## Just Fingerprints and Lasers

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

**Intro** [00:00:21] Welcome to Just Science, a podcast for justice professionals and anyone interested in learning more about forensic science, innovative technology, current research, and actionable strategies to improve the criminal justice system. In episode four of the case study season, Just Science sat down with forensic consultant, author, and instructor Brian Dalrymple to discuss his research and impact on the field of latent print identification. In 1977, a team of researchers developed a method for detecting fingerprints by examining inherent fluorescence using an argon ion laser. This new technology revolutionized the field of latent print identification. Brian Dalrymple was an original member of that research team, but his career did not stop there. Listen along as he discusses the origins of his research and methods for examining bodies for fingerprints in this episode of Just Science. This season is funded by the National Institute of Justice's Forensic Technology Center of Excellence. Here is your host, Dr. Mike Planty.

**Dr. Mike Planty** [00:01:33] Hello, welcome to Just Science. I'm your host, Dr. Mike Planty, with NIJ Forensic Technology Center of Excellence, a program of the National Institute of Justice. Here to help us today with our discussion is guest, Mr. Brian Dalrymple. Welcome to the podcast, Brian.

**Brian Dalrymple** [00:01:49] Thank you, glad to be here.

**Dr. Mike Planty** [00:01:51] Brian was part of the original research team that introduced lasers in 1977. He retired in 1999 from the Ontario Provincial Police as manager of the Forensic Identification Services. He initiated the first computer evidence enhancement system in Canada in 1991. He initiated and co-wrote a standard operating procedure for body examination for Ontario and during his career completed approximately a hundred examinations of murder victims for fingerprint evidence. The topic of our discussion today. He's currently a forensic consultant and instructor for Ronsmith and Associated and an adjunct professor. He is the recipient of multiple awards, including D'Andaro Award from IAEI and the Lewis Minchel Award from the Fingerprint Society. Before diving into that area, tell us a little about your career, Brian, and how you got started. You've been doing this for quite a while.

**Brian Dalrymple** [00:02:41] Yeah, it's kind of a sobering thought to think that it's approximately half a century ago that I started looking at fingerprints for the first time. I was hired by the OPP in 1971. And prior to that, I had a somewhat, uh, unpolished experience career as an auto parts truck driver. And, uh prior to, that I was actually for a short time, I was, uh. Junior art director for an advertising agency.

**Dr. Mike Planty** [00:03:13] And you currently work with a consulting company. What types of cases do you handle there? What kind of work?

**Brian Dalrymple** [00:03:19] Well, I decided my own name, my own ticket. I just decided that when I retired from the police force, I was ready for that, but I wasn't ready to stop my connection with fingerprints. So I am a forensic consultant. I have the only full service fingerprint laboratory in the private sector in Canada. And there is quite a volume of work out there in the forensic field that the police are simply not resource to deal with. And this would be for the corporate sector, for banks, for private investigators, and for civil matters,

that type of stuff. So that is the bulk of my client base for for my consulting and uh as you mentioned in addition I teach I'm an adjunct professor at Laurentian University and teaching in the degree program of for forensic identification there and I also teach for Ron Smith and Associates in the States so it's kind of a diversified portfolio. So you have it retired.

**Dr. Mike Planty** [00:04:32] So we'll put that on the table. So our topic today is examining bodies for fingerprint and understanding proven methods. You conduct and hold a workshop on this topic. And one of those points you make in your workshop, it's an interesting point here, that many methods may work really well in controlled settings. But when you really get out into the field, they may not perform as well in actual cases. Yeah.

**Brian Dalrymple** [00:04:58] The thing is we, if we're properly field testing a technique, we want to duplicate the conditions that are going to be faced. It's not going to do us any real good. If we find a technique that develops beautiful fingerprints. On pristine surfaces within 14 seconds of them having been laid down. We need to consider all the things that investigators face when they arrive at a crime scene or when they at first look at an exhibit. Also, when people who are presenting fingerprint identification equipment or chemistry do so, they want to show you the technique when it's really on its game. So they will show you fingerprints, usually, that have been developed under ideal conditions. But speaking of someone who's attended to quite a few crime scenes over the last half century, you don't get ideal conditions all that often. So we have to think about how these things are going to work when you don t have everything working for you.

**Dr. Mike Planty** [00:06:05] Array of techniques that you have that you can work through in different conditions and understanding which one is probably optimal for certain conditions. It's really what you're going to tell us about today. So let's start with a brief history lesson. How have these techniques evolved over time?

**Brian Dalrymple** [00:06:20] Well, there's kind of a neat story for the evolution of the first technique that I was introduced to. And that is called the iodine silver plate transfer technique. And this was developed by a very bright guy in California and Pasadena back in the 1930s. And it depends on the ability of oils in a fingerprint to absorb iodine vapor. Preferentially over the background and then immediately a plate of pure silver is pressed in close contact with that surface. There's an immediate photochemical reaction between the iodine and the silver and this forms silver iodide on the plate. Now the the silver compounds of the halogens as are called iodine, fluorine, bromine, and chlorine. Have this unique ability or characteristic that they are light sensitive. They are called halides and they are the compounds that were used to make photographic film. So when they are exposed to light they will turn dark. So what would happen is if you press this plate of pure silver onto the surface that's been fumed with iodine in my case many times it was human skin, there would be this transfer and development on the plate. You then expose the plate to the light and it will darken and you're basically taking a very high resolution contact photograph of whatever was on that surface in iodine. And the beauty of the transfer technique is that it's not dependent on background. So you know, you can have a purple paisley background and it's not going to make any difference or you could have very, very dark skin where you wouldn't be able to see anything in a normal one-step process. So that was one of the big advantages of that technique. Now, interesting story about this. The technique was developed in the mid-30s. It was presented at a couple of conferences. A paper was written about it, and this brilliant individual that came up with it, John McMorris, actually patented a device for fuming iodine. And then it basically fell off the radar screen for several decades. In 1966 or 7, my very first boss at the Ontario Provincial

Police, who has always been possessed of a insatiable curiosity, loved this technique and. Wondered for the very first time, I wonder if it would work on human skin, because McMorris, when he developed it, it was for difficult surfaces like waxed milk cartons, leather and acetate, but the skin had never been mentioned. So the exciting project that my boss, Bud Hines, put together involved actually putting fingerprints on cadavers. In cooperation with the coroner of Ontario of that day, and then attempting after different time frames to develop fingerprints. And it was most exciting because he was successful, his group were successful in developing fingerprints up to 105 hours after deposition. And that wasn't the outside end. It's just he felt What kind of condition is a body going to be in after 105 hours? So he kind of left it at that. But as a result of the success of that, the technique was incorporated into our program delivery in 1970, which was one year before I arrived. So it was a fait accompli before I got there. So that was one technique. There's an interesting bit of serendipity about this. This sort of happened in the late 60s and into the 70s. But concurrent with this, but totally unrelated or unconnected in any way, was another individual in Florida named Eddie Stone, who worked for Miami Dade. And he had the same kind of sense of curiosity and passion for his job that Bud Hines had. So he had been looking at ways of finding fingerprints on bodies, and he had explored two totally different ways. One was a direct application. And that is of magnetic fingerprint powder. And the other one was a paper transfer. So he would take this very high gloss, high quality card stock that they would use for the cover of a very expensive magazine, for example. And then he pressed that against the surface of the skin and leave it there in contact for indeterminate time, let's say 10 seconds or so. And then he would use fingerprint powder to dust the contacted surface. So he was getting positive results with both of those techniques, and that was during the period of the mid to late 70s. And then in 1978, they had a case in Florida called the Spa Murders, where there was a triple murder at a health club and there were two female victims and a male victim. Eddie Stone and his colleagues were examining the bodies for fingerprints. And one of the female victims had been found beside a jacuzzi. She was nude and the appearances were that it was sexually motivated. So he was using the paper transfer technique. And then as he went, he would dust. Each surface with the fingerprint powder. He was actually working on one of her lower legs and he saw something that was, I guess, the best way to put it. I was never lucky enough to talk to him directly, but from what I understand, it was sort of an anomaly. It just didn't look right. It wasn't a fingerprint, but it didn't work right. So he made a fateful decision to directly apply the powder to her leg in that area. And developed a cluster of three impressions on her lower leg, one of which was ultimately identified as the suspect in the case. And the murders had nothing to do with sexual motivation. The target was the male victim, who was the business partner of the accused, and the other two, the women, were just unfortunately in the wrong place at the wrong time. That's the first time in history that a criminal. Has been identified by his fingerprint on the skin of his victim. Major, major breakthrough.

**Dr. Mike Planty** [00:13:30] So two thoughts on that, when we talk about developing fingerprints or identifying fingerprints on skin, primarily we're talking about deceased the individuals, we're not talking about someone who may have been knocked unconscious and assaulted and pulling fingerprints or are we? Is this really primarily on dead bodies?

**Brian Dalrymple** [00:13:49] And there's a number of reasons for that. The first point perhaps is that a reminder that we live in a very litigious society and the use of any kind of chemistry or techniques on someone would possibly open the door for lawsuits down the road. You know, someone could claim rightly or wrongly that they suffered a health reversal as a result of this being done. So anything like that would have to be done extremely carefully. The second thing is of course, with a living organism, it's living and it's

constantly conducting chemical reactions, which change everything. So when the body, when the organism dies, two things that start to happen. First of all, all of those chemical reactions that go on with the metabolism, they cease and something. Else comes in, which is basically the process of decomposition. So it is a race against time in that way, but in a strange kind of way, the skin surface as an exhibit surface becomes more stable and fingerprints persisted for many hours on skin. We've seen that.

**Dr. Mike Planty** [00:15:06] Just like any investigation, any crime scene investigation, you're looking at the body to identify areas where there was some intention, right? Some point of whether the person was handled by another person, was it bruising or something. There's other clues to help you drive your investigation of where you should look for fingerprints.

**Brian Dalrymple** [00:15:27] Exactly. And it's important to remember, too, that fingerprint evidence is, as is all physical evidence, circumstantial evidence. And you can look in the movies and see a defense attorney casually dismiss certain evidence as purely circumstantia. Well, the strongest evidence we have is circumstantially. What that means is that it doesn't support a conclusion of guilt by itself that has to be corroborated by other things. So the prosecution in a case will attempt to get as much evidence as possible so that at the end of the day, the jury and or the judge can come to no other reasonable conclusion than the one they do come to, and that may be innocence or guilt. But it is an accumulation or a sort of an unmasking. Of that kind of evidence that will eventually, you know, make the day or not, and with fingerprint evidence on skin, the inculpatory potential for it is so much higher. You know, I remember being taught in my basic training about the circumstantial evidence. I've got a guy who is arrested with a block bag containing cocaine. And I found his fingerprint on it. And quite rightly, the defense will ask, how long do fingerprints last? And I would make the answer that it's not possible to determine that. There's no technology to determine the age. And he would say, well, it could have been there for two hours, two days, two weeks, or two years. And I can't exclude any of those possibilities. So in other words, that fingerprint, my client left there could have been left when it had a ham sandwich in it rather than 10 grams of cocaine. So that is the circumstantial nature of fingerprint evidence or any physical evidence. But when you have a fingerprint that has been found on the body of a deceased person at or close to the time of death, particularly if it's an area of the body that's usually covered in clothing, it really closes down a lot of possible alternative theories. Absolutely.

**Dr. Mike Planty** [00:17:45] Really aids in telling the story. The next step I think is really getting to the light examination really where you develop additional techniques.

**Brian Dalrymple** [00:17:55] Light examination, yeah, that I was fortunate enough to be part of the the research team in 1976 and seven that introduced lasers to our world of fingerprint detection. And this was another kind of a first in that it was the first time in history that fluorescence was used as a detection strategy. In the past up till that point and continuing on I should say as well because many of our good techniques still do rely on staining but all of the techniques to that point in time relied on changing the color or giving color to a fingerprint or in rendering it visible making it lighter than its background or darker than its back ground or as I say another color for example, we have ninhydrin. Which for many years was the default technique for fingerprints on paper. You get a piece of pure white paper that has no visible fingerprints on it, you immerse it in ninhydrin, subject it to a mixture of mild heat and humidity, and magically fingerprints colored magenta will appear. So that is the process of staining. But in... The use of the laser and other subsequent light sources, we have exploited the principle of fluorescence and it is orders of magnitude

more sensitive than staining something. And this is particularly important when you're talking about things that are sub-nanogram in quantity like a fingerprint. My favorite analogy is it's kind of like the Dr. Seuss thing, Horton hears a who and you can have... One voice. And if it's very, very small, nobody hears it. And where you're sitting now and where I'm sitting, fluorescence is going on all around us, quietly and unseen, because we haven't set up the circumstances to view it. And we really haven't listened, in a sense. But when you do listen, and when you eliminate all of the background interference. The noise, it is a far, far more powerful signal to follow than a stain. And in the world of forensics, I characterize it that we are in the business of forensic signal recognition, either the signal itself or the potential for it. And once we've recognized a forensic signal, usually there is some modicum of noise involved that prevents a. Unimpeded look at or listen to. So our mission is always to optimize the signal to noise ratio to the degree possible. And companion to that is the rule. You don't need a super strong signal if you don't have any noise. So that is beauty and the power of using light as a detection strategy. And the other part of it that's so powerful is that it's not restricted to fingerprints. It can be trace evidence of all kinds, chemistry, body fluids, hairs and fibers. It's actually an open-ended list and many of these have been key in major investigations over the years. Just before you go on, I would say that It has the ultimate value of being non-destructive. So you can use it without cutting down or limiting any of your existing other options, have nothing to lose by light examination.

**Dr. Mike Planty** [00:21:49] And then since then, we've had other developments in the field, other techniques. I'm gonna touch on some of those blood impressions.

**Brian Dalrymple** [00:21:58] Yeah, it's amazing how frequently that has actually come up. That's another example of a much higher inculcatory value. If you have a fingerprint of an accused in the blood of their victim, either on the victim's skin or in the immediate vicinity, that just intensifies the, as I say, the can do, specifically laser examination, is to darken a blood impression that's borderline that may not be seen well or at all in ambient light, but under laser light it can be viewed and photographed. And in fact that is the case with one homicide case here in Canada in Alberta back the 80s. So, as I mentioned before, it was accomplished with a changing the body in any way or limiting any further examinations.

**Dr. Mike Planty** [00:23:02] Where do we go from here with the evolution of these techniques on body examination for fingerprints? Have there been, given the development, standard operating procedures related to how to go through that process of investigation at the scene?

**Brian Dalrymple** [00:23:18] Yes, and that's a very good question. When I began in this business, the term SOP or standard operating procedure was not nearly as common as it is today. And we learned a lot by bumping our shins as it were, and you hopefully learn from each mistake. You do not want to be losing $10 on the race and another 10 on the replay. So you develop protocols. As you go. And in the 90s in Ontario, I think it would be safe to say that we probably did many more body examinations than any other police agency, because we actually had it formally in our program delivery statement, in our mandate, and we were doing it on behalf of police forces from across Canada and even into the United States for quite a while. We did prepare a protocol for the examination of bodies, and it has been noted many times that one of the reasons skin is a difficult substrate is that it does not remain stable. I mean, there have been cases of fingerprints developed on paper for over 40 years, but paper, unless it's subjected to extreme heat and humidity. Will remain stable for a very long time. That's not the case with skin. So the higher the humidity, the higher, the heat, the smaller window you have for a successful

examination. So anything we can do to grease the skids to make the process go quicker. So the protocol started with the time that a murder was first reported, the first officer on the scene and so on. So that everybody would know who to call when and to get the process rolling right away. So that was one of the main things. The other thing was to diagnose and triage the scene to say this is something that with the approval of the coroner or the medical examiner, we feel would be best to do right here or at least the light examination. This is a case for a group discussion with all the stakeholders. Or other cases, if you're dealing with inclement weather or a very public area, you may say, we have to secure this body and transport it for examination to a controlled environment like a morgue. And in doing so, we laid down very specific recommendations for the moving of the body so that the key areas, the target areas, would not be compromised. And just through this protocol, it was possible to reduce the chances of evidence loss.

**Dr. Mike Planty** [00:26:18] So it is getting really the key stakeholders involved in trying to making sure they recognize the value of the potential evidence on the body and that there's a lot of value to keeping the body in place versus taking it to another location for examination and those key factors. So one of the things you talk about too is when the examination procedure starts, it goes from the least to most invasive, right?

**Brian Dalrymple** [00:26:44] Yes, exactly. The least invasive process, of course, is the light examination of all kinds. And by that, I include a very good, strong white light, but, uh, we can go through and do frequently go through the range of ultraviolet and violet threshold and laser and. You know, it depends. I mean, we've had body examinations that could last as long as four and five hours just because of the separate steps involved in doing things. I mean I also like to remind people that we don't investigate anything more serious than murder. So we don't want to be treating it like a break-in of a cottage kind of thing where we have to sort of budget. So. From the least invasive, which is light, we can then go to consider iodine silver plate transfer. And in that case, it is virtually non-destructive. It's very, very close to non- Destructive because the only thing that is touching the skin surface is iodine vapor and ultimately a silver plate. And it doesn't in any way really change the color or the chemistry of the body, so that would be my personal choice as number two. Another technique that has come up and been used with great effect is the cyanoacrylate fuming approach and I'd be remiss if I didn't touch on an absolutely wonderful case from Des Moines, Iowa. I mean, it's one of the best investigations I've ever seen. I spoke directly with the officer who conducted the examination of the scene. And this is a case of a woman who was a victim of domestic abuse, and she'd been separated from her husband. She was found last seen alive at midnight and found the next day somewhere around noon hour by the brother of her estranged husband. She was found in bed and she was nude and she had been garroted. And the investigating officer, the forensic officer made the decision to build or create a fuming chamber for cyanolactinolate right at the scene. And I spoke directly to him about it. And I mean, it was incredible because he was the picture of persistence in He said, I created this chamber. We put two tubs of cyanoacrylate, one at the head, one of the feet on heating pads. And we put the top on and fumed the body for, I think he said a half an hour. He said we took it off and I looked and I wasn't satisfied. It just didn't look like much had happened. So we redid the process with more glue and longer time. The next thing was you could see the effect of the polymerization. And maybe just a quick word on that, the cyanoacrylate process you start with the monomer which is a very small molecule chemical and intensely reactive and wants to bond with everything in sight which is what makes it a good glue. So experience has taught us that it will bond with oil and moisture and when it does so it forms polymer. Or plastic. So both of those oils and moisture are common ingredients of fingerprints. So in a nutshell when you put a body in a chamber or anything and subjected to the fumes of

crazy glue or super glue, which are the commercial forms of cyanolacrylate, it will plasticize and reveal fingerprints. And that's what my colleague did in this case. And when they took the top off and re-examined the body after the second fuming, there was a very high quality palm print on the abdomen of the victim. And this was extremely compelling to me, because getting back to what I spoke about earlier, the inculcatory value of evidence. That print was ultimately identified as her estranged husband. Now if that print had been found anywhere else in the house, it wouldn't have had any meaning because he used to live there. But here it is on an intimate part of his ex-wife's body at a time close to death.

**Dr. Mike Planty** [00:31:38] Yeah, absolutely. And you think even if he touched her a day or three before, she would have showered, cleaned herself, done other things, but to have it there, yeah, really strong evidence.

**Brian Dalrymple** [00:31:49] I would just say that on a very difficult surface, that was one of the finest pieces of forensic work that I've been acquainted with over the years, not only for the way they did it, but for the fact that they even conceived it, that they did.

**Dr. Mike Planty** [00:32:03] Yeah, it seems like on the fly like that, going in, creating a tent over the body and feeling it. Very, very interesting. Just bringing back on the standard operating procedures. We talked about stakeholders and going from the least invasive to the most invasive. So we would look at light, laser, or maybe iodine plate transfer, sign or acculate. Are there other techniques?

**Brian Dalrymple** [00:32:29] There certainly is the paper transfer technique that I spoke of earlier, and people have expanded on Eddie Stone's original research in that area and have used different kinds of paper and even other types of transfer medium. But when I researched for the book, I failed to find any documented cases of investigation success with that technique. Not to say they don't exist, it's just that I was not successful in finding them, and we had no success with that approach at all at the OPP, so we dropped it from our repertoire, and our repertoire would basically consist of first of all light examination, secondly iodine silver plate transfer, and then in some cases when we got the approval to do so, we would proceed to direct powder application. Now that is a, there's a real caveat associated with that and you really need to have the approval of the pathologist or the medical examiner because it will irreversibly change the appearance of the body. You're going to be putting black powder all over the body. But in terms of actual success in casework which is what always rings resonates for me and that gets back to our opening discussion about why techniques can work in practice or in theory or in laboratories and not necessarily in the in the real world. The reason I'm so supportive of iodine silver plate technology is because it has identified murderers in two actual documented cases. Uh, and by the same token in at least two, cyanoacrylate fueling has done the same thing. And the powder examination has also proven effective in two cases. So six cases off the top there, uh, there have been more, uh. And I'm really not sure how many more there are in total because not all of it gets reported. There's no sort of central reporting depot for this. But the techniques that I know and have most support for have all had at least two documented successes in homicide investigation. And this is not even counting the times they've developed prints that were not identified.

**Dr. Mike Planty** [00:35:08] Oh, that's a really good point. How commonplace is it for folks to look for fingerprints on scan based on your research? I mean, is this something that needs more communication to the field? Or is it pretty commonplace for people to use these techniques all the time? And is it a combination also of having the right conditions? You've done a lot of research trying to identify cases in this area.

**Brian Dalrymple** [00:35:33] I think when one has finite resources, I think it's critical to make sure you're not squandering them. And the appropriate application of these techniques is really relevant in a small number of cases. For example, you... You don't typically suggest a examination of the victim's skin in a drag by shooting or some other such case. So when you have a case where a there is clearly a sexual motive and where the chance exists that the body has been handled or touched when a body has So the murder scene is actually somewhere else and this is a dump site. Anywhere that your investigation tells you that there's a good chance that fingers or palms came in touch with the skin surface, those are the times where you would be thinking about that. Okay, we have that part of things established, what circumstances of the case would indicate a examination. The next thing is if the body has been immersed in oil or covered in soot or out in the pouring rain and and so on, or is in a state of decomposition, then once again your chances are slim to none. So there are actually a fairly small number of appropriate cases that would call out for a body examination. As to how this happens where I think this changes from jurisdiction to jurisdiction, it's perplexing in a way. You can't do something that you didn't even know existed. You know, there is sort of urban legend going around that it's not possible to find fingerprints on human skin, or it's so difficult, you've got a better chance of being an astronaut. You know there's a whole lot of happy malarkey associated with this, but I'll be quite blunt about it. Skin is a challenging substrate, but it is by no means an impossible substrate. And I think the number of documented success stories proves that beyond doubt. And as I said before, we were only talking about homicides. So it was that in mind that for the last approximately 20 years, I've been doing these workshops at the IAI, trying to get the word that, you know, this is not all the... Out there, but it's quite possible. And not only is it possible, it's worked. And secondly, the information, the history was never in one place. And I just, I wrote the book because I felt there should be sort of a central repository, a place that gathered it together and said this is what happened over the years. This is what's worked, this is what hasn't worked. And these are some recommended procedures if you're thinking of implementing it in your agency. It is expensive, it is time consuming to do anything new or added to the regular protocol and those are always challenges because we're all people, they get met in different ways in different places so I would just hope that for applicable homicides This will be done.

**Dr. Mike Planty** [00:39:18] Like you said, there's nothing more important than investigating the homicides and trying to, that's where you really should utilize your resources. So, giving your expertise in this area, what types of research or emerging trends do you see or needs in this are that could help improve these techniques?

**Brian Dalrymple** [00:39:37] What will generally happen in terms of research, in terms of improving or creating better techniques, a research group will take a look at a history. I would really like to see a bigger history built up. I would like to a lot of applications of the technology across the board. I mean, that would make me very happy to learn that that was going on because... I think any kind of researcher knows that the broader your database, the more factual or more accurate your findings are going to be. So finding out the success rate on five bodies is not going to as revealing as your success rate on 500. And I think that a comparison of the techniques would be appropriate. I think I think more work can and should be done on the power of light. There was a marvelous technique done by a good friend and colleague of mine in Canada here named Della Wilkinson and she's been a powerhouse in our business for a long time. She was most interested with the cyanoacrylate fuming of bodies And of course, if you look at the body afterwards, bodies fluoresce, they exhibit. They're organic and there's just a sort of a pretty broad

fluorescent to output under light sources. So she discovered a rare earth dye to apply to the skin surface after the cyanoacrylate fuming. And this was called phenoyl europium chelate, or TEK for short. And the beauty of this stuff was it has an enormous stokes shift. It absorbs light in the ultraviolet and it fluoresces deep red. So if you were to have a filter that excluded all light except that red region of the spectrum, the chance of any kind of fluorescing noise from the body is virtually non-existent. And I saw some of the the test impressions she got on bodies and I was just blown away, it's absolutely marvelous. There are some technical issues in using this, and so it has been, it was shelved, but it's a technique I would love to see revisited and reevaluated, because in any of the other techniques we've done, you know, if you look at ninhydrin, if look at DFO, you They didn't come up with the winning formula immediately. It's an evolutionary process over 10 or 15 years before they tweak it just right. And I think that that one really deserves another look.

**Dr. Mike Planty** [00:42:40] Yeah, the enhancement refinements of these techniques that are, you know, just improving and getting better. I mean, that's a real good way to go. Um, well, any final.

**Brian Dalrymple** [00:42:51] There is quite an enormous range of choices out there. Sometimes maybe a bit intimidating range of choices for examiners in terms of a murder investigation and in looking at the skin. You know, you might be thinking to yourself, do I do light examination and do I do iodine silver plate transfer and do I do, you know, CA fuming and powder? I would just say that any of those is better than none. You're not going to win a lottery unless you buy a ticket and I just encourage everybody to buy a tick.

**Dr. Mike Planty** [00:43:32] Yeah, give it a shot, right? Try. Exactly. Well, great. I'd like to thank our guest today, Brian Dale-Rimple, for sitting down with Just Science to discuss the topic of examining bodies for fingerprints. You can find his book at Carolina Press, I believe. Thank you very much, Brian.

**Brian Dalrymple** [00:43:47] My pleasure, Michael.

**Dr. Mike Planty** [00:43:49] If you enjoyed today's conversation, be sure to like and follow Just Science on your podcast, platform, or choice. For more information on today's topic and resources and field of forensic science, visit forensiccoe.org. I'm Mike Flanney, this has been another episode of Just Science.

**Outro** [00:44:06] In the next episode of Just Science, we sat down with cold case investigation consultant Rockne Harmon to discuss familial DNA searching and the case of the Grim Sleeper serial killer. 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.