

**IN THE COURT OF COMMON PLEAS OF WESTMORELAND COUNTY,  
CRIMINAL DIVISION**

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<b>COMMONWEALTH OF PENNSYLVANIA</b>	)	
Respondent,	)	
v.	)	Case No. 482 Crim. 1991
	)	
<b>JOHN KUNCO</b>	)	
Petitioner	)	
	)	

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**AFFADAVIT OF IAIN PRETTY, BDS, MSc, MPH, Ph.D, MFDSRCS**

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Personally appeared before me, the undersigned authority, the witness named Iain Pretty who being first duly sworn, deposed and said:

1. My name is Iain Pretty. I am over the age of eighteen and the information set forth in this Affidavit is based on my personal knowledge and belief. I am a Senior Lecturer, NIHR Clinician Scientist and forensic dentist at the University of Manchester. *See Ex. 1.* I have published numerous scholarly articles, research papers, books chapters, and books on forensic odontology, particularly bite mark identification. *See id.* I have qualified as an expert in the field of forensic odontology and bite mark identification in courts in the following states and countries: England and Wales in Crown Courts, High Courts and Family Courts. I am a member of the following forensic science and forensic odontology organizations and associations: American Society of Forensic Odontology; American Academy of Forensic Sciences; Forensic Science Society; British Association of Forensic Odontology; and British Academy of Forensic Science.

1. I have been requested by John Kunco's attorney, Craig Cooley and the Innocence Project, to review the bite mark photographs and testimony presented during the trial of *Commonwealth v. Kunco*, Case No. 482 Crim. 1991.
2. Mr. Cooley also asked me to review Dr. Sobel's and David's trial testimony and offer an opinion as to whether their testimony is still valid in light of the National Academy of Science's recently released report entitled *Strengthening Forensic Science in the United States: A Path Forward* (NAS Report).
3. I reviewed the following photographs and transparencies:
  - a. Commonwealth Exhibit #18;
  - b. Commonwealth Exhibit #21;
  - c. Commonwealth Exhibit #22;
  - d. Commonwealth Exhibit #23;
  - e. Unmarked color photograph of bite mark on Donna Seaman's shoulder;
4. I reviewed the following reports:
  - a. Dr. David Sobel's July 8, 1991 pre-trial report; and
  - b. Dr. Thomas David's July 8, 1991 pre-trial report;
5. I reviewed the following testimony:
  - a. Dr. David Sobel's trial testimony; and
  - b. Dr. Thomas David's trial testimony;
6. I reviewed the procedural history of Mr. Kunco's case, including his instant and previous state post-conviction petitions.
7. Drs. David Sobel's and David's pre-trial reports and trial testimony are based on the aforementioned photographs and transparencies.

8. I reviewed the NAS Report.
9. Upon reviewing the aforementioned photographs of the bite mark on the victim's shoulder, it is my opinion that there is insufficient detail in the photographs to render an opinion as to whether a known dentition created the bite pattern. This is particularly so for Commonwealth Exhibit #23 — the black-n-white (UV-lighting) photograph taken by Drs. Sobel and David on May 19, 1991, more than five months after the bite mark was originally inflicted. While I agree that the bruising exposed by the UV-lighting reveal a human bite mark, there are insufficient details contained within these marks to enable a comparison of a suspect's dentition for the purpose of positive identification. It can be stated that this is a bite injury with a low forensic value. Any bite mark identification(s) premised on these photographs are therefore inherently unreliable and should not be considered safe.
10. Bite marks must be thoroughly analyzed before any comparison is made to a suspect's teeth. This means that measurements, angles, and other features should be exhaustively studied (and identified on photographs) before the teeth of any suspect(s) are viewed. This provides a modicum of control where the determinations of the forensic value of the bite mark are established prior to the dentist comparing the suspect's bite pattern. In Mr. Kunco's case, due to the insufficient detail in the markings, Drs. Sobel and David could not have accurately determined these measurements. Indeed, while Dr. David testified at length about the measurements of Mr. Kunco's teeth, what is noticeably absent from his testimony are the corresponding measurements from the bite mark on

Donna Seaman's shoulder. Thus, the absence of these measurements renders Drs. Sobel's and David's measurements from the teeth invalid – and hence opinions unreliable.

11. I reviewed Drs. Sobel's and David's pre-trial reports.

- a. In his July 8, 1991 report, Dr. Sobel concluded: "Within a reasonable medical certainty, the bite mark on the back shoulder area of Donna Seaman was made by the teeth of John Kunco."
- b. In his July 8, 1991 report, Dr. David concluded: "After careful consideration it is my opinion... to a reasonable degree of dental certainty that the bite mark found on the victim was produced by the teeth of John Kunco."

12. I reviewed Drs. Sobel's trial testimony.

- a. At trial, Dr. Sobel testified: "I could say that within a reasonable dental certainty, that the bite on the left back shoulder area of Donna Seaman *was in fact inflicted by the teeth of John Kunco ...* I felt comfortable about this decision because there were no inconsistencies that I could come up with at all and everything fit perfectly[.]" NT at 187. Dr. Sobel added that he had "no doubt" that the Kunco inflicted the bite mark and that, next to fingerprinting, *id.* at 188 (emphasis added), "[d]ental identification... is the most accurate form of identification of an individual." *Id.* Dr. Sobel also stated that because "dental identification is based on class and individual characteristics of an individual's teeth... *I'd say we can be very certain that if all these characteristics match, that it is uniquely related to*

*an individual.* The size relationships, the shape of the teeth... the fractured portions of a tooth, the worn areas, all of these taken together create a fingerprint picture of the individual.” *Id.* at 188-89. At the conclusion of his testimony, when the prosecutor asked Dr. Sobel whether his opinion was that the bite mark originated from Kunco, he replied: “The bite mark originated from the teeth of John Kunco.” *Id.* at 189 (emphasis added).

13. I reviewed Dr. David’s trial testimony.

- a. At trial, Dr. David testified that Kunco had “a relatively unique set of teeth,” *id.* at 245, and that there was a “remarkable consistency” between Kunco’s bite pattern and the bite mark on Seaman’s shoulder. *Id.* at 249. Dr. David also described the consistency between Kunco’s bite pattern and the bite mark as “very consistent,” *id.* at 262, and “incredibly remarkable.” *Id.* at 250. Dr. David offered the following opinion regarding the bite mark’s origin: “It is my opinion, to a reasonable degree of dental certainty, that the mark in question is indeed a human bite mark. It is also my opinion, to a reasonable degree of dental certainty, *that the bite mark was made by the teeth of the defendant, John Kunco.*” *Id.* at 265 (emphasis added).

14. It is important to recognize what Drs. Sobel and David are claiming; they claimed that they could examine a bite mark — a five-month-old bite mark in this case — and determine whether a known biter (or dentition) inflicted the bite mark. In short, they claimed to be able to *individualize* a known biter (or bite pattern) to a

bite mark to the exclusion of all other biters (or bite patterns) who could have had access to the victim.

15. As a practicing, forensic dentist who wishes to see that the field of forensic dentistry becomes more in tune with science and the scientific method, it is obvious that Drs. Sobel's and David's is significantly undermined by the NAS Report's conclusions and findings regarding bite mark identification. The NAS, which is a highly respected scientific organization in the United States, thoroughly reviewed and studied the bite mark literature and research for two years. Upon completing its review, the NAS concluded that for a variety of reasons, which I will address, forensic dentists *currently* cannot individualize a known bite pattern to an unknown bite mark.

a. For instance, the NAS Report stated: "Often in criminal prosecutions... forensic evidence is offered to support conclusions about 'individualization' (sometimes referred to as 'matching' a specimen to a particular individual or other source)... With the exception of nuclear DNA analysis... no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source." *Id.* at S-5.

b. The NAS Report also stated: "Bite mark testimony has been criticized basically on the same grounds as testimony by questioned document examiners and microscopic hair examiners. The *committee received no*

*evidence of an existing scientific basis for identifying an individual to the exclusion of all others.”* NAS Report, at 5-37 (emphasis added).

16. Moreover, the NAS Report also concluded that bite mark examiners cannot even opine as to the statistical likelihood of a coincidental match because there is no baseline data regarding the characteristics of teeth and bite patterns.

- a. The NAS Report also stated that while “the majority of odontologists are satisfied that bite marks can demonstrate sufficient detail for positive identification, *no scientific studies support this assessment, and no large population studies have been conducted.*” *Id.* at 5-37 (emphasis added).
- b. The NAS Report also concluded that “[m]ore research is needed to confirm the fundamental basis for the science of bite mark identification. Although forensic odontologists understand the anatomy of teeth and the mechanics of biting and can retrieve sufficient information from bite marks on skin to assist in criminal investigations and provide testimony at criminal trials, *the scientific basis is insufficient to conclude that bite mark comparisons can result in a conclusive match.* *Id.* at 5-36 (emphasis added).
- c. Finally, the NAS Report stated: “If a bite mark is compared to a dental cast using the guidelines of the ABFO, and the suspect providing the dental cast cannot be eliminated as a person who could have made the bite, *there is no established science indicating what percentage of the population or subgroup of the population could also have produced the*

*bite.*” This follows from the basic problems inherent in bite mark analysis and interpretation.” *Id.* at 5-36 (emphasis added).

17. The NAS Report’s findings and conclusions also invalidate three fundamental premises (or assumptions) that support bite mark identification. The premises are as follows: (1) the dental features of the biting teeth (six upper and six lower teeth) are unique; (3) these unique dental features can and are transferred and recorded every time the person bites into an impressionable object, such as human skin; and (4) trained forensic dentists can accurately determine whether a mark or wound on a person’s body is a human bite mark and link the bite mark to the one and only person who could have left the distinct bite pattern. *See* C. Michael Bowers, *The Scientific Status of Bitemark Comparisons*, in DAVID L. FAIGMAN, ET AL., *MODERN SCIENTIFIC EVIDENCE: FORENSIC* 483 (2008). All three of premises must be valid before bite mark experts can individualize a known bite pattern to an unknown bite mark.

a. In regards to the first premise — that dental features are unique — the NAS Report concluded that the bite mark community has yet to establish that teeth and bite patterns are in fact unique. For instance, the NAS Report concluded that “[n]o thorough study has been conducted of large populations to establish the uniqueness of bite marks[.]” *Id.* at 5-36.

b. In regards to the third premise — that the unique dental features of a person’s bite pattern are transferred and recorded every time the person bites into an impressionable object, such as human skin — the NAS Report concluded that “bite marks on the skin will change over time and

can be distorted by the elasticity of the skin, the unevenness of the surface bite, and swelling and healing. These features may severely limit the validity of forensic odontology. Also, some practical difficulties, such as distortions in photographs and changes over time in the dentition of suspects, may limit the accuracy of the results.” *Id.* at 5-37.

- c. In regards to the fourth premise — that trained forensic dentists can accurately determine whether a mark or wound on a person’s body is a human bite mark and link the bite mark to the one and only person who could have left the distinct bite pattern — the NAS Report concluded that bite mark identification is a fraught with error, particularly false positives. For instance, the NAS Report concluded: “Many examiners claim in testimony that others in their field would come to the exact same conclusions about the evidence they have analyzed. Assertions of a ‘100 percent match’ contradict findings of proficiency tests that find substantial rates of erroneous results in some disciplines (i.e., voice identification, *bite mark analysis*).” *Id.* at 1-9 and 1-10 (emphasis added). The NAS Report also commented on the “high percentage of false positive matches of bite marks using controlled comparison studies.” *Id.* at 5-36.

- 18. It must be emphasized that the NAS Report *did not* invalidate bite mark identification entirely. For instance, the NAS Report acknowledged that “[d]espite the inherent weakness in bite mark comparison, it is reasonable to assume that the process can sometimes reliably exclude suspects.” *Id.*, at 5-37. More importantly, the NAS Report did not say that individualizing bite marks will

forever be impossible for forensic dentists. To the contrary, all the NAS Report said, at least with respect to bite mark identification, is that there are *currently* inadequate data, be it baseline data, error rate data, or data regarding the transferability of bite marks, to individualize a known bite pattern to an unknown bite mark or even to offer an opinion as to the statistical likelihood of a coincidental match.

19. The NAS Report has the potential to impact only a small percentage of cases involving forensic odontology. As the NAS Report noted, “[f]orensic odontology... includes several distinct areas of focus: the identification of unknown remains, *bite mark comparison*, the interpretation of oral injury, and dental malpractice.” NAS Report, at 5-35 (emphasis added). Bite mark comparison (or identification) cases represent only a small sub-set of forensic odontology cases and not all bite mark comparison cases involve testimony that claims to have individualized an unknown bite mark to a known biter (or bite pattern). Thus, the NAS Report can only impact, potentially, those cases where a forensic dentist or dentists testified that he or they could individualize a known bite pattern to an unknown bite mark. Mr. Kunco’s case, unfortunately, qualifies as such a case.

20. In my opinion and professional judgment, the scientific basis for bitemarks, as summarized by the NAS report, and combined with the low forensic detail of the injury, does not support Drs. Sobel’s and David’s testimony in John Kunco’s trial.

Further affiant sayeth not.

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Iain Pretty, BDS, MSc, MPH, Ph.D., MFDSRCS

Dated: August 18, 2009.