Book Report

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CRIM 403: Dilemmas in the Criminology & Criminal Justice

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April 16, 2023

Introduction

"*Junk Science and the American Criminal Justice System"* was written by Chris Fabricant and published in 2022 which describes the rise and fall of junk sciences. I picked this book because I was heavily interested in learning more information about these debunked forensic sciences after listening to several podcast reactions for class that involved the misuse of forensic evidence. Junk science refers to a group of forensic science fields that are based on training and experience, rather than facts and scientific methods. These junk science fields include bite mark analysis, arson investigation, hair microscopy, bullet lead analysis, polygraphs, voice spectrometry, handwriting analysis, and bloodstain pattern analysis. These fields go on to account for "Nearly half of all wrongful convictions overturned by DNA evidence involved the misuse of forensic sciences (Fabricant 2022)." While the book talks about each of these topics, it mainly goes in-depth into the junk science of bite mark analysis, and the rise and fall of its dominance in the criminal justice system.

Description

Bite mark analysis started gaining traction during the late 1980s when dentists began emerging as "forensic odontologists" being brought in as expert witnesses in criminal trials. Bite mark analysis worked by interpreting bruise marks on the skin, inferring if they could have been caused by teeth, and if so, using molds to compare a suspect's teeth to the marks left on the surface. Through media coverage and several prominent court cases, these self-proclaimed experts" began becoming super stars in the forensic world, " being portrayed as swashbuckling

crime fighters (Fabricant 2022)." Some even went on to become full-time court experts, making more money than they ever would as regular dentists. Bite mark connoisseurs began exchanging information on the art of identifying bite marks and using them to match suspects to those injuries, publishing articles as early as the start of the 1970s. One article written by Lowell Levine titled *"Dentistry: An Emerging Forensic Science"* argued that dentists had long been a contributor to the forensic sciences and that there was a need to form a certification so that their findings could start to be used in courts. Levine needed to be able to create an established odontology board and the perfect case to be able to bring bite marks into mainstream forensics. After struggling to find the ten certified dentists needed to create a section in the American Academy of Forensic Sciences (AAFS), they created the odontology section that was meant for dentists who were identifying dead bodies based on dental records. Dentists across the United States could now use bite marks as a viable forensic science in court and were now members of the AAFS, which made them able to be labeled as expert witnesses. According to the author, it was "very important to be selective with the first case, to get it right a first time: a guilty defendant and a perfect bite mark (Fabricant 2022)." Levine got his case with People V. Marx. In this case, Lovely Benovsky was found dead in her rental where she had a bite mark on her nose. Their only suspect, Walter Marx, was charged with voluntary manslaughter when a dentist labeled as an expert witness stated that Marx's teeth matched those left on the victim. This historic court case brought on the precedent of not requiring scientific evidence, and rather the opinion of an expert alone to charge someone, relying on the jurors to separate scientific evidence from junk science. After this court's decision, bite mark evidence would go on to be the major reason prosecutions were able to win cases; Ted Bundy, David Wayne Spence, and Keith Allen Harward were all put away on bite mark evidence alone and for the case of the latter

two an innocent man was sentenced to jail based on junk science. Many of these junk sciences were brought up in the same fashion as bite mark analysis, only having knowledge that was "learned in the field" being passed down from generation to generation, and never taking a second to look at the science behind their claims.

It was not until 1993 when the court began questioning forensic evidence in the court room. At the Supreme Court case of Dauber v. Merrell Dow Pharmaceuticals two standards of admitting scientific evidence into the court room were put to the test. The original Frye standard deferred to the scientific community of that field rather than having the court conduct an independent evaluation of evidence. Putting the trust that these experts knew what they were talking about. Justice William Rehnquist was said to have complained about the amount of evidence that delt with scientific knowledge rather than their expertise in law (Fabricant 2022). On the other hand, the Daubert opinion was formed. In this the court acknowledged the ability of experts to mislead jurors who could not evaluate scientific evidence and set up tests for evidence to be used in court. Judges need to make sure that; 1) Evidence had a testable/tested hypothesis, 2) It was peer reviewed and had been tested by science community, 3) a tested error rate, and 4) have the ability to be recreated in a test environment. Many of the junk sciences did not pass any of the above requirements. Criminally speaking, this decision changed nothing, and in 2018 the author teamed up with professor Brandon Garrett and did a study showing that "prosecutors virtually always won challenges and never lost challenges to their experts even those with track records of fraud and wrongful convictions (Fabricant 2022)."

In 1992 with the rise of a new forensic science that used DNA evidence, the Innocence Project was created to free the innocent and prevent wrongful convictions. The project and its team of lawyers would go on to prove that many of the most trusted forms of evidence had

misled jurors into convicting the innocent, with “many convictions resting on bad eyewitness testimonies, weak confessions, and forensic science where proven false, overturned and labeled as junk science (Fabricant 2022).” In 2006, the United States Congress requested that the National Academy of Sciences research and report on the state of forensic sciences. The experts from several fields came to defend their fields .

David Senn presented to NAS that “Bite mark analysis is too important and valuable to the investigation to be discounted or overlooked.” Even though he had presented that there was a 63% error rate (Fabricant 2022). At the time of this presentation there was no scientific research, but research that was started by Senn later found that teeth were proven to not be unique and that the skin was not a reliable medium to record bites. NAS reported that there was no scientific evidence backing bite marks as being able to reliably identify those who left them.

Another highlight of this hearing was the presentation of arson investigations. This presentation was unique because the presenter did not defend the field. John Lentini fought the “time tested guild wisdom taught by legendary experts” through creating replicas of so-called arson fires and testing them in controlled fires. Lentini showed that in his experiments that the test fire had burnt down quickly, could reach same temperatures, had pour patterns, and showed multiple points of origin, just as in fire that had been labeled as telltale signs of arson. Lentini reported that 10% of all fires were labeled as arson, with a 5% error rate, which meant 2500 people had been innocently charged with arson(Fabricant 2022).

While NAS had proven that bite mark evidence and others were routed in fake science. The Obama administration requested a follow up study on the NAS Report, this Presidential Council of Advisors on Science and Technology (PCAST) came to the same conclusion that no forensic technique can identify the source of crime scene evidence. The criminal justice system

did not make a statement on these reports until 2018 when a Texas court of appeals finally stated that “Bite mark evidence, which once appeared proof positive of guilt, no longer proves anything. Each piece of the state’s trial evidence is questionable or has since been undermined or completely invalidated (Fabricant 2022).” The Department of Justice under the Trump administration released a statement towards the end of his presidency stating that the PCAST Report was labeled as wrongheaded and incorrect and encouraged judges to reject them, during this time the federal government also abandoned regulation of forensic sciences and junk science is still admissible in court across the nation.

Analysis

Ethically, I can not understand how detectives and prosecutors used these junk sciences as their main point of evidence to charge suspects. According to the book *“Justice, Crime, and Ethics”* a person shapes their ethics through social norms, upbringing, religious beliefs, and codes of conduct in that society (Braswell et al., 2017). This book gives us two looks into how people choose their ethics, with the two main groups of ethical beliefs being deontology and utilitarianism. Deontology believes that the means must be justified to make the conclusion justified; while utilitarianism believes that it doesn’t matter how conclusions are formed as long as there is the greatest amount of good for society. While one could argue that regardless of credibility of the evidence junk science is able to put bad guys away making overall society a better place or the ends justify the means. I believe that this is not true since junk science has been shown to primarily put innocent people, usually those of minority groups, to jail on crimes they did not commit. According to a database from the National Registry of Exonerations, there has been documented in at least 553 cases since 1989 in which someone was convicted on false or misleading forensic evidence (National Registry of Exonerations 1989). It is important to

note that this is only the documented cases and that there could be hundreds of more innocent people still locked up in jail. Two negatives do not make a positive in my opinion, and while it has been used to put definite criminals away like Ted Bundy, I would say that a utilitarian belief does not hold and that it is not ethically sound to use such evidence as it has gone on to convict innocent people. Not only have these people been put away for a majority of their lives, some have even put to death, and then later found out to be innocent. The overall happiness of innocent people, their family, and people effected by them going to jail overpowers the happiness of the people where a truly guilty person was convicted based on the junk evidence.

Even though time and time again junk science has been used for over 50 years in the criminal justice system. An interim report from the National Registry of Exonerations and the Innocence Project found that 46% of all DNA exonerations involved the misuse of junk science, and that there are currently reviewing more than 3,200 cases to see the extent of its use in faulty convictions (Cole et al., 2022). While it has been proven that these forensic fields are based on made up science and lies, the criminal justice system continues to unethically use it in courts as evidence. Not only does the science behind these not line up, but the training it takes to become an expert is abysmal. In John Lentini's book *"Scientific Protocols for Fire Investigation"* he stated that "training typically consists of a 40-hour "basic arson" school (Lentini 2018)." Someone who only puts 40 hours into something should never be considered an expert in that area. For instance, you would not trust a person who had a quick crash course to perform surgery. You would want to seek out the best of the best to ensure that you were in good hands. Experts should be required to show that they have been in the field for multiple years and have done scientific research backing their claims and experience. It is now 2023 and junk science

and so-called experts are still able to affect court decisions which highlights a major problem in the criminal justice system which needs to be stopped before continuing for another 50 years.

Evaluation

Overall, I greatly enjoyed reading *"Junk Science and the American Criminal Justice System."* Chris Fabricant did an amazing job of presenting the facts on how these junk sciences have been used in the criminal justice system for decades. Throughout the book, Fabricant used several prominent and well-known court cases to show how junk sciences have been a leading cause of innocent convictions. When the author listed trials such as Virginia V. Keith Allen Harward, Texas V. Steven Mark Chaney, and the case of Ted Bundy, he gave the reader all the details regarding cases including a detailed description of the crime that was committed and how junk science was used to convict people since the early days of forensic science. Towards the end of the book the reader is presented with a "happy ending" where the Innocence Project is able set a lot of the people free whose cases were talked about at the beginning of the book, but the overall book ends with the author saying that there is still more to be done until junk science is never allowed to be used in the court room.

While I think overall the author did a great job presenting the topic with evidence and examples. I believe that the author could do a better job organizing the overall layout of the book, making it easier for readers to remember the information. While the book mainly talks about bite mark evidence throughout the book, it did offer information on other junk sciences which I felt were sometimes randomly thrown into parts of the book. For example, in one part the author is talking about bite mark evidence and then goes onto a sidebar for a sentence or two about bullet lead analysis or hair microscopy. I think it would have been easier for the reader to retain information through the use the chapters for each different type of junk science and give

all the information on how it came to be, cases, and how people were wrongfully convicted. The author did this during his telling of how the NAS Report came to be, and it would have been nice if it was used throughout the book. While reading I found myself having to go back to the beginning of the book to remember what case or who the author was talking about when he gave only the last name of the person. If the information was given through chapters of each field, it would have made it easier to match people with the topics throughout the book. While the he did a great job going in depth on mainly bite mark analysis, and a couple of pages on arson investigations. Other types of junk sciences were either only talked about for a couple of sentences or not at all, which could leave readers wanting more.

As a Computer Science student who does not plan on pursuing a field in the criminal justice system, Chris Fabricant keeps me hooked in for the entirety of the book and it never felt like there was a dull moment. This was the first time in a while where I was able to enjoy reading an "assigned reading" and finish it within a day or two. I would recommend this book to anyone wanting to learn more about junk sciences and their effects on the Criminal Justice System. I feel that anyone going into the criminal justice field should read this book to be able to recognize junk sciences and get it out of the criminal justice system.

Conclusion

"Junk Science and the American Criminal Justice System" and its author Chris Fabricant provides an in-depth look at forensic science which is based in history and experience rather than data and science. Junk science has aided the criminal justice system in putting over 375 innocent people in prison and is still admittable in courts across the nation. The criminal justice system must back actual science and having actual evidence in courts, and finally take the killing blow on junk science.

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