



## Retraction of a peer reviewed article suggests ongoing problems with Australian forensic science

## ARTICLE INFO

## Keywords

Shaken baby syndrome  
Abusive head trauma  
Forensic science  
Scientific publishing

## ABSTRACT

We describe events arising from the case of Joby Rowe, convicted of the homicide of his three month old daughter, and explore what they illustrate about systemic problems in the forensic science community in Australia. A peer reviewed journal article that scrutinized the forensic evidence presented in the Rowe case was retracted by a forensic science journal for reasons unrelated to quality or accuracy, under pressure from forensic medical experts criticized in the article. Details of the retraction obtained through freedom of information mechanisms reveal improper pressure and subversion of publishing processes in order to avoid scrutiny. The retraction was supported by the editorial board and two Australian forensic science societies, which is indicative of serious deficiencies in the leadership of forensic science in Australia. We propose paths forward including blind peer review, publication of expert reports, and a criminal cases review authority, that would help stimulate a culture that encourages scrutiny, and relies on evidence-based rather than eminence-based knowledge.

## 1. Introduction

Despite many attempts, there are no definitive criteria for distinguishing science from non-science, but there are features that are generally agreed to be characteristic of science, including independent replication and openness to scrutiny and criticism. It is argued by philosopher of science Paul Hoyningen-Huene that “scientific knowledge differs from other kinds of knowledge ... by its higher degree of systematicity” [1]. These characteristics exist because of systems that create appropriate incentives.

*Forensic science* spans a wide spectrum of analyses to support the presentation of evidence to courts, including methods from many sub-disciplines of biology, chemistry, materials and medical sciences. It is distinguished from other areas of science not by its subject matter but by its goals. Forensic science benefits from the respect that science enjoys for objectivity, accuracy and measures of confidence in deriving new knowledge, but we argue here that it can lack some of the systematic features that have earned science this respect. These include an openness to scrutiny, competition among many independent participants, incentives for criticism and amelioration, and funding streams that are not threatened by unwelcome results.

In this article, problems in forensic science in Australia are highlighted through events following the conviction of Joby Rowe in Melbourne, in 2019. Rowe was found to have violently shaken his infant daughter, resulting in her death. Shaken Baby Syndrome (SBS) was diagnosed (nowadays often called Abusive Head Trauma, AHT, without external signs of trauma [2]), based on a “triad” of medical findings of subdural haemorrhage, retinal haemorrhage, and encephalopathy. There was no eyewitness evidence, no history of violence and no signs of injuries to indicate that an assault had occurred. The case was described

by one of the experts involved as “the first successful conviction for a ‘triad only’ case in [the state of] Victoria” [3].

A commentary article [4] (*Brook 2019* hereafter), published in the Australian Journal of Forensic Science (AJFS), critically examined the scientific basis for SBS/AHT, focusing on the Rowe case. The article scrutinized the evidence given by three highly credentialed forensic medical experts (the *experts* hereafter). According to the editor of the AJFS, *Brook 2019* was reviewed by individuals “of high standing in their respective disciplines” and “the correct editorial processes” were followed [5]. However, the paper was later retracted by AJFS under circumstances that highlight serious problems in the way forensic science is practiced in Australia.

Here we will not revisit the validity and reliability of SBS/AHT diagnoses, but focus on the deviations from internationally established scientific norms in the retraction of *Brook 2019*. We first describe the circumstances of the retraction, then outline systematic failings of which the retraction is symptomatic. Finally, we point to ways in which forensic science can improve through better systems, such as publication of expert reports, increased peer review, and a criminal cases review authority. New principles and systems are needed to incentivize a culture of increased scientific quality through more openness and encouragement of review and criticism.

## 2. The retraction

After *Brook 2019* was published, a senior pathologist who worked at the forensic medicine institute of one of the *experts* phoned the editor to complain about the article and, according to the editor, expressed surprise that the editor “hadn’t brought it to their attention earlier” [6]. The boss of another of the experts, who had signed off on the report of the

<https://doi.org/10.1016/j.fsisy.2021.100208>

Received 20 September 2021; Received in revised form 21 October 2021; Accepted 25 October 2021

Available online 30 October 2021

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expert and so was party to the work being criticized, wrote to the editor asking for the article to be retracted, and expressing concern “that the journal’s clear and explicit criticism of decisions made in the Victorian Supreme Court might impact future prosecutions, particularly prosecutions for child homicide.” [7] The editor suggested that they arrange to meet, with boss of the *expert* agreeing to meet to talk to the editor “about the peer review process and editorial decision making” [8].

Such phone calls and meetings are not part of a proper post-publication discussion process and should not occur in an open science system. Further, the individuals who contacted the editor outside usual scientific channels were more senior forensic scientists than the editor, creating an opportunity for improper pressure.

One of the *experts* thought it “extraordinary (and alarming) that this journal would publish this paper without consulting” [9] her or the other experts from the case. It is, however, neither extraordinary nor alarming but an established part of a robust scientific system. The editor should not consult experts before publishing criticism of their work, to avoid undue pressure that might stifle fair criticism. The review is instead performed by disinterested, external, experts acting as referees. The standard process is that if an unfair criticism or an error survives this review, those criticized or others can write a post-publication response (a letter to the editor) to which the original authors are offered an opportunity to reply.

The editor offered the *experts* an opportunity to publish a response alongside the original article. Two of the experts proposed to write a response on the condition, contrary to scientific norms, that the original author Dr Brook be denied a right of reply [10]. The editor then suggested that the *experts* publish a “commentary” (rather than a “response”) thus avoiding the presumption of a right of reply: if Dr Brook did reply, the editor could use his “discretion as to whether it would be published” and he would “prefer to not do so” [11]. The “commentary” was titled “In response to Brook C *Is there an evidentiary basis for shaken baby syndrome? The conviction of Joby Rowe* AJFS 2019” making it clear that it was a response to Brook 2019.

Meanwhile, two experts from outside Australia (co-authors of the present paper) who have published extensively in the field, and had no connection with the Rowe case, independently wrote a letter to the editor in support of Brook 2019. The editor planned to send that letter to referees, thus treating these independent experts differently from the *experts* who had a vested interest and who had applied pressure on him from outside of the system.

Ultimately, neither the response from the *experts*, nor the letter to the editor from the independent experts in favour of the article, were published.

### 2.1. Legal threats

The *experts* also complained to the editor that the reviewers had not been provided with the trial transcripts [12]. In the editor’s view, this was “akin to sending out pdfs of a reference list of a paper” [13] and thus “unrealistic”. He went on to say “I trust in my reviewers to undertake appropriate measures to provide a thorough review process.” [14] The *experts*, however, considered this an editorial failing and requested that the editor “make an apology for failing to ensure rigorous review standards were applied”. They added: “We view a failure to do this at the same time as publishing our names, professional positions and workplaces, as completely irresponsible. If the acknowledgment and apology we have requested does not accompany our response, our next action will be to seek advice as to possible legal remedies.” [15] The institute’s lawyers were copied into the email.

This was not the only legal avenue considered by the *experts*, one of whom was “wondering about contempt of court etc” [16]. Dr Brook also received a series of emails from the Chief Legal Officer of the university hospital that employs one of the *experts*, making enquiries as to how he gained access to medical expert reports referred to in a blog, which were in fact acquired legally. Further, another one of the *experts* contacted a

police officer, who sent her Dr. Brook’s personal details and information pertaining to his background, and looked into whether he had any personal links to Joby Rowe or other people convicted of similar crimes [17].

Later, a journalist from a major Australian newspaper wrote an article about the retraction of the article and asked the *experts* for their side of the story. One of the *experts* contacted police [18], and a senior police officer phoned the editor of the newspaper to prevent the publication, citing concerns that it could influence an upcoming new SBS case for which one of the *experts* would provide evidence [19].

### 2.2. Article retraction

In response to the threat to “seek advice as to possible legal action”, the editor contacted the publisher, Taylor and Francis, and together they agreed to retract the article, telling Dr Brook that “the decision to remove the article was made due to legal concerns – specifically, libel concerns” [20] and stating that it was “not factual inaccuracies that led to its removal.” [21] However, no threat of defamation or libel had been made. Regarding the threat by the *experts* to “seek advice as to possible legal remedies”, the publisher was “slightly unclear on what exactly they may seek advice about” [22] and stated that “there’s no specific legal threat” [23]. It appears that the guise of a defamation threat was used to retract the article without having to follow the guidelines of the Committee for Publishing Ethics (COPE) that the journal officially adhered to, which outline a system for retractions.

Even if threats of defamation were the real reason for the retraction, that should be a decision of the publisher, not the editor. If a defamation threat had been made, the role of the editor should be to try to defend the integrity of the journal and its editorial and refereeing processes.

The real reason for retraction emerges from emails between editor and publisher. The editor states that “I don’t think he is entirely wrong in what he is saying - it’s how he said it + his deliberate harassment of the authors and their colleagues after that’s the real problem.” [24] This seems to refer to emails that were sent by Dr. Brook to the experts, notifying them of the acceptance of the paper and later questioning why their prestigious institutes continued to provide evidence that, in the opinion of Dr. Brook, amounted to junk science. Discussion through email is part of scientific discourse, which is why corresponding authors of published articles provide a professional email address. Receiving an email that questions or criticizes a result or finding is part of the scientific process. Perhaps “harassment” also refers to blog posts that criticized the testimony of the experts in the Rowe case and others. The blog posts scrutinize the scientific foundations of the evidence provided, which is not “harassment”.

The COPE guidelines for ethical publishing state that the main purpose of retractions is “to correct the literature and ensure its integrity rather than to punish authors who misbehave.” [25] COPE further advises that “This underlying principle can be difficult to remember when tensions run high in handling ethics cases and their ultimate retractions or corrections, but reminds us that our ultimate purpose as shepherds of the literature is to uphold its integrity.” [26] The guidelines give no justification for the editor, the publisher, and the *experts* to be exchanging emails about Dr. Brook’s emails and blog posts, and no justification for the retraction.

The editorial board of the AJFS were aware of the circumstances of the retraction, yet they endorsed the decision and then refused to respond to enquiries about it. The AJFS is the official journal of the Australian Academy of Forensic Science (AAFS). There is no justification for an Academy to support the retraction of a journal article outside the COPE guidelines. It not only refused to provide reasons for its support, but also refused to conduct a review of the process. The AJFS is also the official journal of the Australian and New Zealand Forensic Science Society whose president is on the editorial board. When the retraction was raised, the president stated that there was nothing he could do as Dr. Brook was not a member of the society. That both these major Australian

forensic science organisations refused to act against, or even to review, improper editorial behaviour at their own journal raises serious questions about the leadership of forensic science in Australia.

One of the complaints made about *Brook 2019* was that the *experts* claimed that they “are not prosecution witnesses, as attested to by Brook. We are witnesses for the court.” This was a response to the statement in the article that “three expert witnesses testified for the prosecution”, which is an accurate description of the adversarial system in which some witnesses testify for the prosecution, some for the defence.

Despite proclaiming their independence and duty to the court, when *Brook 2019* was published the *experts* contacted both the police and the Office of Public Prosecution but not the court. Forensic science institutes need to have working relationships with police and prosecutors, but these should be managed to ensure independence. According to the Deputy Director of the Forensic Science Division of the Victorian Institute of Forensic Medicine, when criminal investigations occur it “could be argued the pathologist finds themselves working for the police.” [27] The Deputy Director says that “forensic medicine and pathology are probably the last of the forensic sciences to really address the problems of contextual bias including how it applies in regard to interactions with police investigators.” [28] The Deputy Director points to the existence of protocols for tracking interactions between police and forensic doctors, but says there are difficulties in managing these interactions given that “much of the interaction between pathologists and the police is discursive and includes possibility/hypothesis creation” [29].

### 3. Systematic problems in forensic science

Extensive and authoritative reports in the US [30] found serious problems with a range of forensic fields including (but not limited to) hair fibre analysis, arson investigations, blood spatter analysis, and tooth mark comparison. These reports noted that the adversarial legal system has largely failed to identify and correct errors. Forensic hair fibre analysts, for example, provided misleading evidence in thousands of cases over decades [31].

According to Hoyningen-Huene, science operates within systems that serve to identify and to minimize errors. Scientists typically know that their work will be scrutinized, and moreover that “Science is socially organized in a way that systematically supports critical discourse” [32]. This arises due to incentives for scientists to critically question the work of others, which occurs for example because scientists strive to report their results at major conferences where others can attain prestige by asking incisive questions. Forensic scientists are cross-examined by trial lawyers, but even if they ask a key question, they often do not have the expertise to evaluate the response and pose the appropriate follow-up question. Moreover, in court there are no professional peers present to discourage the witness from giving incomplete or potentially misleading answers.

The Rowe case provides an example of the lack of error correction in an expert’s report. Referring to an alternative explanation, as proposed by Geddes and collaborators in a series of papers, for the “triad” of conditions associated with SBS, one expert wrote that “Geddes theory that the triad was caused by hypoxia was rejected by the high court in the UK and has been withdrawn by Dr Geddes” [33]. Similar remarks were made by forensic medical experts as far back as 2009 [34], to which Geddes herself made a published response [35], stating that the “theory that we proposed [36] is that profound hypoxia in the presence of raised central venous pressure, not hypoxia alone, can lead to subdural bleeding (SDH)” and that “I did not retract our theory, and have never done so – indeed, we have since given further evidence for raised central venous pressure being implicated in the production of SDH<sup>l</sup> [37]<sup>l</sup>”. She cited two recent papers supporting her theory [38,39].

Would this error have happened if reports were open to scrutiny and comment like a scientific paper? The journal that published the error had allowed the record to be corrected in post-publication

correspondence, but there is no similar process for expert reports.

#### 3.1. Accepting standards set by courts

In the expert’s report quoted above, the decision of the UK Court of Appeal was cited as though it carried scientific weight. Similarly, following the Rowe case, the *experts* stated that “complex medical evidence was presented over several days, all of which was subjected to rigorous cross-examination” [40]. However, cross examination is in general not effective in establishing either validity or reliability of scientific evidence. For example, the NRC report states that a number of forensic science disciplines “have yet to establish either the validity of their approach or the accuracy of their conclusions, and the courts have been utterly ineffective in addressing this problem” [41].

The fact that the acceptance of forensic evidence by courts is cited in support of scientific validity highlights a lack of systematic and rigorous standards. Often the initial use of a novel type of evidence is somewhat cautious, but once a court admits the evidence, caution may be discarded in subsequent cases. Past “successes” within the court system can remove the onus for further developmental work to explore the limitations of methods. Thus, for example, fingerprint evidence was widely accepted over more than a century without its limitations being appreciated [42]. Forensic science goes astray when it allows standards to be set by the legal system, rather than a scientific system.

#### 3.2. Appeals to authority

Reviews and criticisms [31] of forensic science have emphasized that credentials and years of experience are not substitutes for proficiency testing and rigorous blind trials. Expert witnesses do typically have considerable experience, but there are often aspects of the evidence outside their expertise and experts are not always proficient in evaluating the weight that should be assigned to various alternative explanations of the evidence.

PCAST [43] states that “an expert’s expression of confidence based on personal professional experience or expressions of consensus among practitioners about the accuracy of their field is no substitute for error rates estimated from relevant studies.” Particularly problematic is medical evidence in which there has traditionally been an emphasis on the authority of experienced clinicians. The phrase “evidence-based medicine” refers to a movement within medical practice away from the opinions of experienced individuals and towards reliance on high-quality studies such as clinical trials. Such a movement has also been active in forensic practice internationally, but there continues to be fields that lack foundations in scientific studies and data rather than professional eminence.

Regarding *Brook 2019*, the *experts* in the Rowe case wrote in their response that “courts require expert witnesses to demonstrate their credentials but may still, nevertheless, challenge the expert both about the relevance of their qualifications and the evidence upon which their opinion is based. Academic fora would be well placed to consider a similar rigorous approach to scrutinising the appropriateness of an author to publish” [44], and that they “challenge Brook’s credibility to criticise ...” [45] Recall that *Brook 2019* was accepted for publication in a *double blind peer review* by reviewers “of high standing in their respective disciplines” [46]. In their response to *Brook 2019*, the *experts* are suggesting that academic journals should make publishing decisions based on credentials, replicating the problematic deference to authority in courts. This response had been circulated for comment and approval to senior members of the prestigious institutions where the two *experts* who authored the response work, including the directors of those institutes, yet it appears that they did not correct this misunderstanding of appropriate forensic science practice.

Further, as quoted above, the director of a major Australian forensic science institute expressed concern that “clear and explicit criticism” of a court decision may “impact future prosecutions”. But this is precisely

why we need criticism of forensic science that is presented in our courts, in order to impact future prosecutions by making them safer.

#### 4. Towards better forensic science

Expert reports written for criminal cases are not subject to effective systems to identify errors. The erroneous representation of the Geddes research discussed above continued years after a correction was made in the literature. Making expert reports public would open them to scrutiny, improving error-detection. Benefits would occur even if the reports were published after the trial, as experts will be aware that their report will be scrutinized by peers as well as by the court. Publication of reports will help prevent the same errors being repeated.

An additional possible avenue for improvement is anonymous, blinded peer review of reports. These could be managed in the same way as papers submitted for publication to academic journals, so the system is well established.

Training that develops and fosters an understanding of the scientific method, preferably through involvement in research projects that lead to publication, should be more broadly adopted throughout the forensic community. As a response to flaws identified in the NRC report, the American Academy of Forensic Science created an Academy Standards Board to ensure that scientific standards are followed across all forensic fields. A similar institution in Australia could contribute to setting standards.

A further critical step to create a mindset among Australian forensic scientists that their work is open to scrutiny is a criminal cases review authority, with wide powers to investigate possible miscarriages of justice. Such bodies exist in comparable legal systems, such as the UK, New Zealand, Canada, many US states and some European countries, but not in Australia.

Perhaps most important is cultural change through incentives for an evidence-based rather than authority-based approach. This will be facilitated if expert witnesses develop more interactions with the wider scientific community. Ultimately, forensic science forms an aid to the justice system and close interaction between the forensic science and legal communities are natural and common. This is reflected in the editorial board of the AJFS, as well as the membership of the AAFS and ASFS, including their office holders, who are a mix of forensic scientists and legal scholars and practitioners. Distinguished scientists without any connections to the Australian legal system should more frequently be invited to participate in Australian forensic science, through editorial boards, review bodies for forensic institutes and as conference speakers and organizing committee members. Universities typically have mechanisms to reward outreach and community service that could incentivize such participation. To make sure that such external invited members are not merely tokenistic, the independent scientists should have specific responsibilities, for example to review methods and procedures according to scientific criteria.

It is also crucial that a criminal cases review authority include members from the scientific community outside forensic science, as well as from the legal and forensic science communities.

#### 5. Conclusions

The demarcation between science and non-science remains a challenging philosophical question. Applying Hoyningen-Huene's perspective on systematicity is illuminating. Forensic science developed as an aid to the legal system, which provides different incentives from general science. Science has systems to detect and reduce errors through scrutiny and critical discourse that are not necessarily mirrored within the legal system. This has led some fields of forensic science to develop a culture and practices that differ from those traditionally found in science, leading to deficiencies that have been highlighted in the NRC and PCAST reports.

The events surrounding the retraction of a properly peer reviewed

journal article point to a forensic science community in Australia that can over-ride scientific publishing processes in order to suppress criticism. Problems exist on multiple levels as reflected by the actions of senior members of esteemed forensic science institutes, by the active involvement of the editor of the AJFS, and by the response of the editorial board of the AJFS and its parent societies.

We encourage the Australian forensic science community to address these issues by incorporating more of science's systems. Our suggested improvements are adequate training of expert witnesses, the publication of reports, anonymous peer review of reports, uniform standards across forensic fields, and the added scrutiny of a criminal cases review authority that includes scientists in its membership. Efforts also need to be made to increase the quality of the justice system's ability to deal with expert reports and evidence, including a reliability requirement [47].

To support such changes a more scientific culture can be facilitated by increasing the cultural ties between forensic science and other scientists through invitations to play roles on forensic organisations, institutions, reviews and conferences [48]. A good scientific culture is a delicate thing: like democracy, it needs the right environment to flourish and this environment needs to be supported through appropriate organisational structures and processes.

#### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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