

The Peter Falconio Investigation: Needles, Hay and DNA

Jeremy Gans*

Introduction: Falconio and the No-man

Very early on a Sunday morning in mid-July 2001, a road train roaring down the Northern Territory's Stuart Highway stopped at the sight of a lone woman. She had grazed knees, bound wrists and blood — her own and, crucially, someone else's — on her t-shirt.

The woman's name and her story would soon be known across Australia and in her native England. Joanne Lees and her boyfriend, Peter Falconio, had been driving from Alice Springs to Darwin as part of a backpacking trip across Asia and Australia. Shortly after dusk, a passing driver signalled that there was a problem with their Kombi's exhaust, prompting Falconio to get out and speak with the apparent Samaritan. In quick succession, a shot rang out and Lees found herself dragged onto the road, handcuffed and thrown into the back of the stranger's utility vehicle ('ute'). A short while later, she slipped through a gap in the ute's canopy and fled into the outback scrub, terrified of being tracked by her assailant's dog. Five hours later, she returned to the road, finding no sign of her boyfriend, the stranger, his dog nor either vehicle (Chulov et al 2001b).

The Northern Territory police referred to these events as 'the Barrow Creek incident' (after the pub some 10km away that Lees was taken to by the road train drivers), while the media generally termed them 'the Falconio case'. The vagueness of both names was consistent with early doubts about Lees' tale.

The case's broad resemblance to another Northern Territory incident, the 1980 disappearance of infant Azaria Chamberlain, was striking. However, the intervening twenty-one years had seen an important change in crime investigation. In 1986, just as the Australian legal system was slowly realising its error in convicting Azaria's parents, biochemist Alec Jeffreys used the new technique of DNA identification to clear a boy wrongly suspected of the murder of two girls near his central English hometown of Leicester (Wambaugh 1989:ch 17).

The police investigating the Barrow Creek incident used DNA identification to conclude that a pool of blood beside the Stuart Highway was Falconio's while a tiny blood stain on the back of Lees' t-shirt was from an unknown male (Atkinson 2001; Cass 2001a; Hurley 2002b). These results went a long way towards lifting suspicion from both backpackers. Moreover, evidence of a DNA match was central to a Darwin jury's finding in late 2005

* Senior Lecturer, Faculty of Law, University of Melbourne. The author's research on mass DNA screenings is generously funded by the Australian Research Council. Andrew Dempster, Andrew Palmer and Denise van Dijk provided useful feedback on a draft of this article.

that Bradley Murdoch, a drug runner operating in the no man's land of Australia's outback tracks, had abducted and assaulted Lees and murdered Falconio.

Taskforce Regulus, the team of Territorian police eventually formed to investigate Lees' tale, was a success. But was its use of DNA identification optimal? The Falconio case differs from many other high profile DNA-based successes in that DNA databases played no role in its outcome. So, the case is an opportunity to consider how effective individualised DNA sampling was in a major police inquiry involving a large and disparate population of possible offenders. Of interest is whose DNA was and wasn't obtained, why that was the case and whether a different approach should be used in the future.

This article will examine the challenges facing the investigators and their response during the first ten months of the inquiry, when several hundred DNA samples were obtained. A companion article, to be published in the next issue of this journal, will discuss Taskforce Regulus' pursuit and DNA sampling of Murdoch himself.

Searching the Hay

Responding to early public alarm and media scrutiny, Commander Bob Fields, who led the investigation in its early weeks, relied on an analogy to explain the magnitude of the task that lay ahead: 'we're looking for a needle in a haystack and you don't get a haystack much bigger than the Northern Territory' (Cornford 2001; see also Anonymous 2001a; 2001b; Cock 2001; Scott 2001).

Finding a needle in a haystack is, of course, notoriously difficult. The reason is primarily quantitative: haystacks contain very many pieces of hay, which together surround and obscure small objects like needles. Likewise, Taskforce Regulus had a lot of potential suspects that fit Lees' description of her assailant and his vehicle, gun and dog. A British documentary later quoted the view of local police that the published photofit 'looks like a third of the population of the Northern Territory' (Wilson 2002). (The *Guardian's* Nancy Banks-Smith (2002) thought it resembled 'a camel with a moustache'.) The *Northern Territorian* observed: 'There is no shortage of white four-wheel drive utilities with red heelers in the back on Top End roads; it's the vehicle of choice of both the bushie and the office worker who enjoys a weekend fish' (Wilton 2001c).

There is probably a lot more hay in the average haystack than the roughly 200,000 people then living in the Territory, let alone the 10,000 or so Territorians who would fit the stranger's reported description of being in his early 40s, Caucasian and male (Australian Bureau of Statistics 2006:table 34). Nonetheless, there is more to the challenges of a criminal investigation than just the number of potential suspects.

A person literally searching a haystack for a needle has two advantages that can be pitted against the weight of numbers. First, it is easy to tell the difference between hay and a needle. Secondly, a haystack is quite amenable to searching. Taskforce Regulus had neither analogous advantage when seeking the highway stranger, at least initially. These problems would only be partially remedied by DNA identification.

The Needle

A searcher can easily tell whether something in a haystack is hay or a needle, as each has readily observable characteristics that the other lacks. However, the Falconio investigators had no quick way of resolving whether someone was or wasn't Lees' assailant. Merely looking at a candidate's current characteristics would be insufficient, as all of the most

striking features in Lees' description — the man's hair and moustache, his clothes, his gun, even his ute and dog — could be changed or disposed of.

Some potential suspects could be easily excluded, such as the man seen driving a white four-wheel drive on the Tanami Track two days after the Barrow Creek incident. Surrounded by armed police after he fled into the bush, he was soon released when the police saw that he was in his late 60s or 70s (Chulov et al 2001a; Hardie 2001). But what if the man had been Murdoch, aged 42 and believed to have been driving his white Toyota Landcruiser on the Tanami Track that Sunday, possibly after burying Falconio's body?

When Taskforce Regulus was formed a month into the inquiry, the roadblocks had long been lifted and the trail was cold, so the investigators faced a difficult inquiry to determine both the movements and appearance of potential suspects in mid-July. The timing of the Barrow Creek incident — at night, in the middle of a weekend — would work against relying on employment records, which, in any case, may be unenlightening for many living or travelling in the outback. Rather, inquiries would turn on the recollections of potential suspects and their acquaintances, as well as circumstantial evidence derived from documents such as receipts and photos (Hardie 2002a). Especially as time passed, inquiries of this sort would often fail to either implicate or clear a potential suspect. In other words, even close analysis of an apparent piece of hay might not be enough to detect or exclude the possibility that it was actually a worn or disguised needle.

DNA identification is suited to overcoming this sort of hurdle. While macroscopic features — appearance, movements and personality — require time to observe and are fairly easy to disguise — microscopic characteristics are much less open to the confounding effects of change, mistake and deception. The DNA of the man described by Lees would remain in every one of his cellular nuclei until his death (and for some time after). In other words: microscopically, once a needle; always a needle, and detectably so.

However, to make use of DNA identification, investigators must have a part of the offender's bodily tissue in a condition suitable for lab analysis. The Barrow Creek incident was particularly unlikely to meet this requirement, as the crime scene was outdoors and neither a body nor a weapon was present. When Lees' and Falconio's Kombi was found just off the highway, initial DNA profiling failed to detect any useable DNA inside it other than that of the two backpackers. Forensics at the roadside crime scene revealed only Falconio's blood, while most of the blood on Lees' clothing was her own (*Murdoch* trial transcript 2005:775–852). So, any DNA from the criminal might have been entirely hidden by his victims' blood.

For want of a hangnail, the identity of the highway stranger would have been forever lost. A chance meeting between a tiny cut (termed a 'hangnail' by Carmen Eckhoff, the Northern Territory police's lead forensic biologist) and the back left sleeve of Lees' t-shirt gave Taskforce Regulus the opportunity to use DNA identification to pursue its inquiry. The resulting tiny brown smudge in an otherwise unstained section of the light blue t-shirt yielded the only significant DNA profile in the investigation (prior to Murdoch's arrest) that matched neither Falconio, Lees, her rescuers nor one of the investigators (*Murdoch* trial transcript 2005:810–817, 921–922).

DNA (deoxyribonucleic acid) is a lengthy chain of four types of molecules called nucleotides that, in the right order, can prompt the creation of proteins. 'Junk' DNA, where the nucleotides are in the wrong order and sequences sometimes repeat over and over, is the domain of DNA identification. In contemporary labs, human tissue is subjected to chemical and electrical processes that count the repeats at particular points, yielding a pair of numbers

representing each parent's contribution (Gans et al 2002:2). In the case of the t-shirt smudge, counts at nine standard locations used by forensic profilers yielded the following set of numbers: 15/15, 16/19, 21/22, 14/14, 29/30.2, 15/17, 11/12, 10/11 and 9/10 (*Murdoch* trial transcript 2005:816).

This 'DNA profile' has no meaning on its own. Rather, its significance is that exactly the same numbers will emerge from analysis of any tissue of the person who was the source of the smudge on the t-shirt. Moreover — and this is the power of DNA identification — there is almost no chance that this same eighteen numbers would appear in a person unrelated to the source of the smudge. According to Eckhoff's calculations based on the Northern Territory's database of DNA profiles, the odds that a randomly chosen person would have the t-shirt smudge's sequence were 1 in 150 quadrillion (*Murdoch* trial transcript 2005:818).

Did Taskforce Regulus have a test for distinguishing needle from hay? Yes, but it was flawed in two ways: one minor, one major.

A DNA match between a person and a sample does not always mean that that person is the source of the sample (Gans et al 2002:4). Apart from the tiny chance that another unrelated person will happen to have the same DNA profile, there is also the greater chance that a close relative of the sample's source will share the source's profile. Indeed, the source's identical twin would have an identical profile. Also, lab errors may have misidentified part of the DNA profile from the smudge or, more probably and less testably, the measured profile may actually be from some other tissue that contaminated the smudge *en route* to or in the Territory police's forensics lab in Darwin.

These risks — some of which were raised in Murdoch's defence at his trial — are mitigated by the other things that Taskforce Regulus knew about the highway stranger. It is unlikely that someone who is unfortunate enough to be wrongly identified as the source of the t-shirt smudge, either through coincidence, relatedness, error or contamination, would also happen to be a man in his middle years with a dog, a ute and an opportunity to be on the Stuart Highway on that particular weekend in mid-July 2001 (or at least no capacity to prove otherwise during the lengthy investigation that would doubtless follow a match). While these risks could never be ignored — especially in any later court case — they pale beside the regular risks of error that are present in most criminal investigations.

Rather, the great danger for Taskforce Regulus was not that the wrong man would be identified as the source of the smudge, but rather that the smudge may have been completely unrelated to the Barrow Creek incident. The smudge could have been left by anyone who brushed against Lees' t-shirt. Many more people than the highway stranger would have had that opportunity and such people may be more anonymous than the stranger himself, especially given Lees' recent journeys. Both Lees and the true source of the smudge might be wholly unaware of the transfer. They might not have even met at all, if, say, the source had touched a doorframe that Lees had later brushed up against.

Eckhoff testified at Murdoch's trial that the smudge consisted of blood, that it was the product of direct contact rather than an airborne spray and that the source was male (*Murdoch* trial transcript 2005:815); these characteristics are arguably especially consistent with Lees' account of her struggle with the highway stranger. However, the possibility of an innocent source could never be ruled out without either matching the smudge to someone (who could then be thoroughly investigated) or excluding the vast number of males who had or ever could have been near Lees or her t-shirt or anywhere they went, however fleetingly, prior to 15 July 2001. The latter task would require a universal DNA database.

The uncertainty about the provenance of the smudge, like the other innocent hypotheses for a DNA match, might cause an innocent person to be fingered as the highway stranger; however, again, investigators could, if suitably cautious, depend on alternative investigative paths to pick up such a false positive. Rather, the more dangerous possibility was that the true offender could be wrongly cleared of suspicion through DNA identification if the smudge proved to be from someone else. In other words, the police would not know whether the needle they were searching for was the right one until they found it; if it was the wrong needle, then it might not be amongst the hay at all.

The Haystack

Taskforce Iegulus had a test for identifying a needle, albeit an imperfect one. But what of the other part of the analogy: the haystack?

No-one would want to search a haystack, but there are worse places to misplace a needle. Haystacks are daunting numerically, but are otherwise well suited to searching. Being dense, a haystack can be sifted, whereby large amounts of hay are quickly (albeit fallibly) checked for a particular attribute of a needle, such as sharpness, reflectivity or magnetism. More importantly, being finite and bounded, a haystack is ultimately amenable to an exhaustive search, piece by piece, that will inevitably locate any needle inside it. So, the haystack represents a quantitative, rather than a qualitative, impediment to a search.

The Australian outback is no demographic haystack. The Barrow Creek incident occurred in the middle of one of the country's most sparsely populated and undefined regions. Moreover, there was no reason to think that the highway stranger was a local. Lees' tale suggested a crime of opportunity, perhaps even impulse; the backpackers were simply in the wrong place at the wrong time. So, the suspect population was defined merely by its capacity to be at the crime scene on that particular evening. Even if the temporal focus was limited to that weekend, the geographical zone of suspicion could be measured in millions of square kilometres.

Moreover, Lees' assailant had the means (given his vehicle) and, of course, the motivation to avoid the checkpoints, both real and figurative, that were set up by the Territorian police (in any event, some eight hours after his last sighting by Lees). The worst case scenario — that the stranger went to ground before the investigation began and was permanently outside the investigators' reach (e.g. living in strict and remote isolation in the outback or already having left the country) — was entirely plausible.

Again, DNA identification can overcome even this sort of investigative disadvantage, but only for some offenders. DNA profiles are permanent, so they can be gathered independently of the timeframe and constraints of any particular investigation. They are also digital allowing quick and accurate mass comparison. This is the idea behind investigatory DNA databases, which operate analogously to running previously gathered hay through a metal detector.

However, since the commencement of databasing in the late 1990s modern DNA profile databases consist largely of profiles of people who have committed serious crimes. This artificial haystack does not reach those with pristine criminal records, who have avoided police contact or whose last contact was before the database was created. Murdoch, it later emerged, had a lengthy history of offending, including serving prison time for a firearms offence near Fitzroy Crossing in 1995, but this pre-dated Western Australia's DNA database (*Rv Murdoch* (sentence), unreported 15 December 2005:6–7).

A relatively little-used alternative to database searches is a public appeal for so-called volunteers to assist a specific investigation by providing bodily samples for DNA profiling. By 2001, there had been two significant mass screenings in Australia: a screening of 2700 Perth taxi drivers in a failed attempt to identify the Claremont serial killer (Tooth 2000) and a request to 500 male residents of the NSW town of Wee Waa that led to the confession of rapist Stephen Boney (*R v Boney* (sentence), unreported 20 October 2000:2–3). However, these initiatives, like subsequent Australian screenings in NSW, Queensland and Norfolk Island, were aimed at tightly defined and geographically narrow groups, who were susceptible to both social pressure and a degree of police surveillance.

By contrast, the Falconio investigators lacked any effective rake for constructing a useful haystack for the purposes of identifying the highway stranger, who could be anywhere in Australia. Not only were many Australians sceptical about Lees' tale, but many of the potential suspects would have had little love for the police. A public appeal to the 'older men of Australia' (or the ute-driving and/or dog-owning and/or gun-toting and/or occasionally moustached men of Australia) would presumably generate much derision, a daunting number (albeit a tiny fraction) of the desired DNA samples and no information whatsoever about the true offender. No such appeal was made by Taskforce Regulus.

So, the Territorian police had a lot of hay to investigate, a description of a needle (albeit maybe the wrong one) but no stack to search. Commander Fields' surname provides a better description of the task facing the investigators than the homely analogy he drew about needles and haystacks. The Falconio investigators' task resembled a search for a needle in a vast hay *field*, punctuated by a variety of different-sized haystacks but also strewn with very many individual pieces of hay. And there was every reason to think that the true needle was not in a stack, but was rather out in the field amongst the wind-blown and potentially buried individual pieces of hay.

Searching the Field

Although such bleak investigative conditions are rare in popular accounts of crime investigations, they are not at all unusual even in the new world of DNA identification. The problem confronting Taskforce Regulus was the same as that faced by all investigators who have a perpetrator DNA sample from a crime that could have been committed by anyone. Such scenarios sometimes arise in crimes of violence, such as homicide, rape or assault, but are probably more common for so-called 'volume crimes' such as break-and-enter and theft.

'Cold cases' of home and car burglary are notoriously difficult to investigate, but thieves may leave their DNA at crime scenes, for example in blood on broken windows, saliva on cans and cigarettes, or skins cells in a fingerprint. Recent programs expanding police reliance on DNA identification in such cases have yielded increased clearance rates, but the gains all arise from database matches (Home Office Forensic Science and Pathology Unit 2005:16). If the offender's DNA profile is not on the database, then progress depends on further developments, often in the form of a subsequent crime by perpetrators that places their DNA profile on an available database.

But the Falconio case was no ordinary investigation. Unrelenting media attention in Australia and abroad meant that there was no possibility of the Northern Territory police simply waiting for the highway stranger to identify himself. The Taskforce's leader, Assistant Commissioner John Daulby, promised an extremely proactive inquiry: 'We are

determined to leave no stone unturned in our resolve to solve this investigation.’ (Hurley 2002b). So, how did the Taskforce capitalise on its DNA lead?

Narrowing the Field

In testimony at Murdoch’s committal and trial, Senior Sergeant Megan Rowe, the head of Taskforce Regulus’ intelligence cell, outlined the methodology of the investigation. The first step was the construction of a list of persons and vehicles ‘of interest’.

Rowe analysed government and commercial records to identify approximately 17,000 people in transit in the Northern Territory in the weeks surrounding the investigation (*Murdoch* committal transcript 2004:1190; *Murdoch* trial transcript 2005:2062). However, this methodology would not have detected people who were avoiding (or simply not using) public and private services. Many outback travellers would fit this category, including Murdoch, who was running cannabis from South Australia to Broome and always took stringent measures to avoid surveillance, including refraining from using his mobile phone while travelling (Shears 2005:90).

But no man is an island. Unsurprisingly, the Taskforce drew heavily on informal sources. While an unspecified number of people on Rowe’s eventual shortlist based on tips were internal recommendations from police across Australia, the vast majority were the result of the Taskforce’s repeated pleas for public assistance. Strategies such as a \$250,000 reward and drip feeding the media to generate new interest yielded over 2500 phone calls in the first three weeks of the investigation and an average of thirty per week thereafter (Cass 2001b; Hurley 2002b; *Murdoch* trial transcript 2005:2066).

The size of the resulting list of over two thousand men (*Murdoch* trial transcript 2005:2071) demonstrates the chief disadvantage of relying on the public for information: most public tips are worthless, due to mistake, malice or the background noise of unrelated suspicious behaviour. These effects would be multiplied by the uncertainty inherent in Lees’ description of her assailant. In terms of the hay field analogy, the creation of a shortlist based on tips can be likened to shining a searchlight over a field and noting bright points that might be a reflection from a needle. This approach is obviously preferable to searching blind, at least in a very large field; however, there will be many irrelevant sparks. A later review of Taskforce Regulus, shortly before Murdoch’s arrest, found: ‘The police information system had trouble initially coping with the tremendous influx of information, although the matter was soon rectified’ (Hurley 2002a).

Prior to Murdoch’s arrest, Daulby told the media that more than three hundred ‘persons of interest’ had volunteered to supply DNA mouth swabs to Taskforce Regulus in order to eliminate themselves as potential suspects (Lawrence et al 2002). This figure, later downgraded to ‘over two hundred’ and ‘several hundred’ in court testimony (*Murdoch* committal transcript 2004:1217; *Murdoch* trial transcript 2005:2107), is a fraction of the list of people of interest identified by Rowe. Some of the remainder may have been amongst the thousands of convicted offenders whose DNA profiles were already on Australian police databases. However, it is apparent that the Taskforce never obtained DNA profiles from a sizeable majority of its potential suspects.

In the absence of DNA profiles, those men must either have been eliminated by reference to macroscopic characteristics (like appearance, belongings, movement and psychology) or were not cleared at all. As noted above, clearing men in the target demographic — surely the balance of the public and police tips and a large fraction of the travellers — via these means would demand a historical inquiry that, in many cases, would not yield a definitive

result. Indeed, Rowe testified, eighteen months into the investigation (and six months after Murdoch's arrest), that about one thousand men remained to be cleared from the list generated by the public appeal. Only forty-three lacked sufficient details to be identified by name (*Murdoch* trial transcript 2005:2106–2108).

This raises the question: why did the Taskforce make so little use of DNA sampling? Four explanations based on investigative constraints can be rejected:

One explanation is distrust of the DNA lead because it was a potential red herring. However, while it is true that people excluded by DNA were not thereby ruled out as Lee's assailant, collecting samples from potential suspects would still be highly worthwhile to the investigators, as a match would be an incomparable lead. In any case, at Murdoch's trial, Rowe unequivocally testified that if the Taskforce 'had a DNA profile of a person of interest and it didn't match the DNA profile ... from the T-shirt, that person would be eliminated' (*Murdoch* trial transcript 2005:2107). This indicated either a failure to recognise the limits of the DNA lead or a pragmatic recognition that, for many candidates on her list, no alternative inquiries would resolve their status.

A second explanation is that the investigators exploited their DNA lead parsimoniously in order to avoid alerting the culprit to the fact that they had a likely means to identify him. However, while this may have been the case in the inquiry's early weeks, it could not have been true after 2 August 2001, when the police informed the media at a press conference that there was unknown male DNA on Lees' clothing, describing it as 'a significant development in the hunt for the gunman'. Daulby added that the police were searching DNA databases for the profile and that the news was only kept from the media initially because of the need for scientific confirmation of the profile (Wilton 2001b).

A third explanation is lack of confidence in the various shortlists, given their provenance. Indeed Rowe explained that she identified much narrower groupings that she considered more worthy of investigation. She focused on around seventy-five of the 17,000 transit suspects, based on the correlation of their movements to the backpackers' or other characteristics, such as use of a stolen vehicle (*Murdoch* committal transcript 2004:1191, 1214). The thousands of police and public tips were similarly narrowed:

There were approximately 30 people, I'd say, over the course of the investigation ... that met a number of criteria for the person and the vehicle we were looking at. Not only were they the person similar to the description but they ... also owned a vehicle similar to the description we were looking for. That elevated them, so to speak, in the eyes of the investigators, to more than just persons of interest ... to ... 'hot prospects'.

They were prioritised as high priority follow-ups within the investigation and later the task force as it became, and more concentration — or investigation was put onto them — those persons in particular (*Murdoch* committal transcript 2004:1191).

However, the Taskforce's approach to its high priority follow-ups confirms, rather than rebuts, its apparent underutilisation of DNA sampling. According to Rowe, DNA samples were obtained from only half of the investigation's hot prospects (*Murdoch* committal transcript 2004:1191).

The final explanation is resources. This, however, is an unconvincing explanation for several reasons. Three hundred DNA samples would represent less than one sample a day over the year-long investigation; this would scarcely have burdened the Northern Territory's lab, which would surely have accorded significant priority to the case. While there might have been early backlogs, samples could still have been gathered for profiling down the track. In 2001, the main method of taking a sample — a buccal swab — was both

cheap and easy, requiring little or no skill to administer. Rowe testified that, with the exception of the hot prospects, the investigation of other candidates was 'farmed out' to junior police officers across Australia, who would have had no more than a handful of men to find and sample over the course of the year (*Murdoch* trial transcript 2005:2071).

Of course, the police had no legal power to compel mere persons of interest to provide a sample. But they could always use the most common method for gathering a person's DNA: asking for it. Even a refusal could provide useful intelligence to the Taskforce (Gans 2001) and the police could also gather an unwilling candidate's DNA from something he touched, a method expressly endorsed by the Northern Territory's Chief Justice a year earlier (*R v Braedon* [2000] NTSC 68:[11]). Anyway, refusals to requests for DNA were rare. Rowe testified:

I can recall *a couple* of cases along those lines, but we still managed to investigate sufficiently through alibi witnesses or banking records, for instance, we were able to exclude them in any case, without forcing them to do something that they didn't need to do (*Murdoch* committal transcript 2004:1217, emphasis added).

This answer indicates the other objection to the resources explanation: the alternative methods of elimination carried resource burdens of their own, which appear equal to, if not greater than, those involved in utilising DNA identification and carried their own risks of error.

It is obvious that Taskforce Regulus eschewed a blanket policy of seeking DNA profiles from every person of interest. Indeed, the number of samples obtained, relative to lists developed by Rowe, suggests that DNA sampling was not even its primary method of clearing its shortlist. Moreover, Rowe's testimony reveals that, in those cases where the Taskforce pursued a DNA sample, its efforts were limited to a single request, rather than more aggressive techniques, such as follow-up requests or the gathering of discarded samples.

The Taskforce's apparent reserved approach to its strongest lead was akin to hayfield searchers relying mainly on their eyes, limiting themselves to, at most, one pass of a rake and refraining altogether from using their hands when trying to find a needle. Why would one of Australia's most well-resourced and high-profile crime investigation taskforces restrict itself in this way? With the above explanations rejected, it is necessary to consider reasons external to the investigation.

Sampling the Field

According to two secondary accounts, an apparently important DNA lead was abandoned by Taskforce Regulus in the first month of its investigation. A newspaper claimed that members of the Taskforce travelled to Ireland after a profile on a DNA database, while not matching the t-shirt smudge, was found to be a very close. Reportedly, 16 of the 18 numbers in the pair of profiles were identical, a fact that strongly suggested that the source of the database profile — an Irish-Australian — was a relative of the source of the t-shirt smear. However, the Taskforce pronounced this lead 'fruitless' as soon as it was made public (Bowles 2005:78; Wilton 2001a).

The claimed abandonment of this lead is surprising. Such 'familial' DNA investigations have been used successfully in recent years to solve cold cases where a crime scene profile lacks a full database match (Smith 2006), which was precisely the problem facing Taskforce Regulus. A familial screening, that is, sampling all possible relatives of the Irish-Australian, would have taken some time, as relatives would need to be located and

unacknowledged relations identified. It is possible that the police's disavowal of the lead was an attempt to avoid alerting potential suspects (though, if that was the case, then the leak to the press was an enormous blunder).

However, a quite different explanation is suggested by one author. Bowles claims that the Irish-Australian's profile was not lawfully on the database when it was partially matched to the t-shirt smudge (Bowles 2005:78). If true, this seemingly small flaw — perhaps due to a failure to remove the profile after a statutory time limit — would have had consequences for any future prosecution resulting from the familial screening. Under the doctrine of the 'fruit of the poisoned tree', the illegal retention of the Irish-Australian's profile would taint everything the investigators learnt from it, including a full match obtained from one of his relatives and (arguably) non-DNA evidence implicating him in the disappearance of Falconio (Gans et al 2004:426–429).

In Australia, unlike the United States, the dividing line between lawful and unlawful criminal investigations is neither routinely litigated nor enforced by the automatic exclusion of the unlawful investigatory 'fruit' (Gans et al 2004:415–423, 430–432). However, there are two reasons why Taskforce Regulus might have taken legal concerns more seriously when pursuing DNA leads. One is the potential, as illustrated above, for a legal mistake in the handling of a DNA sample to contaminate the whole case against a future defendant. The other is the high stakes nature of the Falconio investigation. The senior management of the Northern Territory police — who had already faced considerable criticism of their handling of the Chamberlain case, bolstered by the eventual acquittal of both defendants — might have judged that even a small risk of a collapsed prosecution in this case could not be countenanced.

These legal concerns — unlike the other explanations discussed in this article — are capable of explaining Taskforce Regulus' apparent relegation of DNA sampling to a subsidiary role in its inquiry into its shortlist. There was no plausible legal difficulty with obtaining DNA *per se*; by 2001, statutes regulating the taking of DNA had been enacted throughout Australia and consensual DNA sampling was commonplace. Rather, doubts would more likely have focused on particular aspects of DNA sampling: the line between consensual and non-consensual sampling during a highly public inquiry; the procedures for cross-jurisdictional sampling; the lack of clarity about the limits of acquiring DNA from touched objects and, perhaps, concerns about potential allegations of police or laboratory mishandling of the evidence. These constraints — alongside other investigative demands, such as a desire not to be branded heavy-handed by some elements of the media — could plausibly have prompted a managerial decision to pursue more traditional leads (to some extent) in preference to asking for DNA and to restrict to a single request efforts to obtain DNA.

In fact, legal concerns about DNA sampling in the Falconio case received public and official attention just a few months before Murdoch's arrest. In early June 2002, the media was alerted that Michael Sorrell, a man recently arrested for a murder in Sydney, was a person of interest to Taskforce Regulus, on account of his itinerant lifestyle and history of violent offences (Chulov et al 2002a; Chulov et al 2002b; Sun 2002). The next day, a flurry of complaints reached the press that 'legal red tape' was preventing the NSW police from comparing his DNA to the Northern Territory's t-shirt smudge (Chulov et al 2002b; Hardie 2002b).

NSW, along with the balance of other Australian states and territories, had enacted so-called 'model' legislation on forensic procedures (Gans 2002); one feature of this legislation was that Australian jurisdictions with substantially different DNA laws — such

as the Northern Territory's relatively lax sampling rules — were excluded from provisions authorising the interstate transfer of forensic information and enforcement of sampling orders: *Crimes (Forensic Procedures) Act 2000* (NSW) Part 12. However, this legal problem could have been side-stepped in several ways. First, the Northern Territory statute contained no similar limits, so there was nothing to stop the Taskforce from sending the t-shirt smudge profile to the NSW police (a simple matter of e-mailing eighteen numbers). Second, the NSW rules on interstate transfers only applied to databases; the letter (if not the spirit) of the law would permit the transfer of samples taken from Sorrell before they were profiled or databased. Third, it was even less likely that the rules regulated samples gathered from the NSW crime scene, which reportedly included Sorrell's.

And yet Taskforce Regulus reportedly balked at these options, because Sorrell had neither consented to being sampled nor been convicted for an offence, the most straightforward legal means of obtaining a person's DNA (Hardie 2002b). (In an interview with the author, Detective Sergeant Robert Peters, in charge of the Australian Federal Police's investigation of the murder of Janelle Patton on Norfolk Island, said that he took a similar line when pursuing fingerprint matches across jurisdictional borders.) Absent these circumstances, Taskforce Regulus chose to treat the resulting legal uncertainty flowing from the rules on interstate database comparisons as precluding it from pursuing its DNA lead. As appears to be the norm in NSW politics, the police utilised the media to prompt a speedy government solution. Within two days of the Sorrell situation emerging, the NSW government declared all Australian states and territories to be 'participating jurisdictions' under its law (i.e. regardless of the content of their DNA sampling procedures: *Crimes (Forensic Procedures) Amendment (Corresponding Laws) Regulation 2002* (NSW)).

One objection to legal concerns (as explaining the Taskforce's approach) is that the Falconio investigators would scarcely have refrained from gathering DNA — or indeed, pursuing just about any lead — from a person who was believed to be the highway stranger, just because of legal doubts. However, such an objection does not apply to candidates whom the Taskforce regarded as mere persons of interest. Indeed, it quickly emerged that Sorrell was recognised as a very doubtful candidate to be the highway stranger, due to his age, appearance, psychological profile and alibi (Bevin 2002b). The same day that the NSW regulations were passed, Daulby announced that Sorrell's DNA did not match the t-shirt smudge, describing the result as 'another low' in the investigation (Bevin 2002a). His words were truer than he intended. The Darwin media quoted local police as saying that Sorrell was 'used in a political push for a national DNA database' (Bevin 2002b; Gans 2002:220–221).

The Taskforce's policy of underutilising its DNA lead when trawling through its shortlist probably spared many innocent men from providing a DNA sample, albeit exposing some of them to background- and alibi-checking instead. Aside from the integrity of the legislation regulating Australian DNA databases, the main cost of the policy — and the legal doubts about DNA sampling that may have instigated it — fell on Taskforce Regulus, which carried the resource burden of alternative inquiries.

But one apparent instance of this policy carried a much higher cost, for the Taskforce and for many others: the case of a man who wasn't high on Taskforce Regulus' list of priorities, but whose DNA was a match to the t-shirt smudge.

Conclusion: An Unturned Stone

Taskforce Regulus' most important break after the t-shirt DNA came from another piece of modern surveillance technology: CCTV cameras. Of course, such cameras are hardly a feature of the Australian outback. However, they are present in the Territory in one particular type of venue that would have been indispensable to a driver suddenly turned fugitive: the petrol station.

Less than 24 hours after the investigation commenced, Alice Springs police officers sat down to view footage taken by a security camera at a truck stop 300km from Barrow Creek. They quickly focused on footage of a moustached solidly built man driving a white four-wheel drive, who purchased a large amount of diesel fuel, as well as water, ice and iced coffee, at 12.45am on the Sunday (just as Lees emerged from her hours in the wilderness). Alas, the footage was too blurred to show the ute's licence plate (*R v Murdoch (No 4)* [2005] NTSC 78:[23], [26]-[30]).

Like the t-shirt smudge, the man in the truck stop video may have had no connection to the Barrow Creek incident. Indeed, Lees' initial reaction to the footage was 'The man's too old', though enhanced footage led her to concede: 'He's somewhat of a man I described' (*R v Murdoch (No 4)* [2005] NTSC 78:[9], [11]). However, while the t-shirt smudge could have been left unknowingly, the man in the video would surely know that he had been at an Alice Springs truck stop that weekend. So, it is significant that, after the police released stills to the public, no-one claimed to be the man pictured. Either he had somehow missed all the publicity or he had decided not to come forward out of fear of being linked to the Barrow Creek incident (correctly or not).

Whatever its flaws, the truck stop footage had a huge advantage over Lees' tale: it accurately (albeit imprecisely) captured the macroscopic features of the man and, more significantly, his vehicle. Examination of the footage revealed that not only was the vehicle a Toyota Landcruiser, but it was a particular model, 'a 75 series vehicle manufactured between May 1991 and November 1999' (Anonymous 2002). The man's purchases recorded on the stop's cash register narrowed this description further to the diesel model, HZJ75.

A list of registered owners of such vehicles would have included Bradley Murdoch, who had purchased a white 1993 HZJ75 Toyota Landcruiser second-hand under his own name in March 2001 (*Murdoch* trial transcript 2005:2061). Murdoch was also one of the thirty-six men who callers had claimed to recognise as the man in the truck stop stills (*Murdoch* trial transcript 2005:2072-2073). The police visited Murdoch in his Broome flat in November 2001.

While there are no official descriptions of this visit, one journalist's account is that local police officers attended on behalf of Taskforce Regulus. According to Rowe's methodology, the 'farming out' of enquiries was reserved for people who were not of elevated interest to the investigation. According to the account, Murdoch chatted politely with the officers, who reported to the Taskforce that neither Murdoch nor his vehicle resembled Lees' descriptions and that he also had a Broome alibi. In fact, Murdoch's alibi — possibly a record of a local phone call to his flatmate — was only for 4am on Monday 16 July 2001, arguably allowing just enough time for a lengthy and difficult 27-hour drive up the Tanami Track from the Alice Springs truck stop (Williams 2006:193).

While the November 2001 interview seems a blunder in hindsight, it would be unfair to criticise Taskforce Regulus for failing to do more at that stage to investigate Murdoch's movements and background. Murdoch was just one of thousands of leads the investigators

were pursuing. It was probably already known that he did not register on Rowe's analysis of electronic records, so any further investigation of his alibi would involve asking residents of Broome about the details of Murdoch's movements some twelve or more weeks earlier. While Murdoch's closest acquaintances — including his flatmate and his then girlfriend — could (and later claimed to) remember his absence that weekend and odd behaviour on the Monday morning, they might (and, it seems, did) decline to volunteer such information to the police in 2001. The Broome police, who scarcely would have been unaware of Murdoch's possible involvement in trafficking cannabis, would probably not expect cooperation from Murdoch's friends. Inquiries with less intimate acquaintances about whether or not they had seen Murdoch that weekend would prove little.

But it *is* fair to ask why Taskforce Regulus did not obtain Murdoch's DNA sample then or shortly after. Asking and gathering a sample during the interview at Murdoch's flat would have taken the Broome police little time; lab analysis, though somewhat less speedy, could have been done in Darwin at the Taskforce's leisure; Murdoch's refusal to be sampled could have been treated as meriting an operation to obtain his DNA from something he touched. It is clear that these things did not happen, because otherwise Murdoch would have soon become the investigators' hottest prospect of all. Instead, he did not become a priority of Taskforce Regulus until about six months after the November interview.

Too little is known about the November 2001 interview to identify precisely why Murdoch's DNA was not obtained. The Broome police may have blundered in judging Murdoch's demeanour, appearance and alibi to be sufficient to exclude him from suspicion. Alternatively, they may have decided that, given Murdoch's criminal connections and his claim to have an alibi, any request for DNA might simply have been refused. A final explanation is that they might have actually asked Murdoch and been rebuffed, a fact that (under most Australian DNA statutes, including Western Australia's: see *Criminal Investigations (Identifying People) Act 2002* s81(1)) could not be mentioned at his later trial.

However, all of these explanations are consistent with this article's portrayal of the Taskforce's approach to DNA sampling persons of interest. The investigation of Murdoch in November 2001 focused on traditional methods and attempts to get his DNA (if any) were limited to asking for it. The undoubted fact that his DNA wasn't obtained then or soon after simultaneously confirms the Taskforce's reserved approach to DNA sampling and demonstrates that policy's costs.

The companion article to this one, to be published in the next issue of this journal, will describe the consequences of the Taskforce's initial failure to obtain Murdoch's DNA sample and will detail further barriers to the use of DNA identification by the investigators.

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