

Just Nature's Patterns Podcast Transcript

Intro [00:00:05] Now this is recording. RTI International Center for Forensic Science presents Just Science.

Intro [00:00:22] Welcome to Just Science, a podcast for forensic science professionals and anyone who is interested in learning more about how real crime laboratories work. In this season, we will cover content given at the NIJ Forensic Technology Center of Excellence's Impression Pattern and Trace Evidence Symposium. The symposium was held January 22nd through 25th in Arlington, Virginia. The symposium had over 200 on site attendees and over 300 online attendees. To kick off the season, Just Science interviews Jon Vanderkolk from the Indiana State Laboratory. John discusses his belief of the importance of challenging your teachers and how nature's patterns are apparent throughout friction ridge evidence. This season is funded by the National Institute of Justice's Forensic Technology Center of Excellence. Here's your host, Dr. John Morgan.

Dr. John Morgan [00:01:17] Welcome to Just Science, the podcast for Forensic Science Professionals. I'm John Morgan, your host from RTI International. Welcome on board. We're recording today from the Impression Pattern Trace Evidence Symposium in Arlington, Virginia, from the beautiful Renaissance Capital View Hotel. We're here with a good friend of mine, a new relatively new friend. John, I think you and I have known each other a couple of years now. John Vanderkolk, John Vanderkolk received a Bachelor of Arts degree in Forensic Science and Psychology from Indiana University in 1979, the same year he became an Indiana State police trooper and then, became a, went over to to the good side and the forensic laboratory as a crime scene tech in 1983 and was assigned as a criminalist in the following year. He became a laboratory manager in 1996 and retired as a police officer in 2005 and is now serving as a civilian and manager of the Indiana State Police Laboratory in Fort Wayne. Welcome, John.

John Vanderkolk [00:02:12] Good to be here. One thing real quick first is my major was forensic studies, not quite forensic science. I emphasize that in court because forensic studies was criminal justice basically before criminal justice came along. So it was early in the stages of criminal justice degrees with some forensic science courses.

Dr. John Morgan [00:02:33] What kinds of coursework outside of forensic science did you have to take?

John Vanderkolk [00:02:36] It was mostly the police side of criminal justice, the classic crime statistics and crime, behavioral crime, criminals, investigation aspects, prisons, probation, courts, classic criminal justice degree of today. In early in my first semester, I said I think I'd like to be a state trooper. And I started looking for universities and said, hey, I'm already here, forensic studies. So I started the very next semester as a forensic studies major and I wanted to be a trooper. I wanted to be outside. I liked the challenge of being outside and working and working with people. And the aspects of being a police officer is what I wanted to do.

Dr. John Morgan [00:03:19] We're going to be talking a lot about the philosophy of forensic science, as well as the philosophy of science today. I'm going to start right now because I'm a scientist by trade. And when I think about fingerprints versus tire prints versus, say, cartridge cases, I think about it in terms of there's a very different physics going on or biology in the case of fingerprints. And so although they are all patterns, their sources are different and therefore how they manifest is going to be very, very different. Is

that manifest in terms of how the practitioner works fundamentally and how the practitioner talks about the matches or how does that come out in the work with respect to how practice actually occurs?

John Vanderkolk [00:04:04] The way I would emphasize today is to study the source object first. Where did the image or impression come from? Was it from a natural item such as your friction skin? I don't like same friction ridges. I like same friction skin because there's more to the skin than just ridges. So is it friction skin from nature? Is that the gun from the design manufacturing process? A shoe from the manufacturing process? What features in the manufacturing processes can be repeated and what are the random or unique features in the item that is produced? So nature produces patterns. The manufacturing process by humans and machines produces patterns. So study how the patterns in the source object are produced first, before you study the impressions left behind.

Dr. John Morgan [00:04:55] There is one fundamental difference, isn't there? Because you can't really you can attempt, but they always grow back. You can't really change the patterns in a finger. I'll say friction ridge. But those ridges in that case do come back basically, no matter what you do to try to within reason, try to modify them. And so the fingerprint examiner works by, in some respects, exclusion, right? If there's something not right, there's something not matching, then you have an exclusion. Whereas the firearms examiner will look at inclusion. Right? If there's something that doesn't quite fit, it's because there is that variability in that system and you can't always pick up that variability each time that gun is fired. So there is something fundamentally different about those two in that regard, isn't there?

John Vanderkolk [00:05:48] There are two different ways to look at it. One, when your finger touches an object, what is the object that is touching it? Like, is it a concrete block of concrete or the texture that receives it may not receive the fingerprint image sufficiently or as a bullet passes through the bore of the gun, it's a bullet a little bit undersized. The features within the bore of the gun may not record sufficiently onto that bullet. Sometimes it might, sometimes it might not. So it all depends on the object leaving the impression and the object receiving the impression as part of the quality and quantity of detail in the resulting impression. Plus, between skin and guns, in skin, you're only going to have natural patterns, in guns, you'll have repeatable patterns and uncontrolled natural patterns as part of the manufacturing process. Can't eliminate all of the repeatable patterns. So there will be some random patterns also in the bore of the gun.

Dr. John Morgan [00:06:51] Examiners talk a lot about experience. Right. And you have been in the field for over 30 years now. You have a lot of experience. You've seen a lot, But there's no way you can hold in your head every glass shard you've ever examined, right?

John Vanderkolk [00:07:06] Most definitely.

Dr. John Morgan [00:07:06] And so how do you know, you know, intuitively, how can you rely intuitively? Well, one thing I should confess also to the listeners is that John and I have been working on a sourcebook in human factors. He and I are on a working group of about a dozen folks. Some of them are cognitive psychologists, some of them are practitioners who are putting together what we hope is a very nice sourcebook to try to understand more deeply how human factors relate to not only the examination process, but even the organization of laboratory, the training of laboratory practitioners and so on.

So I worry that because the human mind is so good at filling in patterns that when you look at these kinds of variability, natural versus unnatural, that you're making judgments that probably may not be there. I mean, how do you how do you deal with that?

John Vanderkolk [00:07:57] Experience also has a trust factor and trust factor and participating in my communities that I do. I participated in the firearms community, the fingerprint community, the shoe print community and the fracture community. The trust factor is what are these other scientists, forensic scientists, telling me about patterns in their specific discipline. Trust and belief work together. I can't know everything there is to know about forensic comparative science, but I also trust my peers who are working in the forensic science discipline, and I glean from them their experience, understanding and judgments into my experience, understanding and judgments of the past and what I am looking at today in this particular exam. So I don't memorize patterns of what I've seen before. It's more of a trust in the philosophy of comparative science than memorizing patterns from years gone by.

Dr. John Morgan [00:08:54] So is it fair then, if I were a defense attorney and you were, you know, had some evidence against my client for me to ask you reputational questions?

John Vanderkolk [00:09:04] Go for it.

Dr. John Morgan [00:09:05] Yeah. And you think that in these qualitative disciplines, at least they're qualitative now, I know we're working on some other things right now, but they're certainly qualitative now, that the, that reputation to some extent matches with reliability.

John Vanderkolk [00:09:19] The reputation of the people that you're talking about.

Dr. John Morgan [00:09:22] Well, yeah, because that really is what the core of it. If you're saying, okay, in order to be able to determine whether I am able to make a particular kind of comparison in an accurate way or reliable way, you need to understand within the context of your community, your forensic science community of practitioners within that discipline, you know, kind of what constitutes an appropriate judgment, right? But in any community of human beings, there's going to be your gadflies. I think I'm, I think I've always been a little bit of a servant fan. Those who are leaning against windmills can have their view and their point. But in this case, we also are looking at am I relying on people of good repute, right? I mean, you're really looking at it. I mean, you're talking about a qualitative human discipline. You're almost talking about it from a community perspective.

John Vanderkolk [00:10:13] I'm talking about what they teach me, what I teach others, how we challenge each other, and also the experience understanding judgments that I make, what they make and trust in them. But within that is also the proficiency test that we take, the competency test we take and the training that we give. As I make my known ground truth source images, I know where they came from and present them to trainees, presenting them to other people, present them in the workshops I conduct. The comparative science discipline works. Humans can make mistakes, but let's talk about the mistakes that we make. But the overall philosophy, I believe, of comparative science works. We are not infallible. We can make mistakes. I believe we should challenge all teachers that we have. I believe you should challenge me. And that's what you're doing on this question maybe.

Dr. John Morgan [00:11:06] In a friendly way.

John Vanderkolk [00:11:07] In a friendly way. But we should challenge our teachers and we don't take it as a blind trust. But what you teach me, I'm going to take back and try to experience, understand and judge what you taught me. I'm not going to take it and say you're Dr. John Morgan said that so I'm going with it. I'm going to challenge every student I have in the state police lab. I say, go out, get multiple teachers out there, go to their seminars, go to their workshops and challenge them and come back and challenge me. Challenge what you're learning from many in the community. Because we're all different. We teach differently. As you can probably tell, I'm going to teach differently than the next workshop instructor. If we all thought and taught and acted the like and knew everything the same, we wouldn't be here this week.

Dr. John Morgan [00:11:53] Yeah. So forums like the Impression Pattern Trace Evidence Symposium here are very, very important because there are times not only for workshops but also for you all to discuss and sort of challenge each other a little bit, isn't it?

John Vanderkolk [00:12:04] I believe challenge each other is also part of forensic science, not just the blind trust of they said it, so go forth with it.

Dr. John Morgan [00:12:12] I worry because there are it seems it isn't as common as it might have been at one time. Or maybe it wasn't. I don't know if it ever was for folks to spend 30 to 40 years in the discipline. And so if you're going to have an apprentice based discipline, I mean, that's what you're really describing, right, is that it's an apprentice based discipline. You need to have some of the folks. You need to have people around who are taking the time and have the time and are making that part of their career choice to be able to do that kind of. It's beyond instruction, but to kind of sponsor the broad community's apprenticeship of the new practitioners.

John Vanderkolk [00:12:53] Yeah, I would like the apprentice, the students and the teachers to go beyond just the local laboratory. You have to get out. You have to go beyond one instructor or one students. And therefore, just because you said it, I'm going to trust you and only you, you have to broaden your horizons. The one part of apprenticeship is yes, you have to learn from experience, understanding and judgments that you make, but also what the teacher makes. The teacher has to review the work product you're doing and challenging you on the work product. Like one philosophy back in my early days of comparative science was all the student in training thou shalt not make any mistakes, otherwise you're going to get booted out of the program. Well, that's wrong. You should make mistakes in your training. You don't make any mistakes in your training. The training is too easy. What is the actual threshold that you're going to work with once you start doing case work on your own? Well, if you never made any mistakes in training, you don't know what that threshold is going to be. You're way too conservative, probably on both sides of the threshold, the exclusion and the identification threshold. You don't want to make mistakes when it counts during casework. And that's part of the quality assurance program in the laboratory to review the work product and monitor the work product. So on the making mistakes in training, learning experience, understanding and judging the images you're looking at, you'll probably remember those mistakes that you made in training more than you remember correct identifications, the correct conclusions or the correct exclusions that you made in training. So with that, you have to build through training what that threshold for judgment making is or should be within self and the community.

Dr. John Morgan [00:14:45] And so what John is referring to here is at the core of a lot of our discussions in the human factors sourcebook. And also in a lot of discussions being

held now about leadership in the crime laboratory and the culture of the crime laboratory and a culture that accepts error as part of the course of doing businesses. You know, again, I come from the scientific field, and if you're not making mistakes and if you're not failing in scientific research, then you're not doing it right. I mean, you're supposed to be getting to the point where, you know, some of the experiments are going to work out the way you anticipated. And the ones that don't work out, the way you anticipate it, that are really the interesting ones. Right. And you also learn a way of using language that is descriptive of what you find. Right. You know, one of the things I have is a problem with a lot of scientists sometimes these days, some scientist is that they will have a finding like in medicine. All right. I have a finding that if you eat more pomegranates. Right, you'll be healthier, right? Well, really never is that finding. The finding is usually I did this public health study with a particular population and the population that was eating the pomegranates wound up being healthier than the population that didn't eat the pomegranates. And I may not even have a theory of why pomegranates are actually better, right? So there might be a thousand other factors. And so you learn as a truly as a scientist to characterize what you say very carefully. You report what your findings are, and try not to let your own interpretation of the findings go too far beyond what the science actually can tell you. So I know you're an advocate very much for being careful with language. Which disciplines do you think do a really good job in terms of the language that they use to describe comparison findings?

John Vanderkolk [00:16:33] I'm going to start with probably the fracture exam. I really like their ranges of conclusions, but also fractures exam takes into more things than just the broken or torn edges. You might be looking at things in the two pieces, like a tool mark exam where they produced on the same machinery, things that carry cross from one piece to the other beyond the fractured edges. So there might be more to the fracture exam than just the fractured edges. So you might incorporate a tool mark result into the fracture result. I like the fingerprint conclusions. Basically, identification exclusion inconclusive. I don't know. I think firearm and tool mark should be extremely similar to the shoe print tire print conclusions, even though they're not. They both have repeatable features in the manufacturing process. The bore of the gun, number of lines and grooves, the width of the lines and grooves, design specifications of the bore of the gun as one aspect of it. Shoes, let's say they come out of the same mold. So they have repeatable features. Guns have repeatable features. So when you do comparative measurements of guns and shoes, the images from guns and shoes, first you measure the details of the repeatable features. Then you measure the details of the random imperfections within the repeatable features.

Dr. John Morgan [00:17:54] So I'll challenge you one way, and that is that the footwear folks tend to stop at class characteristic and type classification, right?

John Vanderkolk [00:18:04] No, they can go to identification.

Dr. John Morgan [00:18:05] I know they can, but they don't often because the persistence of the shoe print features obviously changes because they're where they're basically where Mark's right. Yes. Whereas the firearms examiners are able to do identifications much more readily than the shoe print folks. So there is a difference there.

John Vanderkolk [00:18:24] Not in the philosophy, but in the practicality. There's a difference in the persistency of the features on the source object. So in the philosophy is the same, but the practical aspect, the persistency of the features in the gun are probably more durable than the persistency of the features on the bottom of a shoe. So therefore the philosophy is the same, but the practice may be a little less often with the shoes

because the persistency wears away. One example I like using it for shoe prints is if I have bubblegum stuck to the bottom of the shoe and I have grains of sand wedged into the bubble gum, that gum starts to get hard and pretty well set amongst the tread of the shoe. I have this crime scene impression with that bubble gum impression recorded very well. And the shoe is acquired quickly let's say, and I make my test impressions in that bubblegum and sand pattern sufficiently persistent enough between the time of the crime scene and the time of my test impressions, I'm going to identify that bubble gum print as being the same source of bubble gum, not necessarily even a shoe print, even though it came in as a shoe print request. So persistency is the big, big component of everything we do, like in fingerprints, friction, skin impressions. I might have a blister or paper cut on my skin in that blister or paper cut as recorded in the crime scene impression. I'm going to use it if we find you quickly and make a new ink impression with you. And that paper cuts right in the same spot or that blisters right in the same spot. I'm going to use those blisters and paper cuts in my examination process.

Dr. John Morgan [00:20:07] Sure. Sure.

John Vanderkolk [00:20:08] So persistency is a very big component for the impressions.

Dr. John Morgan [00:20:12] Yeah. So one of the other things that I've been thinking about lately is the medium on which the impression is made too. So I'm thinking about that because I've been looking at bite mark impression evidence, because human skin is an imperfect medium to capture whatever uniqueness there is in dentition. That's one of the things. Again, I'm going to go back. I'm going to say, well, mud is also a harder medium to try to pull out of than a bullet or casing. Right. Which are just nice and beautiful way to capture impressions. And I think that where forensic scientists and the qualitative disciplines have gotten in trouble, it's actually on that side of it. It's I think there's a good understanding of persistence, but there's been a lack of appreciation of the quality of the medium of impression. What do you think?

John Vanderkolk [00:21:02] The medium of impression is very critical. Like you mentioned, mud, Can mud be sufficient? Well, it can be sufficient in a shoe print, but probably not very often, unless of it's a nice three dimensional hard clay type mud. But if it is a sloppy, wet, muddy impression, I'm going to struggle with it most likely. You talked about skin impressions. How many shoe print examiners tried to do a shoe print or tire print exam on a like a photograph of a body, whether it's living or deceased? Shoe print examiners might try that exam, but what do they understand about the medium receiving that impression? How is the bruising taking place when the tread contacts the body and breaks the blood vessels? You know, is it a positive image? Is it a negative image? Which way is the blood bruising the body? When I see tread patterns, so I have to consider positive images, negative reverse images, things like that. Bite marks in the body could be similar to bruising of a tiger print or shoe print on a body, but different in that does the bite marks break the skin or just bruise the skin? Does the shoe tread break the skin or just bruise the skin? So, yes, the receiving medium is very critical on the quality and quantity of detail recorded in the impression.

Dr. John Morgan [00:22:22] One of the other things that you mentioned and I kind of want to revisit it, is this idea of the experience of the community, as it were. And we're going to go into the workshop on a different podcast. But the workshop you're doing now is mostly about fracture, right?

John Vanderkolk [00:22:37] This week's workshop is fracture.

Dr. John Morgan [00:22:39] Yeah. And one of the problems with fracture is that it's not as common. And so building up this sort of what is the knowledge that we have of the fracture dynamics in a particular kind of etiology. Maybe glass is more well known just because there's so much failure analysis work that's done out there. So I guess one question I have is, is it fair for the forensic scientist to be looking at and do you do much interaction with people who look at these systems outside of the forensic science domain? The glass one actually is interesting to me because I actually did a little bit of failure analysis work back when I was in the materials laboratory at Hopkins, and we would look at different kinds of components from spacecraft or missiles and all that kind of stuff. And so some of the stuff that I've seen in fracture reminds me of that. But is it possible to try to broaden your community in that regard or how do you struggle with that issue?

John Vanderkolk [00:23:32] Yes, I would say, you know, back in my day of doing active casework, I might do 5 to 10 fracture cases a year for northeast Indiana. So like you say, the numbers aren't there. Yeah, not that many times is the evidence collected at crime scenes. For the broadening the community, at one of these type symposiums, I crossed paths with a fracture researcher, Iowa State University Dr. Ashraf Bastawros. He was trying to come into the community and he's an expert in metal and metal fractures and aeronautical engineering and I was in the back of the same room with him. They were talking NIJ grants. It was an NIJ meeting room all day at one of the seminars. And he says, what do you do? And so I told him basically what I just told you a little bit of everything of comparing patterns, including fracture exam. Then he kind of got to glean in his eyes, and says, Hey, you want to talk metal fractures with me? I said, Sure, why not? Where are you from? He said, Iowa State University so I can drive to Iowa. Yeah, I'll come see you. So he's actively pursuing measuring topography of the fractured cross-sectional edges of metal. We're using broken knives, and I do the forensic comparative side of the exam without putting the pieces in direct contact of each other because he doesn't like that. And he uses his technology to measure the cross-sectional edges of the broken knife blades. So he's trying to bring his knowledge of fractured metal to help us in forensic comparative science. So in that aspect, yeah, I'm trying to go beyond the discipline.

Dr. John Morgan [00:25:06] Dr. Bastawros is actually going to be doing a podcast for us. We're going to hope to line Dr. Bastawros up right after this podcast, so you'll be able to hear more directly about him and his work. And he is giving a talk here at the Impression Pattern Trace Evidence Symposium. And that talk will also be archived as well. So you'll be able to both see his talk and John's talk on the generalizing across disciplines archival in addition to listening to the podcast. One of the things about that though, which is interesting and I like to highlight it and that is the whole idea of forensic scientists, you know, interfacing with the research community. You've been a real paradigm for that, not only with Dr. Bastawros, but also with Tom Busey at Indiana University your old alma mater. And for my money, I think Tom has done more relevant empirical work in human factors of forensic examination than anyone else out there. And he's really relied on you for a number of years. How long have you known Tom?

John Vanderkolk [00:26:01] I recruited Tom, you see, in 2002 to help us explain and understand what we're doing, how we make our judgments.

Dr. John Morgan [00:26:10] I love how you put it. Recruit. That's exactly what I would hope that the forensic scientists listening would look on door. It's like I need this kind of scientist. I'm going to go and find that person and recruit them because we need to get some of these research scientists excited about forensic science.

John Vanderkolk [00:26:25] I'm happy. You know, like Dr. Bastawros has recruited me in the backroom of a meeting. I recruited Dr. Busey by writing a letter to the chair of the psychology department at IU Bloomington. And I did get a degree in psychology, but it is more the behavior side of psychology is because I wanted to be a state trooper.

Dr. John Morgan [00:26:43] Right?

John Vanderkolk [00:26:43] Knowing what I know now, I should have studied more of the cognitive side of the psychology. But Tom's on the vision cognitive side of psychology. So I wrote a significant letter after Judge Pollak made his famous fingerprint, Daubert decision of we don't need no stinking experts and fingerprints. Just show the fingerprints to the jury and let them decide. Well, I was in SWGFAST at the time and I started shaking when I heard that ruling and I said, gosh, there's more to making judgments than just looking at shapes. What's the difference in experts and novices? I said, Well, cognitive science, I use psychology. I know where the building is. Let's see if I can recruit somebody to help us explain how do we see, think and know and make our judgments? Is there a difference between experts and novices when we make our judgments? And Tom's been doing wonderful research since 2002 with us.

Dr. John Morgan [00:27:41] And I think that's really interesting because many forensic scientists may look on stuff and human factors, which is really been way too heavy into confirmation bias, which I understand is an important issue. But there's so much more fundamental work here. And I love how you put it, which is this idea that what is the difference between a trained and experienced forensic scientist and a layperson who would be on a jury, for example? And that is kind of the classic dichotomy, isn't it? Otherwise, yeah, you would just show the fingerprint to the jury. Why not? But there is a difference there. And understanding that difference is where why we're interested in some respects and human factors per se, and trying to understand the forensic scientist. So let's wrap up by talking about a particular case that illustrates these concepts. You know, what is the uniqueness of natural versus unnatural phenomena and how that can be exploited by the forensic scientist? Before we started recording, you talked about a particular case, which is elbow impressions. And of course, nobody does elbow impressions, even though we think elbows are fairly unique. So tell us about the case and how you all analyzed that case.

John Vanderkolk [00:28:45] Let's talk about why did they send us the case? They send us the case because the CSI who worked the crime scene said, let's send this case to Fort Wayne, they'll do it because (*laughter*).

Dr. John Morgan [00:28:59] Like Mikey and Life cereal.

John Vanderkolk [00:29:02] I remember Mikey. Mikey, he likes it. Yeah. So, Mikey, you try it. It goes back to the cow and sheep muzzle prints back in 1985. That's about the day I started doing casework. The local newspaper, small town where I lived, put it in the local newspaper. Hey, John at the state police lab, who lives in our hometown of Bluffton, is now the fingerprint expert at the state police lab. So a few weeks after that, I get a phone call from Roger. Roger is the Director of the 4-H Fair in Wells County, Indiana. John, we're starting to do cow and sheep muzzle prints. You're at the fair, kind of like your inked fingerprints. Why don't you come see what we're doing and tell us what it's all about.

Dr. John Morgan [00:29:41] It's such an Indiana story so far John.

John Vanderkolk [00:29:43] Yeah, you got that right. I can take it to Iowa and talk about Pickles the cow to in Iowa, but on the cow and sheep muzzle prints. I said, What are you talking about, Roger? And he says, It's supposed to be like fingerprints. John, you're the fingerprint experts. You tell me. So I got permission from my laboratory command to study cow and sheep muzzle prints with the help of I'll say this Purdue University, the arch rival of Indiana University. I went to the Purdue Agriculture School where they maintain the cow and sheep muzzle prints statewide. Kind of like what a fingerprint record database would be, just cards. And they were recorded by the cow within a county and followed by the ear tag number. But on each card they had a series of muzzle prints from the cow or from the sheep. And as I studied this, I said, Hey, I can do this. Just look at the different shapes, intra cow variability on each impression, kind of like fingerprints and inter cow variability between cows among cow variability. As long as the quality and quantity of details in both impressions, I should be able to do this.

Dr. John Morgan [00:30:45] Is it like friction Ridge? Is it actually, it's more than just the geometry of the nostrils is actually the skin of the animal on the nose?

John Vanderkolk [00:30:53] Most definitely. People are familiar with dogs. Look at the pebbly grain of the dog's muzzle, well those are growth of skin around sweat pores on the muzzle of cows, sheep and dogs. So the American Kennel Club even used to do muzzle prints of dogs back in the day, but too many of them came in poor quality and quantity of detail to make it a practical experience. But the state fair was doing the statewide, they would register the cow and sheep. Like in January, the child would grow the animal and show it in July or August. If there was a challenge, they would look at the muzzle prints to say, This is the same cow the kid registered. Okay, very good. The CSI that work the case it is the abduction case in which the victim knock at the door of the house opens the door, she gets stunned gun, she drops. Suspects puts her in the trunk of her car, drives away, puts her in the trunk of his car and drives to Wisconsin. When the crime scene investigator worked, the crime scene of her car abandoned away from the original crime scene, he developed an image on the inside of the driver's door window. What do you think that is? Using black fingerprint powder. He looked at the detective. He got thinking about it. Gosh. The way it's a nice little round circle. Then it slides down the middle of the window, right to the left and looks like if somebody pop the door handle and use the left elbow to push the door open, then the elbow would slide down the window as the door opened. He said, That's an elbow print. What are we going to do with it? The CSI knew what I did with cow and sheet muzzle prints and the way I talked about nature's patterns and impressions. He said, Send it to Fort Wayne they'll do it. So I made proficiency tests for my fingerprint examiner latent print examiner. He was willing to work the case if we got it reviewed everything with our command at Indianapolis.

Dr. John Morgan [00:32:39] Proficiency tests of different elbow prints?

John Vanderkolk [00:32:41] Elbow prints? We made them.

Dr. John Morgan [00:32:42] Did you make them, like, clean on a surface or did you actually do scraped across a surface like was in the evidence?

John Vanderkolk [00:32:48] Right off the bat? I didn't know what the evidence looked like. I just made a wide variety left and right, elbows. What I was the most amazed about was the very wide variety of natural patterns and elbow skin, just all sorts of different shapes. I don't know how to quote unquote classify, but basically in nature, I need texture, I need

shapes. So Rick Otis, who did the case, he correctly associated each unknown print, each standard print correctly that I prepared. But he said, John, I can't find this one. Okay? But I'm thinking, gosh, you should have identified all of them to something, someplace, a standard, someplace. Once I look at everything I gave him, I failed to give him a standard for the one unknown.

Dr. John Morgan [00:33:30] Okay.

John Vanderkolk [00:33:31] I said, ca-ching. He did not incorrectly identified to the wrong elbow.

Dr. John Morgan [00:33:36] So false positives and false negatives are important.

John Vanderkolk [00:33:40] That was a bonus. So we reviewed it with our command and they said go forth and compare. So instead of doing the classic ACE-V, we did a simultaneous ACE examination of the elbow prints. Before he started his case work, he made copies of the crime scene prints and copy of the standards of the suspects. And when they obtained the ink prints from the suspect, I said, get multiple angles of expression of the left elbow, making prints and multiple expressions of the angle of the right elbow making prints. Just give us a stack of standards. Don't throw any standards away. So they did. They send us about a half inch pack of standards of left and right elbow prints of the one suspect. I said, Rick, just before you start, make me copies of everything, the unknown print and the standard prints and you go to your office, I'll go to mine. And when we're ready, we'll talk to each other. So in about 20 minutes, he came to my office and said, I'm ready. And I said, Give me a few more minutes. About ten minutes later, I said, Write your answer down on a piece of paper. We'll flip him over at the same time and see what we say. So we both flipped the paper over and said I'd left elbow and we went with it. So yeah.

Dr. John Morgan [00:34:53] That's interesting because you almost had to create a new forensic discipline in order to be able to do the work.

John Vanderkolk [00:34:58] But I don't view it as a forensic discipline by itself. I view it as comparing nature's patterns, impressions of nature's patterns.

Dr. John Morgan [00:35:08] Did you end up testifying in that case?

John Vanderkolk [00:35:10] Oh we tried to. This is the early days of Daubert. Daubert had already started in the early 2000s. It's probably about the same time as 2002 with Judge Pollak's and rolling in. Since the case had crossed state lines, it became a federal prosecution case. So I called the federal prosecutor and told them, We'd like to testify on this elbow print. He goes, okay.

Dr. John Morgan [00:35:34] So he hadn't gotten a call like that before?

John Vanderkolk [00:35:36] No, we would like to testify. He goes, okay. And as far as our evidence goes, he chose not to because the victim was still alive in the suspect's house in Wisconsin. When they surrounded the house, the suspect approached the house and the police said something like, where's the victim? He says, in the house, you got me. So the living victim was a very good witness against the suspect. Right. Federal prosecutor in the early days of Daubert did not want to go forth with it. We did after that trial, approached the state prosecutor and say, well, you charged the suspect with conversion of her car at the

original crime scene. He goes, How many years did he get in the federal case?
(Indiscernible)

Dr. John Morgan [00:36:21] Like 500 life sentences I assume.

John Vanderkolk [00:36:24] He obviously did not hear what I said. He said, How many years did he get? I said something like 235 years. So he goes I don't think I can justify another trial. So we tried to testify, but we're not able to.

Dr. John Morgan [00:36:36] You're ready though?

John Vanderkolk [00:36:37] We wanted to.

Dr. John Morgan [00:36:38] Well, thank you very much for being with us here, John. I appreciate it very much. We are going to have John on again. I hope you look for the next podcast with him. We're going to be talking in more detail about the workshop that he presented here at Impression Pattern Trace Evidence Symposium. In the meantime, thank you very much for being with us. John.

John Vanderkolk [00:36:54] My pleasure to be with you. I enjoy talking about forensic comparative science.

Intro [00:37:02] Next week on Just Science, we will discuss fracture mechanics with Dr. Ashraf Bastawros From Iowa State University. Did you miss the 2018 Impression Pattern and Trace Evidence Symposium? We are releasing the archive content today, so please visit forensicceo.org to register now. Opinions or points of views expressed in this podcast represent a consensus of the authors and do not necessarily represent the official position or policies of its funding.