Preferred citation: Toom, V. 2010. "Inquisitorial forensic DNA profiling in the Netherlands and the expansion of the forensic genetic body." in Hindmarsh, R. and Prainsack, B. (eds.), *Genetic Suspects. Global Governance of Forensic DNA Profiling and Databasing* 175-196. Cambridge: Cambridge University Press.

A slightly adjusted version of this article is published in Hindmarsh, R., & Prainsack, B. (Eds.). (2010). *Genetic Suspects. Global Governance of Forensic DNA Profiling and Databasing*. Cambridge: Cambridge University Press. The volume and some of the chapter can be downloaded from http://www.cambridge.org/gb/knowledge/isbn/item5562820/?site_locale=en_GB

Chapter 9 – Inquisitorial forensic DNA profiling in the Netherlands and the expansion of the forensic genetic body

Victor Toom

ABSTRACT

This chapter describes how Dutch DNA profiling became governed through legal measures and the inquisitorial orientation of the Dutch legal system. Secondly, the trajectory – the lines of development – of Dutch DNA profiling practices is described, outlining who and what has been involved in DNA profiling. This account provides insight into first, strategies employed by various stakeholders to deploy DNA profiling extensively and routinely in volume crimes, and, second, to apply DNA profiling in the process of crime investigations. The analysis contributes to the understanding of how current DNA profiling practices were realised in a country – *the Netherlands* – with an 'inquisitorial legal orientation', where judges and other involved jurists in legal cases act impartially. Finally, some implications for current directions in the governance of Dutch forensic DNA profiling practices are highlighted, especially the view that broad and informed public debates need to better address and resolve the many issues arising with regard to forensic genetic bodies and the civic protection of genetic suspects.

INTRODUCTION

During the 1990s in the Netherlands, DNA profiling became established as a mechanism to provide legal evidence for severe, violent crimes, including sexual assault, manslaughter and murder. That development was in accord with what Williams and Johnson (2008[C009-033]: 1) have observed in many

jurisdictions regarding the transformation of DNA profiling into an important tool in processes of crime investigation and usage in so-called 'volume crimes'. Drawing upon the Dutch situation, in this paper I first describe how Dutch DNA profiling became governed through legal measures and the inquisitorial orientation of the Dutch legal system. Secondly, I describe the trajectory – the lines of development – of Dutch DNA profiling practices, outlining who and what has been involved in DNA profiling. This account will provide insight into, first, the strategies employed by various stakeholders to achieve the current situation, where DNA profiling is deployed extensively and routinely in volume crimes, and, second, DNA profiling applied in the process of crime investigations. Hence, my analysis contributes to the understanding of how current DNA profiling practices were realised in a country – the Netherlands – with what I refer to as an 'inquisitorial legal orientation', where judges evaluate legal cases impartially.[1] Finally, I highlight some implications for current directions in the governance of Dutch forensic DNA profiling practices.

DNA PROFILING IN THE NETHERLANDS: LEGAL SYSTEM AND LAWS

Most Continental European legal systems, including that of the Netherlands, are organised according to an inquisitorial principle. Van Kampen (1998[C009-006]: 48) compared the Dutch and American legal systems regarding admissibility of forensic evidence. She found that the Dutch inquisitorial legal system rests on the assumption that different members of the system working on legal cases – judges, prosecutors, police officers, and experts – act impartially, fairly and expediently. Whereas 'adversarial' forensic evidence, as examined in US courts, is sceptically regarded and questioned intensively by lawyers and prosecutors, inquisitorial forensic evidence is attached to a practice that puts trust in experts, legal professionals and institutes.

Trust in Dutch forensic evidence has been achieved through the institutionalising of dealings with forensic technologies on various levels. First, the Netherlands Forensic Institute (NFI) is an agency of the Ministry of Justice and is under the Directorate-General for Law Enforcement. This means that the Minister of Justice is responsible for the NFI as an impartial, fair and expedient organisation. Second, the role and functions of expert witnesses and the NFI are circumscribed in the Code of Criminal Procedure. The Code prescribes, among other things, that expert witnesses have to take an oath that they will competently perform their tasks, like drafting a written testimony or being in 'good conscience' when they appear in court as expert witnesses. After taking the oath, an expert witness is installed permanently. Third, expert evidence usually takes the form of documents, for example, of DNA evidence, autopsies or drug analyses, which are supposed to be unbiased and neutral; however, expert witnesses themselves hardly ever appear in Dutch courts and are thus hardly ever questioned or cross-examined.[2]

[1] In an inquisitorial legal system it is the suspect who is the object of the process of finding juridical truth. The Office of Public Prosecution leads the process of criminal investigation, makes the decision on bringing legal cases and suspects to court, and prosecutes, and judges actively search for truth during court proceedings and impose sanctions. See Van Kampen (1998[C009-006]) for further elaboration on the differences between 'inquisitorial' and 'adversarial' legal systems.

[2] For exceptions, see: M'charek (2005[C009-010]), Bal (2005[C009-001]).

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DNA evidence has a somewhat special position within Dutch forensic practices. In the early 1990s, the Minister of Justice decided that DNA profiling should be governed through special DNA profiling legislation to form a fourth mode of institutionalising forensic evidence. In September 1994, the Forensic DNA Profiling Act (Staatsblad 1993[C009-024]) came into force. This law mainly sought to regulate two aspects of DNA profiling. First, it became a legal possibility to issue a compulsory 'body search' (the legal term) of individuals suspected of having committed severe and violent crimes – such as murder, homicide and sexual assault – to obtain blood (on medical grounds, saliva or hair roots could also be obtained) for DNA profiling. Second, the law laid down various measures to ensure the reliability of DNA evidence. It stipulates, for example, that only DNA profiles produced in a laboratory with accreditation according to international standards (ISO 17025) may be used as DNA evidence in court.

In November 2001, an amendment was added (Staatsblad 2001[C009-026]), which offered an important widening of the scope and applicability of DNA profiling. Most importantly, individuals suspected of having committed more minor crimes like theft, break-ins, and mistreatment or being a (severe) public nuisance – so-called volume crimes – could be body-searched to obtain saliva for DNA profiling. Another amendment was issued in 2003 (Staatsblad 2003[C009-027]). This amendment, the Law on External Visible Personal Characteristics, allowed for the forensic DNA determination of the 'sex' and 'race' of an unknown originator of crime scene samples (see also Washington this volume with regard to the US situation on the latter aspect). The amendment belongs to the category of so-called 'window' legislation, as it leaves room for other externally visible traits, for example, colour of hair or eyes, to be included through an Order in Council.

The most recent Dutch law was enacted in 2005: the DNA Convicted Persons Act (Staatsblad 2004[C009-028]). Since this Act came into force, persons convicted of offences (that is, sentenced to imprisonment, community service orders, hospital orders, placed in psychiatric hospitals or in penal institutions for systematic offenders or institutions for juvenile offenders) carrying statutory maximum prison sentences of at least four years will be obliged to provide DNA samples. Currently, new amendments are being considered, pertaining, for example, to familial searching and DNA dragnets (see: Ministerie van Justitie 2008a[C009-014]). The Netherlands is also a signatory to the Prüm Treaty, which merged Dutch DNA profiling into a European data-sharing endeavour (see Chapter 2 this volume).

THE DUTCH DNA DATABASE

In 1997, the Dutch forensic DNA database was established. By September 2009, the database contained more than 132 000 DNA profiles, all from a population of some 16 million. Of DNA profiles currently in the database, 88 026 are reference profiles, also known as subject profiles. Reference profiles are derived from persons whose identity is known to the authorities. The remaining 40 192 DNA profiles are derived from crime scene traces.[3] The 2001 amendment and the 2005 law in particular, contributed importantly to this number of DNA profiles.

[3] Available from: http://dnadatabank.forensischinstituut.nl/.

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Figure 9.1 here

Most reference profiles (subject profiles) originate from convicted individuals, but they also include suspects and deceased victims. The DNA profile of a convict is stored for 20 years after a person is convicted for a crime laid down in the Penal Code that carries a sentence of less than six years imprisonment. In contrast, DNA profiles are stored for 30 years when a person is convicted for a crime with carrying a sentence with six years or more imprisonment. Retention periods for reference (subject) and evidentiary (traces) samples are the same as for DNA profiles. The DNA profile and the biological sample of a suspect are removed if the suspect is not convicted. DNA profiles obtained from crime scene traces are removed when the originator of the sample has been convicted or when the public prosecutor decides not to use the match to prosecute the suspect. DNA profiles and samples of deceased victims, as well as crime scene profiles and traces, are stored for 12 years if they are related to crimes carrying a sentence of less than six years imprisonment. They are stored for 20 years if they are related to crimes carrying a sentence of six years or more imprisonment, and 80 years in cases of crimes punishable with life imprisonment. About 90 per cent of matches between crime scene profiles and subject profiles pertain to volume crimes like burglary and (car) theft (NFI 2008[C009-018]).

Above, I mentioned the trajectory of DNA profiling, which in some ways is the same as in many other jurisdictions which have introduced forensic DNA technologies. The Dutch situation, however, sheds light on how DNA profiling practices were transformed in a legal system with an inquisitorial orientation; from being used on a case-to-case basis in severe, violent crimes, to their now routine deployment in volume crimes. This begs the question: Why and how did this happen? In addition, how did the function of DNA profiles change from their use as evidence in courts, to their informing processes of crime investigation? In exploring such transformations, three historical phases can be distinguished. First, during 1989–1997, DNA profiling was introduced into the courts and became established as evidence for violent crimes. Second, during 1997–2001, new forensic DNA profiling technologies were introduced that led to the extension of DNA profiling beyond the scope of serious crimes to the realm of volume crimes. Third, the years post-2001 highlight the increasing room given to DNA profiling practices, with new criteria for 'body searches', a redistribution of responsibilities and competences, and DNA profiling becoming increasingly used for criminal investigation. After exploring these transformations, I discuss some implied challenges for governance.

DUTCH DNA PROFILING PRACTICES: 1989–1997

When Alec Jeffreys and colleagues invented DNA profiling in the mid-1980s, the technique was dependent on biological materials containing large amounts of DNA, that is, DNA extracted from reference blood, or DNA extracted from stains of blood and semen of about one square centimetre. Usually, such amounts of (crime related) DNA could be found at crime scenes or on the *corpus delicti* of serious violent crimes, but absent from less-severe or non-violent crimes like burglary.

Soon, in the late 1980s, DNA profiling was introduced in the Netherlands. Initially, various suspects delivered blood samples voluntarily to prove their innocence. But it was not long before a compulsory body search was issued in a legal case brought against an individual suspected of rape.

The suspect appealed successfully against this order. The case was finally brought to the Dutch Constitutional Court and it led to the so-called 'saliva decision' (Hoge Raad 1990[C009-004]). This decision ruled that taking blood from the veins or saliva from the inner cheeks comprised a breach of the right to inviolability of the body, a basic right articulated in Article 11 of the Dutch Constitution and Article 8 of the European Convention on Human Rights (ECHR).

To address this situation, and apply DNA profiling in serious crimes, Dutch law had to be changed (Toom 2006[C009-029]). In September 1994, the Forensic DNA Profiling Act came into force. For the first time in Dutch history, a compulsory body search could be issued to obtain blood, saliva and hair roots for DNA profiling. It was considered by the law to be proportionate if someone was suspected of a crime with a penalty of eight years of imprisonment or more. Crimes that incur eight or more years of imprisonment include severe, violent crimes like sexual assault, manslaughter and murder. Special measures were laid down to protect the rights of suspects. Only examining judges were allowed to order a bodily search for (both compulsory and voluntary) DNA analysis; DNA profiling had to be assessed as vital for finding 'the truth'; suspicion had to be backed up by facts and circumstances; a suspect needed to be asked to cooperate at least two times without success; only a licensed physician was allowed to take the sample; and samples were to be destroyed when the case at hand no longer demanded their availability. The law allowed digital storage of DNA profiles in a DNA database.

DUTCH DNA PROFILING PRACTICES: 1997–2001

Soon after the Forensic DNA Profiling Act came into force, new genetic technologies found forensic applications. First, polymerase chain reaction (PCR), a technology to copy specific strands of DNA millions of times, was introduced. Traces containing only small bloodstains, saliva or flakes of skin sufficed for reliable DNA profiling. Second, short tandem repeats (STRs) were shown to produce reproducible results between different laboratories using different DNA profiling methods, thereby remedying problems regarding production and interpretation of DNA profiling techniques as developed by Jeffreys and his colleagues (see Aronson this volume). Third, geneticists of the British Forensic Science Services (FSS) combined PCR and STRs in standardised multiplex DNA profiling kits, which rendered DNA profiling cheaper and faster to use. A second generation multiplex (SGM) DNA profiling system followed that was considered 'a highly discriminating and reliable individual identification tool suitable for both routine forensic applications and intelligence database construction' (Sparkes *et al.* 1996: 201).[4] In 1997, at the same time that the Dutch DNA database was activated, the Netherlands Forensic Institute (NFI) received accreditation for SGM from the Dutch Accreditation Council. This meant that SGM profiles could become legal DNA evidence.

A DRAFT LAW PROPOSAL, THE 'DNA & BURGLARY' PROJECT AND THE 'ALBIN' CASE

Following these technological innovations, in 1997, Ministry of Justice policymakers drafted a law amendment to the above mentioned 1994 Forensic DNA Profiling Act (Ministerie van Justitie

[4] A later version of SGM (SGM+) is now applied in forensic laboratories internationally.

1997[C009-012]). The drafted amendment provided that DNA profiles should be derived from saliva rather than blood samples. Taking a buccal swab was considered a less severe violation of the right of inviolability of the body. Thus, it was proposed that an order to obtain a sample by an examining judge would be no longer required if a suspect provided a sample voluntarily, and that the objective of 'finding [the] truth', as laid down in the 1994 law, would no longer be required to obtain a DNA sample from a suspect. Instead, it was proposed that there was sufficient reason for taking a sample if it could be seen as being 'in the interest of the investigation'. These measures, it was argued, would lead to beneficial effects, like a larger DNA database to combat crime. Nevertheless, despite the fact that taking saliva rather than blood samples was seen as a less severe violation of the right of inviolability of the body, it was not proposed at the time to extend the use of DNA profiling to other, less severe, crimes like theft and burglary.

In the summer of 1997, the law proposal was submitted to key stakeholders such as police officials and legal experts.[5] The Netherlands Bar Association found the law proposal overly far-reaching on two counts. First, the violation of bodies was considered so severe that it was argued that high thresholds – that is, 'vital for finding truth' – should remain. Second, the Bar Association argued that only examining judges should be able to assess the necessity of a body search. Other consulted organisations found the proposal too conservative and advocated lowering the threshold for mandatory DNA profiling from eight years to four years of imprisonment based on the argument that taking a saliva sample could hardly be recognised as a violation of the body and thus as an infringement of bodily integrity.[6]

The reason given in the draft law proposal for restricting DNA profiling to severe, violent crimes was that: 'DNA research usually seems to contribute little to the investigative process solving break-ins. In general, no blood or saliva left by the perpetrator is found at crime scenes of theft' (Ministerie van Justitie 1997[C009-012], author's translation). This quote, however, surprised the former head of the Unit of Forensic and Technical Research of the Midden & West Brabant police district. When I interviewed this official in the summer of 2006, he disagreed with this line of reasoning:

I had read the explanatory memorandum [of the draft law proposal]. It was said that the threshold would not be lowered to four years of imprisonment, because in practice it has been shown that few biological traces are found [at crime scenes of less severe crimes]. Then I thought: 'That is not true. We do not collect biological traces at volume crime scenes because they do not do so much with it at the NFI. You're not going to collect traces that won't be used.'

According to this police official, thieves, for example, *do* leave biological traces; those traces, however, are usually not collected because crime scene investigators know that those traces will simply not be analysed. The reason for this is the limited resources available to the NFI, and the fact

[5] The draft law proposal was submitted to police organizations (Criminal Intelligence Service of the National Police Services Agency; Netherlands Police Institute; Board of Chief Superintendents), the NFI, the Board of Procurators General, Council for the Judiciary, the Netherlands Bar Association, the Dutch Organisation for Help to Victims, and the Royal Dutch Medical Organisation.

[6] When the law proposal was submitted in November 1998, many Members of Parliament aired the opinion that taking a saliva sample could hardly be recognised as a violation of the body. Only the members of the Green Liberal Party (GroenLinks) and the Socialist Party agreed to maintenance of the high thresholds (see: Tweede Kamer 1999a[C009-031]).

that typically most burglary suspects cannot be issued a compulsory body search to obtain blood for DNA profiling (to compare the crime scene stains with their DNA). After reading the draft law proposal, the official of the police district Midden & West Brabant organised a meeting with colleagues of the Utrecht police force and NFI officials. Together they decided to initiate a pilot project called 'DNA & burglary' to support the case for lowering the threshold from eight to four years of imprisonment based on the argument that forensic DNA could well contribute to juridical 'truth-finding'. Before the project began in January 1998, the Offices of Public Prosecution (districts Breda and Utrecht) were enrolled into it. Forms were especially designed and printed so as to efficiently streamline the various administrative acts. It was decided to run the project for six months, but this was extended to a year after a donation of €45,300 from the Ministry of Justice. The project was carried out in accordance with the 1994 Forensic DNA Profiling Act. To limit the workload for the NFI, the submission of DNA traces – like blood, cigarette butts, saliva and hairs – collected from volume crime scenes was restricted to a maximum of 60 traces monthly, meaning that both police districts (Midden & West Brabant, Utrecht) were allowed to submit 30 biological samples each month.

Three questions lay at the heart of the 'DNA & burglary' project. First, do burglars typically leave DNA traces? Second, would it be possible to produce usable DNA profiles from those traces? Third, do DNA profiles, after being stored in the Dutch DNA database, contribute effectively to solving volume crimes like burglary? The project ran from January until December 1998. During this period, a total of 562 biological traces were collected and submitted to the NFI. Subsequently, 391 DNA profiles were produced and uploaded to the DNA database (DNA bij inbraken 1999[C009-003]). The project thus demonstrated that biological traces could indeed be found at volume crime scenes and that most could be analysed, thus answering the first two questions.

The third question dealt with the DNA database, which had been operational since 1997. In its first calendar year, 49 DNA profiles, broken down into 28 reference DNA profiles and 21 DNA traces, were uploaded to the DNA database (NFI 2008[C009-018]: 10). In 1998, during the second calendar year, and the year that the project 'DNA & burglary' ran, a total of 708 DNA traces were uploaded. The project 'DNA & burglary' contributed 391 DNA traces to the total amount, and, with the use of the DNA database, 137 matches were established. In one case, it was found that a suspect's DNA profile matched DNA traces collected at 16 different crime scenes. This case involved a person referred to as "Albin" (not his real name of course). Albin was suspected of having committed more than 100 burglaries in 1998.[7] His case illustrates how forensic DNA profiling became extended to the realm of volume crimes. My focus in illustrating this is on two identifying stickers that were placed onto a DNA trace (T 123) and a reference sample (P 9999), respectively.

[7] The analysis is based on the criminal file compiled against 'Albin' (Pro Justitia, 1998[C009-021]). The Dutch Board of Procurators General gave permission to use the file on condition that the privacy of individuals (suspects, victims, witnesses) not be jeopardised. Consequently, I have altered the registration numbers in this chapter, used an alias for the suspect, and I used my own DNA profile in this chapter.

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CONNECTING CRIME SCENES: T123 AND THE DNA DATABASE

Let us revisit the following scene: one day in 1998, in the police district Midden & West Brabant, a burglary is reported. Later that day a crime scene investigator from the Forensic and Technical Department secures from the crime scene, amongst other things, a cigarette butt. It is accounted for as shown in Table 9.1[C009-001].

After collecting the crime scene trace and tagging it T 123, a Public Prosecutor of the Breda district submits T 123 to the NFI for DNA analysis. It is one of the 562 traces collected as biological evidence within the framework of the project 'DNA & burglary', and one of the 391 DNA profiles produced and uploaded to the DNA database.

Table 9.1: here

It should be mentioned here that the DNA database is administered by the NFI and is subject to legal regulation (Staatscourant 1994),[8] which, in the early 1990s, oversighted three different systems in the DNA database. The first was an analogue administrative system that stored information related to reference DNA profiles and DNA traces on 'datacards'. Datacards include all relevant information regarding the sampling and securing of tissue and production of the DNA profile, administrative numbers, the DNA profile, the submitted testimony, and the identifying stickers. The full name, date and place of birth, nationality, sex, and aliases are added to this information for reference DNA profiles. The second system was a digital system of reference DNA profiles. The third was a digital system that holds DNA profiles derived from crime-related traces. DNA profiles that are uploaded to the two digital systems can be linked to the identity of the originator or sample by means of evidentiary stickers like T 123 or P 9999, and data cards. Information that can be traced back to individual identities is not stored digitally.[9] The format of the DNA profile that T 123 takes when it is uploaded to the digital DNA database is a numerical representation that gives insight into the amount of repeats for each marker, as shown in Table 9.2[C009-002].

Table 9.2: here

Returning to the story, for analysis, the DNA profile T 123 is scanned for any previous entries. It soon appears that it matches several other DNA traces, and as a result, different crime scenes are linked together. As it so happens, soon after T 123 is uploaded to the DNA database, Albin is arrested on suspicion of burglary by the Midden & West Brabant police force. During interrogation, Albin admits that he, together with accomplices, has committed over 100 burglaries. After being officially charged, reference fingerprints and shoe prints are obtained and compared with fingerprints and shoe prints collected at various crime scenes, which are found to match. The police suspicion of Albin's involvement in a large number of criminal offences is now backed up by evidence. Subsequently, DNA information is brought to the attention of the detectives by an NFI official, who tells them about the DNA database matches. The detectives then summarise the legal case against Albin and the DNA matches in a written report:

[8] Note that this description shows how the DNA database was governed in 1998. Below, I describe the current governance of the DNA database.

[9] Currently, data cards are stored digitally.

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> When Albin was caught in the act of a break-in, a biological trace was collected at the scene of the crime which was subsequently DNA typed. It has been determined that that DNA profile matches DNA profiles typed from biological traces collected at ten other scenes of burglary (Pro Justitia 1998[C009-021]).

One of the functions of the forensic DNA database is that different crime scenes can be linked to each other as has occurred in Albin's case by obtaining 'matches' between different crime scene samples. But how is it possible to link Albin's DNA profile to profiles derived from crime scene samples?

CONNECTING ALBIN TO CRIME SCENES: P 9999 AND THE DNA DATABASE

To be able to link Albin's DNA profile to DNA traces stored in the DNA database, police and prosecutor prepare Albin's case to bring it to the examining judge. The examining judge is the official who decides on issuing a body search to obtain blood for DNA profiling. The rules laid down in the 1994 Forensic DNA Profiling Act are thus applied.

At the time that public prosecutor and police approach the examining judge, Albin is suspected of burglary, a crime with the liability of a maximum penalty of six years of imprisonment. However, if there is a suspicion that a burglary occurred *during the night* in combination with circumstances indicating that those break-ins were done *in cooperation with others* or by *forced entry*, a prison sentence of up to nine years can be imposed. Albin was suspected of breaking in during the night, and opening windows using tools in cooperation with others. Hence, the series of burglaries that Albin is suspected of is one of the only cases, in that year of 1998, for which mandatory blood-taking was mandated in the context of a non-violent crime. Nevertheless, other issues have to be taken into account, too. Is mandatory blood-taking proportionate in this case? Is it vital for finding 'truth'? In addition, how will Albin respond when the examining judge requests him to volunteer a blood sample? In a nutshell, the examining judge regards it as proportionate and vital for truth that a DNA profile of Albin be produced. But Albin volunteers a sample, hence it is not necessary to execute article 195d of the Code of Criminal Procedure to obtain a blood sample by force.

After a blood sample is obtained by a licensed physician, as taking blood is considered a medical procedure, Albin's reference sample is labelled with sticker P 9999. It is submitted to the NFI; the DNA profile is determined and finally uploaded to the DNA database. It appears to match DNA profiles collected at 16 different crime scenes. During the court case against Albin, this DNA evidence, together with other evidence (footprints and fingerprints, confessions) leads to a verdict of the judge that he finds it both *legally* and *convincingly* proven that Albin has committed a total of 56 (attempted) burglaries and six car thefts. The judge sentences him to five years of imprisonment, which is reduced to four years following appeal.

Albin's case is the first of its kind in the Netherlands, where one suspect was matched by means of the DNA database to so many different scenes of volume crimes. An NFI DNA expert, who was involved with Albin's case, wrote "MEGAHIT" on a laboratory printout. When I interviewed this DNA expert, she told me:

-ext

> Official: [It was for the first time] during the project DNA & burglary that we determined DNA profiles from traces collected at scenes of burglary [and uploaded them to the DNA database]. It did not take long before we started to observe matches, with this case with 16 matches as the highlight. It was the smash hit of the project.
>
> Interviewer: What did this 'megahit' mean for you?
>
> Official: This is the future. It works! It proves that our expectations regarding DNA profiling and databasing were right. And this is only the start; it will become huge. Now it is 10 years later and DNA profiling can be considered a business by itself, for instance regarding the Prüm Treaty.

DUTCH DNA PROFILING: 2001–PRESENT

When the project 'DNA & burglary' was terminated at the end of 1998, the participants evaluated the project and published its results in an official report in May 1999 (DNA bij inbraken 1999[C009-003]). A month later, in June, with the results presented to the Ministry of Justice, the following response ensued:

> Minister of Justice A. H. Korthals is considering making it possible to order a body search for DNA typing regarding crimes with a penalty of four years or more imprisonment. The threshold is currently set on crimes with an eight-year or more sentence. Lowering the threshold means that DNA typing can be used more often (Ministerie van Justitie 1999[C009-013], author's translation)[10].

Subsequently, in November 1999, the Minister of Justice submitted a new law proposal to Parliament, which a large majority in Parliament supported (Tweede Kamer 1999b[C009-032]).[11] The new law, called the Forensic DNA Profiling in Criminal Proceedings Law, became effective in November 2001 (Staatsblad 2001[C009-026]). Most importantly, it became legal for DNA profiling to be ordered when someone was suspected of having committed a crime with a penalty of four years or more, which included volume crimes like (car) theft, breaking and entering, mistreatment of persons and animals, and making a public nuisance.[12]

With this expansion of DNA profiling, the NFI (2000[C009-017]: 10) predicted that DNA profiling would be ordered up to 20 times more often when the 2001 amendment came into force. This posed a challenge to Dutch DNA profiling practices in several ways. First, in an attempt to deal with all the expected requests, the NFI had to move to a new building with an extensive forensic DNA

[10] See also Tweede Kamer (1999b[C009-032]).

[11] In this document, the Minister gave three reasons for lowering the threshold: the success of the project 'DNA & burglary'; a decision made by the Dutch Constitutional Court, the so-called 'toothbrush decision' (Hoge Raad 2000[C009-005][0]); and the critique of several Members of Parliament who found that maintaining the high threshold of eight years was too conservative.

[12] Since November 2001, a compulsory body search for purposes of DNA profiling is linked to article 67 of the Code of Criminal Procedure. This article describes the crimes for which someone can be taken in custody. This usually is the case when someone is suspected of having committed a crime with a penalty of four years or more.

laboratory. It also had to hire new analysts and install new experts, buy new equipment and further streamline the production and administration of producing DNA profiles. Second, measures to protect basic rights of suspects, laid down in the 1994 law, were changed in two respects. First, it was decided to grant public prosecutors – the officials in charge of the process of criminal investigation – the same authority as the examining judge to issue an order to obtain a sample (saliva, blood or hair roots) from a suspect. This meant that responsibilities were shifted from an impartial examining judge to the leader of the process of crime investigation. Secondly, it was decided that medical doctors no longer were required to obtain a reference sample; police officers who had received special training were allowed to collect saliva or hair roots from cooperating suspects. Both measures can be understood as a move away from using DNA profiling as evidence in criminal proceedings towards an application in crime investigation.

Since 2001, more links have been established between DNA profiling and the police. In the introduction to this chapter, I described the Law on External Visible Personal Characteristics, which allows for the forensic DNA determination of 'sex' and 'race' of an unknown originator of crime scene samples (Staatsblad 2003[C009-027]). Genetic information regarding 'sex' and 'race' is not so much used as evidence but is considered as an important lead which feeds into the process of criminal investigation. It enables detectives to focus their investigations on one group that shares a particular trait, like 'race' and/or 'sex'. Cole and Lynch (2006[C009-002]: 53) use the term 'DNA photofits' for these traits and other DNA markers informative about external visible characteristics.

DNA photofits have informed the process of criminal investigation in the Netherlands several times. An example is the case of 'Milica van Doorn'. She was found murdered in the city of Zaandam in 1992. The case was not solved. In December 2008, the Office of Public Prosecutor announced that a DNA photofit had been produced from biological material found near or on the body of the victim.[13] The DNA photofit indicated that the originator likely came from Turkey or North Africa. It was then decided to organise a DNA dragnet. A total of 75 Turkish and North African men, aged between 16 and 30 who lived close to the crime scene at the time of the crime, were selected and requested to volunteer a DNA sample. At the time of this writing, 71 men were excluded as possible suspects. Yet, four persons still have to deliver a sample. The case remains unsolved to this day.

Organising DNA dragnets based on DNA photofits can raise important ethical and normative questions. First, there is the issue that the statistical chance that the originator of the sample is likely to come from Turkey or North Africa was translated in news reports to a firm claim that the perpetrator *was* Turkish or North African, which, of course, did not have to be true.[14] Second, and by association, DNA photofits have implications regarding privacy and discrimination (see also Washington this volume). Third, DNA photofits produce a population of 'interesting persons' or a 'suspect population' (Cole & Lynch 2006[C009-002], M'charek 2008[C009-011]) that must be excluded as possible suspects. DNA photofits link 'suspect populations' to crimes. Establishing such links is not a value-free exercise; it interferes with the relationship between civilians and the state, as the onus of proof, which traditionally rests with the Office of Public Prosecutor, is shifted to the 'genetic suspect'

[13] 'Opnieuw grootschalig DNA-onderzoek in oude moordzaak' [Once more a DNA dragnet in old murder]. Available from: http://www.om.nl/ [accessed 31 March 2009].

[14] 'Turk vermoordde Milica van Doorn' [Turk killed Milica van Doorn]. Available from: http://www.laatstenieuws.nl/ [accessed 31 March 2009].

to prove his or her innocence. Currently, scientific research is being conducted in the Netherlands in an attempt to gain genetic knowledge about externally visible characteristics that may be used in crime investigation (see also 'phenotypic profiling', Chapter 2 this volume). This leads the topic of the next section.

SCIENTIFIC RESEARCH AND FORENSIC APPLICATIONS

Population geneticists of a Dutch university recently published their research results regarding genetic markers for determining eye colour (Kayser et *al*. 2008[C009-007], Liu *et al*. 2009[C009-009]). The genetic materials used in these studies are derived from two biomedical research projects. The first project, the 'Rotterdam project', assesses the occurrence and determinants of chronic diseases; the second concerns the city of Rucpen and is part of a program titled 'Genetic Research in Isolated Populations'. Both groups who donated samples to these biomedical studies were populations of predominantly Dutch origin (Kayser *et al*. 2008[C009-007]: 412). The findings of the geneticists led them to the claim that they can predict brown and blue eyes with an accuracy of respectively 93% and 91%, and other eye colours with an accuracy of 73% (Liu *et al*. 2009[C009-009]: R192). Subsequently, the results led to an announcement of the NFI, in March 2009, that the Minister of Justice would be asked for permission to apply this technique in forensic case work (NFI 2009[C009-019]).[15]

This research is an example of how biomedical and genetic research can converge with forensic DNA profiling (see also Tutton & Levitt this volume). But another route by which to gain genetic knowledge about externally visible characteristics has also been made available by means of the 2001 Forensic DNA Profiling in Criminal Proceedings Law, which involved two important decisions. First, reference samples (the DNA provided from subjects) no longer had to be destroyed when the case at hand was closed. Since 2001, more than 85 000 DNA profiles have been stored, meaning that a similar number of reference samples originating from criminals convicted in the Netherlands is available. Second, the Personal Data Protection Act (Staatsblad 2000[C009-025]) is legally applicable to the DNA database, meaning that DNA profiles and biological (reference) samples both are understood as *information* (see M'charek 2008[C009-011], Toom 2006[C009-029], Van der Ploeg 2007[C009-020]). This allows biological reference samples to be used for scientific research, for example, to develop a genetic test that is informative regarding external visible characteristics. After results are proven (sufficiently) accurate, and the Minister of Justice allows use of the test through an Order in Council, the test can be used in the process of crime investigation to determine external visible characteristics from an unknown originator and consequently produce other 'suspect populations'.

This is not only a hypothetical possibility. A Dutch academic research institute currently uses – with the permission of the Minister of Justice (Ministerie van Justitie 2008b[C009-015]) – genetic material derived from reference samples from the DNA database. The samples are anonymised except for the country of birth. This is supposed to enable geneticists to develop new genetic tests informative about external visible personal characteristics from biological traces. This latter example and the above mentioned example of determining eye colour show how forensic and biomedical practices

[15] The NFI expects that the Minister will authorise this technique through an Order in Council before the summer of 2010.

converge and both shape and are shaped by forensic DNA practices. I will now reflect on the different aspects and implications of the introduction of forensic DNA technologies in the Netherlands that I have focussed upon here.

GOVERNING THE CHALLENGES OF FORENSIC GENETIC BODIES

In this chapter, I have described the trajectory of Dutch DNA profiling practices. It has contributed importantly to, as Turner (2006[C009-030]: 228) has called it, the common understanding that the 'code of the body' is becoming a major tool in criminal investigations. To become major tools in criminal investigations, bodies need to be discursively reconstructed (Williams & Johnson 2008[C009-033]: 97). Such discursive reconstruction has in the Netherlands been achieved by, on the one hand, legal measures and jurisprudence, and, on the other hand, by genetic techniques like PCR, STRs and SGM. 'Bodies' in forensic DNA profiling practices have thus been 'enacted' (Mol 2002[C009-016]) by both a discourse of law and the practice of genetics, as 'forensic genetic bodies' (see also Hindmarsh this volume). Using forensic genetic bodies as a metaphor allows for an association with 'growing'. Here, I have described how forensic genetic bodies in the Netherlands have been 'growing'. At first, the forensic genetic body only consisted of individuals suspected of severe, violent crimes. The forensic genetic body then expanded to volume crimes. Next, 'all individual bodies' of convicted criminals were ushered into the forensic genetic body. Finally, the forensic genetic body is expanding in the refrigerators of the NFI with multiple forensic reference bodies at the disposal of the authorities, which can be used to create knowledge about them. This raises the question of how large the forensic body should be allowed to 'grow', and where the limits are. For example, should the complete criminal population be included, or the population at large, or all males from 12 to 60 years of age, and/or every migrant or tourist entering the Netherlands? Until now, this issue has not been discussed in the Netherlands; but successive policy makers seem to be driven increasingly by the possibilities generated through new DNA profiling technologies and changing ideas about a safe society and the 'war' against crime and terrorism.

The DNA database and markers for external visible characteristics thus gain in importance for crime investigation. Robust connections between DNA profiling and the police and the Office of Public Prosecution have been established and remain in place. Public prosecutors have gained authority to issue an order to obtain a saliva sample; police officers with special training are allowed to take saliva and hair root samples; DNA markers (or photofits) of external visible characteristics inform processes of crime investigation in 'suspectless' forensic cases; and new DNA photofits have been proven scientifically accurate or are currently being developed. DNA photofits create new and complex relations between the process of crime investigation and forensic genetic bodies.

Turning to issues of DNA photofits, they not only reinforce concerns that DNA profiling and databasing could increase stigmatisation and discrimination, but also, as outlined by M'charek (2008[C009-011]: 527), that a result of this practice could be the lumping together of 'groups of individuals … into a racialized suspect population'. Informed by the DNA photofit, detectives can concentrate criminal investigations on suspect populations, as illustrated in the example of the Zaandam murder case. Individuals who are lumped together in a suspect population can be requested to voluntarily supply a sample for DNA profiling in DNA dragnets. This raises several

further questions: What happens if an individual refuses? At the least, the individual – the genetic suspect – becomes 'interesting' for further investigation. If 'suspicious' clues are found (for example, the genetic suspect has a criminal record or a 'facebook' linked to a victim or another suspect), the public prosecutor can designate this person as a legal suspect, thereby transforming his 'body' into 'a forensic genetic body'.

However, as we have seen, one-trait DNA photofits currently have a maximum accuracy of 93%. When traits are combined (for example, 'sex', 'race', 'eye colour' and 'geographical origin') in a DNA photofit, the statistical likelihood that the perpetrator and the combined DNA photofit actually converge decreases, thereby increasing the risk of plainly focussing a DNA dragnet on the wrong 'suspect population'. This leads to pressing questions. Is a combined DNA photofit with a low accuracy reliable enough to lump individuals into a suspect population, and to ask all individuals in that population to volunteer a DNA sample? In addition, should DNA dragnets be made compulsory for 'suspect populations'? Then, what happens to innocent individuals who refuse to deliver? Will they automatically be treated as suspects?

In September 2008, two major Dutch political parties announced that they advocated compulsory participation for DNA dragnets.[16] So far, the Minister of Justice has rejected such a radical proposal. But that proposal is only one of the many implications for governance raised by the expansion of DNA databases and profiling, as I have signalled. These are enough to reinforce the view that broad and informed public debate is required to better address and resolve these issues.

ACKNOWLEDGEMENTS

I would like to thank Richard Hindmarsh and Barbara Prainsack for their extensive reviewing and editing. I thank all interviewees for their cooperation, Kees van der Beek of the Netherlands Forensic Institute for his comments, and all my colleagues who inspired this article at the Amsterdam School for Social Science Research (ASSR), in particular Amâde M'charek and John Grin. This chapter is based on my PhD research, which is funded by the Netherlands Organization for Scientific Research (NWO) and is part of the Societal Component of the Genomics Program.

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