

UNDISCLOSED, the State v. Pamela Lanier
Episode 4 - Arsenic and Old Lace
May 14, 2018

[00:20] Colin Miller: In 1939, Joseph Kesselring wrote the play *Arsenic and Old Lace*, which was inspired by the original black widow, Amy Archer-Gilligan, a Connecticut woman who took in boarders and poisoned them for their pensions. In the play and the subsequent Frank Capra movie, Mortimer Brewster discovers that his aunts have been murdering lonely old men by putting poison in their elderberry wine:

[00:41] Excerpt from *Arsenic and Old Lace*

Mortimer Brewster:

Now, look, darling, how did he die?

Abby Brewster:

Oh, Mortimer, don't be so inquisitive. The gentleman died because he drank some wine with poison in it.

Mortimer Brewster:

Well how did the poison get in the wine?

Martha Brewster:

Well, we put it in wine, because it's less noticeable. When it's in tea, it has a distinct odor.

Arsenic and Old Lace is a screwball comedy with a screwball ending as Brewster's aunts are able to evade justice just when it looks like the jig is up. According to the State, the jig was up for Pam Lanier when she was convicted in 2001, and any chance of release seemed snuffed when the appellate courts denied her relief in 2004. But we now have reason to believe that Pam will have her own screwball ending based on new evidence of innocence that could and should give her another shot at release. And, amazingly, this ending might have come about based upon the words that Kesselring wrote nearly 80 years ago.

[2:05] Rabia Chaudry: Hi, and welcome to Undisclosed: the State vs. Pam Lanier. This is the last in a series of four episodes about the case of Pam Lanier, who was convicted

of the 1997 murder of her husband Dorian in Chinquapin, North Carolina. My name is Rabia Chaudry, I'm an attorney and author, and I'm here with my colleagues, Susan Simpson and Colin Miller.

Susan Simpson: Hi, I'm Susan Simpson. I'm an attorney in Washington, D.C., and I blog at TheViewFromLL2.com

Colin Miller: Hi, this is Colin Miller. I'm an associate dean and professor at the University of South Carolina School of Law and I blog at EvidenceProf Blog.

Rabia Chaudry: Now, after Pam Lanier was convicted of murder in 2001, she brought an appeal in 2003. The heart of that appeal was the claim that the trial judge had improperly allowed the prosecution to introduce evidence related to the drowning of Johnny Ray Williams and the fire at the Ludie Brown house under what's known as the Doctrine of Chances. That appeal was being handled by attorney M. Gordon Whitehouse of the law firm Rudolf, Maher, Widenhouse & Fialko. At the same time that Widenhouse was working on Pam's appeal, his partner, Thomas Maher, was handling the appeal of Michael Peterson.

As we mentioned in Episode 1, Peterson had been convicted of murdering his wife, Kathleen, who was found dead at the bottom of a staircase, and, at trial, the court allowed for the admission of evidence under the Doctrine of Chances:

[3:24] Excerpt from *Forensic Files*:

Narrator:

Sixteen years earlier, when Michael and his first wife were living in Germany, their close friend, Liz Ratliff, a widow, was found dead...at the bottom of a flight of stairs.

Male #1:

It gave me chills. It was just incredible that this, that two of these could be so similar.

Male #2:

You looked at Kathleen Peterson and looked at Elizabeth Ratliff. They could pass for sisters.

Narrator:

Michael was the last person to see Liz Radliff alive. She was a wealthy woman, and she named Michael in her will.

Notably, this earlier death was initially determined to be the result of a stroke, but after this second death, Radliff's body was exhumed, and it was now determined that she died from blunt force trauma to the head, the same cause of death for Kathleen Peterson. This change in diagnosis informed Thomas Maher's argument on appeal:

Thomas Maher:

In Germany, I mean, the initial autopsy result was that she died from a stroke. It wasn't even, I mean it wasn't that anybody had anything to do with the death. Uh, and so, you...you kind of look at what happened in Durham, and you're suspicious that he must have done something there, which retroactively suggests he must have done something in Germany, when, in fact, there was no evidence he had anything to do with what happened in Germany.

As Maher worked on the Peterson appeal and Widenhouse worked on the Pam Lanier appeal, the two would express their frustration with the Doctrine of Chances to each other:

Thomas Maher:

Lanier, if I remember correctly, the first death was a drowning. Uh, the second death was a poisoning, or at least there was some evidence that the poisoning was caused by the ultimate decedent consuming things, as opposed to being fed them. Often what they do is they list a bunch of similarities -- a problem is some of those similarities have nothing to do with whether the defendant on trial did anything. I mean, you could list a fair number of similarities between what happened in the woman who died in Germany and the death in Durham, and they don't prove anything. Ya know, they're both women. What does that prove? They're both found at the bottom of the stairs. That doesn't actually prove anything. If somebody has a stroke and falls to the bottom of the stairs that doesn't prove anything about events many years later where somebody else is found at the bottom of the stairs. So there's this -- I guess I'm kinda thinking it as bootstrapping -- I'm like, well these...these look very similar, therefore there must be some logical connection, and therefore we should put it in. Uh, and, ya know, it has been said the problem with this evidence, in some respects, is not that it doesn't have probative force with the juries, it has too much. The jurors are going

to read way too much into, kind of, what really is coincidence more than probative value.

[5:59] Colin Miller: For the North Carolina courts, the coincidence of two women dead at the bottom of the staircase was too striking to ignore, and Peterson's murder conviction was upheld. The Pam Lanier case took a bit more legwork. The Court of Appeals of North Carolina noted that Pam's third and fourth husband had different deaths: one via drowning and one via arsenic poisoning. And, as the court acknowledged, that made it different from most other Doctrine of Chances cases, where there are two or more drownings, stabbings, or shootings.

This then takes us to the key sentence in the court's opinion:

"However, the doctrine of chances has been applied even when the prior misdeed is not factually similar in all respects."

As support for this, the court cited three cases that I had my research assistant AC Parham review. One of these was State v. Taylor, in which Ronald Taylor was charged with fatally shooting his wife, and his ex-wife was allowed to testify that Taylor "chased her through their house, placed a gun to her forehead, and talked about the different angles in which he would need to hold the gun in order to make the shooting look like an accident." A second case was State v. White, in which Sylvia White was charged with murdering her stepson, and the prosecution was able to present evidence that she had conspired to kill her husband. Here's a clip from *The New Detectives* episode on her case:

[7:13] Excerpt from *New Detectives*:

Narrator:

Taylor alleged that Sylvia had offered him twenty thousand dollars and a minivan if he would kill her husband. He said he would do it, but couldn't muster the courage. Sylvia grew impatient. Then she divulged a secret to him.

Male:

She basically told him, if he couldn't do it, she'd do it herself. Uh, that she had done it before, and that she had had a stepchild that she felt wasn't right, so she put a bag over *its* head until *it* stopped breathing.

One thing should be clear from these cases, and it's something my RA immediately identified: these are not Doctrine of Chances cases. These are cases in which the State had clear evidence of wrongdoing by defendants, and they were able to use it against them at trial; this is fundamentally different from the Doctrine of Chances, where the State *can't* prove wrongdoing and has to rely upon the similarity between the past event and the crime charged.

[8:08] Susan Simpson: That leaves us with the last case the Court of Appeals cited for the proposition that the Doctrine of Chances can apply to factually dissimilar incidents. In State v. Murillo, Eric Murillo was charged with murder after he fatally shot his wife Beth. Murillo had previously been convicted of involuntary manslaughter after fatally shooting his prior wife, Debbie. Again, it's debatable whether this is really a Doctrine of Chances case because Murillo was convicted of a crime in connection with his prior wife's death, albeit a death based on negligence or recklessness rather than malice. And it's also a case with two shooting deaths, which doesn't really make it comparable to the Lanier case.

Finally, the court in Murillo did recognize the problems with evidence connected to the death of Debbie. And so, it found that evidence was inadmissible, unless Murillo took the stand at trial and testified that the shooting of Beth was accidental. It was only because Murillo did take the stand that this evidence was ever allowed to come in at all. By way of contrast, Pam did not testify in her own defense.

[9:00] Colin Miller:

Did you ever talk with your attorney's about you testifying at trial?

Pam Lanier:

Yes...

Colin Miller:

And what was the conversation?

Pam Lanier:

And they told me no. They told me I could not testify because it would cost -- I had already spent a hundred thousand dollars, my parents had. And that they had been at trial longer than they thought. And Doug says, we can't, he said because we can't -- you, you've not paid us enough for me to put you on the stand.

Colin Miller:

So that's -- the conversation was... we can't put you on the stand because...you haven't paid us enough money?

Pam Lanier:

Of the money, yes.

Colin Miller:

And that's it? That's the only reason they gave?

Pam Lanier:

That's pretty much it, yeah. No, I could not do it.

Colin Miller:

Did you want to testify?

Pam Lanier:

Yes. And he told me I did not. And I said why? He said because they're gonna sit there a week after week and try to break you down. And he said, even though you're innocent, he said, they're gonna do everything they can to try to break you. He said those two are gonna be like bulldogs on you. And he says -- I said I can handle it. I said, trust me, I can handle it. I said they won't do anything to me. He said no, he said you will not go on the stand.

Given this, the Murillo case actually seems to help Pam's argument rather than hurt it, but the Court of Appeals didn't see it that way. It found that there were enough similarities between the deaths of Dorian and Johnny Ray to trigger the Doctrine of Chances and upheld her conviction.

Colin Miller: At this point, it seems important to underline a point that we made in Episode One: the Pam Lanier case is an island. We've looked at Doctrine of Chances cases from across the country, and there's simply nothing to support the court's conclusion in her case. You name the crime: Two or more shootings, stabbings, or stranglings, and, sure, the Doctrine of Chances might apply. But there is no other case in this country's history in which the Doctrine has applied in which there were different causes of death. Full stop.

But while Pam's case is in one sense an island, if we take Dorian Lanier's own words, it fits the paradigm for cases involving wrongfully convicted women. As we noted in Episode 1, while on his deathbed, Dorian told several witnesses the same thing:

[12:06] Pam Hatcher:

...then she came back in, and he said "If it wasn't for her, I would not be here tonight." Ya know, he said "I did this to myself, but I'm gonna get better."

In 2015, Karen Daniel from the Center on Wrongful Convictions did extensive research and concluded that 63% of female exoneration cases involved women convicted of crimes that didn't even occur, compared to only 21% of male exonerees. I later interviewed Daniel for a special episode of *Undisclosed*, and she noted the particular challenge of undoing this type of wrongful conviction:

[12:37] Karen Daniel:

In a lot of those cases, the evidence that is used to implicate the woman might be scientific evidence. It might be fire science, it might be shaken baby syndrome testimony -- something else along those lines. And it's, I think harder to undo those cases, many times, because to undo science-based cases, you might have to wait for a change in the science. You might have to engage a lot of very expensive scientists and other experts to testify on your client's behalf. And if what your theory is, is that no crime happened, that's a hard sell to a prosecutor or a court.

[13:32] Rabia Chaudry: This is the situation that the Wake Forest Innocence and Justice Clinic found themselves in when they took Pam's case. After working on the case for a few years, they caught their first break in 2017. In September of that year, Whitney Pakalka, an attorney with the Clinic, got an affidavit from a man named Titus Swinson. In pertinent part, it reads as follows:

I met Ivy Dorian Lanier when we were children. We went to school together, and I was friends with him until his death.

In the 1970's, I regularly spent time with Ivy Dorian Lanier. We would often go out to play music and drink.

During the 1970's, and up until his death, Ivy Dorian Lanier farmed poultry.

During that same time period, I regularly saw Ivy Dorian Lanier mix poultry medication with water and ingest it in an effort to alleviate his hangovers from drinking alcohol. He believed it would make him feel better and it would clear up his red eyes after drinking.

Several of our friends that commonly went out with us also ingested the poultry medication to alleviate hangovers. These friends are now all deceased.

Other than being macabre, this affidavit could be hugely helpful to Pam's case, because, recall again the advice given that defense expert, Page Hudson, gave to the defense about 3-Nitro, the turkey medication that Dorian used:

"In Dr. Hudson's opinion with the 3-Nitro mixed in proper dilution (according to the instructions on the packet) [that] he thought it would be very difficult to ingest enough fluid to result in the levels which were present in Ivy D. Lanier's body at autopsy. Dr. Hudson did express an opinion that if taken otherwise (such as with peanut butter or in iced tea) that there is enough inorganic arsenic contained in 3-Nitro to be significant (in other words to result in the levels which were found in Ivy D. Lanier)."

In other words, Dorian drinking 3-Nitro from the turkey medicator hose couldn't explain his arsenic poisoning, but drinking it in a glass with iced tea or some other drink could result in the arsenic levels found in Dorian at death. Here was Pam's reaction when Colin told her the news:

Pam Lanier:

Okay, who said that he was usin' it for hangover drug? I've not heard that one neither.

Colin Miller:

Titus...

Pam Lanier:

Oh...Mr. Swinson. You know, he passed away. Ya'll know that.

Colin Miller:

He said that he knew him since the 70's, and that, as a hangover medication he would take the 3-Nitro and mix it with water and drink it.

Pam Lanier:

I never seen that neither. I mean, I'm just bein' honest, but I never seen that neither.

What Pam noted is correct. Shortly after signing his affidavit, Titus Swinson passed away, and not from drinking 3-Nitro; his affidavit goes on to note that he didn't make use of the same unorthodox hangover medication as his friends.

Susan Simpson: It's unclear how much utility Swinson's affidavit will have on appeal. On the one hand, it seems to provide an explanation of how Dorian really could have done this to himself. On the other hand, the State will claim that they weren't able to cross-examine him, so it shouldn't be admissible. And we haven't located any witness, any living witnesses, including Pam herself, who can corroborate this hangover medication story or point us in the direction of Dorian's friends who might have died the same way.

That said, on a trip to Chinguapin this March, the team at Wake Forest was also able to locate another witness whom jurors hadn't heard from at Pam's trial:

Female:

So, before we start, can you give us your name and tell us where you are?

Jackie Graham:

Jackie Graham. I'm on 209 Keenan Graham Lane, Chinguapin, North Carolina.

Female:

And you live here, right?

Jackie Graham:

Yeah, I live here.

Male:

And it's St. Patrick's Day, 2018, you got your St. Patrick's Day hat on -- are you part Irish?

Jackie Graham:

No, I just -- I got plenty. I gotta bunch of these.

Jackie Graham was an African-American man who lived near the Laniers and was an acquaintance of Dorian's. He's exactly the kind of objective defense witness who could have helped Pam out at her trial:

Jackie Graham:

I said "Man, what the word you got over your leg?" And he said, uh, "I hurt my leg." I've hurt your leg? And he said, yeah. I said, "Man, that thing got pus running out of it. You need to go to the doctor!" He said, "I'm my own doctor." I said, "You can't do that." And he was pouring cow medicine disinfectant in it. And I said, "Pam, he need to go to the doctor!" And she said, "Jackie, I been beggin' him to go." Said, "maybe you can do somethin' with him." I said, "Man, you got to go!" He said, "I ain't goin', I'm my own doctor." Week or so later, I said, well I guess I'll go see Dorian. Went by there again, he was worse. I said, "Man, you've got infected. You are in, you got that in your blood, you need to go somewhere." She said, "he won't go!" Said, "I've tried and I've tried and he won't go." I said, "I'll take ya right now." "No, I got my medicine, I'm takin' my medicine." Same cow medicine.

[18:15] Susan Simpson: According to Graham, Dorian was not just pouring cow medicine on his wounds, he was also injecting himself with animal medicine using an industrial size syringe used to inject medication into cattle. When the Wake Forest team visited, Jackie was able to locate a similar syringe on his farm:

Female:

How big of a needle, Jackie? That just strikes my interest BIG TIME.

Jackie Graham:

A BIG needle!!

Female:

Because, like, Carol's insulin is a tiny little thing!

Jackie Graham:

Nooooo!

Female:

And, his is pre-measured. He just--

Jackie Graham:

No, this was a ... WOOOOAH!!

Female:

HUGE!! OH HOOOO! YES! OH MAN!! [Everyone cheering- they found a similar syringe]

Female 2:

And, what did he do with that?

Male:

Come down here, in the light- and let's get a picture of this--- that's like something from a scary movie. What do you do with that??

Jackie Graham:

You shoot your livestock in the hip, or wherever, -- with medicine!

Female 2:

Their medicine!! Antibiotics!

Female:

And, he was using that??

Female 2:

That's what he says, he thought. Yeah.

Male:

He used this?!?

Female:

Not his. His own.

Jackie Graham:

Not mine. His own.

Female:

He had his own.

[EXCITED VOICES; EVERYONE EXCLAIMING]

Jackie Graham:

I SEEN him use THIS!!!

Female:

You seen him use it for what? For himself??

Jackie Graham:

YEAH!!

Female:

You saw him inject himself in his--

Male:

That's what I'm... You saw him use one like that, on himself??

Jackie Graham:

I mean, it ain't nothin' but a needle!

Female 2:

Jackie, you saw that? Oh my god.

Male:

What did he have in it??

Jackie Graham:

I don't know!!

Male:

But, you saw him use that on himself.

Jackie Graham:

Cause- that was the day he told me he had his own medicine- he reached up there and got it.

Male:

The day uh-- when you were talking about he had the puss in his leg?

Jackie Graham:

Mhm.

Male:

You saw him...?

Jackie Graham:

Yeah. One just like this.

[20:30] Susan Simpson: Finally, Graham was able to corroborate what others had said about Dorian drinking the turkey water:

Female:

I wanna hear a little bit more about-- him drinking out of that hose. So, you'd go over there for work, or you'd go over there just to stop by??

Jackie Graham:

I would just go visit. I'd just go visit sometimes.

Female:

You got a drum around here, anywhere, Jackie?

Jackie Graham:

A drum?

Female:

Like, a drum like that. Is what he would mix it in.

Jackie Graham:

You had a big drum. And you'd mix it. And you had a faucet at the bottom, that you'd turn on, and the pump would pump it down to the turkeys. And he had a hose, where he'd have to keep it full. Just like that hose I've got there, and he would keep it in it, all the time. And we'd be talking, he'd walk out there, pull the hose out of the poison, is what it was, turn it on, let it run a little bit, and then, drink it. And I know that anything's siphoned back up hoses.

Female:

And, you saw him to do this more than once?

Jackie Graham:

Yeah.

[23:24] Susan Simpson: The defense was aware of Jackie Graham and his potential value at trial, but they didn't call him as a witness. Colin asked Pam's current attorney Mark Rabil about this decision:

Colin Miller:

Did the attorneys back then talk to Mr. Graham? Or do you know what happened with that?

Mark Rabil:

We are not sure why they did not put him on the stand. We're really not. Because, he actually, see, this-- venue was changed from the county where Chinquapin is to this other county, so he had to drive like, 30-40 minutes to this-- to court. But he went, you know, and he was ready to testify. Oh, yeah, here's the reason-- apparently, the reason they gave him was this: There's another Jackie Graham, one county over, who had a long criminal record. This guy has no criminal record. But rather than try to explain it, they just figured, well, the jury is gonna think he's a black guy, and they're gonna think he's a black guy with a criminal record and not believe him, but that's insane.

[24:21] Colin Miller: But while this decision not to call Jackie Graham might have been questionable, it probably wasn't ineffective assistance of counsel given what the experts were telling Pam's trial attorneys. This takes us back to the last episode and the expert advice that defense counsel had been given about whether 3-Nitro and other animal medications could have caused Dorian's arsenic poisoning. Here's part of an interview of trial counsel by a Wake Forest student about the decision not to call expert witness Alphonse Poklis:

Trial Counsel:

Whatever reason, I don't think we used Polkis, and if we didn't then I know why.

If

we didn't that means his testimony was harmful to us.

Wake Forest Student:

Yeah. So, I guess, would you mind, with your conversation with Poklis, was he really your main source for the arsenic poisoning and the fact that Dorian could not have gotten that amount of poisoning from the turkey medicine?

Trial Counsel:

Yeah. He was. At the time that we found him, we did a lot of research on who we thought would be kind of a guru in this area, an Poklis was who we settled on. He is a... I guess he's still living, I don't know, Poklis is, at that time, he was the most knowledgeable man about this type of thing. He had done a lot of research, written a lot of articles on it, and so that's why we hired him.

[26:43] Colin Miller: When I first started looking into the Pam Lanier case, I thought about what Karen Daniel told me about waiting for the science to change. I also thought about the parallels between the Pam Lanier case and the Hannah Overton case. After Hannah Overton's four year-old foster son Andrew died, she was charged with capital murder, with the State claiming that she poisoned him by force feeding him salt. Overton was convicted and served seven years before new expert testimony got her released in 2014:

Female Attorney:

This is Hannah's family, her husband and her children. And her mom and step-dad. And, David and I are lawyers in the case, of course. I wanted to invite you, because yesterday, when everyone was out of down, the Court of Criminal Appeals issued three opinions in Hannah's case. Two of them calling for a reversal of her life sentence without parole. I've provided you with a little rundown of some significant quotes from those opinions that will help you in writing whatever you want to after this press conference, but I wanted to address a couple things, and that is, we are very grateful for the thoughtful opinion of the Court of Criminal Appeals, the seven judges in the majority opinion, who decided Hannah did not receive a fair trial. That, in fact, if the testimony of the world's leading expert on salt poisoning had been presented to her jury, that it's likely that her trial would have had a different result, which we think is incredibly significant. And then, the opinion that joined that, by 3 of those judges that added that not only is that true, but the charges, the facts charged in the indictment that Hannah was convicted under, probably don't even state, they suggested strongly, that it probably doesn't even state the offense of capital murder.

Colin Miller: So, while Alphonse Poklis might have been the leading expert on arsenic poisoning, what about the leading experts on 3-Nitro? What if they could be brought together as a sort of Justice League to offer expert opinions about whether drinking the turkey water could have caused Dorian's death? When I called them up, they had a similar thought:

Ellen Silbergeld:

Well, I wonder if there's any need, or any thought that sort of bringing together a group of persons like Keeve and me, who would be expert witness in certain topics, and very interested in helping, if that's something the project would think about. I think we'd be most interested in working on that.

Colin Miller:

Oh, we'd really appreciate it, yeah, if down the road, an affidavit or testimony could be provided, that would be fantastic.

[28:25] Rabia Chaudry: That's Ellen Silbergeld, a professor of Environmental Health and Engineering at Johns Hopkins. Back in the mid-2000s she and her research assistant, Keeve Nachman, now himself a professor at Johns Hopkins, started looking into the public health risks associated with the use of certain animal feeds and medications. At this point, they didn't even know that there was arsenic in turkey medications:

Ellen Silbergeld:

We had published some papers on a variety of things that are used in animal feeds, and how these might not be so good, and there was some response to our research from the National Poultry Council, where they said that poultry is completely safe, there's no problem. And they went on to say, "It's not as if we feed them arsenic." Which struck me as such a strange thing to say, that I said to one of my students, "Would you find out about this?" And he came back and said, "They do feed them arsenic." [Laughs]. I love this industry. They're their own worst enemies.

Rabia Chaudry: And, in terms of being their own worst enemy, the National Chicken Council then doubled down on its claim:

Ellen Silbergeld:

Then, they responded by saying that somehow, Arsenic had a bad reputation. And it really wasn't that bad.

Colin Miller:

And, what happens next after that?

Ellen Silbergeld:

Well, then, I wrote an editorial. In which, I reminded people of things in “Arsenic and Old Lace.” Through the consistent use of Arsenic as a poison, that Arsenic is, in fact, very bad. And, that was then when, let’s see- the FDA, and very wisely, went the way of exerting pressure on the companies not to use this in poultry production. And, the final removal was in 2015. But, they began by removing it starting in 2011, no, before that, 2009. So, slowly but surely, some of the companies just decided, for example Fizer, that they didn’t want to be associated with Arsenic. I think that’s a very plausible explanation for somebody having high concentrations of Arsenic.

[30:39] Rabia Chaudry: But what about what we discussed last episode? As we noted, there is both **organic** arsenic, meaning arsenic that has bonded with carbon, and **inorganic** arsenic, or arsenic in its pure metallic form. Dr. Polkis and the other defense experts told Pam’s lawyers that 3-Nitro, the brand name for the compound Roxarsone, primarily contained **organic** arsenic, meaning that it couldn’t be the cause of Dorian’s arsenic poisoning because organic arsenic is less toxic than inorganic arsenic. Silbergeld and Nachman confirmed that this was the general understanding at the time of Pam’s trial:

Ellen Silbergeld:

I mean, and Colin, it’s worth mentioning that I think wrongly so, the perception that organic forms of Arsenic are non-toxic was fairly pervasive, likely at the time fo the case, and certainly in the years following. And I think only recently that people have started to pay more attention to organic species as being of concern. Even if the science was there to support that notion all throughout.

Colin Miller:

In other words, in looking at this, you can understand why experts at the time would have looked at this and thought, oh, it’s all organic and therefore it wouldn’t have been the cause of lethal arsenic poisoning.

Ellen Silbergeld:

I think that’s fair. The researched focused, at least the epidemiologic literature was focusing on exposures that occurred through drinking water. And, with drinking water, you’re dealing almost entirely in organic arsenic. So there was a very strong basis for inorganic arsenic, and I think in the absence of equivalent

information about organic arsenic, that's where this misperception of its non-toxic nature arose.

[32:10] Rabia Chaudry: But that's no longer the understanding for a few reasons. The **first** is that it is now well understood that organic arsenic is more readily absorbable than inorganic arsenic, making it more toxic:

Ellen Silbergeld:

Arsenic is an element. So, like all elements, lead, cadmium, copper, etc., it exists in an inorganic form when it's the pure form of arsenic or lead, or whatever. But, very frequently, all these metals will bind with something like carbonate, so you end up with lead carbonate. And that's known as organic because it's got carbon in it. And usually, that happens, or that's promoted because it makes a metal more readily absorbable. Which, might not be so good, with, say, lead and arsenic, but depending on what you want to do. Turning metals, elemental metals, into an organic form generally makes them more readily absorbed, which, as you can imagine, makes them more toxic. Another good example, we have lead, but probably the best or worst example of this is mercury. Elemental mercury is not very well absorbed by mammals or birds, however, if it is methylated, and you've probably heard of methylmercury, then it becomes highly toxic. It's not an issue that the mercury or the arsenic or the lead is changing, it's just much more evil if, say, you drink it, or eat it, to cross the gut into the blood, and now you have the metal in your body.

Rabia Chaudry: Of course, in hindsight, all of this makes sense. 3-Nitro was given to turkeys so that its arsenic could promote weight gain and ward off a disease of the intestines. And, if you want a medication to be effective, you want it to be rapidly absorbed:

Ellen Silbergeld:

You wouldn't be giving chickens a form of arsenic that was poorly absorbed. This was selected for the ability, not because it was some special, fancy arsenic, it was because it's a form of arsenic, think of it as a coding. Think of something like, maybe an analogy is like, think of a pill. And, if you have a pill that is just a compounded pill, and you swallow it, the absorption is not generally that good, which is why a lot of medications are encased in capsules. Or in coatings. And these are done to facilitate rapid absorption. So, in a way, roxarsone is arsenic with a special coating. Which makes it stay suspended and it promotes its absorption across the guts of animals. It's why we use it.

[35:11] Susan Simpson: There's also a second reason why the organic/inorganic arsenic dichotomy has been dismantled, and it relates to 3-Nitro research done by John Stolz, a professor of Environmental Microbiology at Duquesne:

John Stolz:

The compound itself can be toxic, that under the conditions that we were using a certain percentage of the compound was breaking down and releasing the inorganic form of arsenic into the media.

Susan Simpson: Aaron Barchowsky, a Professor of Environmental and Occupational Health at Pitt, was also involved in this research and went into more detail about their findings:

Aaron Barchowsky:

Bacteria can break the roxarsone down, and liberate the arsenic, so, my colleagues over at Duquesne found that the bacteria and the gut are also liberating it.

Colin Miller:

So, what does that mean, then?

Aaron Barchowsky:

It means that the bacteria are taking the inorganic out of the organic, and making it accessible.

Susan Simpson: Simply put, when a turkey or human ingests 3-Nitro, its organic arsenic can transform into inorganic arsenic. In response to this research, the FDA did its own testing. According to the FDA's website:

Colin Miller:

FDA conducted the study in response to scientific reports that organic arsenic, a less toxic form of arsenic present in 3-Nitro (roxarsone), could transform into inorganic arsenic. FDA scientists followed up on those reports by developing a new analytical method capable of detecting very low levels of inorganic arsenic in edible tissue. Using that method, FDA scientists found that the levels of inorganic arsenic in the livers of chickens treated with 3-Nitro (roxarsone) were increased relative to levels in the livers of the untreated control chickens.

Susan Simpson: It's also important at this point to reiterate what we said last episode: While 3-Nitro mostly contains organic arsenic, it also contains inorganic arsenic. Colin sent Barchowsky the testing results on the mixture of 3-Nitro and water that Dorian had mixed prior to his death, and he noted the following:

Aaron Barchowsky:

There was some lab analysis of the 3-Nitro that showed that here was actually a fairly significant amount of the inorganic arsenic in the 3-Nitro preparation, those levels were pretty high, and that would have caused chronic toxicity.

[37:06] Susan Simpson: But, based upon subsequent research that Barchowsky did with Partha Basu, a Professor of Chemistry and Chemical Biology at IUPUI, we have even less reason now to care about this distinction between organic and inorganic arsenic. They were able to do follow-up testing on the effect of 3-Nitro on human cell lines. So, what did they find? Here's Dr. Basu:

[37:27] Dr. Partha Basu:

So, this organic arsenic roxarsone, we think is more potent than inorganic arsenic in terms of angiogenesis. And that's what we found in our study.

Colin Miller:

And when you say it's more potent than inorganic arsenic in terms of angiogenesis, what effect does that mean when you have a human who ingests the roxarsone?

Dr. Partha Basu:

So angiogenesis means the ability to grow blood vessels. It's a natural process. In our body we grow blood vessels all the time, but there are tumors that can play a major role. Because that's how the tumors can get their nutrients. OK? So what we found from our study, roxarsone has a higher ability to develop tube formation. So we call that an angiogenic potential.

Of course, this then leads to the million dollar question:

[38:40] Colin Miller:

Ad so then practically speaking, if as in this case I'm working we have a turkey farmer, and they might have ingested some of this roxarsone, what effects might we expect to see in the body of the person who ingested the Roxarsone?

Dr. Partha Basu:

Right, so it depends on the dose.

[38:07] Rabia Chaudry: So, how much arsenic was Dorian ingesting? Colin sent Dr. Basu the information on the arsenic content of 3-Nitro and he compared it to the amount of arsenic they were injecting into the human cell lines in their study:

[38:19] Dr. Partha Basu:

In a very ballpark calculation, don't quote me on the exact measure, ok please? [xxx] math. So he was taking, um, if he takes one glass of x concentrated material, it's still a thousandfold of what we saw the doses which kill human cells. Does that make sense?

Colin Miller:

You're saying that's, if I heard correctly, a thousand times that [Basu: A thousand times, yes]...the amount of the study where you found that lesser amount would kill human cells.

Dr. Partha Basu:

Correct.

And this in turn takes us to the billion dollar question: Could Dorian have died from drinking the combination of 3-Nitro and water from the turkey hose? Colin sent each of these experts Dorian's medical records and the product information for 3-Nitro and asked whether what Dorian was doing could have caused his death. First, here's Dr. Stolz:

[40:18] Dr. John Stolz:

My first take was, you know, I'm not surprised. This was one of the things that, one of the flags that we tried to raise back in 2007, was the fact that when we see how it's marketed, and you've even reiterated this, it's 3-Nitro. Many of the farmers that were using this stuff didn't know it had arsenic in it. And when you realize that the allowable level of arsenic in drinking water is 10 parts per billion, or 10 micrograms per liter, when you're putting milligrams of stuff, of a water soluble compound, that, you know, that's significant.

Second, here's Dr. Basu:

[41:06] Dr. Partha Basu:

It certainly could result that way, with respect to that questions.

Colin Miller:

So in other words, in looking at the product information for roxarsone and how much arsenic it contains, and then how much arsenic was in Dorian's system at his time of death, you would say that would be a plausible explanation that his drinking of the combination could have caused the chronic and acute arsenic poisoning?

Dr. Partha Basu:

Quite possible. [Colin: Uh-huh] Because what is not clear from this information is how much volume of...was he drinking in a given day, of the thing, right? But it's quite possible, quite possible that this may have caused that.

As Dr. Basu notes, a lingering question is how much 3-Nitro Dorian was ingesting, so Colin sent Dr. Barchowsky testimony about how Dorian would dilute the 3-Nitro into water to see if he could give him a more concrete conclusion:

[42:03] Colin Miller:

I gave you the testimony, which at least informally was describing how much 3-Nitro he would mix with how much water to then deliver that to the turkeys, and the son was testifying that he would see him not use the bypass valve and drinking the yellow water from the hose, do you have any conclusions you can draw from that, if he was on a fairly regular basis drinking the water from the hose without using the bypass valve?

Dr. Aaron Barchowsky:

I would imagine that he was getting a substantial amount of both inorganic and roxarsone.

Colin Miller:

Um-hmm. And based upon the lethal dosage of arsenic that could take someone's life, would that be consistent with him possibly ingesting a lethal dose?

Dr. Aaron Barchowsky:

Um, I would think so, yes. The chronic poisoning at that level, um, it could be quite substantial.

Colin gave this same information to Drs. Silbergeld and Nachman, and here was their conclusion:

[43:05] Dr. Keeve Nachman:

I mean the key question for us - is it plausible that roxarsone caused what we see. I mean no one's arguing arsenic was responsible, I think it's just that - is it possible that this form of arsenic through the consumption of this product is what did it. Right?

Colin Miller:

Right

Dr. Ellen Silbergeld:

And I would say, absent other information, this would seem to be the major cause. [background: Yeah, Right] When you see the liver failure and that the immediate cause of death was cardio-respiratory arrest, I mean that's pretty telling.

And they also had a secondary conclusion:

[43:40] Dr. Ellen Silbergeld:

Yeah, I mean I think the [indecipherable] is the main thing, why anyone would look beyond these accounts of his self administration of arsenic, to somehow think that some other person had deliberately poisoned him.

Dr. Keeve Nachman:

Yeah, I agree.

Now, in reaching these conclusions, they were relying upon the testimony about how much Dorian was diluting the 3-Nitro, which was less than the FDA recommended level of dilution, meaning a higher dose of 3-Nitro. After this initial conversation, they followed up by doing a "bounding exercise," which is a best case/worst case scenario in terms of the amount of arsenic that might have been in the water Dorian was drinking. Here's what they found, starting with the worst case, or highest dose, scenario:

[44:32] Dr. Keeve Nachman:

So, his immediate dose, which we would derive by multiplying the concentration of roxarsone in the water times the intake of water that I assumed, divided by the

body weight, would be 3.32 milligrams of arsenic per kilogram of his body weight per day. And that number we could use to compare to some of the adverse outcome data that Ellen was talking about before. So that the worst case scenario.

Colin Miller:

Right.

Dr. Keeve Nachman:

So the other scenario I did is sort of the lower side bounding, would be just assume that he properly diluted the roxarsone to the level that would make it into the turkeys, right? So the concentration there would be 2.29 milligrams per liter. So they take one package and dilute it for 250 gallons, I assume the same size of the drink, they use the same body weight, and we calculate a dose of drinking this once of 0.01 milligrams per kilogram of body weight per day.

Dr. Ellen Silbergeld:

And it's also important to note that the concentration, the first line in this fourth group of calculations, is still way above a permissible level of arsenic in drinking water, hugely above, because it's 2.29 parts per *million* and we would like to see it in the parts per *billion* range.

Dr. Keeve Nachman:

Yes, in the 10's of parts per billion or lower.

Dr. Ellen Silbergeld:

Right. There's no question that this would be, and if you look in the various papers that summarize the health effects, it's not surprising that he would have liver effects at these concentrations. Probably not surprising that he would have neurologic effects too, which might have, you know, made him continue this very dangerous practice. Um, and maybe nobody, I don't know if anybody ever assessed his blood pressure or anything like that, but these were certainly killer doses.

Dr. Keeve Nachman:

Yes they were.

So, it's a lot of math to get a simple result. Even if Dorian were properly diluting the 3-Nitro, every time he drank from the hose, he could have been getting a killer dose. So,

let's say that, ever at this lower dosage, Dorian were merely taking a drink from the turkey hose every couple of weeks after his bulldozer accident:

[46:56] Colin Miller:

So we could say, for instance, for the intended level, if he is maybe even just drinking it once every other week for two months, that could certainly explain his death from the arsenic.

Dr. Ellen Silbergeld:

My opinion is that because these concentrations are so *high*, um, intermittent exposure is going to be very dangerous.

Dr. Keeve Nachman:

I would agree with that.

Dr. Ellen Silbergeld:

I mean these are, you know, orders of magnitude higher than what we consider to be a safe level in drinking water.

Dr. Keeve Nachman:

Yes, many worse.

Dr. Ellen Silbergeld:

We really can't impress upon you how high these levels are. They're incredible.

Dr. Keeve Nachman:

Right. I mean we just don't have anything in the literature that's similar to this type of exposure pattern at these levels, so there's nothing to point to, but I mean I hope you get the impression from Ellen and my reaction to this that these are extremely high levels of arsenic. This is unlike even the worst case exposure scenarios that people experience in drinking water. This is really above and beyond. So, you know, based on that, I think it's very plausible to the two of us that what we see here is explainable by his pattern of behavior with drinking this stuff.

Dr. Ellen Silbergeld:

Right, and of course we also have this point that arsenic is not cleared from the body very quickly. So it's not like say a solvent where you can have a very high dose exposure to a solvent, and then if you didn't have an exposure for two

weeks, your body may clear it. But that's not the case with arsenic. We know that it stays. With the toxicokinetics, I think I sent a paper about that which you can ignore, but just basically the bottom line is: this is a compound that stays in the body for some time. It's stored in certain organs, and blood levels stay up pretty high, even after your last intake dose of arsenic.

Now, of course, Dorian was found to have died from both chronic and acute arsenic poisoning, which might lead to the same question that I had:

[48:53] Colin Miller:

As you say, this is sort of sustained high dosage of arsenic, and then with this being acute at the end, I mean is it consistent with - there's a higher dosage right around the time he dies, or sort of it's consistent over time and it just reaches a tipping point where it's enough arsenic to cause death.

Dr. Ellen Silbergeld:

I say it's...I'd say we can't make that judgement, but the fact is that probably he had had an ingestion not long before he passed away, and so at that point his body had not cleared much of the arsenic that was in his body. I would feel most comfortable saying that.

Notably, this seems to gel perfectly with what we know in this case. As we noted last episode, John Lockerman delivered the 3-Nitro to the Laniers and he testified that (1) he visited their farm on the morning of Dorian's death; and (2) a mixture of 3-Nitro and water would be used up in a day. As we also noted, after Dorian died, one of Pam's attorneys found a barrel with 3-Nitro water that Dorian had mixed before dying, which makes it extremely likely that Dorian mixed and could have drank this water on the day that he died.

Finally, we noted that this water was sent in for testing, and the level of arsenic found in it was between Dr. Nachman's best and worst case scenarios. Specifically, while the recommended FDA level of dilution would have meant an arsenic level of 2.29 milligrams of arsenic per liter, the tested level showed 180 milligrams of arsenic per liter. Given that Drs. Nachman and Silbergeld found that even the lower level could have explained Dorian's death from intermittent drinks from the hose, this higher level certainly can't hurt that conclusion.

[50:51] Susan Simpson: A few final points. First, what's the likelihood that Dorian's cause of death was Pam poisoning him as opposed to his self-ingestion:

[51:01] Dr. Keeve Nachman:

The question I guess from my perspective would be , you know, was the wife capable of titrating the appropriate dose to kill him over time. Do you know what I mean?

Colin Miller:

Right.

Dr. Keeve Nachman:

If he's doing this on his own under the circumstances that were described in the testimony from the son and the friend it seems more plausible that this was the outcome and the autopsy interpretation was the way it was. Whereas if she was deliberately trying to poison him, would she be able to prolong it over a sustained period of time so that it looks like a sub-chronic high level dosing.

Obviously, this is not a definitive answer, but it seems consistent with a common sense understanding of the evidence.

Next, do we have any real world examples of humans becoming ill or dying based in inhalation or ingestion of 3-Nitro? Well, in 2003, a family brought a lawsuit against various defendants, claiming that their son developed a rare form of leukemia based on inhaling 3-Nitro that was being used by poultry farmers in the area. In that case though, a judgment was ultimately entered in favor of the defendants.

Later, however, chicken farmers who used 3-Nitro contacted the Utah Department of Health to say that their children had elevated levels of arsenic detected in their urine. The children were eating between 8 and 10 eggs from the chickens each week, and they wanted to know whether the arsenic from the 3-Nitro could make its way into the eggs and eventually their children's urine. In its 2010 Letter Health Consultation, the Utah Department of Health concluded that

“The results of this sampling show that arsenic in eggs can transfer to humans through ingestion, resulting in an elevation of urine arsenic levels in individuals. Elevated arsenic levels can occur in the body if eggs are consumed at a higher rate than the arsenic can be eliminated from the system. This may harm people's health, especially in children, as they are more susceptible to arsenic poisoning.”

This seems significant, given that the arsenic levels in these eggs would be much lower than the arsenic levels in the water/3-Nitro mixture:

[53:02] Dr. Keeve Nachman:

The levels in contaminated eggs would be wildly different than what he was exposed to. I just, I don't think you're going to find a comparable situation anywhere. When I first heard about this, I mean, this is just the furthest thing from what I ever would have expected.

Dr. Ellen Silbergeld:

Exactly. I mean, yeah, you know I have seen, there are case reports of people who attempted poisoning of other people with arsenic, but mostly people have done this when they're deliberately trying to poison, they use much lower doses and wait over time.

[53:32] Rabia Chaudry: In the end, though, Dr. Nachman was able to find an analogous case...possibly. The United States Food and Drug Administration, or FDA, has what's known as the Center for Veterinary Medicine, or CVM. The CVM has a procedure by which those who use veterinary medicine can report what are known as Adverse Drugs Experiences, or ADEs. The CVM website has cumulative ADE reports from 1987, and most of these consist of adverse effects for animals, like a chicken dying or getting an infection.

If you scroll down to the section covering Roxarsone, the compound marketed as 3-Nitro, you get an interesting result:

[54:10] Dr. Keeve Nachman:

I mean, I can just read it to you. Drug: Roxarsone. Species: Human. Route of Administration: Various, which is kind of interesting so it says, death...it's just this table where they, it's not the best record keeping, but they list death, it involved ingestion of roxarsone, inhalation of roxarsone, and then they also list immune disorder in the emplasm. I know it sounds not very helpful, but that's really all that's listed here. Um, I would imagine that at the FDA there is a record with more detail. I don't know how to access it short of asking them for it, and in my experience and Ellen's too, getting data from the FDA is not an expedient process.

Colin Miller:

OK

Dr. Keeve Nachman:

It is evidence though of an FDA record that a human being died from roxarsone exposure.

Colin Miller:

And you mentioned the word ingestion...

Dr. Keeve Nachman:

I did it's here, ingestion.

Dr. Ellen Silbergeld:

Yeah, but this is not an unknown occurrence, let's put it that way.

A natural response to this might be to say that there's only one reported death connected to 3-Nitro, but there are at least two rejoinders:

[55:18] crosstalk, then Dr. Keeve Nachman:

I'm really curious about what led to this even being documented, because the majority of this database doesn't even concern humans, This is for veterinarians, for veterinary deaths. Veterinarians are the ones reporting. So to see a human death in this is atypical. So I don't know what the mechanism was that led to this even getting this reported in the first place.

Dr. Ellen Silbergeld:

Someone sent it in, and that's why you don't want to, you certainly don't want to be backed into a corner where somebody says "Yes, but there's only one." So you have to understand that this database is a passive database. The FDA is not soliciting these reports. The drug manufacturers are not soliciting these reports. It depends upon somebody deciding to send this report in.

[55:56] Rabia Chaudry: Now, we've attempted to follow up with the CVM to get additional records connected to these two Adverse Drug Experience Reports, but so far we've been unsuccessful. At the same time, those records do largely speak for themselves.

So, the question now becomes, with all of these experts, with these ADEs, with the Utah study, and with 3-Nitro being pulled from the market in 2015, is it enough to get Pam Lanier's murder conviction thrown out?

Colin Miller: The North Carolina mechanism for seeking a new trial in a case like Pam's is known as a Motion for Appropriate Relief, or MAR. To bring such a motion, the defense must establish that they have new evidence "which was unknown or unavailable to the defendant at the time of trial, which could not with due diligence have been discovered or made available at that time." This standard seems satisfied in Pam's case because trial counsel consulted with the leading arsenic expert at the time of trial and the research showing that 3-Nitro was dangerous to humans wouldn't be done until years after Pam's trial.

And then, in order to win on a MAR, the defense must establish seven things:

Susan Simpson:

(1) that the witness or witnesses will give newly discovered evidence, (2) that such newly discovered evidence is probably true, (3) that it is competent, material and relevant, (4) that due diligence was used and proper means were employed to procure the testimony at the trial, (5) that the newly discovered evidence is not merely cumulative, (6) that it does not tend only to contradict a former witness or to impeach or discredit him, and (7) that it is of such a nature as to show that on another trial a different result will probably be reached and that the right will prevail.

Colin Miller: We've been able to locate one case that's analogous to the Lanier case, and this is going to bring us back full circle. And that's because the case is the Michael Peterson case.

Essentially, the seven MAR factors ask us to compare the weight of the evidence against the defendant at trial with the strength of the new evidence. And, if the evidence at trial was weak enough and the new evidence is strong enough, presto, you get a new trial.

Susan Simpson: So, let's start by comparing the case against Michael Peterson and Pam Lanier at their trials. First, as we noted in in Episode One of the series, Michael Peterson was charged with murdering his wife Kathleen, who was found dead at the bottom of their home's staircase, with the cause of death being blunt force trauma to the head. Under the Doctrine of Chances, the prosecution admitted evidence involving an earlier event, in which Peterson was the last person to see Elizabeth Ratliff alive, who was later found dead at the bottom of a staircase in Germany. This event happened

years earlier, but it was admitted, and recall again the argument of Peterson's attorney on his initial appeal:

[58:38] Thomas Maher:

In Germany, I mean, the initial autopsy result was that she died from a stroke. It wasn't even... I mean it wasn't that anybody had anything to do with the death.

So, yeah, it was initially determined that Ratliff had died from a stroke, and it wasn't until Kathleen Peterson died and Ratliff's body was exhumed that her cause of death was changed to blunt force trauma to the head. That weakens the application of the Doctrine of Chances, but still, Michael Peterson was the last person to see two women found dead at the bottom of the staircases, with the cause of death for both being blunt force trauma to the head.

By way of contrast, when Johnny Ray's body was exhumed after Dorian died, the autopsy confirmed that his drowning was accidental and not the result of arsenic poisoning. And the State didn't even try to dispute the conclusion that the fire at the Ludie Brown house was accidental. Given these facts, it seems like the Doctrine of Chances evidence was weaker in Lanier than it was in Peterson.

Second, the alleged motive in both cases was the same: financial gain. Here's a clip from the *Forensic Files* episode on the Peterson case:

[59:42] Forensic Files Narrator:

Surprisingly, Michael hadn't generated any income in more than 2 years.

Female:

Kathleen was supporting the entire household with her income from Nortel, that would include all the children, their educational expenses, as well as the expenses of running a household at that time.

Narrator:

With three girls in college, their credit card debt soared to \$143,000. And Michael's two grown sons were asking for financial support as well. Kathleen's Nortel stock at one time was worth 2.5 million dollars. But because of a drop in the stock price, it was now worth less than \$50,000. And perhaps most revealing of all, Michael was the beneficiary of Kathleen's 2 million dollar life insurance policy.

This again seems stronger than the financial motive in the Pam Lanier case, where the Laniers weren't struggling financially at the time of Dorian's death and Pam was bringing home a paycheck. But recall again how Pam was making money: she was turkey farming, but she didn't know anything about medicating turkeys and needed Dorian's help to do it. And so, while Pam inherited some property after Dorian's death, she couldn't carry on with the turkey farming after he died and she had to find an alternate source of income.

Third, in both cases the prosecution introduced salacious evidence that had a tenuous connection to the issues at trial. In the Peterson case, that evidence was connected to Michael Peterson's bisexuality. Again, here's a clip from *Forensic Files*:

Narrator:

And investigators also found something unexpected. Thousands of gay pornographic images. In Michael's desk were email exchanges between Michael and a male prostitute, making plans to meet for sex:

"Evenings aren't great for me, I'm married. Very happily married with a dynamite wife. Yes, I know, I'm very bi and that's all there is to it."

The emails also revealed Michael had a prior sexual relationship with another man, a local college lacrosse player. Was it possible that Kathleen discovered these materials while using the computer on the night of her murder?

The comparable evidence in the Pam Lanier case was the evidence that she had become addicted to pain medication after a series of illnesses and that she was seeing multiple doctors to fuel her addiction. In the end, I guess you call the evidence in the two cases a wash...because it's not really clear that either proves much of anything without making some really big assumptions.

[1:02:24] Rabia Chaudry: Fourth, we have evidence that kind of contradicted the defense narratives in both cases. Michael Peterson's claim was that Kathleen went inside to do some work at about 1:00 A.M. in the night she died while he remained outside in a t-shirt and shorts for 45 minutes. The prosecution countered this testimony by forensic meteorologist Bill Haggard, who testified that the temperature at the time would have been between 51 and 55 degrees, below the so-called "comfort zone." Here's another clip from *Forensic Files*:

[1:02:52] Bill Haggard

There is a thing called the “comfort zone,” which was established by the Department of Energy. I would not ordinarily want to sit beside a pool in the middle of the night in shorts and a t-shirt, even under the warmer conditions.

A clip from that same episode also shows another way the State attacked the defense’s timeline:

[1:03:14] Narrator:

While searching the Peterson’s home computer, forensic experts discovered an inconsistency in Michael’s story. Kathleen sent an email to her coworker around midnight, placing her inside at the computer an hour or so earlier than Michael originally claimed.

The comparable evidence in the Pam Lanier case was the testimony by Alli Bradshaw and Jackie Hatcher. The defense narrative was that Pam was a loving wife who had to drag a reluctant Dorian to doctor’s visits while both Bradshaw and Hatcher said that she should have done more. It seems fair to say that this type of evidence disrupting the defense narratives in both cases was comparable.

Fifth, we have the murder weapon, or the lack of one. As this clip from *An American Murder Mystery* makes clear, the initial theory was that Michael Peterson could have killed Kathleen with a fireplace blow poke that was a gift from her sister:

***American Murder Mystery* Narrator:**

She gave a unique fireplace tool, known as a blow poke, to her sister as a gift.

Female:

It was a long brass tube, you blow through it to make a fire, flames and embers go up, and then it has a hooked end so you can grab a log and pull it. I thought wow, that poke on the end just looks like something that could have been used to hit her and rip her apart and cast off the blood so high up on the walls.

But, while this blow poke was missing at the start of trial, the defense discovered it in the Peterson garage during the trial, and testing determined that it had not been moved since well before Kathleen’s death.

In the Pam Lanier case, it was also unclear what caused Dorian's arsenic poisoning. At the time, the experts were saying that drinking 3-Nitro water couldn't have caused death, and there wasn't any other obvious source of arsenic found on the Lanier farm.

Now, finally, we have the point at which the Peterson and Lanier cases diverge. In the Peterson case, there were two types of forensic testimony introduced. First, Medical Examiner Deborah Radisch testified that Kathleen died from blunt force trauma to the head from a beating and not from an accidental fall down the stairs:

[1:05:26] Deborah Radisch:

In my opinion the cause of death in this case is due to blunt force trauma to the head.

Attorney:

Were you able to determine, in your opinion, what the manner of her death was?

Deborah Radisch:

In my opinion the manner of death in this case is homicide.

Second, SBI agent Duane Deaver testified that blood spatter on Michael Peterson's clothing was consistent with Peterson being in close proximity to his wife at the time of her blunt force trauma:

[1:05:51] Duane Deaver

Where the stains on these pants were consistent with the impact spatter the result of a forceful impact, and that the individual wearing these pants at the time of that impact was in close proximity to the source of blood when it was impacted.

In turn, the defense rebutted these claims with testimony by Henry Lee, the world's leading blood expert:

[1:06:11] Attorney:

In your opinion, is the blood stain evidence from the Peterson house, and the clothing taken as a whole, consistent with a beating death?

Henry Lee:

Uh, no. Inconsistent with. The blood spatter goes all different directions. Too much of blood spatter, total amount of blood spatter would estimate close to over 10,000 individual blood spatter. Ordinary beating case you don't have that.

It was new evidence regarding the State's expert, Duane Deaver, that led to Michael Peterson's Motion for Appropriate Relief being granted.

[1:06:52] News reporter:

A jury found Peterson guilty of murder in 2003, however the conviction was overturned in 2011 after it was determined that a key witness lied on the stand about evidence.

Specifically, it was new evidence that Deaver had exaggerated his qualifications. For instance, Deaver claimed that he had participated in over 500 bloodstain analysis cases, when he'd only taken part in 54. He claimed to have written over 200 bloodstain analysis reports when he had only written 36. And, there had been 60 cases in which Deaver had failed to qualify as a blood spatter expert.

Colin Miller: According to the court, this was enough to throw out Peterson's murder conviction. As the Court of Appeals of North Carolina would later note:

Susan Simpson:

Due to the importance of Agent Deaver's testimony, the evidence concerning his qualifications would have completely undermined the credibility of the State's entire theory of the case. While the State offered other expert testimony concerning Ms. Peterson's death, the testimony of Agent Deaver was central to the State's case.

Now this seems like the right conclusion, but (1) the defense did have maybe the world's best blood spatter expert to contradict him at trial; and (2) as the court itself acknowledged, the new evidence didn't undermine the medical examiner's testimony that Kathleen Peterson's death was a homicide and the result of blunt force trauma rather than an accidental fall down the stairs.

This takes us back to the Pam Lanier case. We noted the five ways it is similar to the Michael Peterson case, but the big difference is that there was no forensic evidence linking Pam to the crime. The biggest issue for her defense was simply that there was

seemingly no explanation for how Dorian could have died other than Pam poisoning him.

Well, now, we have that explanation. Each and every one of the five leading experts on 3-Nitro have said that Dorian drinking the turkey water is a plausible explanation for his death. Indeed, even under the “bounding exercise” that was the worst case scenario for Pam, the experts concluded that Dorian drinking the turkey water a few times after his bulldozer accident would fully explain his arsenic levels.

This would seem to mean that the argument on appeal for Pam Lanier is even stronger than it was for Michael Peterson. Undermining Deaver’s testimony cut to the heart of the State’s case, but it didn’t touch the medical examiner’s testimony that this was a homicide. In the Pam Lanier case, we now have the likely cause of Dorian’s death and no forensic evidence indicating that Pam murdered her husband.

When I visited Pam in prison, we told her about what the experts had to say, and she noted another way in which things are coming full circle:

[1:09:15] Mark Rabil:

Let me just say that all the stuff they found scientifically is gonna be very important to the case.

Pam Lanier:

So is it lookin’ better and better on my case?

Mark Rabil:

Yes.

Pam Lanier:

It is?

Mark Rabil:

Yeah.

Pam Lanier:

Y’all gonna stay with me? (laughs).

Mark Rabil:

Oh yeah. Well, I mean, with a lot of this toxicology and medical information we'll get affidavits from these scientists and that'll support the motion, we're going to try to get it filed by July, so that we can move forward. But we'll be talkin' to you about that...

Pam Lanier:

You know it's really ironic, it started, the court started in Wayne County and now I'm going back to Wayne County. Is that weird or what?

As we ended our visit, I asked Pam how she felt about the current status of her case:

[1:10:00] Colin Miller:

Are you hopeful? Are you thinking...

Pam Lanier:

I'm positive. I'm not hopeful, I'm positive. I got faith that they're gonna do miracles for me. I really... I do. I feel like it's gonna happen. Everything in my life has a 9 in it, or it has since I been in prison, for some reason, it's got 9's 9's 9's. And I'm very... I'm not a 9 featured person or not, but it has been in my mind a lot, all these are 9s. It's 2018... if you add the 1 and the 8 together you got 9 (laughs quietly). I keep thinkin', they're gonna tell me somethin' positive, or you're gonna tell me somethin' positive that's gonna make this year even a better year for me.

Whether it's 2018 or 2019, we expect to have some new developments in the Pam Lanier case soon, once we've gathered a little more evidence and gotten affidavits from the experts. Pam's case was premised on the Doctrine of Chances, and for years you might say that if Pam didn't have bad luck, she would have had no luck at all. But all the bad luck never dimmed her spirit, and now, through a bit of good luck and a set of altruistic experts willing to donate their time, her chances of release look better than ever.

Rabia Chaudry: A big thank you to everybody who makes Undisclosed possible and has made this series possible. Thank you to our sponsors, who help us put on our episodes week after week. Thank you to Mital Telhan, our executive producer, for helping keep this ship afloat. Thank you to Rebecca LaVoie, our fantastic audio producer, and also the co-host and producer of a couple of my favorite podcasts, including Crime Writers On, do not miss her podcasts. Thank you to Baluki for our logo,

to Christie for maintaining our website. A big thank you to AC Parham for helping with research on the Pam Lanier series, and also Rebecca LaVoie will be hosting our addendum. Make sure to tag Rebecca in your questions, anything related to this case, use the hashtag #UDAddendum and Rebecca LaVoie's Twitter handle is @reblavoie. Also a big thank you to our listeners, thanks for coming back week after week. Check us out and make sure to follow us online on Twitter, Instagram, and Facebook. Our handle is @UndisclosedPod. And please do not forget to subscribe to us on iTunes and rate us!

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