Saal's views were provocative. They had not yet decided how to write about him. But meanwhile, they persuaded him to play a role in their story: home inspector. They asked vom Saal to visit an ordinary home to screen for hidden dangers from plastic products, and he agreed. Next, the reporters had to find a volunteer (using Rust's friend seemed inappropriate). So they posted an advertisement on Milwaukeemoms.com, a website for local mothers with young children. Within days, Ellen Lang Roder, a mother of four from Greendale in southwest Wisconsin, volunteered her home. On August 3, vom Saal surveyed Roder's house room by room. He found plenty of cause for concern—from the plastic yellow ducks in the bathroom and purple bucket in the outdoor sandpit to the children's plastic dolls and the food storage containers in the

[14] http://www.ourstolenfuture.org/myths/vomsaal.htm. This government standard of 50 micrograms per kilogram of body weight would, for a 200-pound person, be equal to no more than one drop of BPA every five days. In vom Saal's own house, there were no plastic bottles.

[15] Industry critics charged that vom Saal's findings could not be replicated, and that his testing methods failed to mimic how humans absorb BPA. They called it misleading, for example, for vom Saal to inject mice with BPA. Since humans absorb BPA from drinking water and food, the critics argued that research scientists should also feed it to mice. Vom Saal defended his methodology, claiming that BPA was most dangerous to fetuses, which absorbed the chemical through their mothers' bodies rather than by eating it.

fridge. "Anything that goes into your child's mouth is a factor for you to be concerned about," vom Saal told Roder. But he also cautioned her against extreme measures.

> No matter what you do, you cannot completely eliminate your exposure to these chemicals, because your world is absolutely full of them, and there's no way to live in the world we live in and not be exposed to these chemicals.[16]

The audit was a success, at least from a reporting standpoint. It would add life to the team's investigative story. Now they needed another element: authoritative voices from the chemical industry and its research organizations. Why did the industry find the chemicals safe? What methodology did it find persuasive? Spivak took the lead on making sure that they reached the right industry spokespeople. "We have got to bend over backwards and get their side, even if they don't like us, even if they don't want to talk to us," Spivak explains. "We have to go beyond. The burden is on us."

Industry View

The team knew that BPA manufacturers, as well as some non----industry scientists, had criticized vom Saal's work. They charged that his findings could not be replicated, and that his testing methods failed to mimic how humans absorb BPA, producing results both unreliable and irrelevant to humans.[17] But when the reporters in early July tried to schedule an interview with leading officials at the American Chemistry Council, they found that no one would take their calls. No one was available, they were told. Or the people to whom they should speak were unavailable. For three to four weeks, a pattern developed. One of the reporters would call the ACC and ask to speak to a specific person. Whoever answered would put the journalist on hold, then come back and say the official was unavailable. Then in early August, as suddenly as the stonewalling developed, it was over—with no explanation. The team was able to schedule an interview for right after Labor Day (when everyone would be back from vacation).

In early September, the team sat down to its hard----won interview with the American Chemistry Council leadership. The team felt better informed than it had when Spivak had made informational calls in June. Their questions were more pointed: How do you respond to Colburn's research? To vom Saal's? Isn't the industry worried about potential long----term harm to humans?

The reporters decided that all three of them should be in on the interview. For their part, ACC had four or five people in on the conference call. Marty Durbin, federal

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[16] Audio Slideshow: Home Audit for Chemicals, http://www.jsonline.com/story/index.aspx?id=688674

[17] Critics complained, for example, that it was misleading for vom Saal to inject mice with BPA. Since humans absorb BPA from drinking water and food, the critics argued that research scientists should also feed it to mice. Vom Saal defended his methodology, claiming that BPA was most dangerous to fetuses, which absorbed the chemical through their mothers' bodies rather than by eating it.

affairs managing director for ACC, told the group that "[s]cience supports our side." The ACC group contended that there was no reason to fear endocrine disruptors because none of the industry----funded studies proved harm to humans. To notice any effects, the ACC group said, an individual would have to consume some 500 pounds of canned and bottled foods *every day*.

In the meantime, the reporters had been in touch with other industry leaders. In July, they called one of the leading chemicals and plastics manufacturers, Dow Chemical Corp., as well as the Weinberg Group, a Washington D.C.----based consulting firm that specialized in advising industry on how to meet regulatory requirements, improve manufacturing processes, and, if challenged, defend their products. Like the other industry representatives, Weinberg consultants defended BPA's safety record. As Weinberg Executive Vice President James Lamb declared in one interview: "I'm very comfortable with my kids and grandkids using the products, and that's really my bottom line." Spivak recalls that "in general, the line that these people took was to point to government findings and say that there was no conclusive evidence that [BPA] was harmful, and that results seen in animal tests weren't seen in humans."

But the team had also been in touch with the government. As far as they could determine, government studies were not necessarily the reliable source that citizens might expect.

The EPA

The team had first contacted the EPA in early June. By July, they had concluded that the EPA's failure to screen endocrine disruptors as required by law might be the strongest angle for the story they were going to write. To write it, however, they needed to ask a host of questions more pointed and better informed than those they were able to formulate in June. Why had EPA not started to screen endocrine disruptors? How much had they spent on those efforts? What about the lawsuits and the settlement? Why had the 2003 deadline to start screening come and gone? As Spivak puts it:

> Now when you call the EPA you're not just saying, "Oh, gee, Congress passed this law in 1996, you were supposed to screen and you haven't, tell us why." Now it's "not only did Congress pass this law, but the EPA administrator set out a timeline saying that it should be done by such and such a point." But when they returned to the EPA, they ran into the same problem they were experiencing with the ACC: a blank wall.

To the reporters, it seemed that the EPA tried several tactics to discourage the team. One was to simply ignore the *Journal Sentinel* as a second----tier, regional newspaper. "They just did not take us seriously, so they would blow us off for weeks on end," remembers Rust. "They wouldn't send us stuff. They kept changing their story on us. It was really

frustrating. It felt like we weren't getting any respect." Spivak confirms that "I had an EPA official say we've given you everything that we're going to give and, as far as we're concerned, the subject is closed."

But the team was not accepting that. It had been dealing with reluctance from the Chemistry Council; now it was up against the same thing from the EPA. But there was a difference—the EPA was a federal agency, funded by taxpayer dollars and covered under sunshine laws that guaranteed public scrutiny of public bodies. Spivak was fired up: "The response [to EPA] was no, the subject is closed when we say it's closed. You don't get to make that decision. That's our call, not yours."

So the team kept calling EPA officials. They also sent emails to the EPA administrator, Stephen L Johnson. The emails complained that the agency was unresponsive. "I know the administrator of the EPA is not going to read my emails," says Spivak. But the point was to go as high up the chain of authority as possible in order to generate a response from a higher----level official who could compel cooperation from his subordinates. Again, after about a month of frustrating back----and----forth, the tactic paid off. "They came back," Spivak says. "And it was all nice, as if nothing happened."

In early August, the national program director of the EPA's Endocrine Disruptor Research Program (EDRP) was on the line. "Clearly, we would like to have been a lot further along [in screening]," Elaine Francis told them. "But science tends to move at its own pace." She confirmed that the agency had spent $80 million on the project so far. She also confirmed that EPA had so far not tested a single endocrine disruptor.

Francis would not say when the EPA planned to start screening, but did inform the reporters that it intended to start with a batch of 73 chemicals—all pesticides. This seemed odd to the reporters (and to scientists they later called) because pesticides had already been thoroughly tested. Besides, pesticides were not the most worrisome group of disruptors as people did not ingest them. The agency planned to complete the first round of tests by 2010, confirmed spokeswoman Jones.

EPA Administrator Johnson steadfastly refused requests for an interview. But the team did succeed in talking to Johnson's predecessor, Browner. It took months to schedule an interview, as she was traveling globally, but they finally arranged to talk on October 9. "It doesn't take nine years" to set up a screening program, she told them. "You adjust as you go. You don't have to build a Cadillac when a Model T will do."

Covering the waterfront. Meanwhile, the team had not sat idle while it waited for the EPA and ACC to relent. Instead, says Spivak, "we're calling every expert you can find." Columbia University Professors David Rosner and Gerald Markowitz, for example, gave them a useful way to think about endocrine disruptors and BPA. Rosner and Markowitz were not scientists, but they taught a seminar on plastics at the Mailman School of Public Health.

They had also co----authored a 2002 book, *Deceit and Denial: The Deadly Politics of Industrial Pollution*, which focused on environmental health.[18] Notes Spivak:

> They compared bisphenol A to tobacco, which seemed really apt because that [substance] also faces a lot of industry pressure and there are similar accusations that the government has been slow to act. And so that proved to be quite a handy little framework for us to kind of emulate… [They also] gave a good perspective on how the government gets to the bottom of whether or not something is dangerous.

The reporters talked to Philip Landrigan, a pediatrician and chair of the department of community and preventive medicine at Mount Sinai School of Medicine in New York. They interviewed Michael E. Mitchell, chief of pediatric urology at Children's Hospital of Wisconsin, as well as Shanna Swan, director of the Center for Reproductive Epidemiology at the University of Rochester School of Medicine and Dentistry. And dozens more—over 100 scientists, physicians, industry representatives, and government officials. "A lot of the interviews are wasted," concedes Spivak, "in that nothing that they said is ever going to see the light of day. But it's not wasted because they're giving you good background."

The team learned anew the value of checking facts. For example Lamb, the Weinberg Group vice president, had assured the team that there was no need to change the industry's approach to toxicology studies (some scientists argued government and industry methods were outmoded), and he cited a National Academy of Sciences (NAS) report in support. Yet when Spivak and Rust read the NAS study, they discovered that "this is saying the opposite of what he told us," says Spivak. "The moral is, if a guy sends you somewhere, you should look at it. Because they're assuming you'll never look at it."

By late summer, the reporters felt they had great material, far more than they needed, and that the time had come to write. They headed for a newsroom side office they nicknamed "the garret."

Into the Garret: Part 1

They debated just how to approach the story, and decided to lead on the EPA's appalling testing record. Kissinger assumed lead writing position at the computer keyboard, while Spivak paced and Rust rolled back and forth on her chair as they hashed out a narrative together. "Meg would start writing something, and I'd say, no, that's not quite right. And then I would say something out loud and she would write it down, and Cary might say, but that's too strong, and then we would sort of retype it," Rust says.

[18] Gerald Markowitz and David Rosner, 'Deceit and Denial: The Deadly Politics of Industrial Pollution," (Berkeley, CA: University of California Press, 2002).

"So it was really a product of the three of us just sitting there and thinking about every line that was put down. And then Meg would go home at night and try to smooth it out."

Much of the discussion centered on whether the story they were telling was balanced. Occasionally during the hours----long sessions infused with coffee and chewing gum, Spivak would throw a dart at a picture of the entire *Journal Sentinel* watchdog team tacked to a board against the wall. It helped relieve stress, he says. According to Kissinger:

> Cary [in particular] with his background in business reporting, was, I think, very concerned that we don't oversell this and that the chemical industry has a voice in this story. [He was] throwing up stop signs to say, wait a minute, it's not a slam----dunk case… Until it's proved to be bad, this stuff is legitimately in the marketplace.

On September 18, the team sent their draft to Katches. They knew that the story had some weaknesses. "I was worried that it was a little egg----heady—I didn't know if the average Milwaukee *Journal Sentinel* reader would find that [intellectual approach] sexy," Kissinger concedes. [fn moved] Overall though, the three journalists were excited by the two----pronged article—about endocrine disruptors and lax EPA testing—that they had produced. "We were proud of ourselves. We felt like we had a pretty compelling story about these dangers and the fact that the government hadn't done anything," Kissinger says. Adds Rust:

> I thought it was a really great story. I mean, a lot of people had written about these chemicals, a lot of newspapers, a lot of magazines. This one though seemed to me the most comprehensive and thorough. It had all the history about what the government had been doing about it, all the history of how scientists have come to this.

But, as the team would soon find out, not everyone felt that "comprehensive" should be the only goal.

A Difficult Meeting

A few days after the team had handed in the draft, Katches met Kissinger, Spivak, and Rust in his glass----paneled office. He knew the trio was excited about the article it had sent him a day earlier. He also knew that a difficult conversation lay ahead.

Katches had kept an eye on the emerging story by "peeking in" to the open computer system in which the team was writing their story. He had also met with Kissinger, Spivak, and Rust every couple of weeks during the previous months, "finding out where [the team] is at, what we're learning, what steps we still need to take to complete what we were doing." Otherwise, he had kept his distance. "When I was a reporter myself, what bothered me a little bit were editors who would form conclusions before I was done with the story," he says. "I want to see what direction they're headed in,

but this isn't the only project I'm managing. I like to give the reporters a chance to write a finished draft before I weigh in."

Still, he had begun to develop concerns about the article. For years, it seemed to Katches, journalism had been intimidated by scientific expertise. Here was an opportunity for journalists to make their own determination, rather than merely parrot the arguments of experts. Instead of providing readers with an article that merely surveyed the various arguments surrounding BPA— however competently—they could and should judge the merit of such debates for themselves. "I thought, look, if you're going to write about this story that's going to scare the shit out of a lot of people, I would really like to have a better sense of what science really says about these chemicals," Katches says. "I figured if we were going to do some real investigative reporting, let's look at these studies and try to make sense of them. Susanne has the scientific skills to do it."

Facing Rust and Kissinger across the table, and Spivak who stood by their side, Katches broke the news: the article wasn't what he was looking for. "I'm not exactly a passive----aggressive guy. I don't mince words. I basically told them that the story wasn't as good as it could be, that we needed to do better," Katches recalls. First of all, he didn't want a piece on endocrine disruptors in general. Katches felt an article on one chemical—BPA—would far more effectively capture reader interest. What's more, he didn't want the BPA material buried in a long, dry article. He wanted Rust to write a piece leading on the BPA debate. He suggested a two----part series rather than a single article.

But most important, rather than repeat the various claims made about the chemical, Katches wanted the team to make the call for themselves: How dangerous was BPA? Specifically, he wanted the trio to look at the research, and not just take Frederick vom Saal's word that BPA was dangerous and that government studies were slanted towards industry. Katches insisted that "I don't want Fred vom Saal telling me this. I want you to tell me this," recalls Rust. Katches did not want Rust—or anyone else on the team—to conduct independent scientific experiments. But he did want her to analyze the science and tell him what she had found, rather than rely on the judgments of others. "I"m very big on 'show me, don"t tell me.' And the only way you could show if BPA was dangerous was to roll up your sleeves and dive into the body of scientific research," Katches says. "Who funded the studies, what did they find? Those were the key questions I wanted to understand."

His verdict blindsided the investigative team, exhausted from the past few months and feeling intense pressure to "prove ourselves" because of the time and money already invested in the project. Spivak, in particular, was visibly unhappy. "It was tense, it was heated... I remember thinking that somebody is going to hit somebody else," Kissinger says. "He [Katches] basically said you guys don't have it. You haven't proved it to me. You need to sharpen this a lot. I really don't care about a he----said, she----said, if one scientist says this and another says that… Don't get me in the middle of a volley."

But how should they unpack the research? What direction should their story now take, and how would they carry out their own independent investigation? The team wasn't sure.

Into The Garret (Part 2): Breaking New Ground

Following their disappointing meeting with Katches, Kissinger, Rust, and Spivak headed straight for the Garret. "There was a lot of four----year----old type behavior in that meeting. We all griped… and had nasty things to say. I think we just needed to vent for a while," Rust says. It wasn't just that the team would now have to re----cast work that had taken months to complete and of which it was proud. Kissinger, Spivak, and particularly Rust, also worried about challenging scientific conclusions that had appeared in peer----reviewed journals, and had thus already been refereed by experts. Says Rust:

> For me to have to go back and unpack the research that a scientist did… He's a scientist and I'm a reporter, what am I going to find that he hasn't found and who am I to think that I'm going to find something that he hasn't found or that I need to check his work?... Obviously, other scientists have been vetting this work and have approved it for him to be able to publish it. So I was really ticked [at Katches] about that.

Adds Kissinger: "He [Katches] was really, really demanding a lot. And I think the worry, I mean I can only speak for me, was that we don't want to accuse somebody or convict somebody if we're not able to prove the case." Kissinger also questioned Katches' premise: "A daily newspaper from the Midwest is going to pass judgment on the safety of a chemical that's been studied for years?... [I was] more than a little scared that we were going off in a direction that was uncharted."

Katches, for his part, was confident in his reporters, and especially about Rust's science training**.** "Susanne, with that great scientific knowledge, was the person who was going to be best capable of reading these scientific studies," he says. "[She] wasn't intimidated by them. I think one of the reasons why very few investigative stories have been written about these [complicated scientific] things is because journalists don't understand them. They are very complicated, jargony, scientific mumbo----jumbo studies that it's sort of hard to penetrate."

Digging Deeper. Despite their misgivings, the team set about tackling the story anew. Their first decision was to stick with the focus on the EPA. They decided to examine the various committees that comprised the EPA, trying to discover when they met and who their members were. Kissinger and Spivak headed to their desks, and to the phones. More familiar now with their subject, the reporters were more knowledgeable than during their first round of reporting, and so they were able to get "much sharper material, sharper quotes" from their interviewees. "[Before] we were kind of laying the framework and we

weren't able to say things with as much authority," Kissinger says. Meanwhile, Rust began to put together a plan for evaluating the bisphenol A scholarship. As she did so, she revisited her list of common science reporting pitfalls in an effort to avoid them.

Art of science reporting

Rust was not sure this story fit the ordinary parameters of science reporting. Nonetheless, many of the customary rules applied. For example, too often scientific reports received insufficient skeptical scrutiny from reporters. The reason: both sides benefited from casting new research as a dramatic breakthrough. The scientist gained publicity—which often meant more funding, while the journalist got a great story. In 2003, for example, the press gave widespread attention to a religious sect that announced its scientists had cloned a seven----pound baby called "Eve." While journalists and scientists raised doubts about the claims made by the "Raelians," the media covered the sensational story enthusiastically: CNN, MSNBC and Fox, among others, all carried live coverage of the press conference where the announcement was made. But the Raelians' headliner was a hoax. For the *Journal Sentinel* story, Rust was not reporting on one specific study. But she was aware of the dangers of adopting too wholeheartedly the findings of vom Saal and his sympathizers.

Then there was the challenge of complexity. Rust thought that, in general, the media did a good job of explaining complicated science issues. But some nuance was inevitably lost along the way. Defenders of science journalism pointed out that some simplification was inevitable in translating complex science for a lay audience. "Any type of reporting involves some loss of nuance because there's only going to be so much space, and you have to makes things clear. The challenge is making sure that you have enough nuance to make what you're writing true. In science journalism it's probably going to be a little more challenging because fewer people may have a background in the subject," says Spivak. Instances of conflicting evidence also stymied journalists. Coffee, for example, drew mixed scientific reviews. Some studies hailed the benefits of enhanced mood and mental performance, while others described potential connections to cancer, hypertension and heart disease. Which was a journalist to believe? One defensive tactic was to remain on alert for any hidden agendas behind the scientific studies. Who funded the study? What were the politics of the sponsoring institution?

The confusion was only enhanced when conflicting studies emerged consecutively, rather than simultaneously. That led to "yo----yo" journalism, with each study in turn earning sensational coverage, only to be turned on its head weeks or months later. Gullible consumers and anxious patients paid the price as they wildly modified their behavior to match the latest findings. A responsible science journalist faced with conflicting studies had to learn where to turn for unbiased judgments.

Finally, there was the temptation of "undeserved balance"—the distortions that could arise when, ironically, reporters were trying to be fair. Into this category fell stories in which

journalists gave competing views equal weight, despite unequal evidence. For decades, this was the case with global warming. The great majority of studies indicated global warming was a real and growing phenomenon, yet the journalism often gave equal play to the views of the minority dissenters. "Too often journalists are afraid to say that the scientific evidence is overwhelming one way or another, so they try to balance it out too much when it's not as balanced as that," says Rust.

In fact, that was precisely what Katches had objected to in the *Journal Sentinel* team's first draft. Now Rust had to take a stand.

Firsthand analysis

Katches had said specifically that he wanted to know what Rust thought about BPA. She was inclined to believe vom Saal's claims that BPA was dangerous to humans, and that only industry----funded studies found otherwise. But how could she prove it? As a first step, she decided to return to the PubMed digital archive, where she searched through existing studies on BPA. It yielded some 7,000 studies—too broad a sweep for her to feasibly tackle on her own.

Criteria. By skimming through several papers, however, Rust began to identify possible parameters for her investigation. Any studies she examined closely, she decided, should be as applicable to humans as possible. So she set two main criteria: First, they should have been conducted in a controlled, laboratory environment as opposed to in the wild; Second, they should have been performed on vertebrates, or animals with spines. Rust compiled an electronic spreadsheet of her "short list." The database kept track of each study's title and its author, and linked to the abstract for each paper. Importantly, she also included a column on the funding source for each study. The new limits dramatically scaled down the number of papers for Rust to wade through to a still significant, but manageable, 258 studies. Through her husband, a University of Wisconsin doctoral student, Rust had access at the university to a range of online, by----subscription----only academic search engines and specialty science publications. The *Journal Sentinel* did not subscribe to such special----interest publications. In early October, Rust hunkered down on campus for two weeks, pulling up studies and reading through documents for hours on end. As she worked, new research details and caveats began to emerge.

It became clear, for example, that to compare studies directly was difficult because their methodologies varied. Different studies used different animals, administered different----sized doses to their subjects, and used a variety of dose----delivery techniques. While some tests gave the animals doses in food, for example, others had used water, injections or even small pumps beneath the skin. Nor did all of the studies mention the type of feed, bedding, and cages used to house the animals. Rust kept track of these elements as she built her spreadsheet so that she would be in the best position possible to compare like with like.

By mid----October, Rust was starting to think that vom Saal was in fact right. Most of the studies did seem to find BPA harmful. Moreover, those that found it benign were almost universally funded by the chemical and plastics industries. Academic studies indicated that even small amounts of bisphenol A could cause serious damage in humans. Of the 258 studies that Rust reviewed, 168 examined low----dose effects of BPA. Of these, 132 found health problems. All but one had been funded by sources outside the chemical industry. By contrast, nearly three----quarters of the studies that concluded BPA was safe were industry----funded.

But there was more. In mid----November, a government program issued a draft report on bisphenol A. Rust hurried to read it.

NTP Report

The National Toxicology Program (NTP) had been created in 1978 to evaluate research and advise the EPA, FDA, and other regulatory agencies on "the potential dangers posed to humans by the 2,000 chemicals registered annually for everyday use." The NTP was housed at and was partially funded by the National Institute of Environmental Health Sciences (NIEHS), one of the National Institutes of Health (NIH) under the Department of Health and Human Services (DHHS). The NTP was not a regulatory body, but an advisory one.

In 2006, Rust knew, NTP had created two panels to assess the safety of BPA. Vom Saal chaired the first, a group of 38 international BPA experts who worked for universities or governments. In August 2007, this panel released its findings: strong concern about BPA. In rodents, it noted, low doses of BPA caused significant abnormalities; humans were continually exposed to similar doses.[19]

The second panel, however, was less alarmed. It also published preliminary findings in August 2007. The second panel was smaller, only 12 scientists, and they were chosen specifically because they were *not* BPA experts. They reviewed 742 studies conducted over 30 years. The group's chair was Robert Chapin, a toxicologist who worked for the pharmaceutical company Pfizer Inc. In its August draft, the smaller panel reported only ""some concern"" that prenatal and early childhood exposure to BPA might interfere with brain development. It expressed ""negligible concern"" that humans exposed prenatally to BPA would develop birth defects.

[19] In a consensus statement published in August 2007 in the journal *Reproductive Toxicology*, the 38-member panel concluded that in rodents, low doses of BPA caused a variety of ailments including breast cancer, enlarged prostates, reduced sperm counts, early female puberty, and neurological effects analogous to attention deficit hyperactivity disorder (ADHD). The group noted that human exposure to BPA was within the range that induced the adverse effects in lab animals.
See: http://pubs.acs.org/cen/government/85/8536gov1.html

In mid----November, Rust received a draft version of a written report by the smaller panel. It was based on reviews and evaluations of relevant scientific data in three primary areas: human exposure, reproductive toxicity, and developmental toxicity.[20] Rust hoped that, given the NTP's mission of providing an "objective, science----based approach" to research, she would find its information on BPA impartial and useful. She turned to the draft with anticipation.

Review. Rust went through the NTP panel's findings, tracking down the studies that the report referenced and evaluating the criteria used to judge the research. To her dismay, she found disturbingly shoddy work. The NTP draft relied on arbitrary data, failed to mention the funding source of the studies that it referenced, and was biased in its review of the scientific evidence. "Some of the studies would say something like 'We don't have all the data from this chemical---funded study, but we know these guys are great, so we're going to say this is a really good study.' Our jaws would just drop," says Rust.

The panel's report criticized one study that had relied on only six rats, only to praise another that used the same number. It cited two studies that had not been peer----reviewed, thus ignoring a crucial standard of scientific credibility. The panel apparently overlooked dozens of studies found easily online, in favor of those chosen by a consultant with links to BPA manufacturers. Finally, it accepted a Korean study that had been translated into English by the ACC, the industry trade group. "That raised a red flag," says Spivak. "How can you be sure if you have a study in a foreign language that's translated by the [chemical] industry that you're getting the full story? Is there a conflict in having it done by the industry as opposed to a neutral third party?"

Kissinger and Spivak called the panel's chair, Chapin, for a comment. "We didn't flippin' care who does the study," said Chapin, who had worked as a government scientist for 18 years before joining Pfizer. His panel, he conceded, had not accepted for its review any studies that found an effect at low doses. He explained that once the panel weeded out studies it believed had been done poorly, none remained that showed effects from low doses. "There's a lot of bad science out there," he said. Steven G. Hentges, executive director of the American Chemistry Council's Polycarbonate/BPA Global Group, added that their scientists had been unable to replicate the work of some university scientists. "Replication is a hallmark of science, and studies that cannot be replicated cannot be accepted as valid," he said.

Even Spivak was satisfied that the team had fulfilled its obligation to get the views of the industry.

What to write?

[20] "Since You Asked: Bisphenol A," National Institute of Environmental Health Sciences. http://www.niehs.nih.gov/news/media/questions/sya-bpa.cfm#4.
"Human exposure" refers to the degree of danger that BPA presented to humans in general, "reproductive toxicity" to fertility issues, and "developmental toxicity" to children's mental and physical growth.

As Thanksgiving neared, the investigative team felt ready to write. They had interviewed more than 100 scientists, physicians, and industry and government officials, and examined thousands of pages of regulatory documents. The question was: what should they write? What was the lead? The failure of the EPA to carry out mandated testing? That industry----funded studies seemed biased in favor of BPA's safety? That NTP research was shoddy? Or, explosively, Rust's conclusion that BPA was not safe?

USA Today. In part, their decision would be influenced by the fact that on October 31, *USA Today* had published a 2,500----word piece on BPA called *'Everywhere Chemicals' In Plastics Alarm Parents.*' The impressive article had upset the team at the time, because it feared that *USA Today* had beat the *Journal Sentinel* on the story. On second reading, however, they realized their information was far more extensive than what *USA Today* reported. On the other hand, now that it was time to write, the reporters wanted to make sure their story was as distinctive as possible. There were also new developments. In October 2007, California passed legislation banning certain phthalates—a family of chemicals that made plastics soft and pliable and which were used in many personal----care products to hold fragrance and color. The ban would come into force starting in 2009. The reporters would want to include that.

As they strategized, they consulted Special Projects Editor Katches about format. He still wanted a two----part series. One part, he stressed, should feature Rust's findings on BPA. "[He] was insistent that what I had done should be almost like the basis of the story itself, and he wasn't satisfied with it just being a paragraph somewhere halfway down in another story," recalls Rust. *Dangerous or benign?* After all her careful work, Rust had thought it would be fairly easy to write up her conclusion, based on her examination of the scientific evidence, that BPA was in fact far more dangerous than the EPA and other government regulatory agencies seemed to acknowledge. But as Rust weighed the facts, she began to second----guess herself. How reliable were her results anyway? She had a scientific background, and had "double, triple, quadruple----checked everything," she says. But at the end of the day, she was still one science reporter, effectively taking on the chemical industry, plus the formidable National Toxicology Program and the Environmental Protection Agency. Was she just confirming her own biases?

What's more, the conclusion that BPA was toxic was incendiary. Was it responsible of the paper to publish such a finding, knowing that readers could do little about it? At the same time, it was surely irresponsible to withhold her doubts from readers. Rust wished she could find a wise arbiter, a dispassionate observer who would confirm her results. But there seemed to be no such person. The burden was on her, and on her judgment. Says Rust:

> I made sure that I had cited the right studies and the right information over and over and over again. But you know, I still felt like, maybe I'm just not getting this and somebody is going to call me on it… We were terrified.