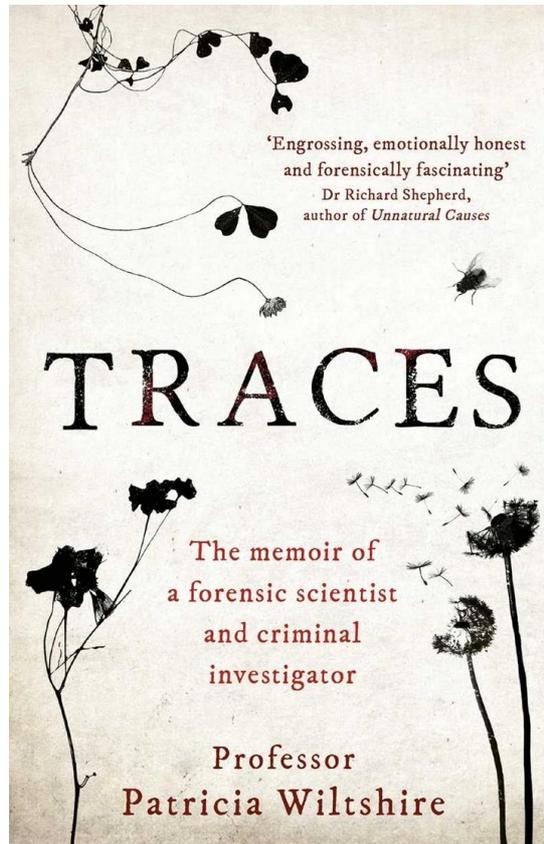


**Book Review:
Pat Wiltshire's "Traces: The memoirs of a forensic
scientist and criminal investigator" 535 Books, 2019**

Norman Fenton¹, 8 September 2019



Gripping, scientifically rigorous, and moving memoir of the world's leading forensic palynologist.

The quote on the back cover of this book says: "Nature will invariably give up her secrets to those of us who know where to look". Pat Wiltshire, a truly 'one of a kind' forensic ecologist, is probably the most qualified person in the world when it comes to knowing where to look.

This book is both a (popular) science book and a personal life story. The science is a thorough introduction to multiple aspects of ecology (and notably palynology – the study of pollen and spores from plants and fungi) as well as a detailed description of the processes of forensic investigation and analysis. The personal story fully reveals how Pat became the person she is, including her motivations, regrets, and loves. The science and the memoirs are interwoven throughout the book and what links much of the narrative are the accounts of Pat's forensic investigations that provide fascinating insights into a

¹ Queen Mary University of London, London, UK, E1 4NS, E-mail address: n.fenton@qmul.ac.uk

number of different crimes (including murders and rapes) that Pat has helped shed light on². There are also eight pages of colour photographs of Pat at most stages of her life in the middle of the book.

Pat Wiltshire essentially invented forensic palynology as a sub-discipline of forensic ecology. Unlike the small number of other experts around the world working in this specialised area of forensics, she is the only one who regularly attends crime scenes and mortuaries. Hence, there is great demand for her services from criminal and civil investigators. Pat is always learning new insights through her real practical field work. As she makes clear throughout, learning never stops because of the complexity of the natural world about which we still know so little. For example, there are 400,000 known species of plants of which 370,000 produce pollen, but new species are still being discovered each year. When it comes to fungi – the specialist area of her husband Prof David Hawksworth (a world-renowned mycologist) – there are millions of different species.

Early on in the book Pat contrasts her work with that of mineralogists. Noting that mineral particles provide only a fraction of the information provided by pollen, Pat makes clear her scepticism of the emphasis given to mineralogy in forensic investigations. In all the case study examples in this book, the richness of the palynological information is the key; pollen and spores identify the plants, and the plants give information on key aspects of the environment, enabling the elimination of large areas of the country, and the identification of likely locations. One notable case was her first where she eventually discovered the best parts of a vehicle to yield the maximum pollen and spore evidence. She was able to predict the exact spot at a field edge where a body had been placed and this linked it to the vehicle which had been used to carry it to that place.

There are other reasons why palynology can prove powerful in a range of investigations. For example, it is good for ‘cold case’ evaluations because pollen can remain in all sorts of fabric and other material for many years. Also, in many rape cases DNA evidence is of little value because the issue is not whether, or by whom, sexual intercourse took place, but rather it is about determining whose account of what happened is the truth. Key differences in the accounts often revolve around the specific location of the event, and Pat’s expertise often makes it possible to answer this question. For example, Pat describes a rape case where she demonstrated that the young girl’s claim to have been raped in a wooded area (while the ‘boyfriend’ claimed to have had consensual sex in a different location) were born out by the pollen on the boy’s clothing and the victim’s clothing. After Pat’s evidence was revealed it led to a confession by the boy, which spared the girl the agony of appearing in the witness box.

It is not just pollen on clothing and vehicles that help Pat shed light on difficult cases. One chapter focuses on the identification of pollen inside dead bodies for determining circumstances of death. She describes a case where the body of a man killed by garrotting was found in woodlands. Investigators wanted to know whether the man had been killed there or somewhere else. She describes the techniques for recovering palynological remains from inside the body. In this case she determined that the man had been killed

² Although Pat is well known for her work on very high-profile cases such as Soham, Millie Dowler, Sarah Payne, and the Ipswich Prostitutes these cases are not discussed. Hopefully they will be the subject of a follow-up book.

on the surface of the grave in which he had been found, and this evidence led to the two killers being convicted, and blaming each other for the actual killing.

There are several chapters in the book that are not for the fainthearted. For example, Chapter 8 describes what happens to bodies after death and the very different ways they decompose under different circumstances. Pat explains that this limits what can be extrapolated for forensic investigation from (notably) the research done at the renowned "Body Farm" in Knoxville, Tennessee, which she visited in 2005. In fact, bodies may decompose very little, as she describes in the example of the body of a man well preserved, frozen in ice for 4000 years in the Austrian Alps. Pat concludes the chapter saying "If the stages of decomposition cannot be relied upon to give us accurate information about the timing of a person's murder then we must use other clues". Hence, this leads into Chapter 9 where Pat describes some of the work on fungi, pioneered by her husband David Hawksworth, including how they worked together to shed light on aspects of the so-called 'jigsaw' case where a man had been murdered and cut into many parts that were distributed over a wide area. There is also a chapter containing a detailed description of poisons. This includes the description of a case where Pat helped to determine cause of death of a man who was alleged to have been poisoned in a shamanistic ceremony. In fact, the "Shaman" was found not guilty of poisoning as Pat's analysis of the 'victim's gut contents, and containers recovered from his room, discovered he had consumed Cannabis, magic mushroom, and a mass of poppy seeds which, together with the psychotropic compounds in the plants provided by the 'Shaman', probably proved deadly.

Despite her astonishing record, Pat says that that her calling as a forensic scientist and criminal investigator was not something she ever planned. She says "I have never planned anything, and my life just happened to me". After lecturing in microbial ecology at Kings College London, and while she was working at UCL in the Institute of Archaeology, she first unexpectedly became involved in a case involving a Chinese triad gang related murder. Her career as a forensic investigator took off rapidly after that.

The many parts of the book describing Pat's childhood and early adult life explain the strength of Pat's character in being able not just to operate in physically demanding and hostile environments, including dealing extensively with dead (often mutilated) bodies, but also with an often hostile criminal justice process. Pat grew up in a small Welsh mining village, but aged 7 her mother accidentally spilled a chip pan with boiling oil, scalding her head and face. With limited medical support at the time, Pat's head was in bandages for 2 years and she still carries the scars from the injury. Moreover, multiple illnesses followed shortly after and Pat could no longer attend school on a regular basis. The happiest time of her childhood was when she went to live with her beloved Grandma with whom she had a much closer relationship than with her parents. Pat describes in depth this relationship which clearly had a profound influence in her life (one curious piece of information I discovered that really surprised me - especially knowing Pat - was that she developed a life-long fear of spiders passed on by her Grandma).

At 16 Pat was shocked when told her mother had left her father. Despite her parents' always volatile relationship she never conceived that they would break up. She was then forced to live against her will with her mother who forbade her from having any contact with her father. Pat's complex relationship with her mother was eventually reconciled shortly before her mother's death in 2005.

Pat met David Hawksworth in 2006 and they married in 2009. Their love and professional relationship is described at various points in the book, but there is not too much detail about the man she was first married to for 42 years. However, she does talk in depth about the tragedy of losing her beloved baby daughter Sian – the only child she ever had - from a very rare autoimmune disease called Letterer-Siwe (after first being wrongly diagnosed with Hodgkin lymphoma). This tragedy was compounded by the fact that Sian's death was long and painful and also occurred shortly after the death of her beloved grandmother in a car crash. Trouble certainly came in threes and, shortly afterwards, she had to have much of her right lung removed because of the damage caused by repeated infections.

The certainty of knowing that her daughter's death was the worst thing that could ever happen to her led to Pat not caring what people would think of her and to her being outspoken and direct. This is something which I can confirm from my professional and personal interactions with Pat. She does not suffer fools lightly and is not afraid to challenge the many pompous and arrogant academics and professionals within the forensic science community. Indeed, one of the most enjoyable aspects of attending conferences with Pat is to see her expose the incompetence and hypocrisy of such people.

Evidence of Pat's phenomenal drive and work ethic is also found in the final chapter. In addition to her multiple practical and academic forensic activities, Pat is an elected local councillor who sits as a Cabinet member of the Council and has overall responsibility for all environmental issues. Like everything she does, she clearly takes this responsibility very seriously, and will be Mayor of the district in 2020. In this final chapter Pat also bemoans the state of much of the current practice of forensic science. She correctly highlights the limitations of certain types of DNA analysis (notably those involving mixed profiles and secondary transfer) which is something that was a recurring issue at the six-month Isaac Newton Institute Cambridge programme on Forensic Science and Statistics that I helped organize and at which Pat was resident in 2016. Earlier in the book Pat also raises another issue discussed extensively at that Cambridge Programme, namely that of 'burden of proof'. This involves answering questions like "what is the likelihood that two people's clothing would have the same palynological profile from randomly chosen sites". We have been jointly working on creating a rigorous probabilistic framework to address this issue.

The final chapter also touches on Pat's own legacy whose persistence she seems to question, noting that "there are no broad-based botanists being trained in the UK universities". Even though some of Pat's knowledge and skills may be teachable, her experience is not, so it is difficult to imagine that there will be too many people who will be able to reproduce what she has done. However, if this wonderful book inspires even one student to become half as good a forensic ecologist as her it will be a bonus.

NOTE: There are different UK and US versions (with different titles). The US version has different grammar and no photographs, but unlike the UK version, the audio version is narrated by Pat

- UK: "Traces: The memoirs of a forensic scientist and criminal investigator" Bonnier Books UK, 2019 <https://www.blinkpublishing.co.uk/traces.html>
- USA: "Nature of Life and Death, Putnam House G P Putnam's Sons 2019 <https://www.penguinrandomhouse.com/books/607788/the-nature-of-life-and-death-by-patricia-wiltshire/9780525542216>