

Performative Circulations: On Flows and Stops in Forensic DNA Practices

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Abstract: The article focuses on circulations and what circulations bring about. It does so by following the movements of DNA through different domains of forensic practice. By zooming in on DNA and the role it came to play in the Dutch Marianne Vaatstra case, the paper demonstrates the performative work of circulations and invites to attend empirically to circulations as an object of research. The article is organized along three steps, in which it is argued that: circulations bring about identities; that circulations make context; circulations are permanent and can only be stopped actively. In the analysis, circulation is no longer to be understood as a process of transmission, as a simple movement of people, commodities, or ideas from one place to another. Rather, the conclusion invites to attend to circulation as a performative event. An event that co-shapes not only humans and things as they move through space and time, but also the contexts in which this happen in situated manners.

Keywords: DNA; forensics; circulation; anthropology of science; genetics.

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In November 2012, no, to be precise, on Monday 19 November at 5.38 hours in the morning the well-known Dutch crime reporter Peter R. de Vries sent out the following tweet.

CASE #VAATSTRA: Man arrested. White suspect, Frisian, lived 2.5 km from crime scene. 100 percent DNA-match! — Peter R. de Vries.¹

¹ See for example this news report on the website of *NRC Handelsblad*: (<http://www.nrc.nl/nieuws/2012/11/19/arrestatie-in-zaak-vaatstra-dna-match-bij-bekende-van-familie/>). See also the follow up tweet by De Vries: *'Breaking news: white man (44) arrested for murder #vaatstra! 100 percent DNA-match! Hurray!*

This message was picked up by the media immediately and it is not hard to understand that the content came to entertain the minds of many people. Now, the fact that this message was going around so quickly is not the most interesting aspect of the theme of circulations, the topic of this address². For, let us have a look at this message and what it draws together. There is: *genetics* in the form of DNA; *identity* for there is a 100% match; *race* since it spoke of a white suspect; *ethnicity* this suspect is also Frisian; social evils namely a serious crime; but also *media*, old and new: after all it is about a *television* reporter using *twitter*; the technology to send, receive and read twitter; and much more.

This *knot* suggests that our tendency to perceive the world as well-ordered, where science and society have and know their designated places, does not hold true in practice³. It is precisely this knot, and the various compositions thereof, that constitutes an interesting challenge to an anthropology of science. Circulations, as I want to show here, bring about and maintain such knots⁴.

It was already in the early eighties that Donna Haraway introduced the Cyborg concept, a mixture of man and machine, to indicate that these knot-like manifestations do not only concern the things around us, but also ourselves (Haraway 1991). In her *Cyborg Manifesto* she pointed at the inextricable relation between nature and culture, between humans and technology. Her manifest was especially aimed at feminist colleagues and

Hurray! Hurray!! (See in Dutch on Twitter: <https://twitter.com/PeterRdeV/status/270377910760771584>).

² This text is a slightly revised version of my inaugural lecture delivered on Friday 18 September 2015 on the acceptance of the position of Professor in the Anthropology of Science. In the Netherlands these inaugural lectures are a particular genre. They cater for a wide and diverse public, they have to be somehow innovative but also accessible, scholarly but entertaining, reporting on research but also agenda setting. An almost impossible task. A nice tradition is that such lectures reserve ample space to thank colleagues and friends for the help, conversations and inspirations along the way. These words of thank are unfortunately not included in this text, but they are there in the original; (https://www.academia.edu/26836606/_Circulations_a_new_object_for_an_anthropology_of_science_Inaugural_address_Amade_Mcharek_September_18_2015_).

³ The division between science and society is reflected in a commonly heard expression used by scientists when they are reminded of the societal effects of knowledge and technologies: "we deliver the facts and the tools and it is up to society to decide whether and how to use these." However, the political impact of this division cannot be underestimated.

⁴ For an inspiration on knots and threads see *Donna Haraway Reads the National Geographic on Primates* at <https://www.youtube.com/watch?v=eLN2ToEIlwM>. See also Thomas (1991) for an approach that attends to the entangled-ness of colonial objects. Therein Thomas shows that the circulation of object is not only key to social life but also helps to problematize the distinction between "centre" and "periphery", "here" and "there", or "us" and "them".

intended to entice them to relate to science and technology. An invitation to look at science and technology not merely as instruments of domination that harm the core of who we are (and therefore need to be criticised and fought against). No, science and technology are at the core of the social. Precisely the knot is who we are. Without clean water (technology) we would die, without spectacles a great part of social traffic (e.g. driving a car, reading) becomes impossible, without coffee you would have a headache.

Science is politics with other means, so Bruno Latour (1988, 218)⁵. Yes, and that is why science concerns us all and not only the scientists. We therefore need to go into how knowledge is put into practice, how it can be made relevant and what the consequences are and for whom.⁶ Now, attention to science in practice may benefit from an anthropological method, a method that enables us to study everyday routines and concerns. Anthropologists are known for travelling distant places to study *strange* cultures. That is true. But anthropology also teaches us how we can make the familiar *strange*. How to have a fresh view on cultures, which are closer to home. This lead for example to a series of so called laboratory studies. Studies in which the tribes of these STS ethnographers consisted among others, of geneticists, biotechnologists, computer scientists, mathematicians and high-energy physicists⁷. What is interesting about these so-called laboratory ethnographies is that they completely altered the notion that science is something that takes place mainly in the heads of very smart scientists. They pointed at the role of technology and tradition, routine and methods, financial means and networks when producing knowledge⁸. The political intervention made by these studies is not to be underestimated. In contrast to the dominant image of scientific rationality, they offered a view of science as a *cultural* activity. An activity

⁵ More in general, Latour (1993) has argued that the modern tendency to separate nature from culture or things from humans has led to a divide between science (representing things) and politics (representing humans). A divide that he has famously termed “the modern constitution”.

⁶ Scholars such as Donna Haraway, Annemarie Mol or Evelyn Fox Keller have encouraged us to get involved with science and technology. At the same time they have, especially Annemarie Mol, shifted our attention; instead of situating knowledge in theories, laws of nature, method or abstract facts, we need to study science in practice. See, for example Mol (1990).

⁷ For the first generation of laboratory studies, see the classics: Bruno Latour and Steve Woolgar (1979), Karin Knorr-Cetina (1981), Mike Lynch (1985), Sharon Traweek (1988) and John Law (1994). These and other STS ethnographers had spent months studying the every day life in various laboratories, and rather than providing us with a critique of the scientific *facts*, they had mapped out *science in action* and drawn our attention to the process of knowledge production.

⁸ Latour (1987) has thus suggested a method in which we focus more on the scientist's hands (what she does in practice) rather than his head (what she thinks in general).

which, moreover, is not universal but situated in time and space. *Science as Practice and Culture*, reads the title of a classic volume within science and technology studies (Pickering 1992).

Even though it is fun to be in the laboratory, here I wish to shift our attention to the world outside the lab. Or more specifically, I want to draw our attention to the heavy traffic between laboratory and society and argue why circulations deserve our attention and why an anthropology of science needs to study circulations. Where the first generation laboratory researchers showed us that science is a cultural practice, today I hope to show that *circulations* are cultural practices. Or, to put it more strongly, *circulations make culture!*

One of the fields where this traffic between science and society is very heavy is forensics. Forensics in fact exists by virtue of an intensive relationship between science and society. An example can clarify this traffic. One morning, in the north of the Netherlands, a young woman was found in a meadow. She was murdered, her throat had been slit and her body showed signs of sexual abuse. The forensic team of the police and the coroner secured the traces at the crime scene. Thirteen biological traces, which were found on and around the victim's body, like blood, pubic hair and traces of sperm were sent to the Netherlands Forensic Institute (NFI). Various individuals in the victim's circle were considered as possible suspects, but quickly regarded as uninteresting by the police. An asylum seekers' centre in a nearby village came into view. The consequence was that a number of former residents were suspected by the local people for many years. The fact that the girl's throat was slit with a knife, was described by a politician as a non-Dutch way of killing⁹. People who make a sacrifice by ritually slaughtering a lamb every year, handle their knives and victims in such a way. This was grist to the mill of the local population. Because of the horrific crime the nerves were obviously already on edge, but with this statement about cutting throats, feelings were running higher and became violent, especially towards the residents of the asylum seekers' centre.

After months of investigation the police, however, was left empty-handed. Because, as it happens, also the suspected asylum seekers, whose identities were made public on national television by the crime reporter Peter R. de Vries, could be excluded based on DNA testing. In the forensic laboratory where I was then working, the case did not leave us indifferent. The tensions in society and the conflict that took on racist forms encouraged the head of the laboratory to act. An act, as he called it, of civil disobedience (Knijff de 2006). For, what was the case?

Population genetic research into the mitochondrial DNA (DNA which is maternally inherited) and into DNA on the Y-chromosome (the

⁹ Thus was suggested by the late Dutch populist politician Pim Fortuyn (1999). Pim Fortuyn was hinting at the Muslim background of the residents of the Asylum Seekers Centre.

male sex chromosome which is paternally inherited), makes it possible to estimate the geographic origin of a person. Comparing the mitochondrial DNA or the Y-chromosome of an individual to a DNA database (holding details of populations from all over the world) you can determine in which population that specific profile occurs more frequent. This way you can make a *probabilistic statement* about the geographic origin of that individual (M'charek 2005a).

But that is population genetics research. The fact that particular research is scientifically possible and sound does not make it legal and admissible in a trial (you cannot simply use it in the criminal investigation). DNA research into the identity or the appearance of an unknown suspect is a taboo in many European countries. In the Netherlands that kind of research was prohibited by law until 2003¹⁰. When in 2000 the head of the forensic institute decided to conduct research into the geographic origin of the unknown suspect, it was indeed an act of civil disobedience.¹¹ An act, which was intended to calm people's feelings and to shift the local population's attention from the residents of the asylum seekers' centre to the general population. His research indeed suggested that the Y-chromosome of the unknown suspect is rare in populations from the Middle East (where most asylum seekers came from) and more common in the North-Western European and Dutch population. To be sure the case at issue here is the well known *Marianne Vaatstra* case¹².

Although I made the story of this case comfortably linear, in reality there are endless loops. We saw many things move: evidence, bodily material, documents, people (medical, biological, investigative, legal) expertise, victims, suspects, refugees and legislation. In order to systematise this constant traffic and to analyse the effects, we will single out one element and use that as an example, DNA. By zooming in on DNA and making use of examples of, especially the *Vaatstra* case, I will show the relevance of circulations¹³. I will do this in three steps and argue that:

- 1) circulations bring about identities;
- 2) circulations make context; and that,
- 3) circulations are permanent and can only be stopped actively.

¹⁰ The use of this technology is allowed in the UK, but forbidden in other European countries.

¹¹ For an overview of the legislation see M'charek (2005b) and Toom (2010).

¹² For a detailed description of this case see Meulenbroek and Poley (2014). Also see M'charek (2005b) and Toom (2010).

¹³ Attention for flows and circulations and the politics such movements bring about has been brought to our attention in particular by postcolonial scholars (Anderson 2002). Movements, so Stuart Hall (1992, 293), "provoke theoretical moments". And Stacy Leigh Pigg has put it as follows: "we need to find out more about how science and technology travel, not whether they belong to one culture or another" (in Anderson 2002, 644).

I. Circulations Bring about Identities

Even though nowadays, thanks to popular series like CSI, we are all too familiar with the route from crime scene to the forensic laboratory, it actually is a miracle that the biological traces which were found in the *Vaatstra* case, led to DNA at the Netherlands Forensic Institute (NFI), a place more than 200 kilometre to the south of the crime scene, where subsequently a DNA profile could be developed, which was regarded admissible evidence later in court¹⁴. It is even more amazing that this was possible without a geneticist or legal expert being at the crime scene. That these are not vain contemplations but serious analytical questions, becomes clear with an anecdote from the controversial O.J. Simpson case. In that case, the famous American football player was suspected of the murder of his ex-wife and her lover. Although all appearances were against Simpson, the DNA evidence failed, among other things, because camera footage showed that the police had secured various biological traces without changing the gloves in between. The biological material was not secured in the proper manner and it may have been mixed with other DNA (contamination). Even if you would be able to scientifically rule out contamination, you need to make it plausible legally¹⁵.

The route from crime scene to court is aimed at making DNA a legally valid piece of evidence. But on that route humans and things arrive changed. Whereas circulations are typically seen as a mere process of transmission of (humans and things) from A to B, I will show here that movement always entails change as well¹⁶. By moving, “the knot” takes on

¹⁴ See for a classic on the durability of knowledge and objects across geographical distances Law (1986); and for a more recent and beautiful example addressing medical practices, see Pols (2012). For a key paper on the effect of CSI on legal practice see Kruse (2010).

¹⁵ See the special issue focusing on evidence published in response to the O.J. Simpson case in *Social Studies of Science* (Lynch and Jasanoff 1998 and M'charek 2000; 2008).

¹⁶ This is, as we know, a central claim in Actor Network Theory, also known as the ‘sociology of translation’. Translation implies *movement* and *change*, see for example, Callon (1986) or Law and Hassard (1999). Working in a more anthropological tradition in her *Gender of the Gift*, Marilyn Strathern (1988) has beautifully shown, that a gender identity does not inhere in bodies. She states: “one cannot read such gender ascriptions off *in advance*, not even when women appear to be the very items gifted. It does not follow that “women” only carry with them a “female” identity. The basis for classification does not inhere in the objects themselves but in how they are transacted and to what end. The action is the gendered activity” (Strathern 1988, xi, *italic added*). More in general circulation can be considered a classical theme in anthropology. Anthropologists have ever since Malinowski (1922) attended to the movement of people and things (the latter in the form of gifts or goods) and analysed the cultural meaning they trans-

a different composition, a different identity. Starting with the DNA. It is of great importance that the police at the scene, usually Crime Scene Investigators, is not only competent in securing traces but also has insight into the trajectory that follows, the genetic research. When a number of properties of the DNA are not taken into account, DNA may lose its identification power. Let us have a look at some of these properties.

1. *The DNA molecule is robust but cannot bear humidity.* The infamous *Schiedammerparkmoord* case and the subsequent extensive investigation, brought to light that the victim's body was stored incorrectly (in a plastic cover) as a result of which the biological traces of the suspect were unusable, the DNA originating from the suspect was destroyed in the humid environment¹⁷.

2. *DNA is also sensitive to contamination.* This is an extra concern because there often is only a little amount of DNA of the suspect present compared to that of the victim or police officer. This risk of contamination was never before as vividly clear as it was in the case of the Phantom of Heilbronn. Here it concerned a female serial killer who was linked to numerous crimes, in France, Austria and Germany. Between 1993 and 2009 nothing more was known about this killer at large than her DNA. Only in early 2009 the assumption arose that the cotton swabs (with which DNA samples were taken) could be contaminated. It thus soon became clear that the Phantom of Heilbronn was an unsuspecting employee at an Austrian company that supplied the cotton swabs¹⁸. The cottons swabs are sterilised before they leave the company. Bacteria and fungi die. But it has no effect on DNA. As I already indicated, it is a robust molecule.

3. Finally, *there is a serious risk of swapping samples* and that you are examining the DNA of a different person than that of the person of interest. There are numerous examples of mix-ups. For example, the 25 years old Mohamed Boucharka was picked up time and again between 2008 and 2014 for car-thefts in which he was not involved. At the NFI his DNA profile had been swapped with that of someone else and despite protest and lack of other evidence he was pulled in every time for crimes

mit as they traffic. The classical reference here is the path breaking edited volume by Arjun Appadurai in *The Social Life of Things* (1986). In my approach I want to move beyond the transmission of *meaning* and focus on the *doing* not just of the things that move, but the doing of the very movement itself, the performativity of circulations.

¹⁷ In this case the ten years old Nienke was killed and her friend Maikell stabbed in a park in the city Schiedam. Cees B was profiled because of paedophilic tendencies and wrongly convicted. After 4 years of detention the actual murderer, Wik H., confessed the crime and a series of blunders that were made during the police and forensic investigation started to surface; see Posthumus (2005).

¹⁸ Claudia Himmelreich (2009-03-27), "Germany's Phantom Serial Killer: A DNA Blunder", *Time* (<http://content.time.com/time/world/article/0,8599,18881-26,00.html>, accessed 8 September 2015).

that were committed by someone else. This mix-up came to the surface when a bright police officer noticed that Boucharka could not have committed a certain crime because he simply was no longer living in the Netherlands¹⁹.

These examples make clear that DNA is more than just biological material. The DNA is inextricably bound up with all those procedures and techniques necessary to be able to use it as means of identification. Without those procedures and techniques, you do not have DNA to start with (maybe a T-shirt with blood on it, but no more than that).

On the route from crime scene to laboratory the forensic team of the police and the forensic researchers in the laboratory need to be attuned to each other's practices. But in order to ensure that the DNA does not only arrive at the Lab but also in court, they also need to have knowledge of legal rules and regulations. These prescribe, for example, that their joint work should result in an uninterrupted chain of custody. In concrete terms this means that every step and every action taken with the evidence needs to be traceable on paper and that this chain may not have any gaps or ambivalences²⁰. In short, paying attention to what is needed to make DNA evidence from a biological trace teaches us that the identity of the forensic team is complex. Anticipating the future method in the laboratory and the preconditions, which are set for the evidence in court, changes the identity of the forensic investigator. During her investigative work she is not just a police officer but also a professional who has knowledge of legal and scientific possibilities of the DNA test.

The same goes for the identity of the geneticist. In accord with rules prescribed in the law he has to conduct his research in an accredited laboratory and use validated techniques²¹. This also becomes clear in the *Vaatstra* case. The population geneticist's research into geographic origin, that we encountered in this case, could possibly be regarded as part of unremitting labour that could produce new insights for science. But because he did not examine random DNA but forensic trace evidence, he labelled his work as an act of civil disobedience. This indicates that his *expertise* not only consists of undisputable scientific knowledge, but also

¹⁹ Victor Schildkamp (6 November 2014) "DNA blunder takes six years of my life" ("DNA-blunder kost zes jaar van m'n leven"), AD (<http://www.ad.nl/ad/nl/4561/Wetenschap/article/detail/3784032/2014/11/06/Dna-blunder-kost-zes-jaar-van-m-n-leven.dhtml>, accessed 8 September 2015); also see http://www.forensischinstituut.nl/over_het_nfi/nieuws/2014/verwisseling-dna-monster-uit-2008-ontdekt.aspx?cp=119&cs=55898 and <https://www.om.nl/vaste-onderdelen/zoeken/@87112/gevolgen-dna/>

²⁰ The quality of partnership and the focus on cooperation between the 'chain partners' received a major boost through the infamous 'Schiedammer Park' murder case. See the report of the committee Posthumus (2005).

²¹ For a case in which DNA testing performed by a non-accredited laboratory risked the evidential value of DNA, see M'charek, Hagendijk and de Vries (2013).

of criminal law²².

The route of the biological material from crime scene to lab and out again comprises therefore more than the transmission of material and information. Along that route a biological trace is made into DNA evidence, a police officer becomes a forensic sleuth and a genetic researcher becomes an expert witness. The various actors together make DNA what it is: forensic evidence. But also the other way around, the DNA that circulates between them makes them what they are; all are more than their occupational title would suggest.



Fig. 1 – Two stills from the video *The Face of Litter*. Source: <https://www.youtube.com/watch?v=HwL5HkEAo8k> (published 21 April 2015).

But what does DNA make of us? What kind of identities does it give to all those who are not connected professionally to this process, the average citizens? How do circulations between laboratory and society affect who we are and how we relate to each other? Looking at daily news teaches us that genetics already left the laboratories a long time ago and that it mixes in with society everywhere. Whether it concerns issues re-

²² Because the study was unsupported legally – it was simply forbidden by law – the DNA evidence failed. The DNA research, although it had its effect in society, temporarily leading the focus away from the asylum seekers as suspects, was not allowed to be part of the legal file of Marianne Vaatstra.

garding reproduction, disease and health, criminality and behaviour, origin and history, and yes, even if it concerns your choice of sport or street litter, genetics seems to be relevant (Fig. 1)²³.

In “The Face of Litter” we are introduced to a clean-up campaign in Hong Kong where, by means of DNA phenotyping, a face is given to the ‘litter-suspects’; people who supposed to have soiled the public space, an offence that is heavily fined in Hong Kong. The short film shows how the suspects of street litter were given a face and put in the pillory, as it were. Those faces were made based on DNA traces found on cigarette butts, left carton coffee cups and used condoms. If you think that this is a cultural oddity of Hong Kong, or maybe even an art project, you are mistaken²⁴. The campaign in Hong Kong makes use of the services of an American forensic company that works together with scientists from Pennsylvania and Leuven and currently also gave this face to the unknown suspect of a murder case in South Carolina, based on DNA (Fig. 2).

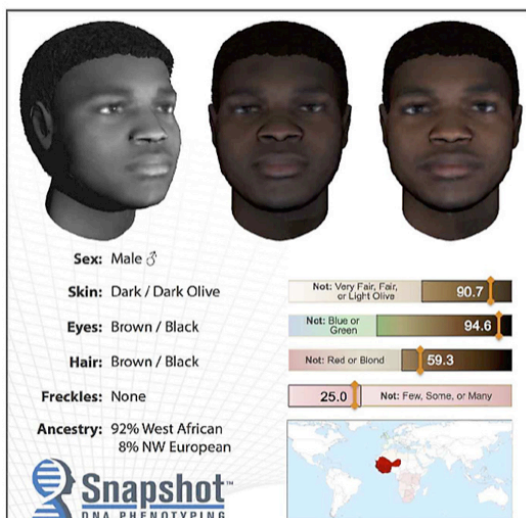


Fig. 2 – Face produced with the help of the analytic software package ‘Snapshot’ of the American company Parabon NanoLabs, a forensic DNA phenotyping service used to give a face to an unknown suspect. Source:

<https://snapshot.parabon-nanolabs.com/posters>.

²³ See M'charek (2013) for some varied examples, but there is a vast scholarship on the social and legal aspects of genetics. For a Dutch example wherein DNA testing is made relevant for the general public in the context of sports and physical health, see: <https://www.dnafit.com>.

²⁴ See e.g. the well-known art project of Heather Dewey-Hagborg who uses similar forensic genetic technologies to produce a face based on litter collected in the streets (<http://deweyhagborg.com>).

There is a lot that can be said about this, but not here, today²⁵.

Since its introduction into the courtroom in the late eighties, DNA is the unchallenged champion of forensic investigation²⁶. It is the golden standard and the key to identifying suspects and victims. It actually started with an issue regarding family reunification in Great Britain in 1984. A Guyanese mother wanted to bring her son to England, but could not prove their kinship relation with documents. When Alec Jeffreys (now Sir Alec Jeffreys!) became aware of the matter he suggested to test the relation via DNA (Jeffreys et al. 1985). This way he could prove that the young man was indeed this woman's son and the brother of her children. Soon the question presented itself whether this technology with which similarity or difference could be established between two individuals could also be used in a comparison between a biologic trace left at a crime scene and an individual.

Enters Forensic DNA! And the rest is history...

2. Circulations Make Context

Circulations are not merely transmissions. At issue is not simply the movement of people and things from A to B. No, as I just argued, movement also means change. Circulations therefore produce new identities. Circulations are performative. And they do more! Within the social sciences the context is represented as a stable factor, it is the firm ground beneath any social science research, or so it seems²⁷. Proper research takes the context into account as to explain phenomena. Globalisation for instance (an exemplar context: large, cumbersome, everywhere, so it seems) is often regarded as the cause of enormous circulations on a global level²⁸. But it actually is the other way around. For example, the fact that in our society the demand for and the interest in genetic knowledge are increasing is not the cause of circulation, but the result. Precisely circulations perform a context where society and genetics can relate to one another. In short, circulations are not the result of the context. No, circulations produce context²⁹.

²⁵ See for a first attempt, M'charek, *Data-Face and Ontologies of Race*, Theorizing the Contemporary, "Cultural Anthropology website", March 24, 2016 (<http://www.culanth.org/fieldsights/835-data-face-and-ontologies-of-race>).

²⁶ National Research Council (1996); Lynch, Cole, McNally and Jordan (2008) and Williams and Johnson (2008).

²⁷ For a problematization of this take on 'context', see Asdal and Moser (2012).

²⁸ See for examples Lee and Lipuma (2002). In fact circulation is often evoked together with globalisation.

²⁹ For another example of rethinking self-evident, often hierarchical, often causal, relationships, through the figure of the parasite, see Michel Serres (2007

Just imagine, a murder is committed, here and now in this church (Fig. 3). Within no time, this sacred ground, cemetery, place of science and dialogue will change into a forensic laboratory. Something like in fig. 4.



Fig. 3 – The Old Lutheran church at the Spui in Amsterdam filled with listeners. Source: <http://www.uva.nl/nieuws-agenda/nieuws/uva-nieuws/content/nieuwsberichten/2012/07/uva-opent-academisch-jaar-met-blik-op-europa.html>.

It is obvious that the forensic lab is far away: in The Hague or Leiden. Yet under such circumstances, a change of context would take place right in front of our eyes. People in white suits, hands and feet protected, enter the space. Science and technology move in. A system of investigation, of detecting traces, analysing, securing, and documentation will unfold. And as we have learned there is more that enters the room. Law and regulations will settle themselves on the shoulders of the forensic investigator. Possibly the media will enter the new space. This all shows that the boundary between the laboratory there and society here can easily be undone. In this case that would be temporarily. But the point I want to make is that such shifting of boundaries between practices is an everyday phenomenon, a matter of fact. The second point is that this should not be

[1980]): 224-234). There is a family of resemblance here with Appadurai's (1996) theory of flows. This theory (and its counterpart, "the production of location") is about how – when modernity goes global – the circulation of people, ideas, media, technology, and finance provides the generative matrix for creating numerous and disjunctive "imaginary worlds". My point here is that the fact of circulation and its performative capacity is not limited to a mode of production or a global organization of the social. It is rather a matter of life.

regarded as a typical example of the “colonisation of society by the powerful science”. Because there are also reverse movements.



Fig. 4 – The Old Lutheran church at the Spui in Amsterdam filled with listeners and a forensic team. Source: olafposselt.com.

To clarify that let us return to the *Vaatstra* case. On 7 October 1999, there was an information evening in the Frisian city of Kollum about the expansion of the asylum seekers' centre. This meeting, however, got completely out of hand. In his inaugural lecture the population geneticist and head of the Forensic Laboratory for DNA Research (FLDO) Peter de Knijff relates the following:

Shortly after, I receive a call from someone on the team of police investigators responsible for the investigation into this murder [...]. The request was simple: could the FLDO help? Was it possible in any way to get a clue [about] the geographic origin of the offender by means of a DNA test? The team had heard that we were working on such a method. If [...] it could be proven that the offender was not an immigrant but, for example a Frisian, there was a fair chance that it would become quiet again (de Knijff, 2006: 2).

The resentment and insinuation against asylum seekers thus entered the lab and helped to move the DNA research into a different direction. This way societal concerns helped to make the laboratory into a socially engaged entity. While law and regulations reside on the shoulders of the forensic geneticist, he decides to an act of civil disobedience, and carry out DNA research that was prohibited by law.

3. Circulations Are Permanent and Can only Be Stopped Actively

A third and last characteristic of circulations, which I would like to attend to here is that circulations are not the exception but the rule. Simply put: everything moves, from the level of the molecules to the social order. And it moves permanently. But circulations can be channelled or even stopped³⁰.

During the *Vaatstra* case four DNA laws were implemented in the Dutch criminal law, of which two were directly ‘provoked’ by the case itself. In 2001 an extension of the first DNA law was introduced. This makes it possible to apply DNA testing in cases of High Volume Crime, like burglaries and care thefts. The 2001 law also regulates the compiling and using of DNA databanks. In 2004, in view of that databank, the *DNA Testing convicted persons Act* became operational. It states that all those who were convicted of an offence with a penalty of 4 years or more (and that is easily done, because it concerns the maximum sentence) are summoned to give DNA to be stored in the databank. Currently the DNA databank holds 245,826 profiles³¹. In 2003 the Externally Visible Personal Characteristics Act came into force. And in 2012 the Law on Familial Searching became a fact; the law with which the suspect in the *Vaatstra* case got caught. This law makes it possible to start looking for partial matches. For example, by comparing DNA left at the crime scene with profiles in the DNA database, or with those of participants in a population screening. A partial match points to the possibility that the sus-

³⁰ This resonates with Marilyn Strathern’s (1996) instance on the importance of cuts and the cutting of networks, stopping the flow and extension. In her *Partial Connections* (1991), Strathern’s argument is more methodological and aimed at problematising the ideal of social science research to present the “full picture”, or “wholeness”. She puts it as follows: “The realization that wholeness is rhetoric itself is relentlessly exemplified in collage, or collections that do not collect but display the intractability of the disparate elements. Yet such techniques of showing that things do not add up paradoxically often include not less cutting but more – a kind of hyper- cutting of perceived events, moments, impressions. And if elements are presented as so many cut-outs, they are inevitably presented as parts coming from other whole cloths, larger pieces, somewhere” (Strathern 1991: 110). Moreover, the notion of circulation advanced throughout my talk steers clear from a so called ‘equilibrium thinking’ (common in e.g. economic theory), i.e. the idea that all movements will come to an end by themselves (think e.g. of the alleged work of the invisible hand of the market), once equilibrium has been reached. As if equilibrium is the nature of things. Attending to circulation is precisely aimed at understanding how, when and where things are moving or rather stopped (see also Lee and LiPuma 2002).

³¹ See: <https://dnadatabank.forensischinstituut.nl/010RDNAatabanken/010-DNAatabankvoorstrafzaken/010Samenstellingenwerkwijze/index.aspx>.

pect is a family member of the person with whom the partial match was found (a brother, father, uncle, etc.).

These laws are the effect of the heavy traffic between science and society. And even though, especially in the case of forensic DNA evidence, they assign detailed roles and set boundaries between science and society, they also encourage and maintain the traffic between them. The well-filled DNA database is just one example. One could say that with this chain of legislation the DNA has created its own infrastructure, an infrastructure that maintains continuous circulations between science and society³².

The fact that circulations are permanent does not mean that circulations cannot be stopped. There are numerous examples of temporary or more durable stops. A prosaic example. In the forensic laboratory extracting DNA (taking DNA out of the cell) is a critical moment. In particular when it concerns fragile, dirtied or little evidence, the laboratory is afraid of possible contaminations. A small piece of foreign DNA at the start of the process may become dominant due to the techniques that are used and 'overshadow' the evidence (think of the Phantom of Heilbronn). But the fact is that everywhere where there are people, there is bodily material twirling around in the room. In order to prevent these twirling biological parts contaminating the evidence, the air in the laboratory is regulated. There are rooms with overpressure and with under pressure in relation to each other. Where the DNA is extracted there is overpressure. Twirling particles are kept outside, or at least pushed out of this lab space. Circulations stopped. Stopping circulation at this basic material level presumes work. It makes use of knowledge and technology to regulate air circulations. It is work that is aimed at isolating the DNA, as well as being serviceable to arriving at the legal truth and to the course of justice. This thus shows that stopping circulations is not only a technical but also a normative matter.

A second example from the *Vaatstra* case. When it was finally legally possible to make use of Familial searching, to everyone's surprise the ending of the *Vaatstra* case was much faster a reality than expected. 7,581 men were invited to donate DNA and already in the first batch of 81 men, two Y-chromosomal DNA matches were found. Charissa van Kooten, who coordinated the DNA testing at the NFI, established these par-

³² This is one could say and example of what Lee and LiPuma (2002) have called "cultures of circulation". What I try to allude to here reminds us also of the rugby example that Steven Brown mobilises to explicate the universe of Michel Serres: "Consider a game of rugby. The players are oriented around the ball, the token. They act in relation to the token, which is like a little sun around which the players orbit. The players become almost extensions of the token – its attributes. They are the means by which it passes, their movements have the sole aim of maintaining the play, of passing the token between one another. In so doing the token weaves the collective" (Brown, 2002: 21).

ticular facts. After a reality check with colleagues she called the team of police investigators. Their premise was that they did not have the suspect but a family member and that they still had to investigate into the suspect.

I phoned through the matches to Ron Rintjema of the 3D-team (team of police investigators, AM). The 3D-team obviously *did* have the names that went with the DNA- seal codes [...]. The 3D-team subsequently had the genealogy of the two families drawn up at the Netherlands Centre for Family History CBG) in The Hague. [...]. It concerned two families with one common remote ancestor, a certain Jasper Jans, of whom was known that he was an innkeeper in *Westergeest* in 1748. The large diagram with all the family lines came to hang in a prominent place in the room of the 3D-team (Lex Meulenbroek and Paul Poley, 2014, pp. 445-446).

It is clear that genealogical knowledge and family trees had entered the police station and that there is traffic between the station and the forensic lab in the form of e.g. information, telephony, DNA seal codes. But the example is particularly important because it shows that certain circulations were brought to a halt. The names that go with the DNA do not end up in the laboratory (i.e. in case of DNA familial searching). This stop has been provided for by law and is necessary to protect civilians who are in no way related to the crime. It is therefore also a political stop of circulations.

Circulations bring about identities, they bring about context and they are permanent unless we actively stop them. And that, I would like to emphasize, does not only apply to the forensic practice, but also to all other domains, for example medicine, food supply, ecology, human migration, financial markets, etc. That is why circulations are crucial objects of study and why an anthropology of science should attend to them.

4. Circulation and Anthropology of Science: Political Consequences

My argument in in this address was about the ways in which various actors that are involved in forensic research relate to one another in varieties of configurations. They literally bear responsibility for the DNA together. Given this inherent involvement, the responsibility of geneticists for these identification techniques does not stop at the laboratories' walls. We hear scientists claim only too frequently that they merely produce knowledge and that society makes normative considerations³³. Circulations show that scientists and legal experts, police and justice, citizens and politicians are inextricable part of this process. They/we together bear re-

³³ In a series of publications we have tried to communicate this problematics to forensic geneticists (see. M'charek, Toom and Prainsack 2011; Toom et al. 2015).

responsibility for what technology makes of us.

To illustrate, again the *Vaatstra* case and we go back in time. Because tactical and technical research did not provide further clues about the identity of the suspect after six months, in December 1999, a DNA population screening was carried out. 186 men were invited to give their DNA. These men were selected because they were, for instance, acquaintances of the victim, or because they had already been convicted for sex offences³⁴. Participation in the screening is officially voluntary. But you incur suspicion when you refuse to cooperate. Renze Merkus (I mention his name because he contacted the media himself to share his story) was such a person³⁵. Because he kept refusing, the Examining Magistrate invoked the *Toothbrush decision* to get his DNA. This decision states that, for the purpose of the criminal investigation, use may be made of bodily material that is not directly, knowingly and willingly, taken from the suspect³⁶. At issue is bodily material that we all unconsciously leave around. Based on DNA testing on cigarette butts and paper-tissues collected in the environment of Renze Merkus, he could be excluded as a possible suspect. This application gnaws at an important constitutional principle: the *presumption of innocence*. This principle says that as a suspect you are innocent until proven guilty (also see M'charek 2008; Toom 2010; Toom and M'charek 2011. This constitutional foundation is now shifting. Because of the DNA that circulates between us, as a citizen, one becomes guilty until DNA excludes one as a suspect.

Furthermore, the research into the geographic origin of the unknown suspect led to the conclusion that the profile of the suspect is more common in the Netherlands and in North-western Europe. It is significant that this was immediately translated in the media to: the offender is a *white* man. This racialisation of identities is even made explicit in the law which was elicited by the *Vaatstra* case. In the Externally Visible Personal Characteristics Act, which became effective in July 2003, it is stated that DNA testing should be aimed at establishing 'the "race" of the unknown suspect'³⁷.

³⁴ "These are men with whom the murdered Marianne Vaatstra had contact, men who were convicted for sexual offenses in our country in the past and men whose names were mentioned by others as a possible subject or because they were seen around the time and place of the crime", *NRC Handelsblad*, 20 December 1999.

³⁵ See e.g. <http://www.trouw.nl/tr/nl/5009/Archief/article/detail/2507398-2000/04/27/Geheime-DNA-test-in-zaak-Vaatstra.dhtml>.

³⁶ "When obtaining a sample of cellular material is not possible for serious reasons (for example when a suspect is fiercely resisting) *non-collected body material* can be used, such as a hair or saliva on a coffee cup". <https://www.om.nl/vaste-onderdelen/zoeken/@59953/nieuwe-dna-wetgeving/>.

³⁷ Article 151d: paragraph1. The prosecutor may order a DNA test aimed at determining externally visible characteristics of the unknown suspect; Article 151d: paragraph2. The DNA test can only be aimed at establishing the sex, the race or other externally visible characteristics designated by order in council, see

Article 151d; paragraph 2.

The DNA test can only be aimed at establishing the sex, the *race* or other externally visible characteristics designated by order in council (*italic added*).

And that brings me to my last and maybe most explosive point: *race*. Although current population genetics does not rely on a concept of race, this much is clear from the impressive research results, biological race has been introduced in the Dutch Criminal Code. This way *geographic origin* was made into *race*. This in itself is a curious given in a country that does not know race and considers itself post-racial. But it points to a much more extensive problem which goes hand in hand with the role of current life sciences.

When in June 2000 the completion of the draft of the human genetic map was announced, this map was presented as a monument of human communality and a proof of the equality between people. We are more than 99.9% the same, said Bill Clinton (during this high profile presentation). Ironically from that moment onwards not the communalities but the differences, the 0.1%, became the object of research. Whether in the field of medical genetics or behavioural studies, historical archaeology or forensics: difference has become the prime focus and where the research money goes into.

With this attention to differences, and given the biologization and geneticization of numerous social phenomena like behaviour, disease, origin etc. we have invited in a classic problem back in, race³⁸. As the common story goes, after WOII, after a long history of racist science, we declared race dead³⁹. Race, as was stated in the famed *UNESCO statement on Race*, had no scientific basis⁴⁰. But *pronouncing race dead also turned into silencing race*. Especially in a country like the Netherlands, the idea prevails that we don't do race. It is irrelevant. Nowadays, with the enormous impact of the life sciences, we seem to be overtaken on all sides by history and as social scientists we risk to be left empty-handed. How can we make the knot which we call race researchable? And what is race? When are differences made into race and when not?⁴¹

also the website of the Dutch Senate: https://www.eerstekamer.nl/wetsvoorstel/-28072_dna_onderzoek_in_strafzaken.

³⁸ There is a growing corpus of literature addressing the various ways in which race has become a growing matter of concern in e.g. health care research, medical practice, pharmaceutical research, genealogical science (Duster 2003; Abu El-Haj 2004; Fullwiley 2007; Montoya 2007; Kahn 2008; Whitmarsh and Johnes 2010; Schramm, Skinner and Rottenburg 2012).

³⁹ As has been observed race did not fade away after WOII, neither in research nor in society (Lipphardt 2012). Yet this ideological turn was and is crucial.

⁴⁰ See on the different Unesco Statements on Race and their politics Selcer (2012).

⁴¹ See for some attempts at this M'charek (2013); M'charek (2014); and M'charek, Schramm and Skinner (2014), which is a special issue in which I to-

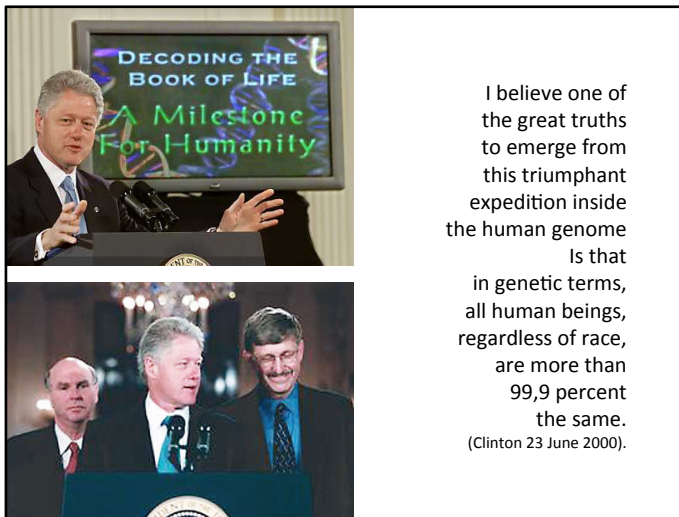


Fig. 5 – American president Bill Clinton (top and middle below) together with Genome researchers Craig Venter (below left) and Francis Collins (right) during the presentation of the rough chart of the human genome project in June 2000.

Sources: <http://pic.biodiscover.com/files/y/25/biodiscover1369274469.-5757490.jpg> and <http://www.the-scientist.com/?articles.view/articleNo/12937/-title/The-Human-Genome/>.

The political question here is: how can we take biology and genetics seriously and at the same time prevent ourselves as societies from racism? In order to find answers to these questions I developed the RaceFaceID project⁴².

gether with a number of colleagues have started to carve out possible specificities to race in Europa.

⁴² “Race Matter: On the Absent Presence of Race in Forensic Identification” (RaceFaceID), a five-year research project funded by an ERC Consolidator Grant. The team consists of the following PhD students, post doc and associate researchers: Reanne Bleumink, Lisette Jong, Marianne Fotiadou, Lieke Wissink, Ildikó Plajas, Roos Hopman, Alana Helberg-Proctor, Irene van Oorschot, Jeltje Stobbe, Denitsa Gancheva. My thinking on, or rather the questions that I have started to ponder *vis a vis* race are highly inspired what could be termed a version of post-colonial STS, wherein I try to think ANT’s affinity for materiality and relationality with postcolonial concerns with temporality, ambivalences and processes of othering. On Postcolonial STS, see Anderson (2002); Mcneil (2005); Verran (2002); Prasad (2008); De la Cadena (2010); Lin and Law (2014).



Fig. 6 – The three forensic practices that are examined in the RaceFaceID project: (1) *genetic facial phenotyping* (2) *craniofacial reconstruction* and (3) *facial composite*.

In this project we research a number of forensic techniques with which a face is given to an unknown suspect or victim. The project attends to ways in which face-making is also involved in race-making. Therewith it allows us to address an obvious yet overlooked question: what is race? Not to answer this conclusively or to provide a universal answer to this question. But rather to unravel what race is made to be in practice (see M'charek 2013 for an example of this 'race as a practice' approach). To do so, we follow the face-making techniques around, from Research and Development, via the forensic laboratories, the police stations, the media, to the courtroom. Rather than defining race we work with the heuristics that we cannot know the individual without situating the individual in a population (a group). We thus focus on the relation between individual and population on the route from crime scene to court and attend to moments when population is translated into race; how that happens and with what purpose. The idea is that race is more than a simple biological definition or an ideological interpretation of differences. In this research we aim at developing a vocabulary and methods with which we can study race in science and society, to gain more insight into how race is given shape in specific practices and to develop and understanding between race and racisms.

This new research was the source of inspiration for my story here. I took the heavy traffic between laboratory and society seriously and substantiated why circulations deserve our attention and why an anthropology of science needs to study circulations. I made three interventions in current academic debates on identity, context and continuity. In my argument I build on, or move away from, work developed in Anthropology, Science and Technology Studies, Feminist Science Studies and Postcolonial Studies of Science. My contribution lies in the fact that I have tried to focus these insights on the concept of circulations. By way of rounding up and connecting with the special issue on 'digital circulation' (Balbi, Delfanti and Magaudda 2016), I will now articulate the theoretical lessons learned on circulations.

Movements, so Stuart Hall (1992, 293), "provoke theoretical moments". As I was writing this address, in August 2015, I stumbled over the important paper of Benjamin Lee and Edward LiPuma (2002) and to my surprise their argument appeared akin to mine. In their article they set out to move the concept of circulation beyond its traditional understanding. Circulation is no longer to be understood as a transmission, a simple movement of people, commodities, or ideas from one place to another, or as a unidirectional relation between production and consumption. Rather they invite us to attend to circulation as a *performative* event that co-shapes humans and things as they move through space and time and it does so in situated manners. "[C]irculation is a cultural process, with its own forms of abstraction, evaluation, and constraint, which are created by the interactions between specific types of circulating forms and the interpretive communities built around them (Lee and LiPuma 2002, 192). Lee and LiPuma suggest to view these structured circulations as *cultures of circulation*.

It is not difficult to understand the practice I described above, the practice of forensic DNA, as an example of structured circulation. Yet, although the infrastructure of forensic DNA is fairly structured, I have in fact tried to attend to emergence and surprising movements. And it is precisely here where I depart from Lee and LiPuma. Whereas they privilege structured circulations, I suggest widening our scope and attending to the permanency of circulations. Humans and things are permanently on the move producing more or less durable infrastructures and changing themselves and their environments as they move about. However as I have shown, circulations are also actively stopped. There are physical borders, laws, language barriers, networks that are down, etc. It is the relation between flow and stops that can become more or less durable, more or less structured. It also means that circulations become structured precisely as to overcome contingencies and possible stops. Rather than reducing our scope to a particular mode of capitalism (circulation-based capitalism, as Lee and LiPuma do) or a particular infrastructure for flow (globalisation), I suggest a more open view on circulations and what circulations do. It seems to me that a focus on the relation between flow and

stops might help us to understand better the politics of circulations.

In the literature on circulation there is a tendency to think this concept together with globalisation, to think flows in Euclidian spaces and movements spanning large distances in short periods of time (see e.g. Appadurai 1990; Lee and LiPuma 2002). The relations suggested here are largely modernist: both space and time are envisioned as linear, suggesting self-evident relations. For example in this approach it is tempting to think the relation between the local and the global as: small versus large, weak versus powerful and transient versus durable. However, Actor Network Theory teaches us that identities are effects of network relations and that these relations do not occupy a Euclidian space but relate topologically (see e.g. Mol and Law 1994; Law 2004). Size or power do not inhere in entities but are performed in relations and they are performed somewhere in space in time.

It is precisely in this vein that I have suggested that circulations enact identities as well as contexts. For, often and again globalisation is seen as the primary mover, the context or the scene against which significant events take place. But if circulations of DNA help to enact context, could we also envision ways in which circulations enact the global, rather than the other way around? To be sure, rather than closing off or providing the final answer about e.g. globalisation, this observation invites more questions about circulations. It invites us to attend to the doings of circulations. How do circulations materially produce what we come to know as the global or the local, the near or far, the now or then, and the we or them? For the issue is not how do cultures bring about circulations, but how do circulations produce cultures.

Acknowledgement

I am very grateful for the invitation to publish this version of my lecture in this timely double special issue on Digital Circulation. I thank Paolo Magaudda for his patience and guidance.

I would like to thank the European Research Council for supporting my research through an ERC Consolidator Grant (FP7-617451-RaceFaceID-Race Matter: On the Absent Presence of Race in Forensic Identification).

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