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Battling Claims of Junk Science in an Age of False Facts

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INTRODUCTION

In this far-reaching case I represented the Castillo family against DuPont—the Castillos' son had been born blind as a result of his mother being exposed to a DuPont fungicide during the early stages of her pregnancy. During the trial—I had to go up against a constant wall of obstruction and an unceasing wave of propaganda from their team of corporate attorneys assigned to the case.

Although this case would go on to become the prevailing standard in the state of Florida for what type of science is or is not admissible in court, at the time we were confronted again and again with DuPont's contradicting its own findings. To bat us back and create doubt in the courtroom, DuPont's lawyers called our scientific research (as well as, when it was convenient to DuPont its own research), junk science.

Calling something junk science is another way of casting doubt on the truth of what you've uncovered.

While deciding whether or not to take this case, I did my best to explain to the Castillo family some of the legal difficulties we would face going forward. I wanted them to understand this wouldn't be easy. To prevail, I had to see if science supported the Castillo family's circumstances. If it did, we had a case.

I realized that it was difficult to make what's called an actual-knowledge case against DuPont, since an "actual-knowledge" case required us to prove that DuPont actually knew how bad this chemical was, and yet still allowed it to be sold and used.

I was certain that DuPont—or its lawyers—would attempt to cover up and hide any corporate knowledge they had. At the same time, there was another way to win and build a case like this in certain states. This case was heard in Florida, where I practice, but I'm licensed to practice in several states including Ohio, New York and the District of Columbia. Florida allows litigators to argue a "state-of-the art" case.

In a state-of-the-art case, companies like DuPont are expected to have expert knowledge of how bad their product is based on the state of the art or science that exists at the time they manufacture, sell, or distribute the product. Since they designed and made their product, the law assumes they have such expert knowledge.

As In my early research, I uncovered a wealth of details that helped me decide to take on the case. DuPont created the product Benlate. The active ingredient in Benlate was benomyl. We discovered that benomyl was tested on pregnant rats at the University of California in 1991. The results were really bad. Some 43% of the rats' offspring were born with ocular abnormalities such as having no eyes, blindness, and other related eye conditions. Worse, if the rats were fed a protein-deficient diet—which is common in low-income households such as those of migrant workers—the percentage of ocular issues jumped to 61%.

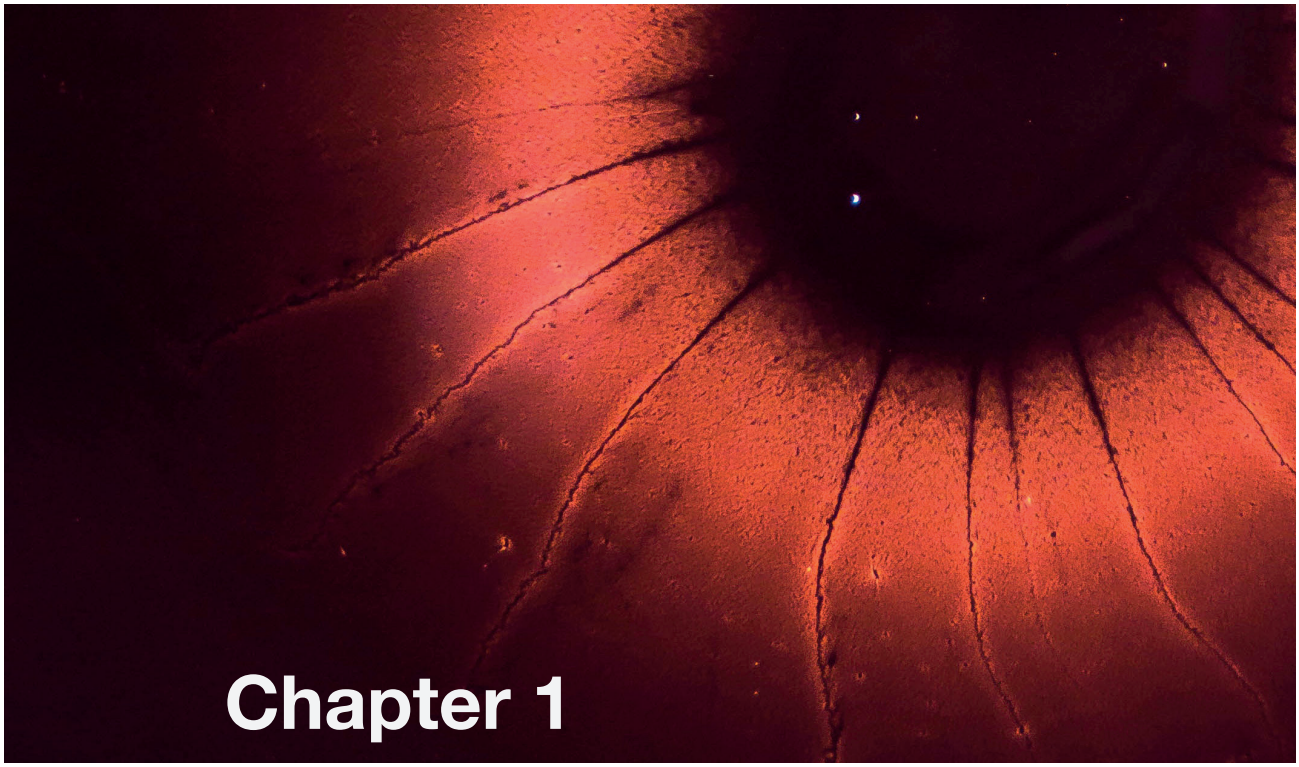
Based on this study and the timing of Donna's exposure, I decided I would take the case. Even though the risks were astronomical, I thought it was worth a shot.

And I knew that I would have to do my best to battle the resistance DuPont would throw up against us.

This white paper is an account of some aspects of our battle to make sure that the truth prevailed. It's drawn from my book *Blindsided*, which presents a detailed picture of the case, the trial and the aftermath.

Here, you will see just a few instances of what my colleagues and I needed to do to ensure that the Castillos were well represented—and that the science behind what happened wasn't discredited.

CONTENTS



Chapter 1

Courtrooms and Science

In the courtroom, you can use various types of scientific findings to back your claim.

Animal studies and human studies are the major types of cited research. The reality, however, is that animal studies aren't always predictive of what the impact will be on a human. What we do know, though, is that the reactions of rats and primates to most chemicals and drugs are closer to human reactions than any other animals' reactions.

For instance, a reaction found in a rat will appear in humans 80% of the time. Animal studies are significant in cases such as the Castillos', and yet when it comes to presenting them as evidence during the trial, they aren't weighed nearly as strongly as they should be.

Courts won't allow a case to be built solely on animal studies. Through the years, the courts—and in some places, legislatures—have cut back significantly on what is admissible science in the courtroom.

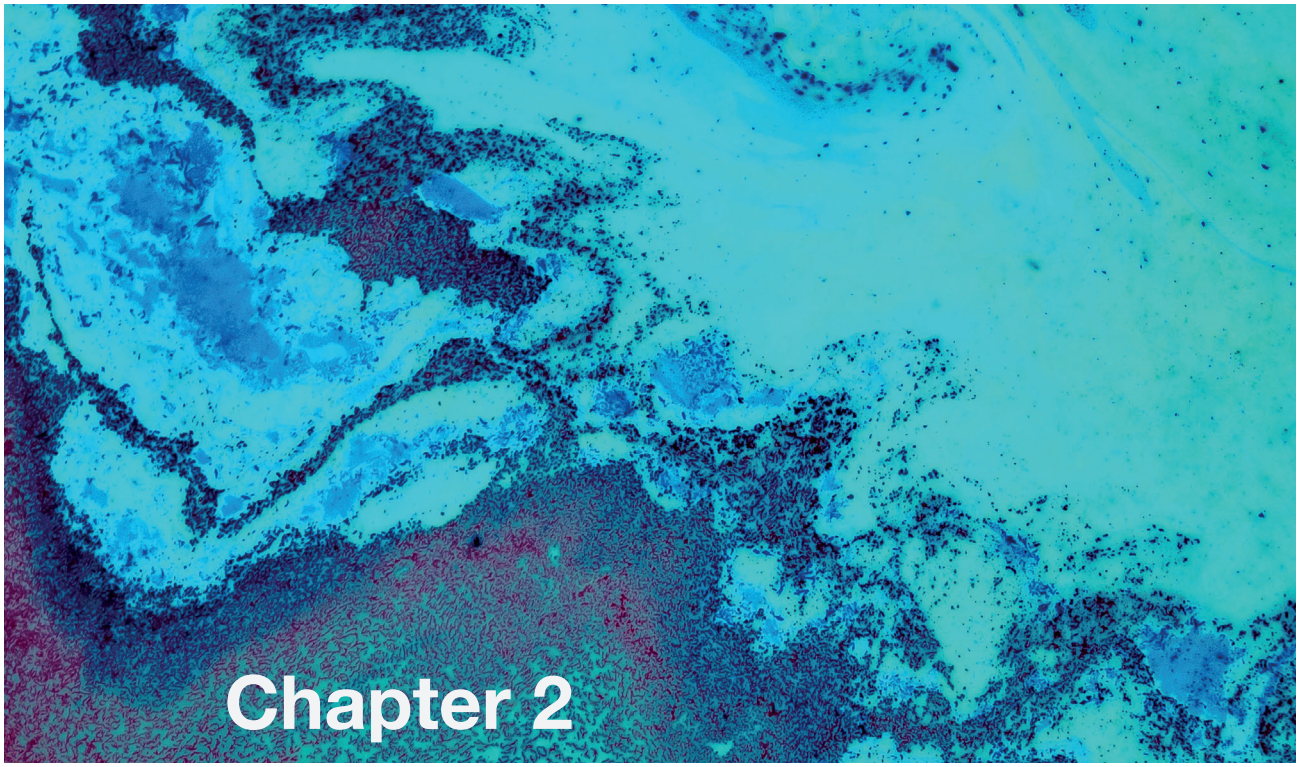
The DuPonts of the world have expended enormous sums of money to protect themselves in the courtroom by having a lot of science excluded from the courtroom. On one hand, a company like DuPont will submit these kinds of studies to the EPA to get a product licensed. But when they get sued over the product's safety and the injured party seeks to admit into evidence the same study that the manufacturer presented earlier to the EPA, the study is suddenly called **"junk science."**

As for human studies, in a chemical exposure case like Donna Castillo's, we were severely limited because of the ethical implications of exposing humans to chemicals for testing purposes. The only acceptable human tests in these cases were dermal skin transmission tests and in-vitro tests done at the cellular level.

Because of the risk, dermal skin transmission tests are performed on human cadaver skin to calculate how much of a chemical travels through the skin.

The bottom line was that we would have to make our case with animal studies, dermal transmission studies, in-vitro studies, chemistry, basic anatomy and biology, and finally with something called a differential diagnosis—the ruling out of other possible causes, if any, by process of elimination. It's standard operating procedure in medicine and science.

Once we proved that Benlate could cause microphthalmia, we would have to rule out other possible causes. As part of the differential diagnosis with Donna Castillo, we had to consider genetics and other environmental causes besides Benlate, such as an overdose of vitamin K or hyperthermia.



The Junk Science Claim

Every time we presented evidence to the judge that could be used as scientific backup, DuPont referred to it as "junk science."

DuPont called everything junk science, and even tried to force us into finding and producing studies that didn't or couldn't realistically exist.

For example, DuPont wanted us to come up with a controlled epidemiological study, which would make perfect sense if we were testing a drug, because drugs, as I explained before, can be tested on pregnant women, whereas chemicals can't.

To produce an epidemiological study, I would have had to find pregnant women who were exposed to this chemical during the critical part of their pregnancies (the seven-to-10-week period) to prove that the same result occurred for them as occurred for my client.

A study like that would have cost tens of millions of dollars. How do you even perform that type of study? We would have had to find women who were unwillingly and randomly exposed, as Donna Castillo was. In fact, Donna was my study. And yet the lawyers for DuPont argued that since there were no good epidemiological studies, the evidence should not be allowed.

Well, they had a point. There were no epidemiological studies.

The fact was, I didn't need an epidemiological study to prove the science. Instead, I assembled a stellar team of 13 scientists to establish our case piece by piece, and I made sure the team included a fetal pathologist—someone who could speak to the jury about what happened to Johnny while he was in the womb.

Having a fetal pathologist testify was extremely important, because it would help the jury understand how the chemical generally got through the skin to the cells of the fetus.

The easiest way to lose the case was to have one scientist act as a jack-of-all-trades.

Each scientist had to cover a very defined aspect of the case based on both their specialized expertise and generally accepted science.

Finding a fetal pathologist who could speak to the issues was no easy task. We literally had to trace the path the chemical took from its point of contact with Donna's skin through her dermal layer, into her bloodstream, through the placenta, and right down to the embryo's cells.

I was on a business trip to London when Alan Care, a British solicitor who I knew and who I sometimes worked with on chemical cases in Great Britain, suggested I meet with a professor at the University of Liverpool by the name of Dr. Vyvyan Howard.

I would later find out that Dr. Howard was a developmental toxicologist, also called a teratologist, which is someone who studies birth defects. His training was in fetal pathology, which made him an ideal witness for the case because of his specialty in breaking every detail down into molecules. He was obviously extremely smart, and appeared to be quite good natured despite being a bit socially awkward.

If you were to conjure up an image of the quintessential scientist, Dr. Howard would fit the description. He was a stout man with a big belly, frizzy red hair, and wire-rimmed glasses that fell to the tip of his nose. If he wasn't studying in a lab, I'd almost expect to find him drinking in an Irish pub and sounding off on the latest scientific theory.

We became very good friends during the discovery phase of the case. Unfortunately, he had little to no experience in a courtroom. I spent days doing my best to prepare him, but despite all that preparation, I had a bit of a scare the night before one of his depositions. I made the mistake of sending my associate Ana Rivero to meet with Dr. Howard for a final review the day before one of his depositions. I flew to London that night to join Dr. Howard and Ana at the Ritz for dinner and one last conference. When I arrived, the first words out of Ana's mouth were, "We have a problem."

"What's the problem?" I asked.

"Dr. Howard can't testify to the exposure."

"What do you mean he can't testify to the exposure?"

"He can't give us a number; he can't do it." Ana was in an absolute panic.

"What do you mean he can't give us a number? He can't say it's, like, 57 parts per billion or something, based on the exposure?"

"No, he can't say that for sure." She was terrified that we had no case without him.

After a very brief but powerful head rush, I asked Dr. Howard if he could forget about providing a specific number. We knew for a fact that when the exposure is 22 parts per billion, the cells die. We also knew that at three parts per billion, neurite retraction occurs, and cells lose their ability to communicate with one another.

What we really needed Dr. Howard to do was show that, based on the exposure the plaintiff had to the chemical, the amount that reached the embryo was in excess of 22 parts per billion—or at least three parts per billion.

***"If you can't give us a precise number, can you say that the exposure described by Donna was in the hundreds of parts per billion?"* I asked.**

***"Oh, absolutely, absolutely. Oh, yeah. No, clearly it was in the hundreds of parts per billion."* He said this with great conviction.**

Perhaps we were getting somewhere.

***"Could it have been in the thousands of parts per billion—which is parts per million?"* I asked.**

***"Absolutely,"* he replied.**

"So when I give you the hypothetical scenario, could your answer be that it's 'in the hundreds of parts per billion, if not thousands of parts per billion'?"

"Absolutely."

Then that is what we will use. That's it. It doesn't have to be an exact number, like 27 parts per billion.

Given his professorial ways, I wasn't sure how Dr. Howard would come across in a courtroom, but I was positive he knew his field of study, and that the jurors would absolutely recognize his expertise.

Alan Care had definitely brought me to the right guy.

Preparing an Expert Witness

I spent days helping Dr. Howard prepare for trial, convincing him to drop the word "possibility" from his vocabulary. I had to really beat the hell out of him to convert his scientific thought process to a legal one, because "reliability" is used differently by scientists than by those in the legal system. Scientists believe that 95% or more reliability is necessary to claim something is "probable." In the courtroom, we need only more than 50% reliability to claim something is probable.

"Don't use the word 'possibility' around me, you got it?" **I'd say.**

"Well, possible is possible," **he'd reply.**

I'd say, "'Possible' doesn't exist anymore if it's greater than 50%!"

In law, when you tip the scales, a thing becomes probable. Factual statements are based on probability or lack of probability—something either is or isn't. In the courtroom, it's really that simple. There is no gray.

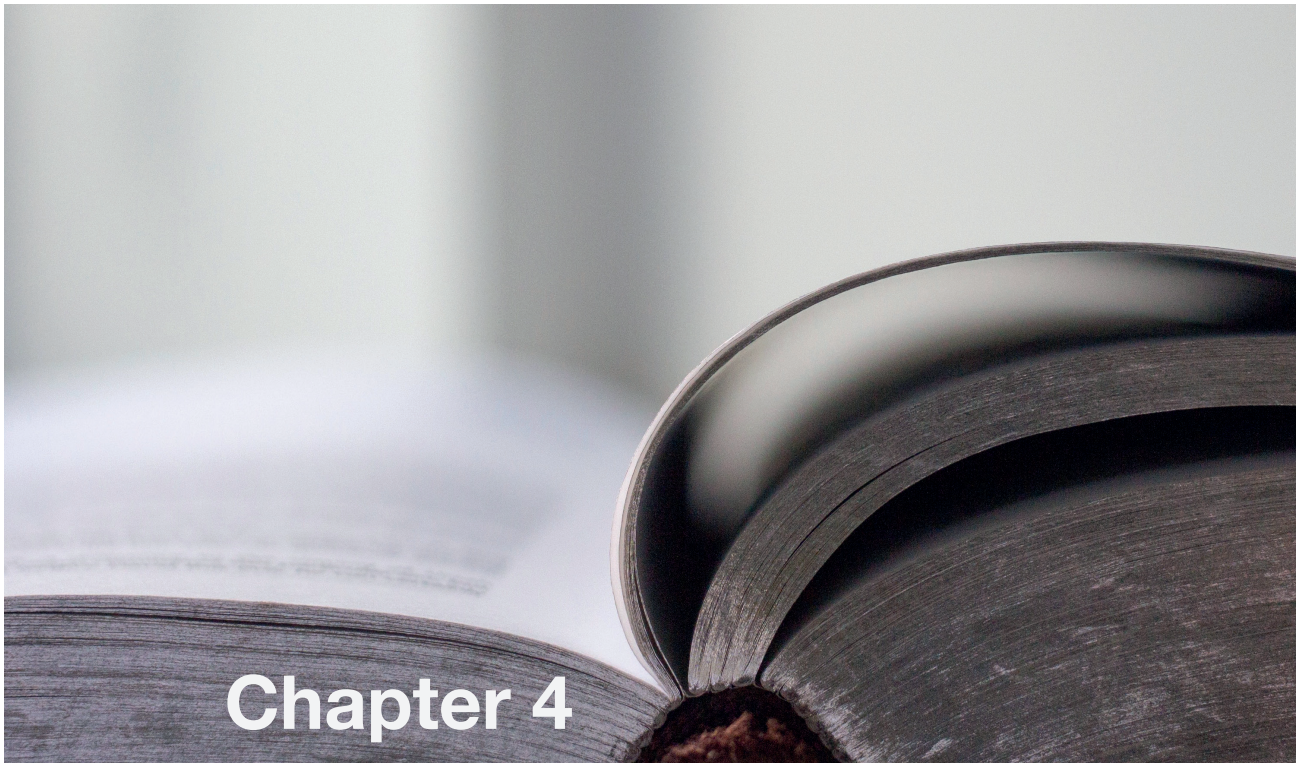
In many ways, preparing Dr. Howard was like prepping an actor for a leading role, except he wasn't making up facts. He was merely learning how to present them in a legal setting.

I knew I was getting caught up in vernacular, but in the courtroom, vernacular matters, and often it can make or break a case. And in the Castillo case, I knew DuPont would be all over any potential weakness we had, so I didn't want to hear that fucking word come out of his mouth—ever.

I bent down, got eyeball to eyeball, and said, *"Your only choice of words in the courtroom are 'It's probable' or 'It's not probable.' That's it. Am I clear, Dr. Howard? Don't fucking say 'possible,' Doc. Do you understand what I'm telling you? Do you?"*

I felt bad browbeating the guy into submission, but it had to be done. I couldn't allow his use of scientific terminology in a legal setting to control the outcome. I needed him to understand that he was no longer living in the scientific world. He was a scientist entering a court of law.

Dr. Howard's testimony was absolutely critical, because as my lead scientist, his testimony was the glue that held all the other scientific evidence together, which made him the captain of our team. If he slipped up, even once, whether in his deposition or testimony, we were done. Therefore, I ended up meeting with him a lot, talking through every possible scenario that might come up both in our favor and against us.



Chapter 4

Exposure and Science

The defendants broke the case down into two major areas: the exposure to the chemical and the science of the chemical. Pine Island was responsible for defending the exposure to the chemical, and DuPont was responsible for defending the science of the chemical.

DuPont took on the science because they didn't think anyone else was smart enough to answer the scientific queries. After all, that's what DuPont does.

DuPont focused completely on the science, which was a lot more work than the exposure case. There were hundreds of studies that didn't matter much. The two most significant studies, the ones that made a difference in the courtroom, were the critical studies I found in the Delaware document depository—Staples I and Staples II.

Naturally, there were others that helped, but those two studies were my whistleblowers.

The fact that DuPont had fixed its own studies wouldn't win the case for us, but it was a sexy-enough point to create some doubt in the jury's minds about who we were dealing with and the nature of the science behind Benlate. Even so, we still had to prove that Donna Castillo's exposure at the time of her pregnancy was equally culpable.

This was my reason for bringing in 13 different experts. Often lawyers will argue in generalities, citing "generally accepted science." This wasn't one of those cases. Given the complexity of the case, there wasn't a single person who could knowledgeably talk about everything we needed to prove in our case. For this reason, I sought individual experts to testify specifically and perfectly about what they knew best.

Chapter 5

Outwitting the Opposition

I had no room for opposing counsel to dispute such important details as the dermal transmission rate of the chemical in question.

I couldn't let the other side argue that the half-life was not 45 minutes, because it was. I couldn't let the other side suggest that people don't have three to four liters of blood in their bodies, because they do. I couldn't let the other side argue that the placenta doesn't absorb everything we consume or come into contact with through our skin, because there is no question that it does. I couldn't let the other side dispute which stage the eyes develop during gestation. And I certainly couldn't let them refute the fact that the brain is the most sensitive part of the developing embryo, or that it can be affected in a low-dose environment. I needed witnesses who could unequivocally present the facts and shut down any falsehoods if and when they came up.

With the exception of some in-vitro studies that DuPont had itself performed, the bulk of the studies hadn't been carried out on humans. As I mentioned earlier, we knew for sure that 80% of the time, a test conducted on a rat yields the same result as it would if the test were performed on a human. The law should probably allow that to be enough evidence to put in front of a jury, but it's not always that simple.

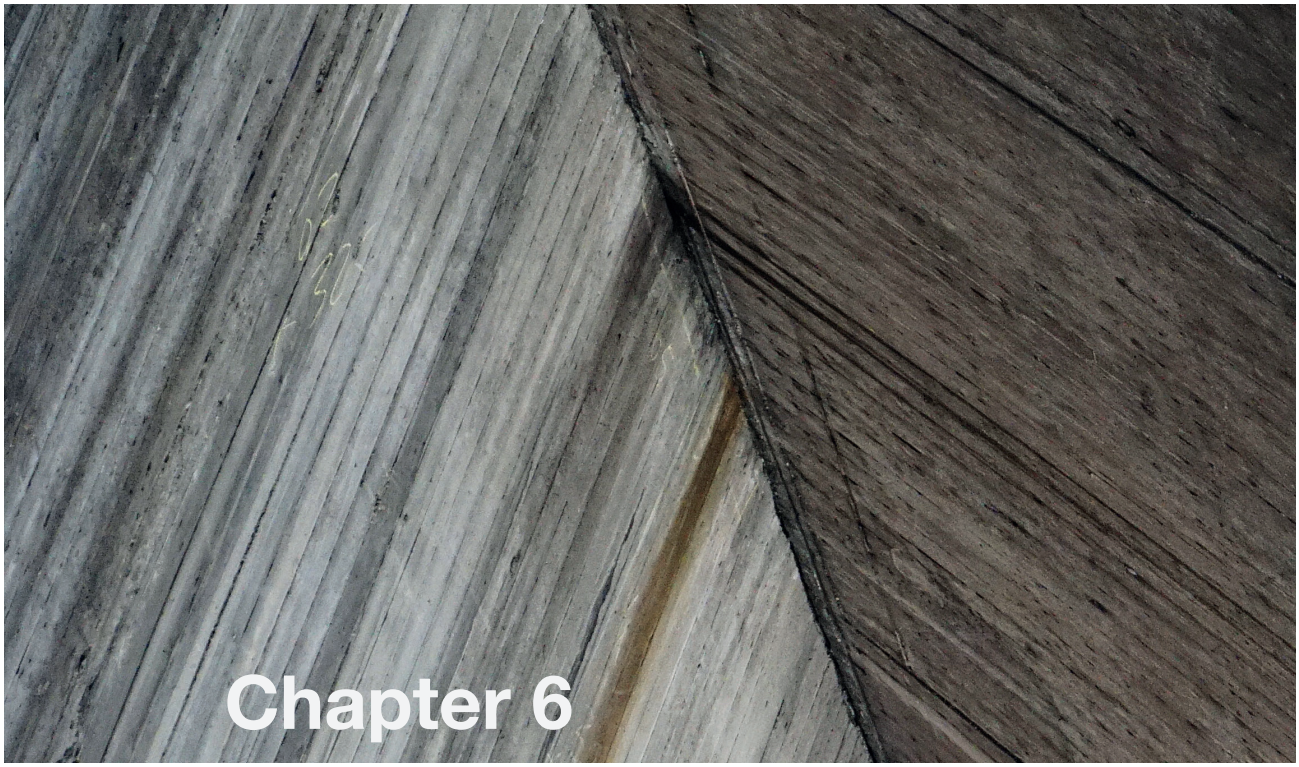
And this is what made Dr. Howard so vital to our case. His testimony would have to convince the jury of just how small a chemical dose was needed to impact the embryo's cell development based on the science we had. He was the witness who could most easily and effectively explain, based on the level of Benlate one is exposed to, how much of the chemical would get through the skin, how much would then get into the bloodstream, and how much would pass through the placenta and ultimately to the embryo as a result.

That link was the difference between winning and losing this case.

The bottom line was this: although the animal studies that resulted in eye malformations were very attention-grabbing, they clearly were not enough on their own for us to win, or even get to a jury.

The animal studies showed "biological plausibility," which means, in many situations, when you get a result in an animal, you will get the same result in a human. We needed those studies, but we also needed additional science that tracked the chemical through the skin to the blood, through the blood to the placenta, and through the placenta to the embryo, into the embryo and into the cells.

DuPont's strategy from the start was to take all the evidence we submitted in the pretrial hearings, including the same evidence they submitted to the EPA, and claim it was all "junk science." DuPont wanted the judge to say the science wasn't reliable or generally accepted in the mainstream scientific community and therefore shouldn't be allowed.



Chapter 6

Calling Real Data False

I expected My chief complaint against DuPont was that it was claiming the exact same science it had submitted to the EPA to get its product licensed was now junk science simply because I was trying to use it against them.

They couldn't have it both ways.

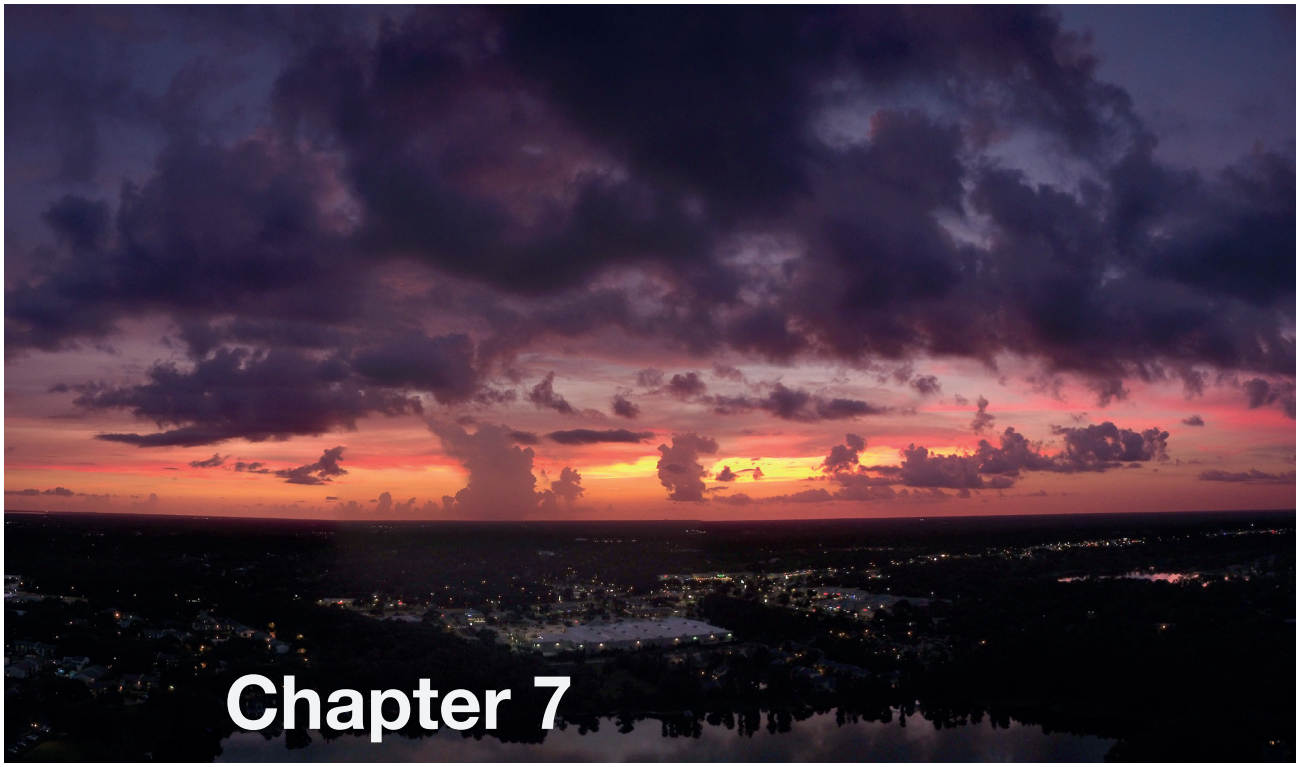
Why the hell should DuPont be allowed to submit scientific studies (many of them self-conducted!) to the EPA to get permission to sell its chemical products to the public, and then also be allowed to turn around and call it junk science when someone from the public sues them over the harm their lethal fungicide caused?

Someday this needs to be corrected. We need a federal statute that makes anything submitted to a governmental agency such as the EPA or FDA for licensing purposes admissible in a court of law, especially when scoundrels like DuPont get sued by someone like Donna Castillo. They can still call it junk science if they like, but they will have to do so directly to a jury, and they'll also have to explain to that same jury why they chose to submit junk science to the EPA or FDA in the first place.

This notion of junk science became a central theme of the trial, as it was the core of DuPont's defense.

I didn't know it at the time, but this case would become the prevailing standard for years to come in the state of Florida for what type of science is or is not admissible in court.

As a lawyer, I found it so unfair to the public that DuPont took such a warped and contrary position on science only when it suited their needs. The prospect of knocking out DuPont on this matter would mean a victory for us right from the start. It would be like shooting the king in the head. And from DuPont's point of view, taking out my key witness—Dr. Howard—would be like doing the same thing.



Chapter 7

The Frye Standard

One of the first things we had to do for the court concerned what is known in Florida as a Frye hearing.

Federal and state courts require a minimum threshold of reliability and acceptance in the scientific community of the medical and scientific evidence to be admitted at trial. In Florida and some other states, the courts adhere to what is known as the Frye standard. Most federal and other state courts follow the Daubert standard, which is very similar to Frye. While forensic pathologists are seldom, if ever, requested to participate in such hearings, their toxicological and basic scientific colleagues often must, because they are more involved in research, methodology and technical procedures.

During these proceedings, the proponent has to prove general acceptance of the methodology to be used in trial. The judge determines whether the proponent has met that burden. If the science proposed meets that burden, then the jury can consider it as evidence in the case.

We clearly met the Frye standard and proved the general acceptance of the underlying scientific principles and procedures.

DuPont, though, raised four points in the motion that we were in front of the judge to prove pursuant to Frye.

First, DuPont claimed Dr. Howard was not a teratologist. Second, it claimed Dr. Howard's opinion was not based on any epidemiological studies. Third, DuPont claimed Dr. Howard's use of in vitro studies (conducted by Dr. Dick Van Velzen, whom Dr. Howard had commissioned) was not acceptable. And finally DuPont claimed Dr. Howard could not rule out alternative causes of birth defects.

In addition to those four specific attacks on Dr. Howard, DuPont also called into question and collaterally attacked the validity of Dr. Van Velzen's in-vitro studies by assailing his character. Dr. Van Velzen comes from Holland and practices medicine in several countries, each of which has different rules and standards.

For instance, Dr. Van Velzen had a habit of keeping preserved miscarried fetuses and embryos in his office for research purposes. In the United States, by law, you are not allowed to keep or preserve embryos and fetuses in this manner.

As a result, DuPont launched a public-relations smear campaign against Dr. Van Velzen, even referring to him as Dr. Frankenstein in one newspaper article.

In reality, Dr. Van Velzen had an off-the-chart IQ score and was one of the most brilliant scientists on the planet, even if he wasn't the most personable individual around. Nothing ever came of DuPont's attack on Dr. Van Velzen, although, as usual, we expended a lot of effort and endured a lot of stress in protecting him, because his in-vitro tests were a critical element of our case. There was no doubt his tests were performed in accordance with sound and proper scientific procedures. In fact, his methodology was precisely the same methodology DuPont used in its own in vitro tests.

Coming into the Frye hearing, we had taken the deposition of each and every expert, including Dr. Robert Brent, the supposed "King of Teratology." Dr. Brent was considered the best expert witness money could buy at the time. In his sworn testimony, he said he found several flaws in our case, including:

- That this case did not rule out genetics as a cause of John Castillo's condition before determining that another cause was probable;
- That the findings of the in vitro testing referred to in this case were not generally accepted in the scientific community (even though DuPont had conducted the tests itself!);
- That this case did not involve multiple malformations (it was DuPont's contention that when embryonic cells are exposed to toxic substances, they are likely to produce multiple malformations—unlike Johnny's single malformation, microphthalmia);
    - That there were no epidemiological studies done; and
    - That there was a lack of adequate evidence from animal studies.

Essentially, with the type of malformation that Johnny Castillo was born with, there were two general potential causes: either genetics or environment. According to one of DuPont's star witnesses, teratologist Dr. Lewis Holmes, 70% of microphthalmia cases are genetic, 15% are environmental, and 15% are due to unknown causes.

Yet despite these statistics, every genetic test known to mankind, including a karyotype test, had been performed on Johnny Castillo, and the results were now indisputable. No test indicated genetics as the cause of his microphthalmia. In this regard, DuPont was left with nothing but pure speculation. Even the geneticist for the defense went so far as to testify that perhaps someday there might be a test to prove there could be a genetic cause in this type of case, but as of then, it did not exist.

Chapter 8

Environmental Causes

This brought me to the grouping of potential environmental causes of microphthalmia that appeared on a list DuPont filed, including such teratogens as benomyl, rubella, and vitamin K, among others.

But in assessing all the environmental causes out there in the world, DuPont's expert witnesses had unwittingly ruled out all of them at deposition, and were therefore stuck with having to take those same positions at trial.

With all other potential environmental causes discounted by the opposition's own denials during the discovery process, I next placed the focus on Benlate. I already had Donna's testimony about her exposure to the spray.

I had the DuPont rat studies, which proved it was a teratogen in rats. I had the outside studies that were conducted at the University of California and other places, which showed that benomyl and Benlate were both teratogens in rats. I had DuPont's skin transmission studies. I had in-vitro tests that showed cell death—known as apoptosis—occurring at such small amounts as twenty-two parts per billion. I even had studies that showed neurite retraction (preventing cells from communicating) occurring at three parts per billion. All of the in-vitro studies were admitted into evidence as both generally accepted and relevant. General acceptance and relevance were very easy to prove, since DuPont itself, along with literally every major drug manufacturer, uses the exact same type of tests.

What was really in question was the alleged need for epidemiology where none had previously existed.

When drugs are being tested, epidemiological studies make sense, because you know who is taking the drug and who is not. You can give it to humans and study the impact by following the population. In a case like the Castillos', such a study was not possible. Pregnant women who were exposed to Benlate between seven and ten weeks into their pregnancies are very rare and extremely hard to find, as are children born with Johnny's condition—statistics show only 1 in 10,000 have it. Therefore, testing this type of chemical exposure is not only difficult but also dangerous to pregnant women, and ethically impermissible.

There was a textbook that DuPont expert Dr. Holmes agreed was authoritative.

It laid out the scheme and interplay between epidemiology and animal studies, taking those two things into account and dividing them into two categories: definitive evidence and adequate evidence.

Under the definitive evidence category, the textbook stated that if you were going to definitively prove developmental toxicity, you needed to have sufficient epidemiological studies from a scientific community that found a cause-and-effect relationship. To definitively prove there was no apparent effect, you needed epidemiological studies that had sufficient power. You also have to look at a variety of developmental end points.

The only study of any significance to this case that we were able to uncover was an Italian study that satisfied neither point: it did not have sufficient power, and did not look at multiple end points.

DuPont had claimed that Johnny Castillo should have had more than one malformation. However, in every microphthalmia rat study we found, the majority of rats had only one malformation, not multiple malformations.

Dr. Brent's position regarding adequate evidence for potential human developmental toxicity required at least one well-executed animal study showing developmental toxicity, or strong suggestive evidence from epidemiological studies. Of course, in this case there were multiple well-executed animal studies, such as the University of California study. In fact, Dr. Staples himself, and other doctors in this case for the defense, had said the methodology of those studies was proper and that the tests were well conducted.

I was about to make my final plea to the court on behalf of Dr. Howard and his qualifications as a teratologist when I was interrupted by opposing counsel. Brian Cella was in the courtroom that morning along with Clem Glynn, both representing DuPont. Brian Cella was incensed by my representation of Dr. Howard's credentials, which had been in question by the defense from the moment I introduced him as a witness.

My contention was that during his deposition, Dr. Brent—DuPont's own witness—testified under oath that Dr. Howard was qualified to be a witness. Cella said, "Your Honor, Dr. Howard is not qualified. Would you like me to make clear once again our position?"

I asked the judge if I could read from Dr. Brent's deposition to remind counsel of what its own witness had said. The question had been "So you believe he is qualified; you just disagree with his opinion?"

"The answer from their expert witness, Your Honor: 'He's qualified and wrong.'"

Brian Cella had a different point of view. He began reading from his deposition: "Dr. Brent, in your opinion, is Dr. Howard a qualified teratologist?"

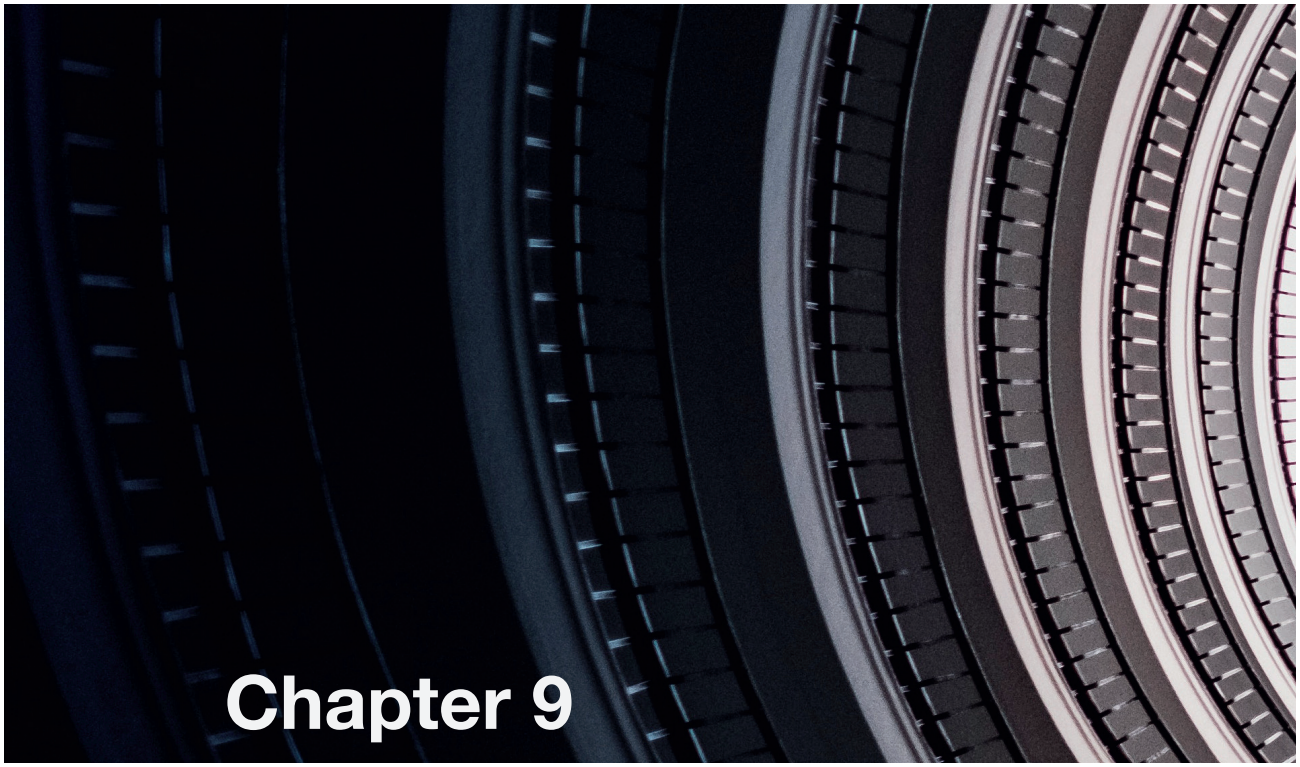
"He's not a teratologist."

"And teratology is the specific discipline that studies birth defects as induced by environmental agents?"

"Among other things, yes; many of us are also geneticists as well. But certainly teratology is the study of environmental causes of birth defects in both animals and humans."

"Looking at the substance of his other opinions, you feel that he is not qualified to give these types of opinions?"

"I really try not to judge other experts. That is for the jury and the judge to decide. He certainly has had very little experience in the field of teratology, and this is not his field of expertise . . ."



Chapter 9

Teratologists

Dr. Howard was known as a developmental toxicologist. A teratologist is a physician of almost any specialty who looks at birth defects. That could include pediatricians, pathologists, or any other type of medical professional, because there is no special training for teratology. That fact came from the King of Teratology himself.

Cella was getting pissed at my use of the term "King of Teratology."

"Your Honor, may I make a personal observation?" **he asked.**

"No. I don't think so," **Judge Donner said.**

"It's the reference to the King of Teratology, Your Honor . . ."

"Excuse me?" **The judge wasn't happy that Cella had continued with his "observation."**

"Okay, I'm sorry," **Cella quickly acquiesced.**

"Mr. Cella, just let Mr. Ferraro finish. Every statement he makes, there is no question in my mind and heart that you disagree. So I'll keep that in my heart as he's speaking. Then, when it's your turn, you'll tell me why you think he's wrong."

I actually didn't believe Dr. Brent was the King of Teratology any more than Brian Cella did, but DuPont had stated it in court, and I used the term in jest. After all, he was the self-proclaimed king in his own deposition, given under oath.

Since the very start of the trial, DuPont had been disseminating all sorts of propaganda about its product and the case itself. DuPont primarily used press releases to send a message that this case was a bunch of crap. They even went so far as to say their own rat studies weren't indicative of anything relevant.

The Dubious 5-Gallon Example

In addition to the press releases, DuPont had witnesses testify that a person would have to drink at least five gallons of the chemical benomyl, to replicate the amount the rats were given in the studies, to cause any real damage to a human embryo or fetus.

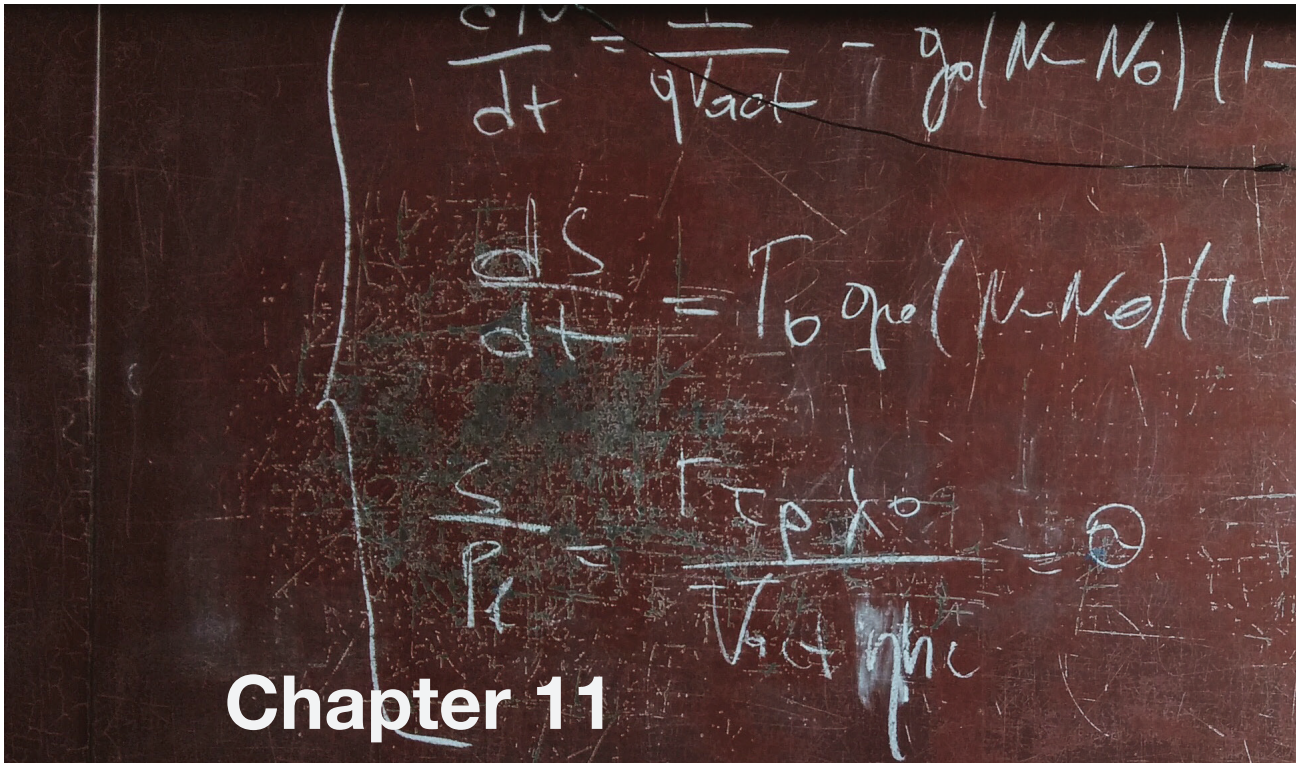
This was downright absurd, if not insulting, to Johnny and to every other victim. The defense went so far as to say that anything in excess—including drinking too much water—could potentially kill people—which it can, but you have to drink enormous amounts for it to be dangerous. That's how down and dirty they got, which wasn't all that unusual in high-stakes cases such as this one, but these kinds of tactics certainly didn't make our position any easier.

This overt attempt to discredit the rat studies by continually calling them junk science throughout discovery and now during the trial kept me up many nights.

Why were the studies great science when they needed them to get approved by the EPA, but now they were junk science when we wanted to use the results against them? Tactically, I understood the attempt they were making, but they didn't have an ethical leg to stand on.

No company would put so much effort or money into such studies if they meant nothing to them. They certainly weren't testing Benlate or benomyl at certain specific dose levels to prove nothing. The big question plaguing my thoughts at this point was, Where in the world was this five-gallon analogy coming from, and how does it possibly make any sense?

In my mind, it was absolutely absurd, and I needed to prove that to the jury. That was critical.



Chapter 11

Doing the Math to Prove a Point

I started doing the math. First I converted gallons to milligrams.

Since all the scientific measurements had been taken using the metric system, I thought it would be tougher for the jury to follow along without this initial conversion. Because it was going to be difficult enough for them to understand the complexity of the math at hand, I had to make it as easy to comprehend as possible. Next, I took the weights of the rats that were used in the study and compared them to the amounts of benomyl they were given to find a weight-to-dosage ratio. Then I plugged in Donna Castillo's weight at the time she was sprayed to get the comparable amount of the chemical for a person of her size. As it turned out, the amount of benomyl needed wasn't five gallons at all, but merely one-fortieth of an ounce!

Because I hadn't gotten Dr. Brent to generally admit in his deposition that the 1982 Staples numbers were a lie, I knew I had to get one of the defense's other experts, Dr. Judith C. Stadler, to admit it under oath in front of the jury.

But working with numbers and science is not as easy as it sounds, especially when you're dealing with a seasoned scientist like Dr. Stadler.

When DuPont realized I had found and then broken down the Staples studies, I believe the company thought it could overcome the obvious discrepancies in its research by bringing in Dr. Stadler as a witness.

She was a senior research toxicologist and head of the inhalation toxicology group at the DuPont laboratory. In its answers to interrogatories, DuPont listed her as one of the top-three most-knowledgeable people in the world about the chemical benomyl and the product Benlate, even going so far as to make her the corporate representative for the trial.

DuPont wanted to humanize itself by presenting a face at the trial to address these issues, and admittedly, Dr. Stadler was a good strategic choice. She looked the part, dressing and acting like a conservative professor or a stately, middle-aged high-school teacher.

The interesting thing about having corporate reps attend a trial is that sometimes they're called to testify and sometimes they aren't.

In this case, I expected DuPont lawyer Clem Glynn would put Dr. Stadler on the stand to say what a great company DuPont was and how responsible and safe their scientists were in conducting their research.

Instead of waiting for Glynn, however, I thought the better move would be for me to call Dr. Stadler in my case as an adverse witness. Dr. Stadler was clearly adverse, as she was DuPont's corporate representative at the trial.

Normally, leading questions are allowed only in cross-examination of witnesses; the exception is with adverse witnesses, who can legitimately be asked leading questions in direct examination. I felt it was critical that I be able to ask Dr. Stadler leading questions because it was crucial for me to have the ability to simplify complicated concepts for the jury. My strategy was to break down the math into easy steps so I could get Dr. Stadler to admit that my analysis was correct. Math can be such a powerful tool when used correctly, because numbers don't lie.

My primary objective with Dr. Stadler was to completely dismantle the bullshit five-gallon theory that had been touted by DuPont.

Dr. Stadler presented very well and appeared quite poised as she sat in the courtroom each day awaiting her turn on the stand. I did my best to be kind and charming. I wanted to keep her both on edge and off guard for when she was actually called to the witness stand.

And then, on May 29, I finally called her.

Once Dr. Stadler was sworn in, I quickly got her to testify that she had spent more than two hundred hours preparing for the trial by reviewing the Staples studies (both Staples I and Staples II), the Hoogenboom study, and a whole variety of other relevant studies, and that she had analyzed them, made comparisons, and reached certain determinations. But even with that level of preparation, she appeared a little unsure of herself at first.

I then questioned Dr. Stadler at length about how the compound enters the bloodstream of rats. She explained that when you gavage a rat (directly introduce a chemical, drug, or food item through a tube into the stomach during a clinical trial), you're going to get a lot of absorption into the bloodstream, which directly relates to the effects the study reveals.

"When doing a gavage study, the compound is placed right into a rat's stomach or digestive tract, right?" I asked.

Dr. Stadler said yes, explaining that when it comes to humans, there are some things that pass right through the bloodstream unabsorbed and others that are absorbed, such as medications.

Next, since the studies were done using the metric system, I came up with 10 simple calculations that converted the metric units to units the jury could understand. My goal was to calculate the amount of benomyl it would take for enough to pass through the skin, enter the bloodstream, and impact a human embryo or fetus.

I put together a 10-step chart so the jury and Dr. Stadler could easily follow my simple math conversions. As soon as I began my line of questioning, Clem Glynn objected. To my surprise, he suddenly proclaimed to the court that "Dr. Stadler isn't an expert." According to him, she had not been designated as an expert, and the fact that she was a corporate representative did not open the door to start eliciting expert opinions from her, let alone asking her to perform mathematical calculations.

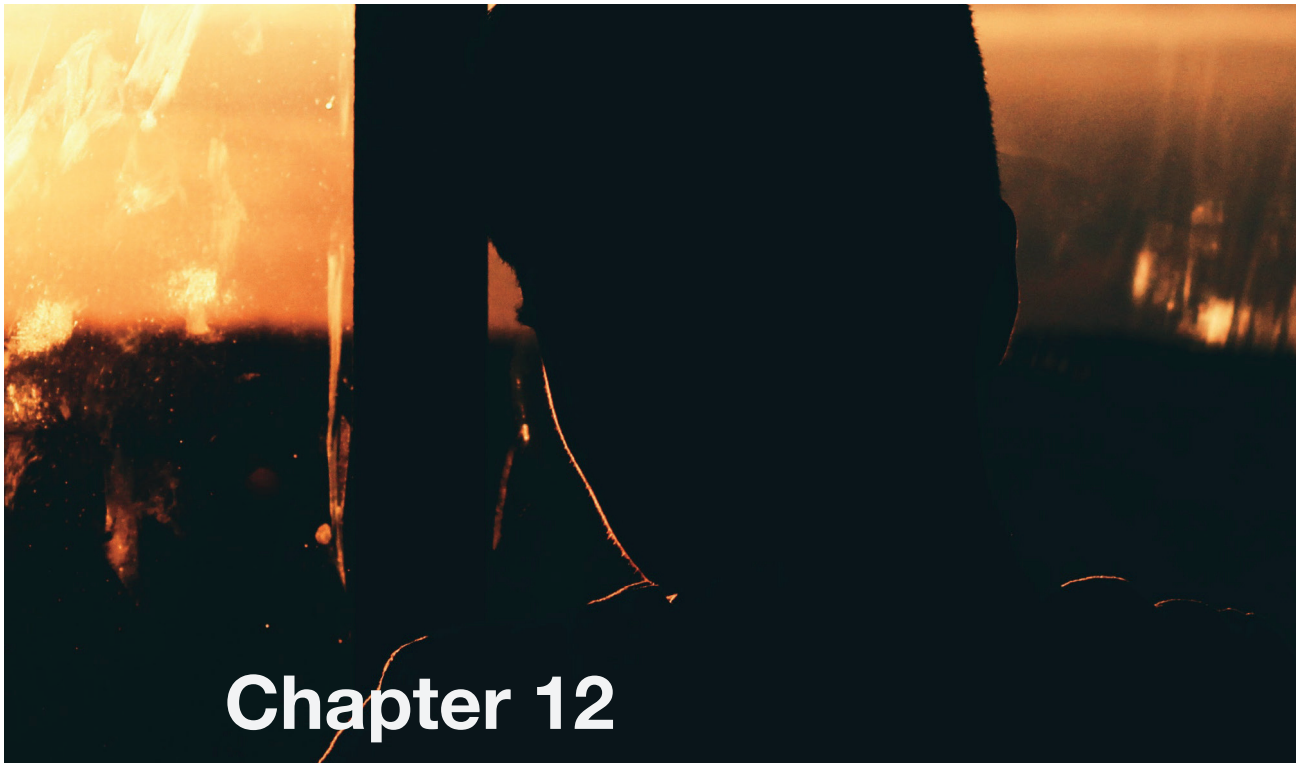
Of course, my position was very different.

I thought she was quite qualified, because she was listed as one of the three most-knowledgeable people on earth about Benlate and had testified earlier that she had a substantial background in math. All I was asking her to do was take some simple metric system numbers, apply them to the gavage doses used in the Staples studies to obtain a ratio, and then help apply that ratio to a one hundred seventy pound adult like Donna Castillo to see just how small the "big" dose DuPont said was required really was. I thought Dr. Stadler was more than capable and qualified to do that.

The judge agreed with me. She pointed out that, by definition, an expert witness is not a specialist—it's a person whose testimony helps decide an ultimate issue for the jury. An expert is somebody who, by special skill, training, or experience, is allowed to testify in the form of opinions.

Dr. Stadler had been designated a corporate representative by DuPont. Either she was just a body to make it look like corporations are people, or she was a person with knowledge.

In this case, she was a toxicologist, which meant I could ask her any questions of fact related to the case that only an expert witness could answer for the jury. I was totally within my bounds, especially since DuPont had identified her as the person within the company who, because of her vast knowledge, could address questions about the studies.



Chapter 12

Flustering the Opposing Team

My tactics may have flustered Dr. Stadler, but they really got to opposing counsel. Throughout the trial, every time the DuPont team suspected I might begin to circle a witness like a hungry shark, its lawyers Glynn, Gaebe, or one of the other attorneys from its teams objected, whether there was a legitimate basis for an objection or not.

This was their way of interrupting the testimony and confusing the jury. To be fair, I may have and probably did do the same thing. The constant objecting from the attorneys on both sides eventually irritated the judge, which usually resulted in a flurry of sidebar conversations between her and counsel at her bench.

During sidebars, the jury is not supposed to hear any of the dialogue between the lawyers and the judge. Anything the jury hears can affect credibility and plant seeds of doubt. Initially, however, the DuPont team, led by Glynn, would jockey for position at Judge Donner's bench and speak loudly enough for the jury to hear. Glynn would then proceed to make self-serving statements, such as "Your Honor, that's a fraud," while facing in the direction of the jury. Since you can't directly address the jury at any time during the trial except during jury selection, opening statements, and closing arguments, DuPont thought these loud and improper sidebars might help their cause.

This immature and completely manipulative behavior really got me angry. It had to stop.

Initially trying to play the part of the good guy, I pleaded with Glynn, asking him to keep it down. "The jury can hear you," I'd say, but to no avail. When it didn't stop, I realized that if I wanted to be in the game, I had to meet my enemy eye to eye, and so decided I would race to the pole position and do the same thing to him. Glynn was 12 years older than me and had a bit of a problem with his hip at the time, so he wasn't nearly as fast getting to the bench as I was. He also had to cover a slightly greater distance from his table than I had to from mine, so I could beat him to the mark almost every time. After finally realizing that his nonsense had backfired on him, Glynn began pleading with me to stop doing it to them. The antics eventually ended.

Chapter 13

A Deadly Duel

It appeared that everything we were doing, even something as mundane as meeting at the bench, was a duel to the bitter end. Strategy and gamesmanship in the courtroom—even stupid stuff like this—can sometimes make or break a case.

It isn't unusual for legal teams to hire investigators to hang around within earshot of the jury and strike up a conversation centering around the trial, saying such things as "This case is bullshit," or "The family should really be ashamed of themselves for bringing a case like this."

While lawyers can't talk to the jurors, some will try to get other people to talk around them. It's awful, disgraceful, and, frankly, the worst part of going up against a conglomerate like DuPont. While not all lawyers are ruthless and without moral judgment, many will practice such guerrilla warfare when it comes to a case like this.

Once the judge cleared my line of questioning, I began slowly and meticulously walking Dr. Stadler through each of my ten mathematical calculations, some as simple as clarifying how many ounces there are in a pound.

"Doctor, these calculations will all relate to a simulated gavage exposure based on the Staples study. Would you agree that the 1982 Staples study came up with a low effect level of 62.5 milligrams per kilogram per day of exposure to benomyl?"

"That's right."

"Would you also agree the 1980 Staples study came up with up with a low effect level of 10 milligrams per kilogram per day of exposure to benomyl?"

"That's right, but it's disputed."

"And the milligrams are the amount of the chemical, and the kilogram measurement is the amount of the body weight, right?"

"That's right."

"Would you convert kilos to kilograms (1000 grams per kilo) and compare milligrams (1000 milligrams per gram) to kilograms? Doctor, if you need my chart or a calculator at any point, please let me know, because I am aware this is confusing, because a kilogram is one thousand grams, and a milligram is one-thousandth of a gram. So basically, in Staples 1982, we are talking about 62.5 millionths of a kilo? Does that sound correct? I still have a calculator if you need to calculate it."

When I asked whether Dr. Stadler wanted to use my calculator and then held it out for her to see if it would make things easier, the jury chuckled, which was unintentional on my part. After all, wasn't she one of the three top experts in the world?

Dr. Stadler didn't like my methodology, but she didn't disagree with my math.

***"Would you agree that an ounce is 28.35 grams?"* As she tried to anticipate where I was going with this, she began to appear uncomfortable and was unable to answer even the simplest questions.**

***"I'm not sure about that. I don't have anything right now to say that's true,"* she said.**

"Do you know anyone in the toxicology department at DuPont who knows how many grams are in an ounce?"

"There are probably people who know it. Offhand, I always look it up if I try to do a conversion."

"Does 28.35 grams sound familiar to you?"

***"I honestly do not know,"* she said.**

"Let's operate under the assumption that's correct. What I'm doing is converting this .625 to grams so we can start to make our conversion to ounces, because we want to get to a bottom line that is in ounces. In other words, what we're doing here is taking .000625 kilograms and making it into grams. To do that, we're knocking off three decimal places."

"I'm sorry. I'm not used to doing this," Dr. Stadler said.

***"Doctor, just take your time. Again, I have a calculator if you need it,"* I said. Clearly, Dr. Stadler was getting flustered. *"And to make kilograms into grams, you would simply make one thousand grams, correct?"* I said, knowing there was nothing simple about this.**

***"That's right,"* she agreed.**

At this point, the judge could also see that Dr. Stadler was uneasy and offered to have the bailiff bring her a calculator that converted ounces to grams and so on. While she wouldn't take the calculator from me, she gladly accepted it from the bailiff. Once she did, she was able to follow along with the rest of my calculations, including the assumption that at the time of her exposure, Donna Castillo weighed 170 pounds.

"I assume you know how many ounces are in a pound?"

"Sixteen."

"Correct. So that would make 170 pounds how many ounces?"

"I don't think she weighed that much."

"She doesn't today, but unfortunately, during her pregnancy, I think that's what she weighed."

"Objection to counsel's comment as to fortunate or unfortunate," **Glynn said.**

"Sustained."

"If Mrs. Castillo weighed 170 pounds, which equals 2,720 ounces, therefore, she would weigh 77.11 kilograms, right?"

"That sounds about right."

"You recall that there are 28.35 grams in an ounce, correct?"

"Yes."

"According to my calculations doctor, 2720 oz. x 28.35 g. = 77,112 g. Then you divide that by 1000 to get 77.11 kg. Now, you come up with the total ounces of active ingredient for her body weight, which equals 0.1619, approximately one-sixth of an ounce over the course of an entire day of exposure, if you converted the Staples 1982 study number of 62.5 to an adult the size of Mrs. Castillo, correct?"

"One-sixth of an ounce taken by gavage, that is correct."

"Then if you went to the 1980 Staples study and you accepted his methodology and the written statement in his summary that the low level effect level was ten milligrams per kilogram per day, you would simply divide the 62.5 by 10, and now the number becomes one-fortieth of an ounce by gavage exposure for Mrs. Castillo."

Although Dr. Stadler fought against answering each calculation, especially the last one, and Glynn objected to my mischaracterization of the study, the judge overruled the objection and Dr. Stadler was forced to answer, essentially agreeing with each of my calculations.

Once I got her to admit to each number on the list of 10, she was left extremely flustered and confused.

At that point, I went back through each step of the calculations that she had just verified as mathematically correct, following them one by one to the conclusion that it would take only one-fortieth of an ounce of Benlate to seep into the skin and then the bloodstream to impact the fetus of Donna Castillo—not five gallons, as had been suggested over and over.

I absolutely needed to make this point clear to the jury through one of the defendants' own witnesses.

Once Dr. Stadler had said yes to the math, she had no option but to say yes to the premise I was attempting to prove, even if she said it kicking and screaming.

I continued my questioning for several more hours, refusing to let up on Dr. Stadler. I asked her to comment on the possibility of a bystander being exposed to Benlate mist as opposed to a user of the product, such as a farm worker.

***"Your Honor, I object on the grounds it is improper use of testimony,"* Glynn jumped in.**

"Overruled."

Dr. Stadler replied, *"I would say that certainly that would not be what you would expect if the material is being used according to the label, but it would certainly be possible. If there was some kind of drift, then a bystander could possibly be exposed."*

"Doctor, are you aware of recent statements made by DuPont in which the corporation has stated or put out information that one would have to drink two pints of Benlate mix to get the conditions microphthalmia and anophthalmia in humans?"

"I object to the form of the question," Glynn said. "It mischaracterizes the evidence."

"Overruled."

Dr. Stadler answered, *"I am aware of a number of estimates of how much you might have to drink that would be similar to a gavage dose. I'm not specifically aware of two pints being one of the numbers. I think a number of different people have made estimates. I've heard many different statements by many different people."*

This was such a typical non-answer by the defense's own corporate representative.

After a long and grueling testimony, it boiled down to one last question: *"Doctor, after benomyl gets through the skin of a human, where does it go?"*

"Where does it go?" she repeated.

"Yes, through the skin of a human; where would it go?" I asked once more.

"It's going to slowly—very slowly—get into the bloodstream," she softly replied.

Bingo. I had her.

"No further questions," I said and turned to the jury, smiled, and walked back to my desk.

I was slowly dismantling DuPont's proverbial house, and after Dr. Stadler's testimony, I believed they knew it.

I think the whole "five-gallon" propaganda tactic by DuPont and its lawyers was a foolish approach. It hurt their case.

I think the better practice for defense attorneys is to be surgical in their approach.

They should be willing to focus on only one or two solid issues they completely believe are right.

Those who take a more surgical approach to the facts are far more persuasive than defense attorneys who say everything about the case is wrong. The real surgeons admit many facts yet pounce on the few flaws they're certain are fatal. To be challenged by such an opponent is rare. It definitely ups your game as a plaintiff attorney. There's no doubt that those lawyers are harder to beat.

This has been a look at some of the tactics used during the trial, mainly to defeat my case. In the over 20 years since the Castillo case, which I write about extensively in Blindsided, what still sits heavy on my mind is that corporations like DuPont, tobacco manufacturers, and pharmaceutical companies are still hiding behind the shield of junk science.

It's so unfair to the public that a corporation can test their products however they see fit; submit that science to governmental agencies such as the EPA to get a license to sell those products to us, the unsuspecting public; and then, when things go wrong, claim that the very same science is nothing but junk.

This is one of the frailties of our legal system, a cancer developed through many years of big money lobbying to keep this sham in place.

My goal going forward is to educate the public about this travesty of justice and to create enough public awareness to get a federal law passed that reads as follows: "Any scientific studies or information submitted by anyone to a governmental agency for purposes of licensing a product shall be admissible in a court of law."

Currently, I am on a mission to get a bill sponsored and passed through the House of Representatives and the Senate that calls for this very important change in our legal system.

What happened to Johnny Castillo could have happened to any of us.

Without change, history will continue to repeat itself.