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Did a killer evade justice due to withheld evidence?

The collapse of the case against Angus Sinclair was a bitter blow to a scientist whose DNA work was not fully presented in court

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Jonathan Whitaker is proud of the science that helped bring Angus Sinclair to court this summer. 'The technology was amazing. It was paramount in bringing this case to court,' he says.

Whitaker is one of the world's most highly respected DNA profilers and has helped to convict a string of killers, including Bradley Murdoch, the Australian who murdered British backpacker Robert Falconio and kidnapped his girlfriend, Joanne Lees, in 2001. Whitaker, a senior scientist at the Forensic Science Services, also led the team that found the DNA that directly linked Angus Sinclair to the World's End murder case.

The solving of the 30-year-old case should have been a triumph for forensic science. Unfortunately much of Whitaker's evidence was not presented in court, resulting in the trial judge, Lord Clarke, dismissing the case last week. It was a bitter blow for the scientist, who had worked tirelessly to provide the evidence to support Sinclair's prosecution. His work was never properly outlined in public and he has never yet spoken of it.

Tall, lean, with curly black hair, Whitaker has a careful, precise manner - perhaps a result of his need for exactitude in his work. Like most experts, he is driven to distraction by popular forensic science TV series. On television, DNA results are provided in minutes when days are needed in reality; scientists are depicted eating food over samples, a process that would cause contamination in real life; experts give opinions of unqualified assuredness that would be unacceptable in a British court. By contrast, Whitaker is the epitome of caution. This does not prevent him from telling an exhilarating tale, however.

His involvement in the World's End murders began with an earlier but similar case: the deaths of 16-year-olds Geraldine Hughes and Pauline Floyd, who were found, strangled and dumped, in September 1973 near Llandarcy in South Wales. Despite a massive police operation, their killer was never found - until the development of DNA profiling (see box). It was Whitaker's tests that produced the breakthrough.

DNA profiles are immensely sensitive, he stresses: 'If a person touches a table or holds a pen, we could take a swab and generate enough material to make a DNA profile of them, one that could identify them with one-in-a-billion accuracy.'

It was the development of this technology which led to the reopening, in January 2000, of the Llandarcy case. Scientists tested semen swabs that were taken from the girls' bodies at the original investigation and produced a full genetic profile. However, no match could be found in the National DNA Database, where profiles of known offenders are stored.

Whitaker was undeterred. 'I wondered if we might find a relative instead,' he explains. People inherit half their DNA from their mothers and half from their fathers, which means a man's profile will give you half a profile for each of his children. So Whitaker began looking through the national database to find people with a partial match to the Llandarcy profile - and found one. It was a local car thief, Paul Kappen, whose father, Joseph, had been one of several hundred suspects interviewed about the murders.

Joseph Kappen had since died, so police exhumed his body. DNA from his teeth produced a profile that matched the crime scene DNA. Thirty years after their deaths, the girls' killer had been identified. If nothing else, this helped to bring closure for the girls' relatives.

Whitaker's success interested other detectives, particularly the team who wanted to reopen the World's End investigation (see box). The cases had key similarities: two girls tied up, raped and murdered. Whitaker was brought in to advise. Crucially, the World's End crime scene samples were in excellent condition. 'Forensic scientists didn't know what was coming in the future, of course, but

they still preserved the samples in the best way they knew - by freezing them,' says Whitaker. His team was able to produce a full genetic profile from semen found on the girls. It was a breakthrough, though again no match could be made from the national database. So he decided again to try to find a relative. But this time the samples had produced results that were difficult to interpret. 'So we went back to the girls' clothing and looked for other semen stains, finding one on Helen's coat.'

To the team's surprise, this produced a profile different from the first. It was the first direct evidence to suggest that more than one individual had been involved. Forensic science was closing in on the killers.

Armed with the new profile, Whitaker went to the national database and this time hit paydirt. The profile matched Angus Sinclair's. The effect was electric, Whitaker recalls: 'We told [the investigation's leader] DCI Allan Jones and he went apoplectic.' Sinclair was serving a life sentence after DNA evidence had pinpointed him for the rape and murder of a 17-year-old Glasgow girl, Mary Gallagher, in November 1978. He is scheduled for release in 2025. Sinclair had also served time for raping several children and had been jailed for the 1961 killing of eight-year-old Catherine Reehill. He was also linked to several other murders in the Strathclyde area. As police put it, Sinclair was a very busy, nasty individual.

Sinclair had a known sidekick, his brother-in-law Gordon Hamilton, who had died at 41 in 1997 from a heart attack. So would Hamilton's profile match the other semen sample? He had been cremated, so with no body to test the question was hard to answer. Nor were there any surrogate biological samples - from a toothbrush or bedding, for example - to provide DNA. Hamilton, who had ended his life in one of Glasgow's homeless hostels, had no possessions or friends.

Whitaker was undeterred and turned to Hamilton's brothers. None had a profile that exactly matched his, but they all showed degrees of similarity. From these, Whitaker concluded that it was about 20 million to one that the crime scene DNA did come from Hamilton. 'To try to improve matters, the police - and I really admire them for this - went to extraordinary lengths to get that full match,' adds Whitaker. They went to a house where Hamilton, a decorator, had put up polystyrene tiles. Some were ripped down and glue on the back was tested. A partial match was produced. 'It was further evidence,' says Whitaker.

Whitaker had not only pinpointed DNA that matched Sinclair from the World's End case samples, but he had also provided strong evidence to show that his partner's DNA closely matched crime scene stains. The discovery was crucial in bringing Sinclair to court.

There was more, such as the ligatures used on the girls. They had been tied up with their tights and underwear. Scientists unpicked the knots and tested for DNA. They obtained profiles very similar to Hamilton's and which partly matched Sinclair's. 'There are traces of Sinclair on the ligatures, which is what you would expect if he had handled them,' says Whitaker. Crucially, this evidence - which linked Sinclair not just to the girls but also to their assault and murder - was never presented in court.

Two other key pieces of evidence were not put forward. One showed that two knots were used to tie up the girls, indicating that two men committed the crime. Sinclair's defence was that his semen was found on Helen's coat because they had had consensual sex and that his brother-in-law must therefore be solely responsible for the murders. But it was found that Helen had been a virgin, while Christine had only slept with her boyfriend. These girls were very unlikely to have had sex willingly with Sinclair.

The non-admission of the evidence regarding the knots and ligatures allowed Sinclair's defence counsel to argue that there was nothing that indicated his client had tied up the girls or had murdered them. The case was dismissed.

Whitaker refuses to comment on the decision, but makes one key point: 'Detecting the criminal is not so important as reducing the fear of crime in a community.' With Angus Sinclair likely to stay in jail until 2025, when he will be 80, Whitaker and the forensic science fraternity can at least claim that they have helped to do that.

The World's End murders

Christine Eadie and Helen Scott were both 17 years old when they spent the evening of Saturday, 15 October, 1977 drinking in the World's End tavern, left, on Edinburgh's Royal Mile.

They were last seen talking to two men, one of whom was described as having a 'brooding presence'.

Next day Christine's naked body was found near Gosford Bay, East Lothian. Later on Helen's partially clad body was found in a field a few miles away, near Haddington, East Lothian. Both had been bound, sexually assaulted and murdered.

The killings triggered one of Scotland's biggest manhunts, with a total of 13,000 statements taken.

Angus Sinclair was the first person to be charged with the murders.