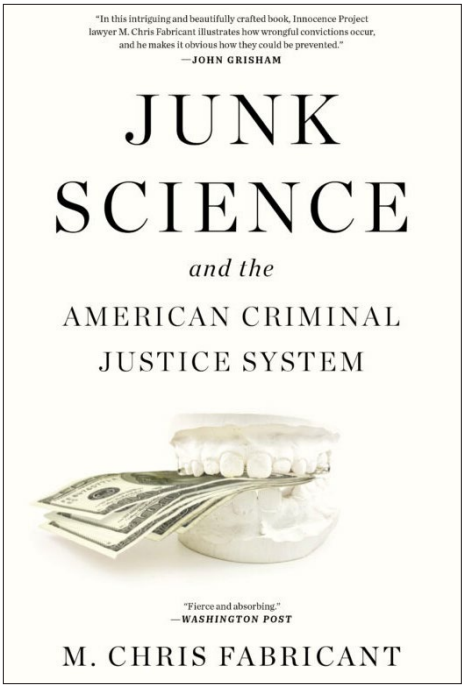

Book Review

Junk Science from Our Courts and Elsewhere

A Review of *Junk Science and the American Criminal Justice System*

Reviewed by Lieutenant Commander J.C. Lundberg

She blinded me with science . . . and hit me with technology.[1]

Junk Science and the American Criminal Justice System[2] (*Junk Science*) outlines the history of pseudoscience's beguiling of our courts. The book's principal focus is "bite mark analysis, but it just as easily could have been shaken baby syndrome, arson investigation, hair microscopy, bullet lead analysis, polygraphs, voice spectrometry, handwriting, [or] bloodstain pattern analysis."[3] M. Chris Fabricant lays out a compelling case for why these techniques have been sufficiently discredited that they have no place in our justice system. At first blush, the bite mark analysis focus seems to limit his ability to speak more broadly to the book's titular issue. The opposite is true. That focus allows Fabricant to guide his audience through a confrontation with the reality of what is being done in our collective name.[4]

The still-growing consensus is that many forensic "sciences" are science in name only.[5] Despite that fact, countless guilty verdicts underlying ongoing prison sentences—and more than one execution[6]—were built on the foundations of these junk sciences.[7] Fabricant's recounting of this troubling history provides important background on a likely gap in most attorneys' knowledge. This is especially so not only because remediating the consequences of courts' adoption of junk science remains a live issue in appellate courts but also because the principles undergirding the efforts to undo those harms have a substantially broader application than the narrow criminal justice context.

Three Decades of Harm

Junk Science opens with a graphic description of a Sailor's 1982 murder of Jessee Perron and the "hours of sexual torture" he then inflicted on Teresa Perron.[8] Keith Allen Harward, a junior Sailor from the USS *Carl Vinson* (CVN-70), was wrongfully convicted of these offenses.[9] This was one of the early major cases involving bite mark evidence, a "science" that exploded into the public consciousness during the 1979 trial of Ted Bundy.[10] Fabricant recounts Harward's efforts to fight his wrongful conviction, which finally succeeded in 2016 when the Virginia Supreme Court declared him innocent based on DNA testing.[11] *Junk Science* probes the decades between Harward's conviction—as well as the convictions in several other anchor cases—and his exoneration, including the discrediting of bite mark identification as a discipline.[12] It does so admirably and relies on two lines of argument. The first is the stories of those who were wrongfully convicted and then often—but not uniformly—formally exonerated. The second is formal proceedings to determine which disciplines constitute the kinds of science on which our courts should rely; this is largely, but not exclusively, a look inside the National Research Council of the National Academies' Committee on Identifying the Needs of the Forensic Science Community (NACINFSC).[13]

These two threads repeatedly diverge and re-twine throughout the text, which can make following the particulars of a given case or committee difficult. For example, Harward's case is discussed at some length three separate times.[14] Further, all "accompanying" photographs are relegated to a section in the middle of the book rather than being published alongside the text they should amplify.[15] This allows the text to follow a linear chronology, but reorienting to the case's particulars can prove difficult.[16] Fabricant's decision to limit the scope to civilian courts, which handle the overwhelming majority of criminal allegations, is understandable but may make a military reader feel an unwarranted sense of remove from these issues.[17]

Junk Science in the Military Justice System

Harward was convicted by a civilian jury empaneled by the Commonwealth of Virginia rather than a general court-martial (GCM) convened by the Carrier Strike Group commander. However, the same result likely would have been obtained at a GCM. The military justice system has not miraculously avoided conviction and incarceration rooted in junk science. Our case law is sparce on bite mark identification;[18] however, Fabricant asserts that "[a]nother entire book could be devoted to wrongful convictions involving [shaken baby syndrome (SBS), a] largely discredited forensic diagnosis, which is responsible for at least as many miscarriages of justice as bite mark evidence."[19] Military case law for shaken baby syndrome is much

more robust, and convictions rooted in this pseudoscience continue to be upheld.[20]

While military courts continue to rely on junk science like SBS, there is at least one area in which we are ahead of civilian courts in handling junk science. Military Rules of Evidence (MRE) 707 expressly prohibits the admission of "the result of a polygraph examination, the polygraph examiner's opinion, or any reference to an offer to take, failure to take, or taking of a polygraph examination."[21] The question of "lie detector" evidence's admissibility goes back over 100 years and led to the creation of the *Frye* test.[22] In civilian courts, it remains somewhat permissible—at least in some limited circumstances—to admit polygraph results.[23] Military courts' original handling of polygraphy offers a good way ahead when handling the junk sciences that Fabricant flagged. Before MRE 707 was promulgated, the then-Court of Military Appeals grappled with a defendant's effort to admit the exculpatory results of a polygraph.[24] The court articulated three tiers of scientific evidence: (1) those which "are so judicially recognized that it is unnecessary to reestablish those principles in each and every case" such as "fingerprint, ballistics, or x-ray evidence"; (2) "that range of scientific and technical endeavor that can neither be accepted nor rejected out of hand"; and (3) "[a]t the bottom lies a junk pile of contraptions, practices, techniques, etc., that have been so universally discredited that a trial judge may safely decline even to consider them, as a matter of law. To that level have been relegated such enterprises as phrenology, astrology, and voodoo."[25] The *Gipson* court failed to articulate what *Junk Science* does at some length: the contents of these three tiers are not and cannot be seen as fixed. Since 1987, bite mark identification has—or at least should have—fallen to the junk science pile while DNA analysis has risen into the category of universal recognition. The consequences of this continual filtering remain areas of ongoing litigation in America's highest courts.

Junk Science is a worthwhile read. This is especially true for military justice practitioners at the trial and appellate level, so they can see the likely path ahead for concepts like SBS. It is also true for judge advocates who advise commanders on military justice and those willing to look beyond the four corners of the text and apply its principles more broadly.

The Supreme Court Recently Flagged Junk Science as an Issue

Fabricant, a twelve-year veteran of the Innocence Project, anchors his text in the history of individual cases, including those where his own clients sought exoneration. This reckoning with the true human cost of junk science—both for those wrongfully convicted as well as for victims and their loved ones who were robbed of the opportunity to see actual justice—is a large part of the apparent purpose of *Junk Science*. In the same spirit, I offer the following background. In 1985, Charles McCrory was convicted of murdering his wife, Julie Bonds, and sentenced to life in confinement.[26] In July 2024—two years after *Junk Science* was released—the Supreme Court of the United States declined to review Alabama's decision to uphold McCrory's conviction even though the expert proponent of the sole physical evidence tying him to her corpse—a bite mark on her arm[27]—not only recanted his testimony but also stated he "no longer believe[s] individualized teeth marks comparison testimony" (the kind of testimony he provided at McCrory's trial) is either "reliable or proper."[28]

Dr. Richard Souviron, a forensic odontologist (i.e., a forensic dentist), originally testified about two small wounds found on Bonds's arm, stating an "expert opinion" that McCrory was the source of the bite marks.[29] Despite Souviron's recantation at the 2019 post-conviction proceeding, and the testimony of two other forensic odontologists, Alabama upheld McCrory's conviction on the grounds that a jury, composed of people without any special knowledge of, training in, or exposure to the relevant science, "had the ability to compare the physical evidence of the photographs of the injury to the victim's arm and the mold of the defendant's teeth for themselves and thus conclude that the defendant's teeth matched the marks of the injury."[30] Put more simply, even though there was no true basis in fact for the panel to match a bite mark to any particular defendant's teeth, McCrory's jury might have believed there was *and* also believed that his teeth matched the bite mark on Bonds's body. He will remain in confinement indefinitely.

Although the Court denied his petition, Justice Sonia Sotomayor took the opportunity to speak about the plight of "innocent people convicted based on forensic science that the scientific community has now largely repudiated."[31] She noted that "[a] court has a variety of tools to test the reliability of forensic evidence introduced in criminal trials today. Yet when a court must look backward, to convictions resting on forensic evidence later repudiated by the scientific community, those tools may fail."[32] Justice Sotomayor ends her statement by noting that the questions McCrory raises have "not yet percolated sufficiently in the lower courts to merit this Court's review. There is no reason, however, for state legislatures or Congress to wait for this Court before addressing wrongful convictions that rest on repudiated forensic testimony."[33] This mirrors Fabricant's implicit thesis: more action is needed to undo the damage done by our courts' reliance on junk science. He stops his argument there, but the underlying reasoning has a much broader scope. There is no reason to limit the application of junk science in our courts but to allow it free rein elsewhere.[34]

Applying the Text's Conclusions Outside the Courtroom

Junk Science's scope is limited to America's criminal justice system, but the principles it raises do not. First and foremost is the recognition that not all science is junk science. Fabricant has a few brief moments where that counterpoint is presented, like his discussion of "dentists' legitimate forensic work: identification of human remains through dental records"[35] or "the potential of DNA evidence to upend the criminal justice system."[36] Devoting a few pages to both identify some of the best examples of good science and articulate the principles that distinguish good science from junk science would have improved the book.[37] As it stands, even most positive examples seem problematic for Fabricant; forensic dental identification offers a "Trojan horse" for bite mark identification.[38] Only DNA evidence, the bread-and-butter of the Innocence Project, appears above his reproach.[39] Perhaps part of the reason for this—aside from the facial problems with junk science's wrongful convictions—is that forensic science seems to be assuming a growing place in criminal justice. Popular conceptions of the justice system focus on forensic techniques in part because they make for engaging television. While many commentators opine that the "CSI effect"—named for *CSI: Crime Scene Investigation* and its four spin-off series—has "twisted society's perception in what should be present at a trial to prove someone guilty."[40] Ironically, the data do not support the CSI effect, and judicial efforts meant to remedy it instead exacerbate the issue.[41] Fabricant puts it more succinctly: "faith in the forensics depicted in [the] popular TV series [CSI] . . . [has] been misplaced. CSI is fiction."[42] So too is the faith we place in junk science more broadly.

Removing that misplaced faith must be an ongoing effort and will require a shift in the public understanding of science. "Science is more than a body of knowledge. It is a way of thinking; a way of skeptically interrogating the universe with a fine understanding of human fallibility."[43] The history outlined in *Junk Science* does not reflect courts' growing understanding of this distinction so much as it reflects courts' recognition that the body of scientific knowledge does not, in fact, include certain things.[44] Much like expanding the idea of literacy to encompass media literacy,[45] science education has shifted to trying to instill a sense of science literacy.[46] For those whose primary and secondary education has ended, those pedagogical changes will not reshape their understanding of science. Instead, an affirmative effort to reframe one's philosophy of science is necessary on both individual and organizational levels.

The military—and the Federal Government more broadly—continues to spend time, money, and energy on junk science.[47] While MRE 707 protects military courts from polygraph pseudoscience, it remains in the security clearance process.[48] Polygraphy was already beyond the pale when NACINFSC published their 2009 report on the forensic sciences; it had been covered at length in a 2003 report on its uses in and out of court.[49] That report found that a polygraph's "accuracy in distinguishing actual or potential security violators from innocent test takers is insufficient to justify reliance on its use in employee security screening in Federal agencies."[50] *Junk Science* offers a call to the Department of Defense—and the rest of our Government—to better align practices and policies with these data.

Conclusion

Extricating junk science from not only our courts but also our society generally is a daunting and continual process. Fabricant effectively highlights a narrow sliver of that project and the harrowing, decades-long effort for some people to vindicate their ongoing assertions of innocence. His personal involvement in some of those cases provides a valuable human-scale look at the realities of those efforts (e.g., a recess of more than a year during an evidentiary hearing after a case was remanded for a third time).[51] That proximity cuts both ways. It seems to color his appraisal of some scientific techniques and reflects a less-than-objective approach to the subject.[52] Despite these shortcomings, *Junk Science* is a worthwhile read. This is especially true for military justice practitioners at the trial and appellate level, so they can see the likely path ahead for concepts like SBS. It is also true for judge advocates who advise commanders on military justice and those willing to look beyond the four corners of the text and apply its principles more broadly. **TAL**

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Notes

1. Thomas Dolby, *She Blinded Me with Science*, *on* The Golden Age of Wireless (CD, EMI Records Ltd. 1983).

2. M. Chris Fabricant, Junk Science and the American Criminal Justice System (2022).

3. *Id.* at 26.

4. This is especially true in jurisdictions like California, Illinois, Michigan, and New York, where the official caption of a criminal case is "The People of [Jurisdiction] v. Defendant." For further discussion of this approach to titling criminal cases, see Jocelyn Simonson, *The Place of "The People" in Criminal Procedure*, 119 Colum. L. Rev. 249 (2019).

5. *See generally* Nat'l Rsch. Council of Nat'l Acads., Strengthening Forensic Science in the United States: A Path Forward (2009).

6. *See, e.g.*, Paul Giannelli, *Junk Science and the Execution of an Innocent Man*, 7 N.Y.U. J. L. & Liberty 221 (2013); Steve Mills & Maurice Possley, *Texas Man Executed on Disproved Forensics: Fire that Killed His 3 Children Could Have Been Accidental*, Chi. Trib., Dec. 9, 2004, at C1; Texas Forensic Sci. Comm'n, Final Report on Complaint No. 09.01, The Innocence Project for Cameron Todd Willingham & Ernest Ray Willis (Texas State Fire Marshall's Office; Fire Debris/Arson) (2011).

7. Fabricant, *supra* note 2, at 287. Please note that throughout this review, the phrase "junk science" is intended to convey not only the specific discredited techniques listed above but unfounded methods or assertions that may be presented in the language of science but do not in fact constitute "true" science because their methods do not comply with the scientific method. Both in the junk sciences listed above and more generally, the two largest issues that are liable to make something a junk science are replicability and bias. *See generally* Karl Popper, The Logic of Scientific Discovery 18 (2d ed. 2005) ("I shall certainly admit a system as empirical or scientific only if it is capable of being tested by experience. These considerations suggest that not the verifiability but the falsifiability of a system is to be taken as a criterion of demarcation [between science and non-science.]").

8. Fabricant, *supra* note 2, at 12–21. Perron's three children, all of whom were under the age of four, were asleep in the next room and the assailant threatened similar sexual violence against her children if she resisted. She was able to identify her assailant as a Sailor—because he was wearing a uniform—and give a rough description including the fact that he was clean shaven. *Id.*

9. *Id.* at 24–25. The ship's commanding officer provided Newport News law enforcement 1,300 dental records to compare bite marks the assailant made on Perron's thighs. Haward's indictment came after congressional pressure to identify a perpetrator and despite the facts that (1) Perron did not pick him from a line-up, (2) he wore a moustache, and (3) the original dental records review did not identify him as a match. *Id*. at 16–17.

10. *Id.* at 43–53.

11. Louis Llovio & Frank Green, *After 33 Years, Keith Allen Harward Walks Out of a Va. Prison a Free Man*, Richmond Times-Dispatch (Apr. 8, 2016), https://richmond.com/news/local/crime/article_4c8094e7-a230-54ba-b912-901de1e03a45.html [https://perma.cc/M96P-6HN6].

12. *See* Fabricant, *supra* note 2, *passim*. This is somewhat of a misstatement of his scope since some cases discussed (like Ted Bundy's first Florida trial or People v. Marx, 54 Cal. App. 3d 101 (1975), the first case in which bite mark evidence was admitted) predate Harward's conviction, but the overwhelming majority of his analysis is focused on the early '80s through the mid- to late-2010s.

13. *See* Fabricant, *supra* note 2, *passim*. This second line of argument also covers proceedings at the Texas Commission on Forensic Sciences, which had a narrower scope than NACINFSC and looked at the results of specific cases rather than at the purported sciences without a tie to a specific individual.

14. Fabricant, *supra* note 2, at 11–25, 241–46 and 272–79.

15. *See id.* at 195 *et seq.* (the photo pages are unnumbered but follow the text ending at page 194).

16. *See* Christopher Chan, *Book Review*: Junk Science and the American Criminal Justice System, Strand Magazine (Feb. 2, 2023) (book review), https://strandmag.com/book-review-junk-science-and-the-american-criminal-justice-system [https://perma.cc/U9LW-MESK].

17. The sole mention of "court-martial prosecutions" comes in the testimonial history of putative expert in forensic odontology, Lowell Levine, who had "been qualified as an expert in nine states, the District of Columbia, and several court-martial prosecutions." Fabricant, *supra* note 2, at 21.

18. In the sole military case concerning bite mark identification, the Court of Military Appeals concluded "from the testimony hat [sic] the tests employed by the expert were sufficiently established to have gained general acceptance in the field." United States v. Martin, 13 M.J. 66, 67–68 (C.M.A. 1982). Corporal Martin was sentenced to reduction to E-1, a dishonorable discharge and thirty years of confinement at hard labor. *Id.* at 66.

19. Fabricant, *supra* note 2, at 234; *see also* Niels Lynøe et al., *Insufficient Evidence for 'Shaken Baby Syndrome' – A Systematic Review*, 106 Acta Pædiatrica 1021 (2017) ("The systematic review indicates that there is insufficient scientific evidence on which to assess the diagnostic accuracy of the triad in identifying traumatic shaking (very low-quality evidence)," and "there is limited scientific evidence that the triad and therefore its components can be associated with traumatic shaking (low-quality evidence)."). For reasons of length, this discussion is limited to SBS but surveying junk sciences and their acceptance in the military justice system is an area that merits further exploration.

20. *See, e.g.*, United States v. Albarda, No. ACM 39734, 2021 CCA LEXIS 75 (A.F. Ct. Crim. App. July 7, 2021) (finding that the defendant's conviction for assault consummated by a battery was legally and factually sufficient without analysis or discussion); United States v. Rodriguez, No. 201500247, 2017 CCA LEXIS 42, at *2 (N-M. Ct. Crim. App. Jan. 30, 2017) (finding no merit in an assertion that "the evidence is legally and factually insufficient to support a conviction for aggravated assault with means or force likely to produce death or grievous bodily harm").

21. Manual for Courts-Martial, United States, M.R.E. 707(a) (2024).

22. Frye v. United States, 293 F. 1013, 1013–14 (D.C. Cir. 1923) (finding that the results of a "systolic blood pressure deception test" had not yet "gained general acceptance in the particular field in which it belongs" and were therefore inadmissible). As an interesting aside, William Moulton Marston—the creator of Wonder Woman—and Elizabeth Holloway Marston—his wife and the inspiration for Wonder Woman—developed the systolic blood pressure measurement device and deception test protocol. *See generally*, Andrew H. Malcolm, *She's Behind the Match For That Man of Steel*, N.Y. Times, Feb. 18, 1992, at B6.

23. *See, e.g.*, *Criminal Resource Manual,: 262. Polygraphs—Introduction at Trial*, U.S. Dep't of Just., https://www.justice.gov/archives/jm/criminal-resource-manual-262-polygraphs-introduction-trial [https://perma.cc/2DKQ-QJS3] (last visited July 3, 2025); *When Are Polygraph (Lie Detectors) Results Admissible?*, Greg Hill & Assocs., https://www.greghillassociates.com/when-are-polygraph-lie-detectors-results-admissible.html [https://perma.cc/C87L-A7DT] (last visited July 3, 2025).

24. United States v. Gipson, 24 M.J. 246, 249 (C.M.A. 1987).

25. *Id.* at 249.

26. Associated Press, *Supreme Court Refuses to Hear Bite Mark Case Involving Alabama Inmate*, CBS 42 (July 2, 2024 1:23 PM), https://www.cbs42.com/alabama-news/supreme-court-refuses-to-hear-bite-mark-case-involving-alabama-inmate (on file with The Army Lawyer).

27. Petition for Writ of Certiorari for Defendant at 1, 10, McCrory v. Alabama, 144 S. Ct. 2483 (2024) (No. 23-6232).

28. *Id.* at 12.

29. *Id.* at 10.

30. *Id.* at 23 (quoting Alabama v. McCrory, No. CC-1985-164.61 (Al. Covington Cty. Cir. Ct. Feb. 14, 2022)).

31. *McCrory*, 144 S. Ct. at 2483 (Sotomayor, J., concurring).

32. *Id*.

33. *Id.* at 2489.

34. Of course, the stakes are incredibly high in the justice system, so our standards should be high as well. But there are high stakes elsewhere and even when an issue is not so weighty as execution or incarceration, junk science remains a poison that taints the decision that relied on it.

35. Fabricant, *supra* note 2, at 34.

36. *Id*. at 96.

37. *See* Chan, *supra* note 16.

38. Fabricant, *supra* note 2, at 34.

39. *Research Resources*, Innocence Project, https://innocenceproject.org/research-resources [https://perma.cc/586S-XW2N] (last visited July 3, 2025) ("Much of the Innocence Project's work focuses on cases where DNA evidence . . . is central to the case . . . .").

40. Natalie Downie, *Opinion: How the "CSI Effect" Is Ruining the Justice System*, Exponent: Univ. of Wisconsin-Platteville (Nov. 29, 2023), https://uwpexponent.com/opinions/2023/11/29/opinion-how-the-CSI-effect-is-ruining-the-justice-system [https://perma.cc/A5M4-KCLY]; *see also* Arun Rath, *Is The 'CSI Effect' Influencing Courtrooms?*, NPR (Feb. 5, 2011, 7:30 PM), https://www.npr.org/2011/02/06/133497696/is-the--effect-influencing-courtrooms.

41. Jason Chin & Larysa Workewych, *The CSI Effect*, *in* Oxford Handbooks Online (Markus Dubber, ed. 2021).

42. Fabricant, *supra* note 2, at 160–61 (internal quotation marks omitted).

43. Charlie Rose: *Geoffrey Rush; Dwight Yoakam; Remembering Carl Sagan* (PBS television broadcast, aired Dec. 20, 1996).

44. Or, indeed, that it intentionally excludes them.

45. *See e.g.*, Päivi Rasi et al., *Media Literacy Education for All Ages*, 11 J. Media Literacy Educ. 1 (2019); Aytac Gogus et al., *General Approaches of Adults on New Media Literacy: A National Survey Study*, 29 Educ. & Info. Tech. 9937 (2024).

46. Doughlas Allchin, *From Science Studies to Scientific Literacy: A View from the Classroom*, 23 Sci. & Educ. 1911 (2014).

47. This is not meant as an indictment of any failed or fruitless primary research or attempts at novel technology or cutting-edge engineering. Those failures are part and parcel to advancement.

48. *See, e.g.*, National Reconnaissance Office, *Security Clearance Process*, U.S. Intelligence Community Careers, https://www.intelligencecareers.gov/nro/security-clearance-process [https://perma.cc/3BLE-PXBF] (last visited July 3, 2025).

49. Nat'l Rsch. Council of Nat'l Acads., The Polygraph and Lie Detection (2003).

50. *Id.* at 6.

51. Fabricant, *supra* note 2, at 308.

52. As an example, he discounts case studies as merely "weaving" "what audiences find memorable and persuasive . . . into a good story with strong visuals and descriptive detail is key." *Id.* at 223. A double-blinded study will always be the gold standard in science; that simply isn't always possible and documenting what was found in a unique case is also a way of moving the field forward. *See, e.g.*, Tineke A. Abma & Robert E. Stake, *Science of the Particular: An Advocacy of Naturalistic Case Study in Health Research*, 24 Qualitative Health Rsch. 1150 (2014) ("[T]he naturalistic case study can have extraordinary value in health research, and is useful from a variety of perspectives."); *see also* D. A. Verkuyl, *Oral Conception. Impregnation via the Proximal Gastrointestinal Tract in a Patient With an Aplastic Distal Vagina. Case Report*, 95 British J. of Obstetrics & Gynaecology 933 (1988).