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The Process and Application of Examining Trace Evidence and Testifying in a Court of Law

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HNRS 4990: Honors Project

Dr. Travis Worst and Mr. Jeffrey Lynn

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Acknowledgments

I would like to acknowledge my professor, Mr. Jeffrey Lynn for his help in completing this project. I was the only person in this class, which was a three-hour class from six to nine o'clock at night. Mr. Lynn left his home once a week and drove up to Bowling Green, staying in a hotel overnight just to make sure that I was able to take this class and excel in my area of study. He created individual assignments and prepared intricate cases for me to work and made an extremely long class interesting. I hold a great deal of respect for him and his dedication to his student (me). Owing to these circumstances, I would also like to acknowledge myself. I sat through a six to nine class every week, and I was alone. It was just me and Mr. Lynn. We couldn't have class discussions, and there were no distractions. I had an amazing time, and Mr. Lynn was an excellent teacher, but I definitely deserve a pat on the back for going through this for a whole semester.

Background Information

When I made the decision to attend Bowling Green State University in 2016, I knew what I wanted to do. I had toured the campus several times. My first tour involved the Honors Learning Community and learning about the campus in general. I was interested, but not completely sold on spending four years of my life there. The second tour I experienced changed that. I had always been interested in forensics, and I had learned that BGSU was putting together a program unlike any I had ever seen before. I had the opportunity to tour the BCI facility that is located on campus, as well as the opportunity to meet with some of the staff members involved in the program. This was the day that I first met my now advisors Dr. Travis Worst and Mr. Jeffrey Lynn. They gave me an extensive tour of the facility, the crime house located on campus, and gave me more information about the program than I could have ever asked for. At the end of this tour, I was absolutely sure what I wanted to do with my future. I committed to BGSU that week, and now my time here is over. I met so many amazing people, student and professor alike. My professors prepared me for a bright future in forensic science. Their courses were highly informative and enjoyable, so much so that I decided to do a full semester of extra work in order to turn it into my Honors Project.

One of the greatest parts of BGSU's forensic science program is the fact that every professor that teaches specific classes related to forensics previously worked or currently works in the field. They are able to provide students with stories, photographs, and reports from real cases that they worked. This provided me with a realistic view of the job that I was preparing for and ensured that I knew exactly what I was getting myself into. I loved every second of my classes, and this led me to double-specializing. Sticking to just one aspect of forensic science was not enough for me. I specialized in forensic biology and forensic examination. Biology deals

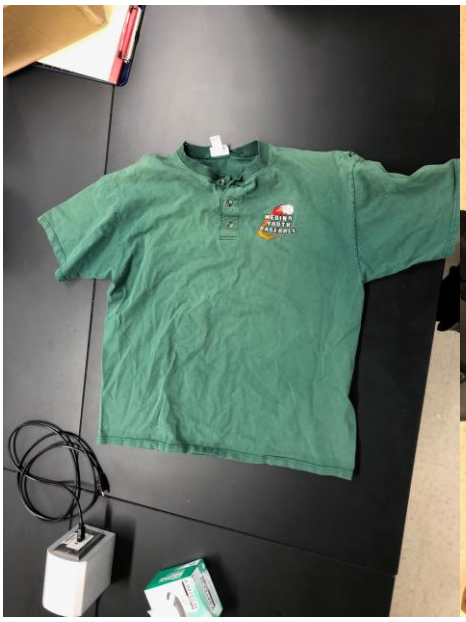
with DNA analysis, and examination deals with trace evidence and latent fingerprints. Both specializations had their own check sheets to follow for graduation, each had individual classes that were unique, including an internship provided through the program. Only one internship was required for someone double specializing, but I knew that I wanted to do both. This field excites me, and I wanted to learn as much about it as I possibly could in my time at BGSU. I asked if I could do both internships, and I was met with hesitation. I explained this to my honors advisor, who suggested the possibility of turning this extra class into my honors project. I was thrilled by this suggestion, and immediately began working to make it a reality. I gathered my advisors, the same two men who had made me fall in love with the program in the first place, my honors advisor, and created my honors project.

The name of the course we created for this class was honors FSCI 4890. It involved learning about trace evidence examination, reporting the results of those examinations, and testifying to those results in court. For the first part of the semester, I listened to lectures and worked a few mock cases with my professor. I studied paint chips, hairs, fibers, latent fingerprints, glass, and footwear impressions. I learned the best ways to collect and process evidence, and the proper way to seal and label it to be recognizable in the future. Nearing the end of the course, Mr. Lynn prepared a full case for me to work by myself without his guidance. He handed me bags of evidence and a file and left the room. I spent ten hours altogether with these items, wrote a report on my findings, and finally, testified in a moot court setting. This paper will discuss the case that I worked on, the processes I used to analyze the evidence, the skills I used in my moot court hearing, and how this experience challenged me and drove me to expand my normal ways of thinking.

Body of Work

My case began with my professor handing me a file. The "crime" that had been committed was a hit and run. On 3/26/2021, the victim, who was identified as Chris P. Bacon, was struck by what witnesses describe as a light-colored (silver or gray) vehicle that had been traveling erratically and at a high rate of speed westbound on Wooster St. The vehicle reportedly ran a red light at the Main St. intersection and struck the victim in the crosswalk. The vehicle did not stop. One witness believed that the vehicle may have also struck a nearby light pole. The make, model, and license plate number of the vehicle were unknown. Officers collected unknown paint from a damaged area of the identified light pole, and later retrieved the deceased victim's clothes from Wood County Hospital. On 3/27/2021, a resident reported that an unknown vehicle was parked in their yard. The owner was Lou P. Partyman, a neighbor who also had multiple DUI offenses. The officers present noticed damage to the passenger side front bumper, fender, and hood. Possible foreign fiber was noted in the damaged areas. Mr. Partyman was located at his residence and questioned. He denied driving the truck the night of the incident and stated that a man named Mr. Bud Light had borrowed his car the night in question and had returned it to the wrong place. Mr. Bud Light was contacted by the police, and he denied borrowing the vehicle, saying that he had never been in the car in question. Known fingerprints were collected from both him and Mr. Partyman. The vehicle was transported to the station. Unknown fibers and known paint were collected from the damaged area of the vehicle. 2 empty alcohol containers were collected from the interior of the vehicle. The evidence submitted to the BGSU Forensic Science Laboratory on 3/30/2021 contained:

1. Known shirt and pants from victim Chris P. Bacon

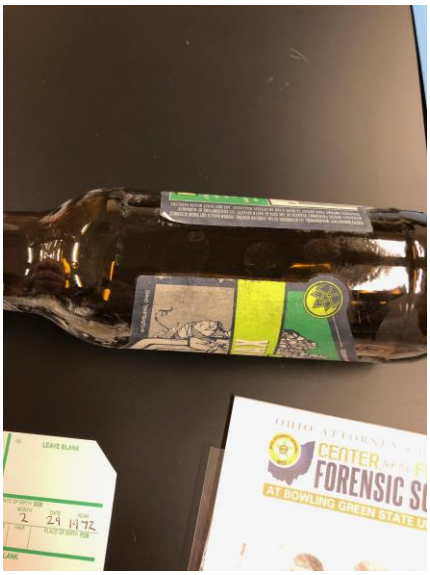


2. Unknown paint taken from the light pole at the scene

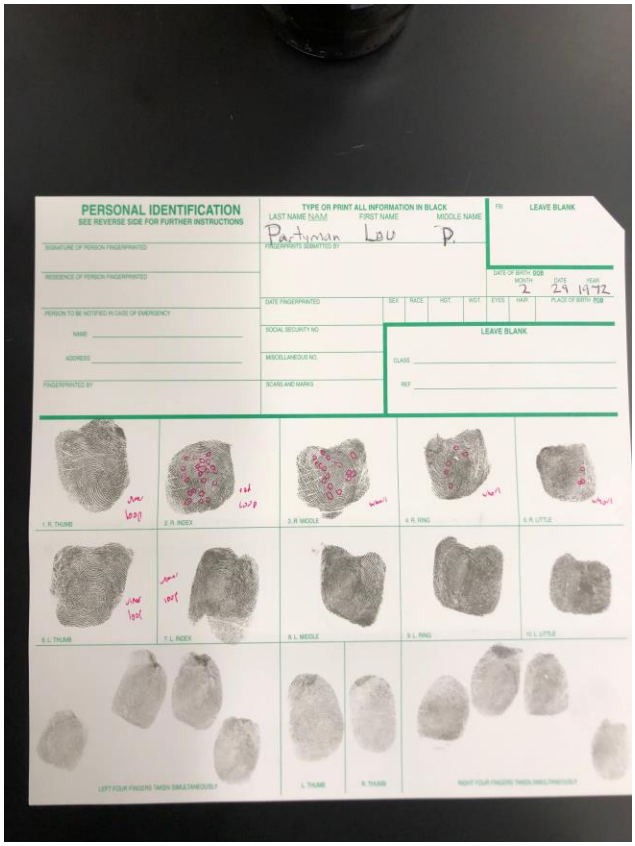
3. Known paint from subject vehicle

4. Unknown fibrous material taken from subject vehicle

5. Alcohol Containers from subject vehicle



6. Fingerprint cards from subjects Lou P. Partyman and Bud Light



This evidence was received by me on 3/30/2021 at 2100 hours. I inspected every item to ensure that it was sealed and labeled properly. This meant that the evidence was dated and had a description and a number, as well as the case number #21-20101, and the initials of the person who had collected it were written across the tape sealing the opening of the bag. Once I had verified this, I began opening the packages. The first one, item #1, contained a shirt and a pair of jeans. I put these onto a clean surface, removed visible debris from them, scraped them off and collected the scrapings, and then performed a tape lift across all surfaces of the clothes (a tape lift is a way of collecting more evidence that may be stuck to the surface of the clothing, done by taking a piece of clear tape and pressing it across the shirt). I also took known fibers from these items and mounted them on microscope slides. Next, I opened the unknown paint taken from the light pole. Using

a microscope, I compared the paint to that of the known sample. I looked at the colors, the type of paint, and the layers of paint. Next, I took the unknown fiber samples, mounted them on microscope slides, and compared them to the known fibers. I did this using a polarized light microscope. This allowed me to better see the shape and cross-sections of the fibers. After that, I took the alcohol containers and placed them in the cyanoacrylate fuming chamber (superglue fuming chamber). This process vaporizes superglue, which then sticks to the fingerprints. I then dusted the can and bottle and found several prints. I performed a tape lift on the prints and placed the lifts onto a piece of clear acetate to make viewing easier. I then took those fingerprints and compared them to the known fingerprints taken from the fingerprint cards. I am placing the results of all of these comparisons in the table below.

These photographs depict the comparison and analysis of fingerprints using powder, photography, and photoshop.

Item	Description	Finding	Conclusion
1.1-3	Unknown paint chips from shirt	Same color and layer structure as item #3	Support for same source[2]
1.2-3	Unknown paint chips from pants	Same color and layer structure as item #3	Support for same source[2]
2	Unknown paint chips from light post	Different color and layer structure than item #3	Source Exclusion[5]
4	Questioned fibers from vehicle	Same color, microscopical characteristics, and optical properties as item #1.1	Support for same source[2]
		Same color, microscopical characteristics, and optical properties as item #1.2	Support for same source[2]
5.1	Beer bottle from subject vehicle	insufficient	--
5.2	Beer can from subject vehicle	Four fingerprints	Source identification[1]: Lou P. Partyman

The likelihood that the evidence arose from a different source is so remote as to be considered a practical impossibility.
[2] This association is not exclusive; other manufactured items with the same characteristics may exist.
[3] While they could not be conclusively identified to the same source, the items were found to exhibit unusual matching characteristics that would not be expected to be found in the population of this evidence type.
[4] Due to significant limiting factors, this association has decreased evidential value.
[5] The items exhibit both differences and similarities in observed and/or measured properties and/or chemical composition to the extent that no conclusion could be reached regarding an association or elimination.
[6] The evidence exhibits fundamentally different characteristics than the known reference and could not have come from the same source

This table displays the results that I came up with while using the methods of analysis learned during the course of this class. Unknown paint chips that I had removed from the shirt and pants matched the color and layer structure of paint from the known car. This led to the decision to label it support for the same source. This means that other manufactured items exactly like this may exist, meaning that the paint cannot be individualized. The unknown paint chips did not match the known chips, so I was able to exclude the known vehicle as being the creator of those paint chips. I found that the unknown fibers taken from the car matched the known fibers, so again I found support for the same source. The prints taken from the beer bottle were not able to be read due to insufficient detail, but the prints taken from the beer can matched the prints of Lou P. Partyman.

Implication of Results

None of these results directly implicate Mr. Partyman in the death of Mr. Bacon. The paint from his car matched the paint found on the victim's clothes, but that pain theoretically could have come from any car that was made at the same time with the same color, or other cars with the same paint layers. The unknown fibers matched the fibers from the victim's clothes, but that type of fiber (cotton) is extremely common, and there is no way to individualize the fibers. The prints taken from one of the alcohol containers matched the prints of Mr. Partyman. This means that at some point, Mr. Partyman touched that can. It does not mean that he was drinking while driving, or that he even drank the beer. It only shows that at some point his fingers touched that can. Individually, none of these things can prove that Mr. Partyman is the one who killed Mr. Bacon. However, it is the job of the examiner to provide the results to the jury, who can then decide whether to conclude that Mr. Partyman was guilty based on the evidence and how it lines. up. The more correlation, the more likely the jury is to find no reasonable doubt in the case.

Testifying in a Court of Law

Often, this process of coming to a verdict is aided by examiners testifying in court to their results. Examiners can get called for any case and must stand before the court and explain their results and be questioned by both the prosecution and the defense. The defense can be aggressive and attack the character of the examiner, which was a point that Mr. Lynn made very clear during my moot court hearing. When I finished my report and submitted it, I was put on the witness stand and questioned, cross-examined, and belittled by Mr. Lynn. He attacked the methods I used, the terms I used to describe things, and the credibility of forensics as a whole.

My job during this was to remain calm and collected, and simply state my opinion. In order to prepare for this questioning, I studied Max M. Houck's *Trace Evidence Analysis More Cases in Mute Witnesses*. This textbook was required by a separate trace analysis class but was full of information that I found very useful. It teaches readers about the different forms of trace evidence, the different ways to process that evidence, and the process of testifying. It stresses especially the importance of only testifying to what one knows. Saying "I do not know" in front of a courtroom full of people may be embarrassing, but it is far better than being caught lying on the stand. That could ruin one's career, as well as the reputation of any employer. Another thing that must be avoided is being led on by questions. There is no known error rate for fingerprint or other trace analysis. If the person questioning asks for statistics or asks if one "agrees" with him about a chance or statistic, one must say that they cannot say. To do anything else would be lying.

In addition to studying the textbook, I watched instances of expert testimony on the Internet. I observed the way the examiners were dressed, how they held themselves, and how they spoke. I also kept track of the way the attorneys questioned the witness. I took notes on the types of questions asked, and once I finished the video, I wrote down the answers to those questions. I rehearsed my basic information and the ways that I would describe different complex things to a jury who may not understand the principles of forensic science. I also had a mock trial with a friend over Zoom. She asked me questions and tried quite hard to get me to break character. I believe that this preparation helped me to remain composed and professional during my mock trial.

During the mock trial, Mr. Lynn played the part of both the prosecution and the defense. As the prosecution, he first established that I was in fact an expert and had me name my various

qualifications. Once I was qualified as an expert, he asked me questions about the results of my investigation. After that, he became the defense attorney. He quizzed me on random trivia to try to throw me off. When I told him that I could not give a statistic he objected and pointed this out to the jury. He repeatedly attempted to get me to agree with him on different percentages and numbers, and each time I had to calmly decline to respond. He attacked the methods I used, and then attacked the results. He greatly emphasized the "arbitrary" information I had found while examining the evidence. He said that his client had just buffed his car with a cotton cloth, and that was why cotton fibers were on the car. He said that his client had been picking up trash off of the side of the road, and that was how his prints ended up on those bottles. He also made a very big deal of the fact that the paint chips taken from the clothing could have been on the ground before the accident occurred. I reiterated that I had discovered this information through following the guidelines of my lab and the government standards and that no, I cannot prove that Mr. Partyman was driving drunk, nor that he was the one who killed Mr. Bacon. All I could do was tell the facts that I knew and hope that what I did was enough.

Thoughts After Testimony

Going through the testimony was nerve-wracking. I am not used to someone being aggressive towards me, even if it is someone I have known for years and I knew exactly what he was going to do before he did it. It was hard not to be hurt when someone is questioning your character. However, I remembered that Mr. Lynn was just doing his job, and that is what all defense attorneys do. The vast majority of them do not hold grudges or mean what they say, they just want the best result for their client. Getting the opportunity to testify in this manner opened my eyes to a new side of forensic science. Knowing that you may have to testify, and actually

experiencing it are two completely different things. I learned that I can remain cool under pressure, that I am comfortable saying when I do not know something, and that I am strong enough to resist leading statements and other traps. Testifying put me out of my comfort zone and tested many aspects of my education, but I enjoyed it and I am so glad that I got to experience it.

Conclusion

This honors project tested me in many ways. It helped me to get more comfortable in my major, learn more about my future career path, and made me more confident in the choices I made. It also stressed me out a great deal. Knowing that you may be up against a very negative person is scary, and I am glad that I got to experience something that not many other people might be able to. Because of the opportunities awarded to me by this project, I believe that I have an advantage over those who have not gotten the same specialized training as me and that I personally am better for doing this program.

References

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Lynn, Jeff, *FSCI 4890 FExam Internship Syllabus-Spring 2021*