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Post-conviction DNA testing: the UK's first 'exoneration' case?

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Abstract

The routine incorporation of forensic DNA profiling into the criminal justice systems of the United Kingdom has been widely promoted as a device for improving the quality of investigative and prosecutorial processes. From its first uses in the 1980s, in cases of serious crime, to the now daily collection, analysis and comparison of genetic samples in the National DNA Database, DNA profiling has become a standard instrument of policing and a powerful evidential resource for prosecutors. However, the use of post-conviction DNA testing has, until recently, been uncommon in the United Kingdom. This paper explores the first case, in England, of the contribution of DNA profiling to a successful appeal against conviction by an imprisoned offender. Analysis of the details of this case is used to emphasise the ways in which novel forms of scientific evidence remain subject to traditional and heterogeneous tests of relevance and credibility.

Introduction

The rapid spread of the routine use of forensic DNA profiling, with its promise to introduce seemingly infallible levels of proof and certainty into criminal investigations, has been promoted widely as a device for improving the quality of criminal justice decision making. This view has been consistently expressed in the United States since the National Research Council Committee on DNA Forensic Science in 1996 and in the United Kingdom since the time of the Royal Commission on Criminal Justice in 1993. Both commissions made comprehensive recommendations for the development and incorporation of DNA profiling into their respective criminal justice systems in the expectation that DNA would introduce greater level of scientific objectivity into investigative practices and prosecutorial proceedings. However, in the US, the National Commission [1] also made specific recommendations and proposals for prosecutors, defense counsel, and judges, about how appeals based on DNA evidence should be received and handled, as well as approving a model statute to aid states to provide testing facilities to those currently in prison [2].

Describing post-conviction testing as an 'unforeseen consequence', but most certainly a welcomed one, a US National Institute of Justice report had already identified 28 post-conviction exonerations by 1996 [3]. At the present time over twenty US states have made attempts at specific legislation regarding various aspects of post-conviction testing, such as: guidelines for the retention of forensic material post-investigation in light of the possibility of appeals; access for inmates to adequate testing and counsel (specifically those sentenced to death); and the resources that are to be made available to inmates following exoneration [4]. Specific government consultation and research programs, like that of the National Institute of Justice, along with resources to fund post-conviction testing, have established it as a legitimate practice. The funding situation is far from ideal, with Barry Scheck's 'Innocence Project', dedicated to providing a post-conviction testing service for those currently incarcerated, complaining that they are starved of fiscal support. Yet despite financial set-backs - for instance, a promised \$750,000 package to aid the post-conviction testing of a limited number of appellants was withdrawn by the US government due a re-deployment of resources after September 11th 2001 [5] - post-conviction testing is regarded

in the USA as an activity worthy, and important enough, to attract dedicated support from federal funding.

In contrast, no specific consideration has been given to these issues in the UK. Whilst the admission of DNA evidence as grounds for appeal may not need to be considered exceptional, access provisions to DNA testing for convicted individuals remains problematic. We have no information available to assess how many individuals are in prison whose appeal would benefit from DNA profiling, although from time to time individuals cases surface. However, there are currently no dedicated resources made available by central government to identify or aid those who would appeal on these grounds. Nor are there any official published guidelines which promote the possibility of DNA profiling to those already serving long-term prison sentences. There is no equivalent of the Innocence Project available to UK prisoners and no official agency designated with the remit to enable post-conviction testing. There has been no dedicated governmental consideration of post-conviction testing, no discrete funding given to aid inmates to utilize its potential, and no scheme organized to make testing possible. Unlike in the USA, post-conviction testing has not become a routine consequence of the incorporation of DNA profiling into the criminal justice system but, on the contrary, remains peripheral to it.

This is especially interesting since in the US, post-conviction testing has proved important in establishing the credibility of this technology. For example, the National Institute of Justice, argued that such uses help to 'dispel any lingering public perception of forensic DNA testing as a threat to civil liberties' [3]. The Criminal Cases Review Commission, who assess all claims of a miscarriage of justice in the UK, have hitherto given no official consideration of DNA post-conviction testing in general terms. Whilst there have been a small number of UK cases in which DNA profiling has been used long after an original prosecution, this has not resulted (until this year) in the release of any individual from prison. For example, the recent DNA profiling of five men who had been accused of the 1990 murder of Lynette White in Cardiff served to finally exclude them as suspects, but the three men who had originally received convictions for this offence had long been released from prison following an earlier appeal. In another important case, the appeal on behalf of James Hanratty, the analysis of DNA and the introduction of the new evidence provided simply served to support the original prosecution case against him.

It is, therefore, the recent exoneration of Michael Shirley by the Court of Appeal, in July 2003 [6], which represents the first time that a UK court has overturned a previous conviction following consideration of new DNA evidence on appeal. Shirley's case also represents the first occasion in which the Criminal Cases Review Commission have supported a successful appeal founded on the potential relevance of newly available DNA evidence. In the next section of this report we describe some features of Shirley's successful appeal before going on to consider some general aspects of the introduction of such DNA profiling several or more years after initial prosecution.

Regina Vs Michael Shirley

Michael Shirley was an 18 year old Royal Navy sailor when he was arrested in 1987 for the murder of Linda Cook — a young woman who had been raped and then killed by her assailant stamping violently on her head and neck. During this brutal assault Linda Cook's jaw and spine were broken and her larynx was crushed. One important aspect of the original trial evidence against Shirley was the result of analysis carried out on semen extracted from Linda Cook's body. As part of common procedure at that time blood group analysis was undertaken on semen swabbed from Cook's vagina, vulva and anus. Evidence presented to the court identified a blood group match between the semen and Shirley; the same blood

group, it was asserted at the time, was shared by 23.3% of the British adult male population. Other physical evidence assumed to link Shirley to the victim included a distinctive shoe-mark logo imprinted on Cook's stomach, which corresponded to the logo on shoes in his possession, along with cuts and scratches on his face and body and bloodstains on his trousers, all of which were supposed to have resulted from the attack.

Forensic DNA profiling was available to police investigators at the time of Michael Shirley's trial in 1988. Alec Jeffreys' 'DNA fingerprinting', based on multi-locus probes had already been employed initially to eliminate a prime suspect from investigation and, subsequently, to identify and link Colin Pitchfork to two murders. However, DNA profiling could not be undertaken in support of the investigation of Linda Cook's murder since semen found on swabs taken from Cook's body were, although sufficient to allow blood group analysis, of insufficient volume to permit profiling with available techniques.

Subsequent scientific developments in DNA profiling technologies (most importantly the development of PCR amplification to allow smaller and more degraded samples to be used to generate full genetic profiles) allowed analysis to be carried out on samples obtained from Linda Cook's body. In 1999 DNA analysis, using Low Copy Number technology (a process which uses increased PCR amplifications to analyze extremely small samples) was attempted on intimate swabs taken from Cook's body and stored since 1986. However the mixed DNA profile derived from this analysis proved inconclusive in the absence of reference samples from Cook and Shirley. In 2001, such reference samples were obtained from mouth swabs taken from both Cook and Shirley and were used to obtain profiles for each of them. When Cook's DNA bands were subtracted from those exhibited by the mixed profile 'there remained an array of "foreign" DNA bands which did not match either the victim or the appellant' [6]. The Appeal Court interpreted these 'foreign bands' to provide significant grounds for Shirley's appeal against sentence and the court quashed his conviction in July 2003.

There are many features absent from the above account since we do not have access to many of the relevant scientific and technical details. Available documents do not specify the number of DNA loci that comprised the 'array', or even if it can safely be asserted that the 'array' comprises a profile (or partial profile) of a single individual contributor. Neither do they specify the laboratory techniques used in the course of the analysis. It is important to note that the Crown did not dispute the results of these analyses carried out on behalf of the Criminal Cases Review Commission and many of the technical details remain absent from the Court's published judgement. Therefore, the Shirley case is as much a story about the way that the criminal justice system has responded to scientific developments as it is a story about the scientific developments themselves.

DNA 'transforms the picture': probability and evidence in the Shirley case

The new evidence which quashed Shirley's conviction in the Court of Appeal is referred to throughout as 'new DNA evidence'. However, the court ruled that this evidence alone did not exonerate Shirley of the crime so much as make his original conviction unsafe. The emphasis is an important one because it highlights the way in which DNA evidence can be utilized in post-conviction cases and what it can achieve. In the words of Lord Justice Laws, the admission of the new DNA evidence 'transformed the picture' of Shirley's case and this 'transformation' in turn allowed a dramatic reassessment of all of the evidence on which the original conviction was based.

The Court of Appeal ruling states that the blood grouping evidence presented at the original trial: 'is of course subsumed by the up to date DNA evidence' [6]. This is based on the difference between the random match probabilities of ABO blood groupings used to

inculcate Shirley and the unmatched DNA bands used to exculpate him. A comparison between Shirley's DNA and the semen on the swabs taken from Cook's body showed that only one band of the resulting profiles matched — the court accepted that this band would appear in approximately 1 in 3 unrelated individuals within the population — and that all other bands were 'foreign'. However, the fact that bands of the DNA profile obtained from the semen found on Cook do not match that of Shirley does not automatically exonerate Shirley of the crime of Cook's murder. As a reaction to the introduction of this evidence, the Crown contended that the semen extracted from Cook's body was unrelated to her attack; that is, that it belonged to an earlier sexual encounter which took place before the rape and murder. However, Shirley's counsel, using expert testimony, along with witness statements, argued that this was impossible and that the semen swabbed from Cook's body was placed there as a result of the rape prior to her murder. This contention - of whether or not Cook had another sexual encounter on the day of her death — thus became a principal deciding factor in determining the rightfulness of Shirley's appeal.

The appellant's counsel disputed the existence of a second semen donor on the basis of an analysis of Cook's knickers which had been removed from her body *prior* to her murder. No semen was found to be present on her underwear. Counsel contended that if a sexual encounter had taken place before the murder, vaginal drainage of semen onto Cook's underwear would have occurred. Shirley's counsel used expert testimony to establish that such drainage would have continued for several hours after a sexual encounter had taken place. Could Cook have had sex with another man early enough in that day to allow the exhaustion of vaginal drainage and then, before leaving her home, changed her underclothes? In order to establish the improbability of this occurrence the appellant's counsel relied upon witness testimony to account for Linda Cook's movements throughout the final day of her life. It is, in particular, one person's testimony (a woman named Linda Gray who lived with Cook) who stated that Cook was only alone for a few hours that day, the hours prior to her death. Yet if sexual intercourse had taken place during these hours, it was contended, vaginal drainage would have ensured the presence of semen on Cook's knickers after the sexual encounter but prior to her attack. The result of such a scenario would be the presence of two deposits of semen from different donors: one on Cook's removed underwear and a second deposit on and inside her body.

DNA evidence cannot show whether or not Linda Cook did have sexual intercourse with an unidentified man earlier on the day that she was later raped. It is only using the testimony provided by the witness who knew Cook that allowed the court to reach the conclusion that the 'whole impression one has is that an interlude of sexual passion, languorous enough for the semen to have drained from Linda Cook's vagina before she put her knickers back on, was an unlikely visitor among these facts' [6]. In making this decision the court argued that: 'The truth is that, taking the scientific evidence together with such knowledge as we have of Miss Cook's movements in the hours before she was attacked, the overwhelming probability is that *all* the semen found in the intimate swabs was deposited by one man on one occasion, that is to say by her killer when he raped her' [6]. Thus in assuming that the semen on Linda Cook's body came from her murderer, the DNA evidence ruled out Michael Shirley as the perpetrator. It is essentially the high discriminating statistical power of DNA profiling which allowed the court to rule Shirley out but, as we can see, this conclusion still relied on additional corroborating evidence provided by lay witnesses along with expert testimony concerning the temporal parameters of 'vaginal drainage'. It is precisely the relationship *between* DNA and the other evidence which overturned Shirley's conviction.

In Shirley's original trial the forensic science evidence provided by the blood group analysis had corroborated the prosecution's case. As well as the blood group evidence the crown relied on other circumstantial evidence to link Shirley to Cook's murder. The Crown had

contented that wounds found on Shirley's body were inflicted by Cook as she struggled during her rape and eventual murder. Expert testimony submitted to the court at that time suggested that the marks found on Shirley's body could be dated to the time of the attack. The Crown still contended in Shirley's appeal that this evidence linked Shirley to the murder scene. However, the Court of Appeal judgement was that, given that fibers taken from under Cook's fingernails do not match Shirley's clothing, and given that her fingernails were long and intact at the time of her death, it is unlikely that she caused the wounds on his body. Further to this, and relying again on the DNA evidence from the semen sample, the Court concluded that: 'the evidence of injuries to the appellant does not begin to dislodge the powerful improbability of a second DNA contributor' [6].

Nor did the Court of Appeal think that the impression of a shoe, taken from Cook's abdomen, and argued to match a shoe owned by Shirley, now constitutes adequate evidence to link Shirley to the scene. The footwear evidence had been central to Shirley's conviction - and to the case being dubbed the 'Cinderella murder'. At the original trial a match probability using sales figures for the same footwear in Portsmouth was used to provide statistical grounds for the likelihood that the shoe impression on Cook could have come from the shoes in Shirley's possession. Shirley did not dispute owning the shoes which bore the same marking as those found on Cook's body but contended that the method for calculating the statistical probability of it being the same shoe was based on inaccurate sales figures which did not reflect the over all sales of the shoes throughout the UK. The Court of Appeal did not recognize this criticism as valid but stated that: 'this piece of circumstantial evidence cannot on its own overturn the probability that there was only one DNA contributor. It is no less clear in our minds that it cannot do so taken in conjunction with the evidence about the injuries' [6].

It should be clear that the value of DNA evidence in Shirley's appeal is the extent to which a whole series of decisions based on probabilities becomes re-framed. The new DNA profiling introduces a level of statistical certainty which assumes a greater level of importance over previous evidence. DNA profiling does not 'prove' Shirley's innocence; on the contrary it is the expert testimony, about semen retention and vaginal drainage, combined with the original witness statement of Linda Gray, which allows the DNA evidence to be interpreted in support of Shirley's appeal. The DNA evidence is only conclusive once we have ruled out the plausibility of Cook having an earlier sexual encounter which would account for the unidentified semen. In ruling out that possibility it is the lack of semen found on Cook's underwear, which had been removed from her body before her rape and murder, which establishes that the semen was deposited by the murderer. At the original trial there was no contention of a second semen contributor because a link between Shirley and the semen samples was obtained through blood group typing. Because the new DNA evidence shows that there is no link between Shirley and the semen then the possibility of the second contributor arises. Therefore, what eventually eliminates Shirley as the probable murderer is not the unmatched DNA profile itself but indirect inferences about sexual activity that can be drawn from witness accounts of Linda Cook's whereabouts in the hours before she was murdered.

Post-conviction testing in the UK

The case of Michael Shirley demonstrates that it is entirely problematic to suppose that post-conviction DNA profiling in and of itself necessarily exonerates individuals. Even where it can be shown that DNA profiles obtained from victims cannot be associated with those convicted of a variety of assaults on them such DNA evidence alone may prove inconclusive. What post-conviction DNA testing brings to an appellant's case is essentially evidence of the same value that is now routinely admitted to courts in prosecutorial

proceedings: that is, a statistically reasoned method for asserting the likelihood of a known individual being the originator of trace DNA found at a particular crime scene. It is the combination of that method of calculation, when combined with other forms of evidence, which is of the greatest value to our criminal justice systems.

Yet the crucial necessity to contextualise the significance of any particular instance of DNA profiling is often forgotten in the rhetorical constructions which surround its use. For instance, in Berger's [7] account of the capacity of this technology to exonerate individuals from involvement in crimes for which they have already been convicted, DNA profiling raises serious problems for criminal justice systems. Berger argues that unlike any previously available method for establishing new evidence, DNA profiling serves not only to re-open old cases but also forces us to re-think the assumptions we hold about our criminal justice system. For her, post-conviction DNA exoneration will not simply release convicted prisoners but will highlight 'flawed assumptions and failing in our criminal justice system that will continue to require attention' [7]. In particular she argues that the 'infallibility of DNA' introduces a level of certainty which shows the inadequacy of our trial system and the evidence types it relies upon: that DNA exposes the failings of the jury system because, by re-opening cases with post-conviction testing, it questions the adequacy of the evidence that had been used to convict. Eye witness testimony, she argues, may especially be called into question by DNA profiling: 'we have irrefutable proof of the fallibility of eyewitness testimony' [7].

However, whilst Berger is correct in her claim that post-conviction DNA testing introduces new levels of certainty into specific aspects of criminal procedure her view that it makes problematic all other forms of other evidence needs further examination. In the Shirley case, as we have seen, the Court of Appeal actually relied entirely on witness testimony, provided by Linda Cook's friend, to establish a basis on which the significance of the DNA evidence could be interpreted. Without that testimony it would have been open to contention that Cook had had another sexual partner that day. Berger's reliance on DNA as an 'omnipresent witness' that can be called upon to verify the certainty of a series of events is, at least, problematic and ignores the contextual complexity of evidence which pertains to all criminal cases.

It is problematic to claim that post-conviction DNA testing reveals flaws inherent to our criminal justice system. All new forms of evidence which exonerate the convicted point to mistakes in particular cases as they were originally prosecuted. In the Shirley case it may be assumed that the jury relied on the standard scientific evidence available at that time to corroborate the other circumstantial evidence. Yet the scientific credibility of accuracy and certainty on which DNA profiling is based makes it a powerful source of evidence to admit as grounds for appeal. Whilst it would be difficult to imagine a high volume of cases in the UK, given that long-term prisoners constitute a small percentage of the prison population (and that many of them may have already been convicted with DNA evidence), it is nevertheless possible that more cases using post-conviction DNA evidence will appear. But at the present time there is little reason to suppose that anything but a small percentage of those cases which should be heard will even reach the Court of Appeal. Without proper consideration by government, and resources made available to those who most need them, post-conviction testing in the UK will remain sporadic.

For these reasons it is difficult to imagine post-conviction exoneration cases developing along the USA model in the UK. However, given that the collection, use and storage of genetic material by the police is, more than ever before, under scrutiny within the UK, the provision of resources for such instances of forensic DNA profiling may be a necessary short-term investment by government. As noted above, in the USA post-conviction

exonerations have served to promote the positive and beneficial aspects of DNA profiling in relation to debates about civil liberties. Whilst these debates have remained muted in the UK there currently exists various critical challenges to the Government's legislative provision and current arrangements for policing. The case of *R v Marper & 'S'* [8] which awaits a hearing in the House of Lords, will challenge the Government on the basis on Articles 8 and 14 of the European Convention of Human Rights, arguing that the retention of innocent persons' DNA constitutes a breach of the right to privacy and constitutes a form of discrimination. It has been this case which has provided a focal point for many commentators' view that an increasing imbalance between the state and individual citizens characterizes the current arrangements for DNA databasing. This is an imbalance which was recently recognized by the Parliamentary Joint Committee of Human Rights [9]. The capability of DNA profiling to right the failures of past judicial mistakes may prove to be a crucial weapon in the government's fight to maintain, or even extend further, the National DNA Database.

This brief consideration of Michael Shirley's case should remind us of the important issues that arise from the use of post-conviction testing: the value of DNA as an evidence type to eliminate, as well as implicate, individuals as suspects in a criminal investigation; the necessity of DNA analysis to be balanced with other forms of evidence when it is used in prosecutorial or appeal processes; the importance of extending the use of forensic DNA to those who would appeal against a conviction rather than simply as a tool used to secure one; the need for DNA profiling to be available to those who, serving custodial sentences, often face the greatest difficulties in obtaining it; and the need for proper consideration to be given to establish practices and procedures for DNA post-conviction evidence to be used as evidence in the appeal courts. The central complaint Michael Shirley made upon being released from prison was the time that his appeal had taken and that, in light of the DNA evidence, he had still failed to be granted bail whilst awaiting an appeal date. His case shows the necessity to make adequate arrangements to allow those wrongly convicted to utilize DNA evidence to achieve a speedy and just settlement in court.

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REFERENCES

- [1]. The Future of Forensic DNA Testing: Predictions of the Research and Development Working Group. US Department of Justice; Washington: 2000.
- [2]. Reilly P. "Legal and Public Policy Issues in DNA Forensics. *Nature*. 2001; 2:313–317.
- [3]. Convicted by Juries, Exonerated by Science: Case Studies in the use of DNA Evidence to Establish Innocence After Trial. US Department of Justice; Washington: 1996.
- [4]. <http://www.dnaresource.com/2003%20Post%20Conviction%20Legislation.pdf>
- [5]. <http://www.innocenceproject.org/about/index.php>
- [6]. *R v Shirley* (2003) Court of Appeal (Criminal Division), London, 29/07/03
- [7]. Berger, MA. *The Technology of Justice: DNA and the Criminal Justice System*. John F Kennedy School of Government; Harvard University: 2001. *Lessons From DNA: Restriking the Balance Between Finality and Justice*.
- [8]. *R v Marper and 'S'* (2002) Court of Appeal (Civil Division), London, 12/09/2002
- [9]. Criminal Justice Bill: Further Report. House of Commons, House of Lords, The Stationery Office Limited; London: 2003.