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DNA and Crime Investigation: Scotland and the 'UK National DNA Database'

Paul Johnson

Paul Johnson (B.A. Durham, M.A. Durham, PhD Newcastle) 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.

Robin Williams

Robin Williams (B.Sc.Soc. London) 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.

Introduction

Recently described by the Forensic Science Service (FSS) of England and Wales as a '21st Century Crime Fighting Tool' (Home Office 2003a), the use of DNA in support of the investigation of crime is said to have been the most significant advance in forensic science since the introduction of fingerprinting in the 19th Century (Her Majesty's Inspectorate of Constabulary 2000). The DNA profiling of biological material obtained from crime scenes and individual suspects, and the searching of these against a collection of the profiles held on police databases, has rapidly become a routine aspect of forensic practice in many criminal jurisdictions across the world. A recent survey conducted by Interpol of its member states showed that 77 states perform DNA analysis, out of which 41 operate a national DNA database, and over-two thirds of those who do not currently operate a DNA database have plans to do so (Interpol, 2002).

Despite this global spread there remain important variations in the local legislative, organizational and financial supports provided by different governments for the collection and retention of DNA samples from both crime scenes and criminal suspects. These variations are likely to become more important as the internationalization of policing generates additional demands for the standardization of technologies for DNA profiling and the simultaneous searching of databases from more than one criminal jurisdiction. Some European groups already meet regularly to discuss the potential obstacles to this future globalization of forensic investigation. For example, the European DNA Profiling Group (EDNAP) has existed since 1988 with the aim of establishing systematic procedures for data-sharing across the European community (Martin, 1998); the Standardization of DNA Profiling in the European Union (STADNAP) group exists to promote co-operation across the EU in order to utilize DNA profiling to detect 'mobile serial offenders' (Schneider and Martin 2001); and the European Network of Forensic Science Institutes (ENFSI) (2003) has

similar ambitions to standardize forensic practices in support of policing across the whole of the EU. However, the kinds of operational issues that will arise in the future for a number of police forces wishing to share intelligence information across the EU are already visibly prefigured in the current arrangements that exist to make possible the linkage of collections of forensic DNA profiles across jurisdictions within the United Kingdom.

The arrangements for forensic DNA databasing in the UK differ across three main jurisdictions. In England & Wales the National DNA Database (NDNAD), operated by the FSS on behalf of the Association of Chief Police Officers, comprises a collection of genetic profiles taken from individuals suspected of involvement in crimes and from crime scenes themselves. In Scotland a national DNA database, operated by the Police Forensic Science Laboratory Dundee (PFSLD), and funded by three police forces (Tayside, Fife, and Central Scotland), contains permanent records of the genetic profiles of convicted persons submitted by the eight police forces of Scotland. The Scottish national DNA Database remains a distinct entity but exports 'copies' of its profiles to the NDNAD. Forensic Science Northern Ireland operate a DNA database on behalf of The Police Service of Northern Ireland and this remains a discrete collection with no exporting of data to the NDNAD (although current practice allows the NDNAD to be interrogated on behalf of the Police Service of Northern Ireland¹). The reach of forensic DNA databasing, as an investigatory tool, across the United Kingdom is therefore afforded by certain data-exchanging arrangements which exist between these distinct jurisdictions.

Since 2001 there have been important differences in the legislative provisions which govern the conditions under which the police can obtain, use and store genetic samples in different parts of the UK. These differences, which designate the circumstances under which it is legitimate to obtain DNA, and the categories of person from whom the police can retain profiles and samples, produce practical and operational issues for the administrators of both databases. This, in turn, affects the types of cross-national coverage that are available to each country. These differences are the focus of this article which seeks to provide a comparison between the legislative and financial supports for the forensic use of DNA in Scotland and in England & Wales as well as a consideration of the issues which arise from data-sharing across both jurisdictions.

DNA databasing in Scotland and England & Wales

The NDNAD, implemented in 1995, is the biggest and most successful forensic DNA database in the world. It contains the genetic profiles of over two million individuals and by 2004 aims to hold the profiles of the entire 'active criminal population' currently estimated at 2.6 million people. The two million profiles currently held on the NDNAD are made up from samples taken across the whole of the UK (excluding Northern Ireland) but the vast majority of this genetic collection is made up of samples obtained by the 43 police forces of England & Wales. This systematic collection of DNA by the police in England & Wales has been aided by targeted funding from the Home Office in the form of the 'DNA Expansion Program' which has provided approximately £200 million to increase the database to its current size. The story of the success of DNA sampling and databasing within policing comprises a complex set of developments in science and information technology, alongside changes in legislative and judicial provisions (for a detailed discussion of this history see: Johnson, Martin & Williams, 2003).

¹The police DNA database of Northern Ireland is operated by Forensic Science Northern Ireland and contains approximately 50,000 entries. The laboratory has not obtained the relevant certification from the United Kingdom Accreditation Service to allow its profiles to be added to the NDNAD. The Government reported to the House of Commons on 30th June 2003 (Written Answers, pt.3. Hansard, column 11w) that 'steps are in hand to carry out quality checks on the Northern Ireland data with a view to adding all the profiles from that database to the National DNA Database'.

The NDNAD is now an established part of police investigation in England & Wales and is seen as a central resource for reducing crime as well as detecting it. FSS statistics from 2001/2 show that the NDNAD produced over 58,000 intelligence matches between samples collected at crime scenes and individuals already on the database (Forensic Science Service, 2002). The importance of this intelligence tool for policing has recently been outlined by the government in the Police Science and Technology Strategy (Home Office 2003b) which places the NDNAD as central to scientific police resources. The Government has encouraged the growth of the database with financial and legislative support and future plans, to extend police powers to sample individuals' DNA, will expand the potential use of the NDNAD further.

The success of the database in Scotland is no less impressive when compared with the NDNAD. The PFSLD database has, up to August 2003, issued 6,151 intelligence matchesⁱⁱ. The database averages roughly 300 matches per month and in August 2003 recorded a hit rate of 74.15%. Yet the development and growth of DNA databasing in Scotland has been remarkably different to that of the NDNAD. In England & Wales, the DNA expansion program has funded both the laboratory costs and the recruitment of new personnel to collect and organize DNA sampling from volume crime scenes.

However, police forces in Scotland have received no such targeted support. As a result, the Scottish database comprises a smaller DNA collection of both crime scenes and criminal suspect profiles than that of England & Wales (its collection, in August 2003, comprised 137, 949 criminal justice profiles). Whilst the size of the Scottish database reflects the relative size of the population (in August 2003 it contained 137,949 profiles from a population of 5 million inhabitants) it nevertheless holds a lower population proportion than that of England & Wales. Whilst the Scottish Executive has welcomed DNA profiling in the Criminal Justice System there exists no dedicated DNA expansion program in Scotland. The Executive has given small amounts of money to individual forces to encourage DNA profiling (for example, in 2001, £800, 000 to Strathclyde Policeⁱⁱⁱ) and this has produced growth in both profiling and match results. Furthermore, resources made available by the Executive to construct a forensic laboratory in Strathclyde in order to reduce dependency on the PFSLD may reduce processing costs and allow more profiling to be undertaken.

It is somewhat misleading to think of the database figures for England & Wales and Scotland as representing separate and distinct sets of records. The permanent collection held on the database in Scotland – which is a collection of profiles derived from convicted offenders and unmatched crime scene stains – is included on the NDNAD. Scotland currently export all of their criminal justice profiles, and all those crime scene profiles which do not match any sample held in Scotland, to the NDNAD. This means that the local collection of Scotland becomes linked to the greater power of an 'engine' which covers England, Scotland and Wales. The PFSLD send approximately 3,500 profiles per month to the FSS for inclusion on the NDNAD. Once those profiles are entered by the FSS they can be speculatively searched across the entire database, allowing CJ samples obtained in Scotland to be compared to all profiles obtained in England & Wales. Similarly, all crime scene stains submitted by the PFSLD can be compared to all criminal justice profiles submitted by the police forces of England & Wales.

ⁱⁱWe are grateful to Tom Ross, of Tayside Police, for the statistical information regarding the database in Scotland, along with his helpful and constructive comments about this paper generally.

ⁱⁱⁱThe Strathclyde Police Annual Report shows that £800, 000 from the Scottish Executive allowed 800 extra samples per month to be collected from crime scenes, with a match rate of 50%. See: http://www.strathclyde.police.uk/news/2001/06/news_231_010614.html

Along with their submissions to the FSS the PFSLD request the removal of 2,500 CJ profiles from the database each month. This amount represents the number of individuals from whom samples were taken and who, subsequent to police investigation, have not been subject to judicial proceeding, or against whom there have been no judicial findings of guilt. These samples and profiles are removed from the national DNA database of Scotland at the same time that they are removed from the NDNAD. The removal of these profiles from the database in Scotland accounts, in part, for the slower growth rate of its collection. Since 2001, the police in England & Wales have been authorized to retain any profile from the NDNAD once it has been legitimately obtained during the course of an investigation, whilst in Scotland the police do not have the authority to retain samples and profiles from those who have not been convicted of a recordable offence. The destruction of these samples and profiles means that two-thirds of the DNA profiles generated in Scotland each month are destroyed.

The destruction of these samples and profiles must be undertaken by the sample holder – the laboratory which carried out the DNA profiling – and all records must be expunged from both the PFSLD database and the NDNAD. There is a window period of approximately 7-12 months when the DNA profiles of unconvicted persons in Scotland are stored and routinely searched on the NDNAD. This is the period between the beginning of an investigation and its outcome in the courts. The different powers to retain DNA samples and profiles across Scotland and England & Wales are just one example of the distinct legislative contexts in which DNA databasing operates. These different legislative provisions arise from the discrete social and political contexts of each jurisdiction and impact upon the operation of each criminal justice system.

Legislative distinctions

The legislative provisions for both obtaining DNA from individuals during the investigation of a crime, and retaining the profile generated from it on a searchable database, differ across the UK. These differences are expressed through distinct Acts of Parliament which apply within national boundaries. In the case of Scotland its legislation, first enacted in the London Parliament, has since been reconsidered by the Scottish Executive in Edinburgh. Distinctions created by legislative provisions fashion the conditions under which data-sharing between police forces can take place. They are therefore important distinctions and they are rooted in the earliest considerations of the use of DNA to support criminal investigations (in the late 1980s and early 1990s) when specially appointed national commissions published specific recommendations for the incorporation of DNA profiling into our criminal justice systems. These were the Scottish Law Commission's 'Report on Evidence: Blood Group Tests, DNA Tests and Related Matters' in 1989, and the Royal Commission on Criminal Justice in England & Wales which published its final report in 1993.

It is important to recall the central differences which emerged from these early considerations of forensic DNA. Both commissions focused on the essential need to allow the police to use genetic technology in a 'balanced and proportionate' way that would ensure the protection of individual rights and civil liberties as well as maximize the potential for criminal detection. Both commissions also placed great emphasis on the potential for DNA testing to exonerate individuals during police investigations, coupled with the idea of DNA as a definitive forensic method which could incorporate high statistical probabilities of certainty (and thus a form of 'objectivity') into legal proceedings. However, they differed in how this technology should be translated into practices for policing. Whilst the idea that extending the power of the police to carry out DNA sampling could ensure a fairer balance

between victims and suspects in the criminal justice process, the types of powers which the police should be given remained controversial.

The Scottish Commission argued that ‘an innocent person has nothing to fear from the testing of a sample of blood or other body matter [and] the result of such tests may well prove his innocence’ (Scottish Law Commission, 9). The Royal Commission in England & Wales, using an almost identical argument, recommended that ‘DNA profiling is now so powerful a diagnostic technique and so helpful in establishing guilt or innocence, we believe that it is proper and desirable to allow the police to take non-intimate samples (e.g. saliva, plucked hair etc) without consent from all those arrested for serious criminal offences’ (Royal Commission, 16). In many ways both commissions reflected the growing desire of both police and Government to utilize DNA more frequently within the criminal justice system and to exploit its maximum potential. Yet the recommendations made by the two commissions were strikingly different in relation to how they imagined the actual procedures for the collection of samples by the police. As we can see, the Royal Commission recommended that non-intimate samples be allowed to be taken by the police without the consent of an individual arrested for a serious criminal offence. Translated into legislation - the 1994 Criminal Justice and Public Order Act - this was crucially figured to allow the police to take non-intimate samples without consent from all those charged with any recordable offence.

One key component of the 1994 legislation in England & Wales was that a swab taken from the inside of the mouth was reclassified from its previous status as ‘intimate’ to its new status as ‘non-intimate’, thus obviating the need for professional medical intervention in its collection. Such a sample has, from this point onwards, been taken by police officers in England and Wales without consent when an individual has been charged (not arrested) with any recordable (not serious) offence. The Scottish Commission had made a strikingly different recommendation. In considering the balance needed to enable DNA to work effectively in the criminal justice system, and the rights and ‘bodily integrity’ of the individual, they proposed that the power to take samples without consent ‘should not include anything which involves going inside a person's body’ (Scottish Law Commission, 12).

The recommendations of the Scottish Law Commission did not find their way into law and the 1995 Criminal Procedure (Scotland) Act allowed for the taking of a mouth swab (alongside the less contentious hair and nail samples) without consent, with the authority of a rank no lower than inspector, from any person who has been arrested and is in police custody. The 1995 legislation in Scotland was enacted in the same year that both the Scottish database and the NDNAD went live and followed the legislation in England & Wales by one year. Yet the context for obtaining samples was immediately different between Scotland and England & Wales. Since 1994 the police in England & Wales have been able to sample DNA without consent at the point at which individuals are charged with a recordable offence. Proposals introduced into the 2003 Criminal Justice Bill for England & Wales seek to extend that power to sample without consent at the point of arrest. The argument offered by Government for such a measure is that taking fingerprints and samples as early as possible from an individual allows the police to establish or verify identification quickly as an aid to investigation.

The power to obtain DNA samples without consent at the point of arrest has been in force in Scotland since 1995. In the 2003 Criminal Justice (Scotland) Act this power has been altered so that police constables may take DNA samples at the point of arrest without, as was hitherto the case, obtaining the authority from a higher ranking officer. The proposals to introduce DNA on arrest in England & Wales have attracted some criticism, not least from

the Parliamentary Joint Committee on Human Rights who have criticized the Government's erosion of the balance between state and individual rights:

The power to take fingerprints and samples without consent was conferred in the Police and Criminal Evidence Act 1984 in terms which provided a carefully articulated balance between the perceived need for police to have new powers and the provision of protection against abuse of powers [...]. Since then, the carefully struck balance has been steadily shifted in favour of the police [...]. The range of purposes for which samples could be taken has been steadily extended. The procedural safeguards have been progressively relaxed (Joint Committee on Human Rights 2003).

This 're-balance' has also been described as disproportionate to the legitimate investigation of crime, with the human rights group Liberty stating that the power to take DNA at the point of arrest is a way of establishing a universal database by 'back door' methods and is wholly unbalanced in favour of the police: 'If there is any significant evidence that someone is involved in a crime, these very personal markers can already be taken. This simply treats everyone who has ever been wrongly arrested as guilty by implication' (Liberty, 2003).

Differences and accommodations

The preoccupation with a balanced and proportional system for allowing the police to utilize DNA has remained central to social, ethical and legal debates across the UK. However, these issues have been legislated for in different ways across England & Wales and Scotland. The differences between what is considered balanced and proportionate legislation across national jurisdictions is not necessarily contentious. One would expect different nations to possess distinct legislative provisions across the whole of their respective criminal justice systems. Yet the variations between Scotland and England & Wales have to be accommodated because of the arrangements for the common databasing of DNA in the NDNAD. It is these arrangements for data-sharing which allow discrete national collections to be combined in order to increase the scope of potential criminal detection across larger geographical areas. With the movement to incorporate the database of Northern Ireland into the NDNAD this scope will increase further^{iv}.

The arrangements which exist in the UK at the present time may prove to be the prototype of a widening accommodation for national differences should there ever be, as some groups such as STADNAP and Interpol hope there might, a European wide DNA database. For those who would seek such a database the current arrangements in the UK highlights some of the procedural subtleties that need to be observed if combining DNA profiles from different jurisdictions in one central database is to be successful. At no other time during the short history of DNA databasing in the UK have these differences been more pronounced.

The current arrangements for police forces across England & Wales and Scotland to obtain and retain DNA samples and profiles are remarkably divergent. As noted above, changes introduced in England & Wales in the 2001 Criminal Justice and Police Act permit the police to retain all sample and profiles taken during the investigation of any recordable offence regardless of the procedural outcome of that offence. In Scotland all profiles and samples must be destroyed subsequent to the end of an investigation which does not result in a conviction. In England & Wales, following the 2001 legislation, the issue of the retention of innocent individuals' DNA has become central to debates regarding the proportionality and balance of police uses of the NDNAD. In a recent judgment by the Lord Chief Justice of

^{iv}The potential for increased cross-national coverage to greatly aid criminal detection is tempered by the fact that the vast majority of crimes are detected locally. The Scottish database, for example, matches 60-80% of its monthly crime scene stains with profiles held on its own database and, therefore, is not highly dependent on the NDNAD.

England & Wales, in the consideration of a case brought under the European Convention of Human Rights (Articles 8 & 16) where the appellants claimed that the retention of their DNA by the police breached their right to privacy and unlawfully discriminated against them, it was ruled that any such interference with individual rights was proportionate and that the current law is properly balanced^V.

Yet, it is important to remember that the introduction of the 2001 legislation in England & Wales was created by a situation which began with the failure by the police to remove from the NDNAD a number of profiles of those individuals who had been cleared, after legitimate investigation, of all charges. This problem was caused by the lack of an adequate system to remove profiles and was officially recognized by an HMIC report conducted by Blakey (Her Majesty's Inspectorate of Constabulary 2000). One result of the failure to adequately keep the NDNAD records updated was a positive identification between crime scene stains with CJ profiles that should not have been present. The police, acting on these matches, subsequently secured convictions which were (in *R v Weir & R v B*) overturned in the Court of Appeal^{VI}. The quashing of these convictions raised general issues about the balance of justice and particular issues regarding the merits of retaining all DNA samples obtained during investigations. In 2000 Blakey had recommended that 'in the general interest of crime detection and reduction perhaps the time has come to revisit the legislation to consider whether all CJ samples, provided they have been obtained in accordance with PACE [the Police and Criminal Evidence Act 1984], should be retained on the NDNAD to provide a useful source of intelligence to aid future investigations' (Her Majesty's Inspectorate of Constabulary 2000: 18). The 2001 legislation in England & Wales secured that recommendation in law.

The context for this change in legislation in England & Wales has implications for the situation in Scotland. The proposal to retain the DNA of innocent individuals has been made by members of the Scottish Executive and was put forward for discussion in debates prior to the enactment of the Criminal Justice (Scotland) Act 2003. So far, the Scottish Executive has resisted the move towards the retention of the DNA of those other than convicted offenders. Yet Scotland has never experienced a case, like those mentioned above, whereby an individual suspect is identified, and convicted, using a DNA 'match' from a profile illegally held. The PFSLD provide assurances that before any match is made available the legitimacy of the CJ sample is checked in order to verify that it is legally held. Yet the illegality of the samples in England & Wales which led to the identification of those who had committed serious crimes was not viewed, at least by the media and by government officials, as a set of procedural problems that ought to be rectified but as a failure of the criminal justice system to secure convictions of individuals deemed violent and dangerous. It remains to be seen if any such argument could emerge in Scotland to change the legislative provision regarding the retention of innocent persons' DNA.

There is one other crucial difference between Scotland and England & Wales in the arrangements for databasing DNA and that concerns the procedures for retaining samples which are given voluntarily. In both jurisdictions DNA samples can be obtained by the police during 'Intelligence Led Mass Screening' where DNA samples taken from a 'relevant' population are employed as an investigative device. Such samples are given voluntarily, with consent, and are used to eliminate (and potentially identify) individuals by

^VCase last heard in: *The Queen on the application of Marper and Another and The Chief Constable of South Yorkshire before The Lord Chief Justice of England & Wales, Court of Appeal (Civil Division)*, September 2002.

^{VI}Opinion of the Lords of Appeal for Judgment in the Cause, *Attorney General's Reference No.3 of 1999*, on December 2000, House of Lords.

comparing their DNA to a profile taken from a crime scene. The difference across England & Wales and Scotland is in the types of consent that can be obtained from volunteers.

In England & Wales consent to allow the police to use a DNA sample given voluntarily must be obtained in two distinct ways: the police must first seek the consent of an individual to allow them to use a DNA sample for the purposes of the particular investigation in which it is taken; secondly, consent can then be obtained to have that profile loaded onto the NDNAD. In England & Wales providing consent to have a voluntarily sample put on the database is irrevocable. In Scotland, under new legislation in the Criminal Justice (Scotland) Act 2003, provision is now in place to allow consent to be given for a profile to be loaded onto a 'volunteers database'. One protocol of the consent arrangements in Scotland is that it may be withdrawn at any future time and the individual may have his or her profile removed from the database.

The volunteers' database in Scotland is not in existence at the present time but a working party will shortly be appointed by the Association of Chief Police Officers in Scotland to consider the specific arrangements for its operation. Questions which will need to be addressed regarding this database are: will the voluntary profiles be exported to the NDNAD and be speculatively searched; and will the voluntary samples constitute a separate database or (as in England & Wales) will they be incorporated into the main criminal database? If the profiles are sent to the NDNAD then an interesting distinction would be created between those individuals in Scotland who could revoke their consent and request to be removed from the database and those in England & Wales who could not. If those voluntary samples are not sent to the NDNAD then what protocols for access would exist should the police forces of England & Wales request to search them? It is the practicalities of these questions which may necessitate the inclusion and open searching of those samples on the NDNAD despite the local arrangements governing how they were obtained.

Conclusion

The current arrangements for the exchange of information between the Scottish database and the NDNAD might not appear to be problematic if one thinks of the NDNAD as a larger search engine into which the data from Scottish forces is entered. However, specific issues are raised by these practices of data exchange because of the differences in the legislative provisions under which they were obtained. As noted above, the law in England & Wales was altered to extend the provisions for the retention of DNA from unconvicted individuals and this was born out of an organizational failure to keep adequate records. Regardless of any arrangements in Scotland, which would seek to prevent the positive identification on the database with a profile that was illegally held, all profiles obtained in Scotland are held on the NDNAD. Whilst it is only possible to speculate on the potential for a failure in record keeping to occur that would allow a match to be obtained using a profile that should have been destroyed, the recent history of the database shows this to be possible. It is this possibility which raises a central problem in databasing DNA profiles obtained across different legislative contexts.

Other practical issues and considerations arise from the inclusion of DNA profiles obtained in Scotland on the NDNAD. When a profile is generated from a crime scene in Scotland and is entered onto the national DNA database of Scotland it can be checked against all those CJ profiles obtained from convicted offenders. However, when that same crime scene profile is included on the NDNAD it is speculatively searched against the whole collection of CJ profiles which includes those who are innocent of all crimes. An important distinction is therefore raised by the ability of the Scottish police to search a register of innocent English and Welsh citizens but the inability of the police forces of England & Wales to do this in

Scotland. There is therefore an imbalance in the types of power extended to different police forces and their ability to access information held in a central UK collection.

These differences may be removed if further pressure is exerted, as it already has been, on the Scottish Executive to extend the powers of the police to enable the retention of innocent people's DNA. In the Justice 2 Committee of the Scottish Parliament, which considered the last Criminal Justice Bill in Scotland, members stated: 'it may be beneficial to consider, at this stage, the inclusion of provisions to enable the retention of DNA samples, legitimately obtained from suspect or accused persons via the normal statutory process, following a not guilty or not proven verdict, or a case being marked no proceedings.'^{vii} That provision was not subsequently included in the legislation and there are no current plans to introduce it on another occasion. Yet, given the declared success of such provisions in England & Wales, the question of extending DNA retention in Scotland will not disappear. It will be interesting to see how Scotland copes with the potential of such a measure.

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^{vii}Justice 2 Committee, 8th Report 2002: Criminal Justice Bill Report Volume 2: Evidence (SP Paper 645), Part 8 'Evidential, Jurisdictional and Procedural Matters'.