

Forensic flowers

The importance of human DNA in solving serious crime has been widely reported, particularly with the expansion of a database holding such information. Yet, little is known about forensic botany and the crucial role it can play in tracking down criminals. Peter Riley reports.

For decades the importance of forensic botany or palynology has been regarded as critical to many criminal investigations around the world, but its importance has become more acute as great advancements have been made in scientific methods of identification, including the DNA of plants.

Forensic botanists are regularly being called upon by law enforcement agencies and police forces to aid them in finding clues to serious crimes, particularly rape, kidnap and murder cases.

In the United States the profession has cultivated names on a national scale, similar to hero-worship once given in Britain to Scotland Yard detectives in the days of such characters as 'Fabian of the Yard'.

One such forensic botanist whose name has become synonymous with solving crimes where plant evidence has proved conclusive is Dr David Hall, one time state botanist in Florida, whose expertise was in such demand across America that he decided to set up his own consultancy to cope with the demand.

He told *Police*: 'I was a state botanist for 19 years and was so overwhelmed with requests for information on forensic botany in criminal cases that I decided there was room for an independent agency, which I set up in Gainesville, Florida. Today I reckon that I personally spend about ten per cent of my time



on such cases, with at least the same amount of time again teaching law enforcement agencies about setting up forensic data bases and laboratories.

Growing evidence

'The importance of having forensic botanists available is that they can destroy alibis, can put vehicles in certain places by identifying plant species and can often determine the time of death of a victim by the same means. It is a terrific tool that is,

unfortunately, not used very much. Investigators only have one chance to look properly at a crime scene and palynology is a tool they should always take the opportunity to use.'

Dr Hall's name first became well known to police forces and criminologists in 1984 when he helped police in Orlando to solve a particularly distressing case in which a girl had been abducted and raped. A man had been cruising the city streets looking for a likely victim and he finally abducted a girl at

knife-point, drove her to a damp, wooded area outside Orlando and raped her on a blanket before driving her back into the city and releasing her.

During the course of being interviewed, the victim, who had spotted her attacker two days afterwards and made a note of his car licence number which she reported to the police, told investigators that the man had a baby in the car in which she had been abducted.

Detectives traced the car to a married man with a baby, and though the suspect alleged he was at home on the night of the attack the officers were convinced they had the right man, but they needed evidence which would be strong enough to stand up in court.

After tracing the crime scene to a wooded wet area next to a busy road, the detectives came across a tissue the girl had claimed she had used to wipe her tear-stained face. They also clearly saw that plants at the scene had been crushed where the girl said the blanket had been thrown on the ground. Police found a blanket in the suspect's car covered with twigs, seeds and leaf matter stuck to it which the suspect said had come from his own garden or a local park when the family had held picnics.

It was at this point that Dr David Hall was called in. Dr Hall visited the woodland and found that several species on the site, namely beard grass, dog-fennel

and beak-rush matched the plant specimens found on the blanket. He discovered a total of six plant species, including sandspurs, creeping beggarweed, Spanish moss, all common enough plants in Florida, but growing together was a rarity. None of the plants were found to be growing in the suspect's garden or in the park where the picnics were held.

Seeds of doubt

Dr Hall also told the court that while it was feasible that seeds and pollen could have blown onto the lawn or park they could not have blown enough "to produce the thousands of pieces found on the blanket." To produce the varied fragments on the blanket the plants would also have had to be between three and nine feet tall, and the chances, he said, of such plants blowing in such large numbers were nil.

The jury found Hall's evidence in palynology compelling and the attacker was found guilty and sentenced to 44 years for kidnapping with a further 44 years for sexual battery.

Because of the compelling evidence shown by forensically examining flowers, plants and their seeds and pollen, Dr Hall believes it is time for an international effort in setting up a worldwide data base of floral DNA.

Dr Hall added that he feels more training within lawenforcement agencies and police forces is needed to recognise the importance of forensic botany and continued: 'I believe a co-operative database is needed with properly trained people looking after it. A plant DNA database will be invaluable in helping police forces all over the world and I have tried to interest the FBI, although it is recognised that there are about 350,000 to 400,000 known plant species throughout the world so it would be a major job. But I believe it will be a great asset.'

Even as long ago as 1960, forensic botany was an important asset in crime solving. In



Australia during the 60s, Stephen Bradley, real name Istvan Baranyay, a Hungarian immigrant, was arrested and charged with kidnapping and killing eight-year-old schoolboy Graeme Thorne while on his way to school in Sydney.

The boy's body had been found wrapped in a carpet ten miles from his home after Sydney police allowed a full scale hunt to be launched after the family received a ransom demand for 100,000 dollars.

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The hunt had panicked the kidnapper who had swiftly murdered the boy and then attempted to escape the country on a ship to Colombo.

Scientists found, under close examination, the carpet revealed the time of death, thanks to fungus spores found on the boy's clothing which told them the body had laid there

for five weeks. Particles from two species of Cypress tree were gathered, the two species rarely growing so close together, and a search of the countryside close to the crime scene revealed a house in the suburb of Clontarf where both species were growing in the garden. The previous occupant of the house, Stephen Bradley, had fled but police were able to establish that the carpet in which boy's body was wrapped had come from Bradley's home.

Australian police moved quickly and Bradley was taken off the ship and returned to Sydney where he was charged and put on trial. The evidence was overwhelming and Bradley was found guilty and sentenced to life imprisonment.

Walter Rowe, professor of forensic sciences at George Washington University, in Washington DC, commented: 'To resolve cases today, police rely greatly on physical evidence. These clues often come from the natural world.'

Another expert, Dr Dallas Mildenhall, a forensic palynologist at the Institute of Geological and Nuclear Sciences in New Zealand, was responsible for introducing the crime-busting technique to the country in the 1970s and has since been involved in hundreds of cases where forensic botany has helped solve crimes.

Dr Mildenhall said every location has what he calls a "distinct pollen signature" that allows palynologists to pinpoint them to within a few yards. He too has mooted the need for an international effort in setting up a pollen and plant database.

He told *Police*: 'It has always been a surprise to me as to why forensic palynology is not more widely used. It is used in Britain and New Zealand more than anywhere else in the world, and as far as I am aware there are only four practitioners and two of those are very part time. Possibly because it requires specialist laboratories and can be time consuming, and therefore costly, law enforcement agencies have tried other means of determining what happened in a criminal activity.'

Dr Mildenhall, who works on around 30 cases a year involving his speciality, continued: 'I am currently involved in the preparation of a special issue on forensic palynology for *Forensic Science International*, due to be published later this year and in a meeting in Freemantle, Australia, on forensic science in which many of the presentations will be on plant DNA.

'There is a problem with plant DNA which is not applicable to animals (yet) and that is the ability of plants to clone and to be cloned. This means that the DNA of common plants like those of the genus *Pinus* may not necessarily help forensically, while its pollen in association with many other pollen and spore types found at all scenes may help. This does not mean that I am not in favour of developing a DNA plant database. It is important that it be done.'

Just as human beings can leave clues through their own DNA, plants also have a story to tell and can provide crucial evidence.

● Peter Riley is a freelance writer and publisher and has been writing about true crime for more than 30 years. He has also published a number of true crime books.