

Inclusiveness, Effectiveness and Intrusiveness: Issues in the Developing Uses of DNA Profiling in Support of Criminal Investigations

*Robin Williams and
Paul Johnson*

Current methods of forensic DNA profiling (known also as DNA fingerprinting and DNA typing), based on Polymerase Chain Reaction (PCR) amplifications of a varying number of Short Tandem Repeat (STR) loci found at different locations on the human genome, are regularly described as constituting the “gold standard for identification”¹ in contemporary society. At a time when criminal justice systems in Europe and North America increasingly seek to utilize the epistemic authority of a variety of sciences in support of the apprehension and prosecution of suspects and offenders, genetic science and recombinant DNA technology are often singled out for particular approbation. Indeed, the development and application of DNA profiling has been widely described as the “greatest breakthrough in forensic science since fingerprinting.”²

Prior to the implementation of PCR based extraction and amplification methods in the 1990's, the initial uses of DNA fingerprinting (based on Multiple and Single Locus Probes) were largely confined to reactive forensic casework. In this modality of use, laboratories directly compared DNA profiles obtained from biological material left at crime scenes with those taken from individuals already charged with involvement in the specific serious criminal offense under investigation. However, the subsequent ability to construct digital representations of profiles and store them in continuously searchable computerised databases has made possible a vastly expanded role for DNA profiling in many criminal investigations. In particular, this technology is increasingly applied inceptively rather than reactively. In other words, it shapes an inquiry by identifying potential suspects from the start rather than merely supporting their incrimination or exoneration after they have been nominated for attention by other more traditional – and often very protracted – forms of investigative practice. In addition, a series of laboratory improvements to enable the reliable extraction of genetic material from a wider range of samples in

Robin Williams, B.Sc.Soc., is Senior Lecturer in Sociology at the University of Durham. Previously at the University of Southampton and Manchester, he has recently published a series of papers on police uses of forensic science in general and of DNA profiling and databasing in particular. Having recently completed a study of the UK National DNA Database he is currently researching police uses of DNA in the 25 states of the European Union and is funded for this by the Wellcome Trust. **Paul Johnson, Ph.D.,** is Research Fellow in Sociology at the University of Durham. He has published in the area of police uses of DNA profiling and undertaken research on the formation, implementation and expansion of the UK National DNA Database. He is currently working on a comparative study of forensic DNA databasing and datasharing in the European Union.

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varying conditions has meant that forensic laboratories can more easily generate DNA profiles to facilitate the investigation and prosecution of a larger number of crime types. Sometimes (as in cold case reviews) such methods may succeed when other forms of forensic or witness evidence has proved insufficient or unreliable in helping bring offenders to justice for crimes committed some years earlier.³

Accordingly, policy makers, criminal investigators, and legal professionals have been able to depict a series of benefits already derived or potentially derivable from the increasingly routine and inexpensive use of this technology and its expanding applications. These benefits include: the potential to make speedy and robust suspected offender identifications through automated profile comparisons in centralized criminal justice databases; the ability to confidently eliminate innocent suspects from investigations; the increased likelihood of generating reliable and persuasive evidence for use in court; a reduction in the cost of many investigations; the likely deterrent effect of DNA databasing on potential criminal offenders; and a possible increase in public confidence in policing and in the wider judicial process.

However, the spread of forensic DNA profiling and databasing has also prompted a wide range of concerns about problems that may arise from the storage of tissue samples (especially those taken from individuals without consent) and the proliferating uses of genetic information by the police. As a result, in jurisdictions where forensic DNA databases have been introduced, a range of critical commentaries have emerged which have sought to counter claims for the effectiveness of DNA-aided investigations with assertions of potentially problematic ethical and social consequences of their uses. Such commentaries have focused on: the threat to the bodily integrity of citizens who are subject to the forced and non-consensual sampling of their genetic material; the intrusion and denigration of privacy rights caused by the storage and use of tissue samples; the potential for the future misuse of such samples held in state and privately owned laboratories; the prospect of long term bio-surveillance occasioned by the storage of genetic information in police databases and biological samples in forensic laboratories; and the possibility for the deceptive use of DNA forensic evidence in police investigations and criminal prosecutions.⁴

Since the early 1990's legislators across the globe have struggled to balance these two opposing standpoints when deliberating the establishment and permissible uses of DNA databases in their own jurisdiction. In doing so, they have been required to address a range of normative questions. These include: under what circumstances should the police be able to obtain, without

consent and with force if necessary, DNA samples from "suspects"; what range of circumstances and offenses should licence this sampling; what agencies should be permitted to carry out the analysis of the samples; what should be the criteria for the inclusion of DNA profiles on databases; what are the legitimate uses of samples and profiles held by the police; from which individuals should samples and profiles be retained following the completion of investigations and for how long should they be held; who should own, manage, and govern the use of databases accessed by the police; should access to samples and profiles be permitted to any other organizations; and what systems should be in place for the quality assurance and oversight of the varying scientific and bureaucratic practices that make up sample analysis, profile construction, storage and comparison?⁵

This paper suggests that whenever policymakers seek to strike a balance between the potential intrusiveness and effectiveness of forensic DNA profiling and databasing, three important matters are the focus of attention. The first concerns the legal (and moral) categorization of those individuals deemed a legitimate and appropriate "population" for compulsory DNA sampling, profiling and databasing. The second concerns representations of the nature of the information derived and derivable from DNA samples and forensic DNA profiles. The third is the question of how the permissible uses of such samples and profiles in the course of specific criminal investigations and prosecutions have been established and contested.

In the following sections of this paper we explore how considerations of these matters have arisen and been resolved in the course of legislative, judicial and other expert deliberations in the UK (England and Wales). We also describe the ways in which the introduction of one particular recent operational innovation in this jurisdiction – "familial searching" – challenged prior understandings of the permissible uses of DNA profiling and consider what this may tell us about the normative and scientific nexus through which DNA profiling and databasing technologies are continuously being developed and applied to the investigation of crime.

The UK National DNA Database

Whenever international comparisons are made in the use of DNA profiling and databasing in support of criminal investigations, the UK National DNA Database (NDNAD) is almost always assigned particular significance. The NDNAD, established in April 1995, was the first national forensic DNA collection and presently remains the biggest such archive both in terms of its actual size and the proportion of the national population held on it. England and Wales, which contributes the vast majority of profiles to an archive

which also contains profiles from the neighbouring UK jurisdiction of Scotland, has the most inclusive and far reaching legislative framework authorizing the collection, storage and use of forensic DNA samples in the world.⁶ This legislative provision (along with substantial dedicated Government support to Police Forces⁷) has resulted in a database that on 31 March 2004 held 2,527,728 million profiles from those suspected, charged or convicted of a “recordable offense,”⁸ along with 228,463 unmatched profiles obtained from scenes of crime. The database records match rates of 45% between newly entered profiles obtained from scenes or crimes and those already databased from individuals. Since May 2001 (when there was a change in the way that match figures were counted by the NDNAD Custodian), suspects have been nominated through DNA matches made from 133,933 crime scenes. 41,618 such nominations were made in 2003/2004.⁹

Regimes of Inclusion: Identity Categories and the NDNAD

There is no singular and distinctive legislative instrument authorizing the collection, analysis and storage of DNA samples by the police in England and Wales or the retention and speculative comparison of DNA profiles on the NDNAD. Rather, the statutory framework regulating the collection, retention and use of bodily samples taken from individuals in the course of criminal investigations and prosecutions rests on a series of piecemeal changes made to the Police and Criminal Evidence Act (PACE) 1984. These changes have resulted in legislative provisions which have substantially expanded the categories of persons from whom the police may legitimately take, retain, and speculatively compare samples and profiles.

The first salient amendments to PACE – in the Criminal Justice and Public Order Act 1994 (CJPOA) – significantly changed the legal basis for the circumstances under which police could obtain DNA samples without consent from those charged with a recordable offense and made new provisions in law for the “speculative searching” of such samples against information held in relevant databases. The Act altered the definition of “non-intimate samples” (those samples which PACE permits the police to take without consent or external medical oversight) to include swabs taken from the mouth.¹⁰ It further removed from PACE the restriction that samples must only be taken without consent in cases where an officer of at least the rank of superintendent has grounds “for believing that the sample will tend to confirm or disprove his involvement” in the crime under investigation.¹¹

It is also important to note that the CJPOA 1994 authorized the taking of samples without consent from

all individuals charged with involvement in a “recordable offense” as opposed to the previous PACE regulation which allowed such samples to be taken from those charged with a “serious arrestable offense.”¹² This change meant that the UK differentiated itself from the majority of other jurisdictions where compulsory DNA sampling regimes have been applied only in cases where an individual is suspected of involvement in variously defined “serious offenses.” In choosing to treat these particular kinds of biological samples in tandem with the previously well-established taking and archiving of fingerprints as a trace biometric identifier, the CJPOA 1994 permitted the indefinite retention of DNA samples and profiles for all those convicted of recordable criminal offenses. However, it also required the destruction of profiles and samples taken from any individual who, subsequent to the completion of the relevant investigation, was not subsequently convicted or cautioned for committing the offense in question.

There were no legal challenges to the inclusion regime established by the CJPOA 1994. This reflects, in part, the long established process of retaining ‘personal’ and identifying information from those convicted of criminal offenses. However, the enactment of the Criminal Justice and Police Act (CJPA) 2001, which removed the previous PACE requirement for the police to destroy samples and profiles taken from those who were not subsequently convicted or cautioned for a recordable offense, has provoked both controversy and legal challenges in the UK. This is because the legislative provision has reconfigured the categories of persons held in and epitomised by the collection. At a single stroke, the CJPOA 2001 changed the database from a collection of genetic material and information taken from a population of *convicted* offenders to a collection comprising anyone *once charged* with involvement in any recordable offense. This reconfiguration of the NDNAD has been highly consequential in criminal justice terms since it means that individuals who have not been subject to further due process, beyond the point of a charge being laid, are now subject to indefinite genetic surveillance through the continuous speculative searching of their DNA profiles against all new crime scene and subject profiles loaded onto the database.¹³

Contesting Inclusiveness: The European Convention on Human Rights

The expanded retention regime enabled by the CJPA 2001, with its potential intrusiveness into, and negative impact upon, individual privacy has been subsequently challenged in the UK courts. This challenge itself has only been made possible by the passage into English law of the Human Rights Act 1998. The Act

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grants courts in England and Wales the power to rule on whether the actions of public authorities (including the police) are in compliance with the articles and principles of the European Convention on Human Rights (ECHR) and effectively made redundant Lord Hoffman's earlier judgement that "English common law does not know a general right of privacy."¹⁴ The ECHR has been relevant to European jurisprudence since its inception in Rome in 1950 and, with its subsequent five "protocol" amendments made between 1952 and 1966, has had wide reaching impacts in a number of relevant jurisdictions. However, whilst the Convention was not directly relevant to British law until its *de facto* incorporation through The Human Rights Act, it would be misleading to think that many of the substantive issues addressed by the ECHR were not present in British jurisprudence prior to its incorporation. As Lord Hoffman himself more recently argued in an important consideration of a case brought under the ECHR: "I would not like anyone to think that we are concerned with some special doctrine of European law...The United Kingdom subscribed to the Convention because it set out the rights which British subjects enjoyed under the common law."¹⁵ Nevertheless the incorporation of the ECHR substantially altered the basis on which individuals can assert a "right to privacy" in England and Wales.

Article 8(1) of the ECHR states that: "everyone has the right to respect for his private and family life, his home and his correspondence." Necessarily this is characterized as a "qualified right" – a right whose exercise has to be balanced against the rights of others or the interests of society in general (other qualified rights are the "right to freedom of expression"; the "right to freedom of assembly"; and the "right to the peaceful enjoyment of possessions"). The nature of the qualification is described in Article 8(2) which states that: "There shall be no interference by a public authority with the exercise of this right except such as is in accordance with the law and is necessary in a democratic society in the interests of national security, public safety or the economic well-being of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others."

It is generally recognized that "a range of policing actions impinge upon Article 8 including the inter-

ception of communications, surveillance, the storage and retention of DNA, fingerprints and communications data, and search and seizure."¹⁶ Assertions that the inclusion regime of the NDNAD, established by the CIPA 2001, is contrary to Article 8 of the ECHR have now been heard on three occasions by the Courts of England and Wales. The case of *R v. Marper & S*¹⁷ concerns the retention of DNA samples and profiles of two individuals, one a twelve year old boy, who were once charged with recordable offenses but not subsequently convicted. The Chief Constable of South Yorkshire Police, exercising powers afforded by the CIPA 2001, refused a request by the appellants to have their samples and fingerprints destroyed following their discharge. The resulting civil case was brought first to the High Court in 2002, then subsequently to the Court of Appeal in 2002, and last heard in June 2004 in the House of Lords (the UK Court of final appeal). In all three instances the appellants contended that the retention of their DNA profiles and samples contravened their rights under Articles 8 and 14 of the ECHR and in all three hearings their case has been dismissed.

The case is specifically concerned with the privacy issues raised by the *retention* of DNA samples and profiles by the police and not with the conditions under which they were taken. This is an important distinction since it precludes any interrogation of the legitimacy of the legislation which allows the police to breach bodily integrity to obtain non-intimate samples without consent. It seems generally accepted in UK jurisprudence that police should have the right to obtain DNA samples for comparison on the NDNAD at the point of charging an individual whether or not there exists DNA evidence relevant to the investigation of the offense for which the individual is being charged. However, the case shows that the Convention is clearly subject to jurisprudential interpretation in relation to the retention and subsequent use of such samples and derived profiles. For instance, Article 8(2) states that any breach of the right to respect for private and family life must be "in accordance with the law" and that it any interference should be "necessary in a democratic country." The appellants in *R v. Marper & S* contend that there is no such necessity for the retention of the samples and profiles of the unconvicted and that, on those grounds, the law is incompatible with Article 8(1). In the absence of such necessity, the powers ac-

corded to the police by the CJPA 2001 to retain samples and profiles subsequent to criminal acquittal are not proportionate to the legitimate aim of detecting and preventing crime.¹⁸

When considering the proportionality of any particular policing action there are a number of general factors which the courts take into account: any action must not restrict the right in question so much that it “impairs its essence”; the action has to be determined in the context of the individual case as a whole; insofar as the interference is discretionary, decision making must be considered and not arbitrary; the nature and severity of any potential harm to the individual whose rights have been interfered with must be considered; and finally the existence of less restrictive or less intrusive alternatives will have to have been considered. For Feldman¹⁹ these considerations mean having to balance the extent of the interference against the reasons for interfering – not balancing the right against the interference. These general factors provide a broad canvas for any assessment of policing in relation to the ECHR.

However, inevitably and necessarily, the actual substantive issues raised in any consideration of a police action draw upon the context, circumstances and – especially relevant to the current focus on this paper – the significance attributed to the categorical identities of the appellants who are making the case. Since the police do not possess the power to collect and retain the DNA samples of the entire population the question in judicial hearings has been framed as this: is the indefinite retention of DNA samples and the indefinite speculative searching of profiles taken from individuals who were once subject to criminal charges a proportionate breach of their right to privacy under Article 8 of the ECHR? In asking this question a specific category of person is invoked – the “charged suspect” – and factual and normative disputes about this category of persons has been fundamental to the challenges and decisions made in *R v. Marper & S*.

The appellants argued that the retention of their DNA samples and profiles unfairly discriminates against their entitlement to privacy and therefore contravenes their right to fair and equal treatment outlined by Article 14 of the ECHR.²⁰ In other words, that in allowing the police the power to retain their DNA, the legislation creates a discriminatory distinction between the appellants (as once charged but unconvicted) and the larger unconvicted population. It is the legitimacy of this distinction which has been the foundation on which all three judicial rulings in this case have been based. Whilst each ruling has recognized that the CJPA 2001 instantiates a particular category of persons, to which a particular forensic regime subsequently has

been applied, none of the judges have accepted that Article 14 of the ECHR has been breached.

Any consideration of the balance between the public good and individual rights is usually formulated as the balance between the good of the *innocent* collective versus the rights of a legitimately *suspected* individual. In this sense, deliberations of proportionality are concerned with whether the consequences of a policing measure are adverse to the suspected individual to the extent that they outweigh the benefits derivable for the collective.²¹ Insofar as DNA profile comparison may serve to exonerate as well as incriminate, the act of taking a DNA sample from a legitimate suspect and generating a profile from it during the course of a specific investigation may be generally accepted as a proportionate response to the necessity to investigate crime. Furthermore, in considering the arrangements for retaining fingerprints and samples from the *convicted* population of England and Wales the answer to the question of proportionality has also been a positive one because of the generally accepted distinction between the categories of “proven guilty” and “innocent” individuals. However, since the 2001 legislation now allows for the retention of samples and profiles from those who, hitherto, would have been (like the rest of the unconvicted population) exempt from such retention, the question of balance is somewhat altered. This is because the question of balance does not concern guilt versus innocence but, rather, persons where police suspicion of involvement in a recordable offense was once deemed sufficient to authorize charges being laid against them versus those never suspected of (or at least never charged with) involvement in a recordable offense.

Inclusion Extension: Arrestee Retention

During the time that hearings have been held in *R v. Marper & S* there have been further changes to the legislative provision in England and Wales – in the Criminal Justice Act (CJA) 2003 – which further extends the reach of the database to include individuals arrested for (but not subsequently charged with) a recordable offense. This Act, which has been in force since April 2004, has meant that the database now contains another category of persons: along with the “convicted,” the “unconvicted charged suspect,” is added the “unconvicted arrested suspect.” The NDNAD Board has estimated that this will add another 170,000 profiles to the database in the first full year of its operation. However, this recent extension of databasing in England and Wales, which initiates a new category of individuals and ascribes to it a reduction of privacy rights equivalent to convicted offenders, has been undertaken without providing any clear justification for the funda-

mental change in balance which it creates. Whereas the Lord Chief Justice, in his consideration of *R v. Marper & S*,²² ruled that it is legitimate to distinguish those who have been subject to sampling (because they have been legitimately charged with a recordable offense) and those who have not, he provided no assessment of the delivery of possible benefits to both policing and the social good. Although police may derive a further “convenience” from the establishment of an even wider retention regime, it is questionable whether such financial or administrative benefits are sufficiently great to justify the further extension of powers without extended judicial deliberation of its effects on individuals who have been subjected to different agencies and stages of the criminal justice process.

Critics of the legislation claim that the profiles and samples of these unconvicted individuals are retained on the basis that such persons are deemed to be “less innocent” than the general population who have never been subject to arrest or charge. As Lord Justice Sedley argued: “Not all unconvicted people, in other words, are equal from a policing point of view, even though they are from a legal one; and among those who have been charged but not convicted it is especially so.”²³ However, the criticism of this view, as one member of the House of Lords prosaically put it, is that it relies upon an illegitimate distinction between “the guilty who have been convicted of offenses, the not guilty, and the probably dodgy.”²⁴

In the recent House of Lords consideration of *R v. Marper & S* (which did not concern itself with the newer inclusion provisions of the 2003 legislation) the Appellate Committee did not reach a consensus on whether the retention of DNA samples and profiles constituted an intrusion of privacy under Article 8(1) of the Convention. Whereas, as stated above, the Lord Chief Justice of England and Wales deemed it an intrusion, albeit a “small” one, the House of Lords demurred from this ruling. However, Baroness Hale strongly argued that both the taking of samples and profiles and their subsequent retention most certainly do contravene Article 8(1). Her argument to justify this intrusion of privacy was: “The whole community, as well as the individuals whose samples are collected, benefits from there being as large a database as it is possible to have. The present system is designed to allow the collection of as many samples as possible and to retain as much as possible of what it has. The benefit to the aims of accurate and efficient law enforcement is thereby enhanced.”²⁵

This justification of recognized intrusiveness distinguishes between the “whole community” and the group of individuals who have been subject to sampling. Yet the distinction is blurred when arrested suspects are

“returned” to the community without having been charged with, let alone convicted of, an offense. If the retention of their DNA is beneficial to law enforcement because it expands the database, is the logical conclusion to such a view that the most effective database would be a universal one? Baroness Hale’s judgment asserts that there are benefits for society and increased effectiveness in policing created by an “expanded” database but it does not explain why the intrusion into the privacy of *specific types of persons* delivers these. As noted above, such an intrusion inflicted upon the convicted population has never been challenged in England and Wales and is never likely to be. At the same time there seems no enthusiasm for the establishment of a population-wide forensic DNA database in England and Wales, even amongst those who currently support the establishment of an “Identity Register” which will underpin the planned introduction of Identity Cards some time in the next decade.

Samples and Profiles: Characterizing Material and Informational Forms

An important resource for the judicial considerations described above has been the availability of competing assertions about the nature and range of information derivable from forensic DNA samples and profiles. Of central importance to the courts, in reaching conclusions about the intrusiveness of the NDNAD, has been a willingness to endorse particular versions of several differing and distinct representations of the character of genetic “samples” and “profiles.” In all three hearings of *R v. Marper & S* the courts have been informed by a particular view of DNA profiles as forensically relevant but informationally sparse. We have described this elsewhere as a form of “genomic minimalism”²⁶ in which such profiles are understood as powerful biometric artifacts but ones which carry little or no genetic data which would permit “diagnostic” inferences to be made about the medical, phenotypical or other personal attributes of the individuals from whom they were derived. Expressions of this genomic minimalism – of DNA profiles as “empty signifiers”²⁷ – are regularly deployed by those stakeholders seeking to defend or further develop the use of forensic DNA profiling and databasing in England and Wales. Such a minimalist representation affords the UK Home Office’s assertion that a DNA profile is much like a “car number plate” (i.e. it carries no inherent information but exists simply as a representation of material individuality). Indeed, the continued use of the early term “genetic fingerprint” encourages DNA profiles to be imagined as equivalent to an earlier biometric, treated (following the abandonment of Galton’s early ideas) as consisting

of intrinsically meaningless furrows on the skin of the hands.²⁸

Of course such a view of DNA profiles is in marked contrast to an alternative “exceptionalist” discourse which is present in well established scientific claims about the significance of genes as “information” as well as in debates about bioethics where it is used, by Murray²⁹ and others, to stress the “special character” of information derivable from genetic material. Assertions of this special character of DNA are often the basis for arguments concerning the necessity to regulate carefully the production, use, and dissemination of genetic data in a range of contexts (of which forensic applications are only one instance). However, in stressing the exceptional information richness of genetic material it can also be argued that using DNA in forensic contexts where samples are taken without consent raises new kinds of questions about privacy and the protection of the interests of individuals from whom such samples have been taken, interrogated and stored. Exceptionalist arguments have certainly been offered on behalf of the appellants in *R v. Marper & S* when they have sought to expose the privacy implications raised by the retention of their DNA samples along with the profiles derived from their analysis.

It is important to recognize that, unlike in many other jurisdictions around the world, the police in England and Wales are given equal powers to retain both the original reference tissue samples, taken in the form of mouth swabs from individual suspects, as well as the derived profiles that are included on the database. The implication of this is that the police are never required to destroy samples that they have legitimately collected. The justification by Government for this retention is based on assertions of the necessity to retain subject samples for quality assurance purposes, to resolve any subsequent disputes about the processing of samples in particular cases, and to facilitate any re-profiling that may become necessary if the current profiling methodologies change to include more loci, or even shift more radically to new kinds of platforms, such as SNP.³⁰ Regardless of the merits of these justifications, the claim of the police to “own” these potentially data-rich samples, in addition to the profiles derived from them, remains a central point of contention in England and Wales. For instance, in making a submission to the second hearing of *R v. Marper & S*, the London-based human rights group Liberty contended:

In contrast, to fingerprints and DNA profiles, the physical *samples* which are retained and used under PACE (swabs etc.) and from which DNA is taken, potentially contain very much greater, more personal and detailed information about an

individual. This may include highly private matters such as information about a latent genetic illness, or the birth gender of a transsexual person. It may even reveal behavioural tendencies, or important information about the individual that he does not even know himself such as the true nature of his familial relationships. The ‘knowledge’ in relation to an individual’s life that can be gleaned from DNA samples has no parallel in the history of science and raises profound questions about the protection of privacy in the 21st Century.

Leaving aside for the moment the implications of “familial relationships” which we will deal with in detail in the next section of this paper, Liberty’s submission concerns the capacity of DNA samples to reveal sensitive and personal information about individuals and, therefore, argues that its storage and use requires special consideration. Regardless of the validity of the scientific claims made by Liberty, the courts in England and Wales have generally accepted assertions of the *potential* data-richness of the reference samples held by the police. What they have not accepted is that such potential should be the basis for the destruction of the samples. The courts have concluded, as Lord Justice Sedley argues, that “DNA samples in themselves have no forensic or diagnostic value” for policing at present but the possibility that analysis of such material may yield distinct types of information in the future justifies their retention.³¹ The case for both the retention and destruction of samples taken from individual suspects is based on claims about the legitimacy of allowing forensic scientists and the police access to this information. The argument for sample destruction is justified by the potential for such information to be used for a range of socially unacceptable and unknowable future uses.

In upholding the right of profiling laboratories to retain tissue samples on behalf of the police, the Courts have consistently argued that PACE significantly limits the uses of any information available from DNA samples and that this prevents the “Pandora’s box,” as Lord Justice Sedley terms it, of illegitimate uses.³² The CIPA 2001 states that the police may use samples for “purposes related to the prevention or detection of crime,” in “use for the investigation of an offense,” and during “the conduct of a prosecution.”³³ This rather vague wording of “purposes related to the prevention and detection of crime” is, for some, an insufficient basis for the regulation and governance of human tissue samples. Yet the House of Lords recently rejected the contention that the legislation allows for potential future intrusions into individual privacy. Considering “the fear of an Orwellian future in which retained sam-

ples will be re-analyzed by a mischievous State in light of scientific advances and the results improperly used against the person's interest," Lord Brown of Eaton-Under-Heywood argued, that "no such abuse is presently threatened and if and when it comes to be then will be the time to address it. Sufficient unto the day is the evil thereof."³⁴

Notwithstanding this judicial conclusion, there are other voices in the UK that are urging a Government reconsideration of current sample retention practices. Amongst these are an important Government advisory body,³⁵ a relevant regulatory body, a respected independent not-for-profit group that monitors genetic developments, and a recent review of the Forensic Science Service.³⁶ Arguments for the retention of samples may prevail over such suggestions, but it also seems increasingly likely that further controls will be introduced to ensure more ethical scrutiny of the operational and research purposes to which samples are put.

Assessing Usefulness

Central to the justifications offered by Government for the wide reaching powers of the police to retain and use samples obtained from both convicted and unconvicted individuals have been a number of claims about the effectiveness of the NDNAD. Indeed, the judicial deliberations referred to earlier themselves incorporated considerations of the wide-ranging social benefits asserted by Government accounts of the uses of this technology. Political enthusiasm for the potential contribution of DNA profiling and databasing to crime detection in England and Wales has been a feature of both Conservative and Labour Governments since early recommendations were made for the establishment of a database in the 1990's.³⁷ Many public pronouncements by successive Government Ministers have celebrated the contribution of DNA profiling and the NDNAD to the successful investigation of specific crimes or of certain types of offenses. For instance, the Lord Chancellor recently stated that: "Each DNA sample, once loaded onto the National DNA database, could potentially help crack serious unsolved crimes, such as rape or murder...The database is a vital weapon in law enforcement which has already helped to detect thousands of repeat criminals."³⁸ And Chief Constable David Coleman, a senior UK police officer who is also chairman of the NDNAD Board which governs the database, recently asserted that "the Database is capable of making a huge contribution to the detection and prevention of crime in the United Kingdom, and has become a strategic national asset."³⁹

There is evidence of widespread public support for the collection and retention of DNA taken from convicted offenders so that their profiles may be compared

to genetic material obtained from any subsequent scene of crime.⁴⁰ There have certainly been many well-publicised serious crime investigations in which individual suspects have first been identified through NDNAD matches or in which a large number of potential suspects – the investigation of which would have required considerable police resources – has been radically reduced by genetic exclusions made possible by NDNAD searches. And instances continually emerge which demonstrate new uses of NDNAD intelligence which have enabled the identification, capture and conviction of offenders who would otherwise have remained undetected.

However, a sober assessment of the overall significance of DNA profiling and the NDNAD to the detection of crime requires a recognition both of the relatively small number of crime scenes from which biological material suitable for DNA profiling and database searching is currently recovered and of the varying significance of DNA matches and mismatches to the course of particular investigations. In 2002-2003 (the latest year for which full data are available) 5,988,450 offenses were recorded by the police in England and Wales. Crime Scene Examiners attended 998,000 (17%) of these crime scenes and collected biological material intended for DNA profiling from 100,000 of them. Only just over half of these samples (57,000) resulted in crime scene profiles added to the NDNAD. To summarize this attrition process: searchable DNA profiles were obtained from the examination of the scenes of less than 1% of recorded crimes.⁴¹

Because of the small number of recorded crimes from which DNA is recovered, the contribution of DNA profiling and databasing to the detection of crime overall may appear small. Whilst 1,388,894 of the crimes recorded in 2002/2003 were detected by the police, only 21,082 of these are described in official statistics as having been detected through the use of DNA. Thus, Home Office figures show that "DNA detections" comprised only 1.6% of all detections, although the contribution of DNA to detections varied according to crime types (0.3% of all detections for violent and sexual offenses, 7.9% of all detections for vehicle thefts, and 8.3% of all detections in cases of domestic burglary were attributed to NDNAD matches).

Enthusiasm for DNA profiling and databasing remains strong within UK Government, and no political party is likely to seek to propose a reduction in investment in this technology as an element in their criminal justice strategies. A recent statement to parliament by Caroline Flint, a Home Office Minister, represents the current government's position: "The NDNAD can make a significant contribution to crime detection by linking DNA evidence found at crime scenes to offend-

ers and significantly increasing the probability of crime detection.” However, it is also clear that Government Ministers, Her Majesty’s Inspectorate of Constabulary, the Police Standards Unit and others are all expecting to see further improvements in the willingness of Police Forces to collect and use DNA profiles as a contribution to meeting local and national targets for crime detection and reduction. While some such improvements may result from a more rigorous application of existing forms of DNA related investigative practice, investigators and their senior managers constantly seek novel technological and organizational solutions to the problem of investigative shortcomings. In the following section of this paper we consider the recent history of the introduction of one such novelty into UK policing.

Operational Innovations and the Challenge to Social Accord: The Case of “Familial Searching”

The Criminal Procedures and Investigations Act 1996 establishes clear obligations on criminal investigators to fully develop all lines of inquiry that are relevant to the identification and apprehension of suspect offenders. Satisfying these obligations – especially in efforts to detect serious crimes against the person – necessitates considerable ingenuity, and sometimes innovation, in the conduct of investigations. Accordingly, novel applications of existing forensic science and technology, as well as the provision of such technologies, are constantly sought by detectives or offered by forensic practitioners to enlarge the scope of what it is possible to seek, know or prove in particular criminal cases. This is as true in the case of DNA forensics as it is true for fingerprint, footwear and fiber comparison, toxicology or document examinations.⁴²

Whatever the character of such innovations, the investigative uses have to be introduced and regulated in ways that will satisfy any subsequent judicial scrutiny if successful prosecutions are to eventuate. However, the history of such developments in policing also suggests that decisions about their introduction are likely to be made within a small and fairly closed network of forensic science providers, legal advisors and specialized criminal investigators long before any resulting detections come to public attention through court hearings. Where successful prosecutions ensue, joint press releases by the relevant forensic science and policing organizations are used to shape very positive representations of the innovative technology or novel supplements to its prior uses – often as “breakthroughs” in the “fight against” or “war on” crime. A mixture of commercial, operational and political considerations lie behind these widespread practices. However, in a

small number of instances, the failure of operational scientists and investigators to offer such innovations for wider social and ethical consideration by relevant public bodies can lead to restyled, stalled or even abandoned developments.

In this section of the paper we examine a recent example of such a process – “familial searching” of the NDNAD – and the ways in which its sudden public appearance, following some years of closed consideration by the UK forensic science community, momentarily destabilized agreed understandings between a range of public bodies with interests in the uses of forensic DNA. We also describe the subsequent re-establishment of an agreed understanding of how the uses of this operational innovation should be regulated and consider whether the meanings and ramifications of its introduction have been fully appreciated.

The term familial searching, as used by forensic scientists and police officers in the UK, refers to a form of database searching based on knowledge about the probability of matches between the STR markers of two members of the same family as opposed to the probability of matches between these markers when the individuals compared are unrelated. This practice makes use of understandings of inheritance that prefigured the discovery of the structure of DNA and which had been largely applied to understanding variation in human, animal and plant phenotypical characteristics (see Bieber⁴³ for a summary account of these assumptions as applied to the forensic context). The work of Alec Jeffreys and his colleagues in the 1980’s represented an effort to operationalize and test these understandings at the genetic level rather than at the phenotypic level.⁴⁴ Conceptually, Jeffreys sought both to reliably differentiate individuals from one another and also to establish patterns of variations between those who were genetically related. Jeffreys’ research program had been focused on the development of robust methods for establishing and representing genetic heredity, and the first human application of his technique of “DNA fingerprinting” using multi-locus probes was in a test of the truthfulness of a claim to family connectedness in a UK immigration case.

The UK FSS have considered the utility of database searches based on this knowledge since 1996⁴⁵ and the FSS Forensic Intelligence Bureau now offers to Police Forces in England and Wales a search of the NDNAD to identify possible relatives of criminal suspects. The procedure has been applied when a full DNA profile obtained from a crime scene has not matched an existing profile on the database. Familial searching to identify databased relatives of an unknown offender utilizes the increased likelihood of similarity between the DNA profiles of those who have a direct genetic re-

lationship in order to identify a parent, child or sibling of an individual whose profile is available for searching. Familial searching therefore refers not to the *social* arrangement of families but the genetic relationships between individuals – a distinction which is important for investigative as well as ethical reasons.

The first use of these practices by the FSS in 2002 compared a full DNA profile, obtained using Low Copy Number analysis, from crime scene stains taken from three women murdered in South Wales in 1973. The resulting profile was used to make a “familial” match on the NDNAD to Paul Kappen, which in turn led to the detection of his father, Joseph Kappen, as the rapist and murderer of each of the women. The case shows that familial searching can be suitable when deployed alongside a number of other investigative techniques. For instance, in the Kappen case familial searching was used only after a prior intelligence-led screen, combined with psychological profiling, targeted 500 potential suspects (a process formulated and undertaken 27 years after the original murders). During the intelligence-led screening of these 500 suspects the police had attempted to visit and take DNA from Joseph Kappen, a suspect on the list, but learned from his wife that he had died some years before their new enquiries had begun. When the subsequent familial search of the NDNAD produced Paul Kappen’s name, as a possible close relative of the person who had left their DNA at the earlier crime scenes, the police re-visited the Kappen family to take samples from Paul Kappen’s mother and his siblings. Inferences made from the analysis of these additional DNA profiles were sufficiently credible for the police to be given permission to exhume Joseph Kappen’s body and subsequently confirm a full match between him and all three crime scenes. It was on the basis of this match that the case was closed. The case shows the highly significant use of familial searching but also the potential problems – investigative as well as ethical – in producing a large pool of potential relatives of a suspect whose guilt may not always be corroborated (as it was in the Kappen case) by other intelligence information.

The other significant “cold case” in which familial searching has been successfully deployed, in the investigation and subsequent detection of Jeffrey Gafoor for the 1988 murder of Lynette White, shows that the composition of the crime scene DNA profile produces variances in the effectiveness of this process. A full profile obtained from the crime scene where White was murdered contained an allele variant found in only 1-2% of those on the NDNAD. By increasing the amount of loci searched (to discriminate further within that 1-2%), and geographically screening the results, the NDNAD produced a smaller pool of 70 potential rela-

tives of the person who left the crime scene stain. During the investigation of that pool the identification of one potential relative, a 14 year old boy, prompted the further screening of a family which led to the identification of Jeffrey Gafoor as the murderer.

A recent use of familial searching, during an investigation following the death of Michael Little (who suffered fatal injuries after a brick was thrown through the windscreen of his moving vehicle), has delivered the first detection leading to a successful criminal prosecution in a current police case. Craig Harman admitted to the manslaughter of Little after being linked to the crime scene via the identification (and subsequent investigation) of a close relative on the NDNAD. Crime scene DNA, obtained from the brick thrown through Little’s windscreen (the DNA was present in blood found on the brick, deposited there as the result of a wound sustained during an earlier attempt to steal a car), yielded a full DNA profile that did not match any profile on the NDNAD. An intelligence-led screen was undertaken which produced no match. The use of familial searching identified a close relative of Harman on the database which directed the investigation led by Surrey police. Harman received a six year prison sentence. This case, along with the others detailed above, is likely to be central in future advocacy of the potential for familial searching in police investigations.

Despite these spectacular instances, applications of familial searching in the UK remain numerically limited. In 2004, the FSS reported that approximately 20 familial searches had been undertaken and that a quarter of these had yielded “useful intelligence information.” The reasons for this limited application include a recognition of the novelty of the process and also the volume of partial matches it may provide. Because familial searching relies on identifying a pool of possible genetic relatives of a suspect, who are then subject to more direct investigation (typically by being interviewed by the police), ACPO has also acknowledged that a number of ethical issues need to be addressed when this strategy is being considered. The *National DNA Database Annual Report 2002-03* stated that the “Database Board has recently sought advice from the Information Commissioner on the ethics and data protection issues of using this new approach more widely and will be issuing guidelines in the near future.”⁴⁶ Discussions between ACPO, the Home Office, the Information Commissioner, and representatives from the Human Genetics Commission, have resulted in an agreement about the circumstances under which such searches will be carried out and their results integrated into existing investigative procedures. However the agreement is operationally sensitive and has not been publicly disseminated.

There are several fundamental problems that surround the use of this search procedure to direct investigations. Issues arise in both the searching of profiles on the NDNAD and in the subsequent investigative trajectories that follow the provision of a list of individuals derived from such a search. A genetic link between individuals might be previously unknown by one or both parties and police investigations may make such information known to them for the first time. Equally an investigation may reveal (to investigators – if not to informants) the absence of genetic

leads to their identification and investigation as a potential relative of a person who has left biological material at a crime scene. Such individuals will have to be approached by the police to name relatives whose own profiles are not on the NDNAD. It may well be claimed that this constitutes a disproportionate interference with their privacy rights under the European Convention. Even if the approach itself is licensed by their lessened right to privacy, which has resulted from their previous criminal arrest, a question is raised regarding their obligation to help the police with their inqui-

The recent history of familial searching in England and Wales provides an example of how previously agreed understandings can become disrupted and thus subjected to further deliberations.

links which participants assumed to have existed. There is also the question of whether this kind of use of an individual's databased DNA violates promises of privacy and confidentiality made when their genetic material was originally collected as part of an earlier intelligence-led mass screen.⁴⁷ Furthermore, assertions about criminality, geography and familial relatedness that are central to the use of this forensic methodology are especially problematic (even if they do accord with the rhetorical endoxa of many detectives). For instance, the Custodian of the database said in a public meeting of the Human Genetics Commission held in February 2004 that "[Familial searching] is based on some very important assumptions that criminality can run in families, that a relative could be on the database, the families tend to live in the same area, and that offenders tend to offend close to their homes or in areas that they frequently visit." The same assertions are made in the most recent *National DNA Database Annual Report*.⁴⁸ Yet they reveal pervasive problems associated with the confusion between "genetic" and "social" relatedness ("families" are not only constituted through genetic lines but through clusters of non-genetically related individuals) as well as the implicit assumption that criminality is fostered because of such relatedness (either because of genetic or social reasons). It is likely that these issues will be widely discussed in the near future when familial searching is more widely exploited by the police and more members of the public become involved in sample requests.

We have already described the way in which the CJA 2003 has now authorized the retention and samples from anyone arrested by the police in connection with a recordable offense. Individuals in this new category may seek to challenge the propriety of familial searching of their profiles on the NDNAD which subsequently

ries in a case where their own DNA profile has already exonerated them from direct involvement. In addition it has to be recognized that those individuals who are themselves being sought to be interviewed (and incriminated or eliminated) will be individuals who have not, since 1994, been charged or convicted of any offense. If they had been in any of these categories then their profile should already have been on the database (although this assumption may have to be qualified since individual police forces are known to have differed in their sampling strategies in the 1990's).

At the very least it seems likely that the use of this particular procedure will bring the police into contact with a number of individuals who have not been prosecuted for a recordable offense, who will have no criminal record, and who are subject to interview only because they are genetically related to someone whose profile is on the NDNAD. It could be argued that both the original informant and the suspect from whom a sample is sought are vulnerable to what Gans⁴⁹ has called "request surveillance" – that is, that in asking for such information the police are provided with the opportunity to observe the response, and potential fearfulness, of any individual. Such an observation may induce the police to consider the use of more coercive sanctions – in particular arrest – to obtain a sample from the newly identified relative.

Familial searching also raises a number of further issues relating to confidentiality and disclosure. Individuals who are invited to volunteer elimination samples, following their identification by relatives on the NDNAD, will have varying degrees of knowledge about their biological relatedness to those who they "matched." Other members of their household, their wider kin groups and the communities in which they live, may or may not be party to that knowledge. More-

over the fact that their relatives have DNA profiles held on the database may also be unknown to them in advance of this approach.

Because of the limited discussions that occurred when familial searching was first operationalized in England and Wales, there remain conspicuous uncertainties about many of these matters. The introduction of familial searching as a set of database procedures, and the investigative strategies associated with them, occurred without prior consultation or discussion with any experts or stakeholders outside of the narrow operational context of policing. The police and the FSS were eager to publicize their first successful applications, and the British mass media reported them as further breakthroughs in the fight against crime. However, key operational stakeholders were unprepared for the less enthusiastic reception given to this development by the external advisory and regulatory bodies described earlier. Perhaps for this reason, the use of familial searching was reconsidered while they negotiated with these bodies over whether and how criminal investigators should employ such innovative procedures in the future. Forensic scientists, the police and the NDNAD custodian may need to develop new forms of consultation with relevant agencies and policymakers in advance of the next round of innovations in forensic DNA profiling and databasing if these innovations are successfully to be introduced into exceptional or routine investigative operations.

Conclusion

The establishment of any forensic DNA database, which contains DNA profiles obtained from individual subjects for use by the police in support of current and future criminal investigations, requires legislative authorization, financial support and judicial endorsement. The success of such a database depends on the comprehensiveness of its coverage and the degree to which operational policing strategies respond to the intelligence opportunities it provides. In jurisdictions like the UK, where a national forensic DNA database is understood to make a substantial contribution to the detection and prosecution of offenders, there are inevitable demands to increase its inclusiveness, broaden the scope of the intelligence provided from its interrogation, and find new ways of utilising this intelligence to inform police enquiries.

A central feature of these considerations – about who should be sampled and profiled, what information samples and profiles currently and potentially provide, and how such information should be used to support criminal investigations – is that they circulate continuously between two different, but social and organizational “sites.” These are: sites of operation (e.g.

criminal investigation departments, police forensic science units, research and service forensic laboratories, etc.) and sites of deliberation (e.g. government departments responsible for policy development and implementation; judicial committees; government advisory commissions; independent social and human rights groups, etc.). In each jurisdiction that possesses a national DNA database it is possible to discern various key organizations and agencies within each of these kinds of sites that contribute to the co-production and co-development of the large number of material and discursive practices that together make up the appropriate and legitimate uses of these technological resources.⁵⁰ Therefore, the existence and continued operation of any national DNA database relies upon a series of continuous considerations and negotiated agreements amongst a range of actors seeking to satisfy different aims, expectations, ambitions and relevant expert and lay constituencies.

Technological and organizational innovations in the uses of genetic information that offer to enhance the effectiveness of investigations themselves become subject to interrogation and commentary by individuals and agencies beyond the limited forensic and policing communities from which they emerge. In some instances, what seems operationally ingenious to investigators may seem dangerously intrusive to external observers. When the deployment of investigative ingenuity disrupts or challenges agreed understandings of what forensic genetic profiles are, or how the genetic properties of persons should be utilised successfully to detect crime, then deliberative interventions into operational practice are the likely result.

The recent history of familial searching in England and Wales provides an example of how previously agreed understandings can become disrupted and thus subjected to further deliberations. The current outcome of such deliberations in this instance is a ‘Memorandum of Understanding’ between ACPO and the FSS on the use of familial searching. This document (whose circulation remains restricted) contains agreed understandings between the police, the custodian of the NDNAD and other relevant parties on what genetic, IT and investigatory resources can be used for such searches as well as the additional organizational arrangements that should supplement their uses.

In cases where criminal prosecutions depending on initial intelligence derived from familial searching have resulted in the conviction of offenders the judiciary have not questioned the propriety of the policing methods employed. This is unsurprising since, as we have described above, there is willingness among senior judges in England and Wales to support levels of DNA collection and retention that exist nowhere

else in the world at this time. This is just one aspect of the celebration of the application of genetic science and technology in support of policing, a celebration which also incorporates the support of the mass media and substantial public approval throughout the UK. However, the debate regarding the actual intrusiveness caused by the NDNAD is far from settled in the UK. It is still possible that the implementation of the CJA 2003 (resulting in a larger proportion of the population being held on the database) will occasion a growing awareness and understanding of the consequences of increased inclusion amongst a much wider section of UK citizenry. With the technological developments created by familial searching, a large population of databased individuals and the people genetically related to them will face implications created by the storage and use of their DNA. The reach of the NDNAD in the UK is already wide but with the capacity to sample all arrestees, and the use of familial searching, the investigative capacity of the database is enormous. Since a quarter of all adult males in the UK have been arrested at least once,⁵¹ the NDNAD is set to hold 25% of all adult males in England and Wales (along with about 7% of adult females). With this level of inclusion concerns about the scope for individual and familial intrusion will surely grow significantly. As such, therefore, the need for expanded deliberative involvement in determining the future directions and use of the NDNAD is essential.

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2. L. Townley and R. Ede, *Forensic Practice in Criminal Cases* (London: The Law Society, 2004): at 8; Her Majesty's Inspectorate of Constabulary, *Under the Microscope: Thematic Inspection Report on Scientific and Technical Support* (London: Home Office, 2000): at 12.
3. There are many accounts of these matters available, but for a recent short review, see M. A. Jobling and P. Gill, "Encoded Evidence: DNA in Forensic Analysis," *Nature Reviews* 5 (2004): 739-751; Lazer, *supra* note 1, provides an authoritative account of this trajectory – especially in the US. See also M. D. Lynch and S. Jasanoff, eds., "Contested Identities: Science, Law and Forensic Practice," *Social Studies of Science* 28, Special Issue (1998).
4. The literature on these matters is extensive. Essential sources include P. R. Billings ed., *DNA on Trial: Genetic Identification and Criminal Justice* (New York: Cold Spring Harbour Laboratory Press, 1992); Lazer, *supra* note 1; Human Genetics Commission, *Inside Information: Balancing Interests in the Use of Personal Genetic Data* (London: Department of Health, 2002); G. Laurie, *Genetic Privacy: A Challenge to Medico-Legal Norms* (Cambridge: Cambridge University Press, 2002); O. O'Neill, *Autonomy and Trust in Bioethics* (Cambridge: Cambridge University Press, 2001); and T. H. Murray, "Genetic Exceptionalism and Future Diaries: Is genetic Information Different from Other Medical Information," in M. A. Rothstein, *Genetic Secrets: Protecting Privacy and Confidentiality in the Genetic Era* (New Haven: Yale University Press, 1997): 60-73.
5. The first considerations given to a number of these issues in the UK can be found in the Scottish Law Commission, *Report on Evidence: Blood Group Tests, DNA Tests and Related Matters* (Edinburgh: HMSO, 1989); and the Royal Commission on Criminal Justice, *Cm 2263* (London: HMSO, 1993). There has been a continuous return to these issues over the ten years since the establishment of the National DNA Database of England and Wales (NDNAD) in 1995.
6. In Scotland the legislative provision for the police collection and use of DNA differs significantly from that in England and Wales. For a discussion of these differences, see P. Johnson and R. Williams, "DNA and Crime Investigation: Scotland and the 'UK National DNA Database,'" *Scottish Journal of Criminal Justice Studies* 10 (2004): 71-84.
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8. A "recordable offense" is any offenses which carries a sentence of imprisonment on conviction (irrespective of the period, or the age of the offender or actual sentence passed) as well as the non-imprisonable offenses under the Street Offences Act 1959, section 1 (loitering or soliciting for purposes of prostitution), the Telecommunications Act 1984, section 43 (improper use of public telecommunications systems), the Road Traffic Act 1988, section 25 (tampering with motor vehicles), the Malicious Communications Act 1988, section 1 (sending letters, etc. with intent to cause distress or anxiety) and others listed in the National Police Records (Recordable Offenses) Regulations 2000. PACE, "Code of Practice for the Identification of Persons by Police Officers," Home Office, 2004.
9. Statistics taken from Forensic Science Service, *National DNA Database Annual Report 2003-2004* (London: HMSO, 2004), available at <http://www.forensic.gov.uk/forensic_t/inside/about/docs/NDNAD_AR_3_4.pdf> (last visited June 28, 2005).
10. Criminal Justice and Public Order Act 1994, Section 58.
11. Original in Police and Criminal Evidence Act 1984, Section 63 (3B) (b).
12. Criminal Justice and Public Order Act, 1994, Section 55.
13. In 1999/2000, 228,088 profiles obtained from individuals were loaded onto the database. By 2001/2002 this figure had more than doubled to 586,026.
14. *R v. Brown* [1996] 1 All E.R. 545 at 556).
15. Lord Hoffman, UKHL 56 (2004): 50.
16. N. Taylor, "Policing, Privacy and Proportionality," *European Human Rights Law Review Special Issue* (2003): 86-100 at 95.
17. *R v. Marper & S* 2002 a [2002] EWHC 478 (Admin). High Court of Justice Queen's Bench Division Administrative Court; *R v. Marper & S* 2002b [2002] EWCA Civ 1275. Court of Appeal (Civil Division); *R v. Marper & S* 2004. [2004] UKHL 39. House of Lords (Appellant Committee).
18. Whilst "proportionality" is not a term found in the text of the ECHR, it has become a major resource for the formulation of arguments and judgements concerning the police uses of DNA in the light of the ECHR. Proportionality, as the Lord Chief Justice stated in his judgement of *R v. Marper & S* *supra* note 17, 2002 b, is usually absorbed by the consideration of "balance" which the court is asked to make; that is, to judge an appropriate balance between an individual right and a collective or social good. Often in British jurisprudence a distinction is made between a "balance-

- ing test" and a "necessity test." To judge necessity a court deliberates the possibility that the objective under consideration (in this case, the future prevention and detection of crime made possible by the NDNAD) could be met using different and less intrusive means. In *R v. Marper & S* ^{supra} note 17, the necessity test has been contended by arguing that the current 'blanket policy' of the police in retaining all samples and profiles of those once charged with, but not subsequently convicted of, a recordable offense is incompatible with the actual wording of the legislative provision in PACE which states that the police *may* retain samples and profiles. The appellants have argued that the intrusiveness created by the retention of samples and profiles, should there be a proven necessity for such a practice in particular instances, would be reduced by a case-by-case consideration of retention. This has been consistently ruled against on the grounds that such a situation would be potentially more intrusive because it would rely on the police making decisions about the 'character' of individual suspects. As Lord Wolf argued: "It would be highly undesirable for members of the public to be treated differently on the basis of some scale of innocence derived by the police" (*R v. Marper & S* 2002 b, ^{supra} note 17, at 12).
19. D. Feldman, *Civil Liberties and Human Rights in England and Wales* (Oxford: Oxford University Press, 2002).
 20. Article 14 of the ECHR, which prohibits discrimination, states: "The enjoyment of the rights and freedoms set forth in this Convention shall be secured without discrimination on any ground such as sex, race, colour, language, religion, political or other opinion, national or social origin, association with a national minority, property, birth or other status."
 21. There are certain problems in assessing proportionality in relation to the individual/society balance. As Lord Sedley notes "proportionality [is] an issue which, with respect, I do not think can ever be absorbed in a simple balancing exercise as between the individual and the public (an exercise which in a majoritarian democracy the individual will always lose, and which the [European Convention on Human Rights] is there precisely to redress)" (*R v. Marper & S*, ^{supra} note 17, 2002 b: paragraph 77).
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 23. *R v. Marper & S* 2002 b, ^{supra} note 17, at 20.
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 29. Murray, ^{supra} note 4.
 30. See P. Gill and D. J. Werrett, et al., "An Assessment of Whether SNPs will replace STRs in National DNA Databases," *Science and Justice* 44, no.1 (2004): 51-53.
 31. *R v. Marper & S* 2002 b, ^{supra} note 17, at 18.
 32. *R v. Marper & S* 2002 b, ^{supra} note 17, at paragraph 78.
 33. Criminal Justice and Police Act, 2001, Section 82.
 34. *R v. Marper & S* 2004, ^{supra} note 17, at paragraph 86.
 35. The Human Genetics Commission, ^{supra} note 4.
 36. A review of the Forensic Science Service was undertaken by Robert McFarland on behalf of the Home Office between 2002 and 2003. The Home Office have not made the final report of the review publicly available. The executive summary is *available at* <<http://www.homeoffice.gov.uk/docs2/reviewfssjuly2003.pdf>> (last visited June 29, 2005).
 37. The establishment of a National DNA Database was first made in the final report of the Royal Commission on Criminal Justice in 1993.
 38. Home Office Press Release, September 1, 2003.
 39. NDNAD, *Annual Report 2002-2003*, ^{supra} note 9 at 4.
 40. See Human Genetics Commission 2002, ^{supra} note 4.
 41. Forensic Science Service, ^{supra} note 9.
 42. Assertions of the spectacular potential of forensic DNA analysis can quickly lead to levels of investigatorial enthusiasm for recent innovations that cannot always readily be met even by those directly responsible for their introduction. The case of Low Copy Number (LCN) DNA is an example of such a problem in the UK.
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 44. A. J. Jeffreys and V. Wilson, et al., "Hypervariable 'Minisatellite' Regions in Human DNA," *Nature* 314 (1985): 67-72.
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 47. The CIPA 2001 also authorized the indefinite retention and continuous speculative searching of DNA samples taken during mass screens – subject to the "irrevocable consent" of the individual from whom such a sample was requested. It seems unlikely that familial searching would have been envisaged by anyone who consented to give their DNA under these circumstances.
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