THE MULTIPLICITIES OF DUST

Showing the skills of DNA at assembling humans and non-humans

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Abstract

Unique to each of us, our DNA nevertheless has multiple ontologies. Following dust through a crime scene, a forensic laboratory and a criminal court, we see that DNA is enacted in three different ways: as a sign, as a result and as a proof. Each of these DNAs entails its own regime of practice, codes and meaning. While forensic genetics has been associated with certainty, stability and truth, we contend that this characterisation is made possible by DNA's multiplicities.

Keywords: *DNA; Ontology; Police investigation; Forensic laboratory; Tribunal; Actor-Network theory*

Introduction
DNA as unique and multiple

The dust that we humans create, consisting of our skin cells, hair and bodily substances, contains our deoxyribonucleic acid (DNA). This molecule holds the genetic instructions for the unique development and functioning of each one of us. It is also a powerful identifier for, in its entirety, it is exclusive to each person[1]. But, as unique as it is, our DNA is also multiple. The criminal justice system is especially effective in revealing that what we call DNA is actually many entities[2]. Forensic DNA is often conceived by its proponents as an essence that travels from the police world, to the laboratory, to the courtroom. As such, it is thought to contribute in creating coherence in the fractured criminal justice system. According to perspectivalism (Law 2004: 25-26), one could say that the various components of the criminal justice system have different points of view regarding the same objective and natural DNA: that of the police officer, that of the laboratory technician, that of the judge and jury.

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[1] With the exception of identical twins.

[2] Our interest in DNA as a research object probably originates from our students' fascination with forensics and their desire to become DNA analysts or television police drama superheroes. Like many others, as we were soon to discover, we were drawn to one aspect of DNA in criminal justice, the creation of biobanks. Our interest probably related to how a DNA databank connects with issues of surveillance, privacy, the geneticization of our selves in a Foucauldian sense and as a symptom of our society in general. We tried to practice informed scepticism about the technical prowess attributed to DNA analysis and DNA banking on the war against crime. Following our desire to work with Actor-Network Theory, we try to follow DNA as it was translated from one actor-network to the other in the criminal justice process.

On the contrary, by taking the ontological turn (Paleček & Risjord 2013, Woolgar & Lezaun 2013), we describe ontologically different DNAs. Indeed, following DNA from a crime scene to its use in court, we see that DNA is enacted (Mol 2002) by at least three different sets of practices. These will produce, in turn: information contained in a bodily sample that plays a role in an investigation scenario; a biochemical entity produced in a laboratory; a mathematical and discursive entity in a judicial process. In other words, we will show that there are at least three different DNA actor-networks at play here, or three different monads. Each of these monads are more complex than the whole, forensic DNA, they are a part of (Latour et al. 2012).

This paper is inspired by Actor-Network Theory (ANT) and post-ANT contributions (Gad & Bruun Jensen 2010, Mol 2002, Strathern 1999). It also builds on previous fieldwork on forensic uses of DNA. Through institutional documents analysis, visits, informal conversations in the workplace and formal interviews with police officers and officials in municipal and national police force, as well as laboratory technicians, scientists and managers at the National DNA databank, we documented the transformation undergone by bodily substances through the criminal justice system (Dufresne et al. 2007, Dufresne & Robert 2008, 2012, Robert et al. 2006, Robert & Dufresne 2008, 2015). With this background in mind, this paper describes the various translation processes that transform DNA into a clue, a result and a proof. In order to do so, we follow a specific investigation, the T. case, from beginning to end, examining the various DNA iterations[3]. Since a criminal investigation is rife with personal information from the victim, the offender and their close ones that cannot be shared for it is protected under section 3 of the Privacy Act, we had to choose a case where a portion of the information was already public (newspaper articles, public court documents, scientific documents on the case), another portion could be accessed by a request to the Access to Information Act, and others were given to us by the Defense attorney for the case (papers presented at conferences, law commentaries). Moreover, the case under study was the object of a forensic science controversy on which the expert for the Defense wrote about publicly in a manual for legal professionals. Ethnography has long recognized the artificiality that «bounded» territory can impose. When the research goal is to follow the connections experienced by an entity as mobile, connected and shared as dust, multi-sited ethnography imposes itself (Hine 2007, Marcus 1995). This

approach acknowledges the heterogeneity of the research object (from bodily substance to a graph to a probability) as well as the diversity of audiences and producers it entails.

The T. case raised serious scientific and legal controversies that forced the scientific actors to be explicit and open the black box of scientific fact making and forced the legal actors to do the same. In a controversial case, the three ontologies of DNA are more easily noticeable than they would have been in a consensual criminal case. DNA is a non-human entity that helps to produce a coherent and seamless crime control apparatus. While forensic genetic technology has been associated with certainty, stability and truth, our thesis is that those characteristics are essentially made possible by DNA's multiplicities.

Investigation
Dust as a clue

On December 16, 1997, passersby noticed smoke coming from a house in Lawn, Newfoundland, Canada. The body of a woman was found in the house. If was first thought that the death had been cause by smoke inhalation. However, the blood later found in the bedroom and bathroom alerted the investigators and warranted further probing (Belec 2001: 1). From a «deathly fire scene», the house turned into a potential «crime scene». The whole space became an intelligible actor in explaining what had happened. Traces of blood on the bathroom doorframe, a facial hair on the bed sheets, and numerous other artefacts were gathered in order to be interrogated- that is, to be analysed for DNA traces.

Over the years, forensic DNA became a central actor-network in criminal justice. It has interested and enrolled a number of other actors and, as such, redefined their identities (Callon 1986). Police bodies have had to reorganize their administrative structures and their budgets to make room for identification technicians, laboratories, stockrooms and drying devices. The distribution of tasks implies that by now, police investigators share their responsibilities with scene of crime officers (SOCOs) and often have to wait for them to secure and explore a location before they can enter it and reconstitute what might have happened. All sorts of objects that will be defined as part of the crime scene are now endowed with the ability to speak. As an actor-network, forensic DNA also transforms the investigative and judicial process into something much more fluid. In the words of

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[3] Our task here is not to question or to validate a version of what could have occurred. This is the tribunal's purpose.

many advocates of the forensic DNA revolution, crime scene DNA and DNA banking have made the criminal justice process more efficient, less prone to errors and faster.

But, as powerful as it is, DNA does not act alone. Both the body of the victim and the living witnesses contribute to the writing of a scenario and the DNA is but a sign in that scenario. Hence, as the potential crime scene becomes secured and «read», the body of the victim also becomes a key actor and is made to speak during the post-mortem. In T.'s case, the province's chief medical examiner conducted the autopsy and so became the interpreter of traces on the victim's body. He concluded that she had been strangled and beaten (Belec 2001: 1). As a result, the police were persuaded; they had a crime to solve.

On the same day they issued their first press release, December 20th, 1997, the police held a town hall meeting attended by roughly 200 people (RCMP 1997), where members of the community were asked to come forward with any information they might have. The deceased's neighbour told the police that the night the victim was killed, she had woken up at 4:00 AM to find T., a young man from the community, in her bedroom without any justifiable reason. Upon checking his criminal record, the police found that the young man had been found guilty of criminal offenses in the past.

On the basis of this information, T. became the main suspect in the investigation (Kennedy 2001). The main concerns in the investigation became to find DNA traces from T. in the deceased's house or on the victim's body, and in turn, traces of the victim on the suspect. Doing so would validate the police scenario.

This reasoning rests on the forensic presumption according to which, when someone walks into a neighbour's house, or enters her car or uses a towel coming out of the shower, in fact, at every point in her movements from one space to another, she leaves marks of displacement. She might leave plainly visible marks, such as a door left open or a wet towel on the floor, but she also leaves other, much less obvious traces, such as fibres from the clothes she is wearing, fingerprints, cells from her skin or bodily fluids such as her sweat, blood, or saliva. The Locard (1920) principle, central in forensic sciences, states that when two bodies touch, even so slightly, they exchange traces of themselves. We can easily understand the forensic significance of this principle. Someone entering someone else's house would leave traces and probably carry some trace of the occupant with her as she leaves the house.

Rather that talking about the Locard principle, we prefer to call it the *minimal* Locard principle. We say minimal because when we look at these objects from a criminal jus-

tice perspective, we tend to look for the single trace of the individual breaking the law. But if the criminal's traces are present, there could also potentially be traces of many people who touched the objects in the past, directly or indirectly, via an intermediary. Studies on skin shedding show how much of our skin becomes widely dispersed beyond our bodies and how much of other people's skin is able to attach to us. When your children have their friends over, they leave parts of themselves in your house and you might bring these traces to your office. There could be traces of your children's friends in your office even without any of them actually having been in your work space. If we adopt a larger view of exchange, a *maximal* Locard principle, any familiar landscape can be seen as a veritable cloud of personal traces from a great number of people who have passed by, or whose traces have been dropped by a third party (Gorayet al. 2012).

The fact that biological traces tend to travel creates a fundamental problem for forensic DNA. Contrary to popular beliefs, finding someone's traces on an object does not by itself constitute a proof. Moreover, the mere presence of DNA on an object does not necessarily make it a valid clue. To become a clue, a trace has to be translated into such; as with semiotics, it has to become a sign in a story. The creation of a scenario of plausible facts revolves around indicators, traces, artefacts, and their articulation. The investigation is a sort of Pierceian semiotic of abduction (Eco & Seboek 1983, Everaert-Desmedt 2011, Ribaux & Margot 2011). Forensic policing converts the entities dispersed at the crime scene into witnesses. To be able to constitute this semiotic, a series of artefacts have to be selected on the basis that they would contain DNA and provide information on its source (an individual). The determination of this area, or the contours of the narrative, is set by the «scenes of crime officers» (SOCOs) and police investigators. By isolating a space from further contamination, by stopping time, they define the plausible elements of the narrative (Dufresne & Robert 2012: 219). Crime scene DNA is the translation of biological matter into the sign of a story. SOCOs and police investigators construct plausible stories or scenarios to determine what is significant and what is not: the cigarette butt, the can of pop, the dried brown stain, the broken window, the tumbled chair, etc. When asked how to determine plausible scenarios, field actors mention the logic, the common sense, the experience they mobilise.

Through a scenario, objects at a crime scene acquire a different status. It is up to the SOCOs to guard them. They define themselves as protectors and selectors of significant artefacts. They have to physically handle them, transport them, and send them to laboratories for analysis. They have to preserve these artefacts from any possible contamina-

tion, including contamination from themselves, and carefully document the chain of possession (who is in charge of the artifact and when). These prophylactic strategies could later be rigorously scrutinized by the courts. They have to be objective and reliable laboratory assistants.

Since identification technicians cannot send hundreds of artefacts to forensic laboratories, they have to prioritise. This entails a second translation where signs are selected anew. Priority depends on the type of material DNA can be extracted from (DNA is more easily found in blood than in saliva), the quality of the analysis that can be expected (some techniques requires a certain quantity of bodily substance), the probability of having mixed sources of DNA (one bodily sample from two or more individuals). These selection decisions are also directed by organisational priorities, volume of work and financial costs.

This second selection process is still governed by the most plausible scenario. These scenarios can be quite fragmented, making this process somewhat of a fishing expedition, hoping to produce additional pieces of a fuzzy puzzle. At the other end of the spectrum, the scenario can already be unassailable and simply needing to be confirmed by DNA. In our murder investigation the latter occurred. The neighbour's testimony directed police attention towards T. His criminal record seemed to justify such attention. Hence, in January 1998, T. was arrested. He was locked up in a police station cell with an undercover police officer who tried to make him admit to the murder. T. did not.

Laboratory
Dust as a result

The absence of a confession meant the proof of T's guilt that the Crown prosecutor needed to provide would have to rest solely on the laboratory DNA results. In addition to the ring that was seized from the suspect on the day of his arrest, dozens of exhibits from the victim's and suspect's houses were tested for DNA evidence (Kennedy 2001: 2).

Laboratories are places where scientists build and operate instruments that make nature visible and readable (Latour 2005). For example, a microscope allows an observer to watch cells divide and multiply. Instruments generate inscriptions in the form of tables, images, graphs, etc. and those inscriptions are used by scientists as intermediaries giving access to nature. In the laboratory, bodily substances left on artefacts selected from the victim's and suspect's houses are not clues or characters in a scenario anymore. They acquire the status of biochemical entities and results that are produced by a definite set of scientific practices.

Forensic laboratories have to make bodily substances speak. To do so, they produce DNA profiles from the biological samples left on artefacts selected at the crime scene. By comparing the DNA profile found at a crime scene to the DNA profile of a suspect, an identification, that is a match, may occur.

Forensic DNA, as an actor-network, redefined laboratory work. With DNA typing, new knowledge, new instruments and new roles were introduced into the laboratories. Moreover, producing a DNA profile is a performance. It requires a long series of translations that mobilize a set amount of well chosen chemical products, commercially available software and other technologies, socially debated standards, human manipulation and interpretations. All those operations and entities are necessary for the performance of a DNA profile, i.e. an assemblage of common traits. While we will not be doing justice to the complexity of the process here, let us follow a portion of the work accomplished in a forensic laboratory[4] to enact DNA results through a series of translations.

1- The initial step is to characterize the bodily sample collected at the crime scene using procedures, namely serology tests. Knowing whether the substance is blood, saliva, sweat, or something else will impact on the next technological choices later in the process. 2- Since a human cell is made of many elements, but only one, DNA, is used for identification purposes, the next step is to chemically isolate and extract the DNA from the cells in the bodily sample. 3- Next, through a process of quantitation, the amount of DNA needed for the following step of the process is determined. 4- At the amplification stage, polymerase chain reaction (PCR) is used to replicate a DNA sequence into millions of copies. The amplification process sometimes introduces data «noise» into the replicated DNA sequence. As John Butler puts it: there are «different types of stochastic effects that may be observed when performing PCR amplification from low amounts of DNA: allele drop-out, allele

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[4] Aside from our previous fieldwork, this description is based on the work of John M. Butler. 2012. *Advanced topics in forensic DNA typing methodology*. San Diego, CA: Elsevier Academic Press. He is a contributing member of the Scientific Working Group on DNA Analysis and Methods (SWGDAM). The organization is composed of members of the forensic community, government officials, academics, FBI. It serves as a North American forum on DNA analysis methods and produces guidelines for DNA analysis.

drop-in, elevated stutter, and heterozygote peak imbalance» (2012: 325)[5]. The type of stochastic effect that interests us here are the «stutters» and we will see below that they can have significant consequences on how to interpret a DNA profile. 5-After the amplification process is concluded, the STR markers phase begins. The amplified DNA sequence is prepared to be read at a number of specific locations (loci), often 13 of them. At those chosen locations, we can see genetic markers, called short tandem repeats (STRs). Those are short pieces of DNA that occur in very differently repeated patterns among individuals. Those patterns are called alleles. The number of possible patterns or alleles at each location is known. For example, the STR named D5S818 can take 24 different patterns. In other words, D5S818 can have 24 different alleles. Every individual has one or two alleles at a specific location. The different patterns or allele we are talking about are different numbers of repetitions of base pairs, the building blocks of DNA. Through a process called electrophoresis, an electric current is used to separate DNA fragments in a gel, according to size. A software records the number of repetitions of base pairs that are found at specific loci (Rose & Goos 2004: 1-12). The end result is an inscription called an «electropherogram» (see Figure 1)[6].

Figure 1
Example of an electropherogram
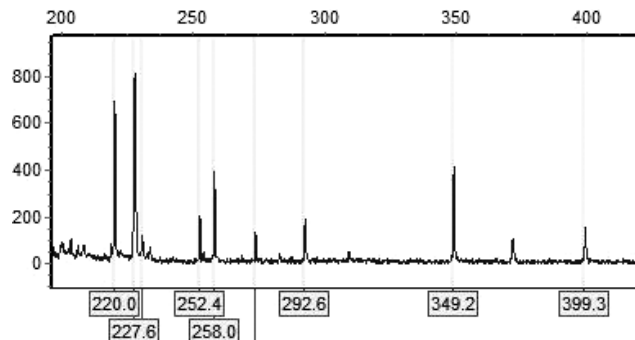
The larger the number of base pair repetitions for an allele, the higher the peak is on the graph. 6-The interpretation stage follows. This stage, like the others above, is framed by a series of norms and standards that allows for the same interpretation to be arrived at in different laboratories. The electropherogram is translated into a table that indicates the alleles found (peaks in profile) at chosen loci. Here is an example of such a table:

Table 1
Example of an allelic table modified from Waye, 2004, p.2-28[7]

Locus	Observed Peaks	Individual 1	Individual 2	Individual 3
D3S1358	13, 14, 15, 16, 17, 18	no., no.	no., no.	no., no.
VWA	15, 16, 17, 18, 19	no., no.	no., no.	no., no.
FGA	19, 20, 21, 22, 23, 24, 25, 26	no., no.	no., no.	no., no.
D8S1179	10, 11, 12, 13, 14, 15, 16	no., no.	no., no.	no., no.
D21S11	27, 28, 29, 30, 30.2, 31, 31.2, 32.2	no., no.	no., no.	no., no.
D18S51	12, 13, 14, 17, 18	no., no.	no., no.	no., no.
D5S818	10, 11, 12, 13	12, 12	11, 12	11, 12
D13S317	8, 10, 11, 12, 13	no., no.	no., no.	no., no.
D7S820	8, 9, 10, 11, 13	no., no.	no., no.	no., no.

[5] See also Butler (2012: 236) for the two schools of thought on the issue of errors of low-level DNA amplification.

[6] The licence for this graph is in the public domain: http://en.wikipedia.org/wiki/File:Electropherogram_trace.jpg

[7] This table is from the T. case. We have erased all the alleles except for one locus. We use locus D5S818 to illustrate one aspect of the controversy.

By comparing the electropherograms (graphs and / or tables) for two samples, one taken from dust left at a crime scene and one taken from a suspect, it is possible to calculate whether the suspect can or cannot be excluded as a possible contributor of the dust left at the crime scene. For example, table 1 tells us that at the STR D5S818 four alleles were present in the bodily substance found on an artefact at the crime scene: alleles 10, 11, 12 and 13. The samples taken from three known individuals as shown in the table all match the mixed bodily substance.

As Aronson (2008) argues, the scientific selections and standardization processes are complex technical and social achievements. It does not mean that DNA typing is not scientific enough – all scientific work is always social work (Latour 2005). It shows that for an entity like a DNA profile to «hold together», an enormous quantity of work has to be invested: heating, separating, cleaning, submitting to electrical field or to laser, dyeing, mobilising software and computers, drawing graphs, comparing, negotiating standards, etc. This is what we mean by the specific performance of an assemblage of common traits.

In the T. case, the DNA analysis was unsuccessful (Waye 2004: 2-26). All those signs that had an important place in the police scenario did not convert into scientific results or did not have a scientific life. In other words, the laboratory work produced a number of these assemblages of traits and none of them were similar enough to suggest they could have originated from T. Until, at the beginning of March 1998, the ring seized from him was taken apart.

Under the rock of the ring, a piece of bodily fragment was found. This sample was of mixed origins. The electropherogram produced, shows multiple alleles on 9 loci (see table 1 above). On one of those loci, there seemed to be eight different alleles, which would mean four different contributors. A conservative estimate, found in the RCMP laboratory report (Kennedy 2004: 2), concluded that in this sample there was DNA from at least three people. The accused, his partner and the victim could not be excluded as potential contributors. The police deemed this result strong enough and proceeded with the prosecution. In March 1998, the RCMP issued a warrant of arrest for T. The suspect became an accused.

Tribunal
Dust as a proof

A DNA proof involves its own assemblage of entities. It is made of a narrative complemented by probabilities of a match between two profiles. The tribunal is the privileged space where a DNA proof is enacted. Forensic DNA is an actor-network that redefined the police, the laboratory but also the legal professionals. Judges and lawyers now have to be trained in the science of biology, identification genetics and in statistics and probabilities.

Introducing a DNA proof in a trial may raise many juridical questions. The tribunal might have to confront the experts as to how they interpret the inscriptions from the laboratory. It might have to determine whether probabilities can be expressed in a certain way or if the jury could be misled by such or such a wording. Finally, the tribunal might have to consider possible connections between the laboratory and the expert. These three issues played out in the enactment of DNA as a proof in the T. case.

Distinguishing nature from the instrument used to read nature

Scientific facticity is the product of conventions (Latour 2005, Shapin & Schaffer 1985). It is the case especially when the act of recognizing facts requires specialized training. This type of objectivity is an epistemic virtue that Daston and Galison (2007) call «trained judgment». Trained judgment authorizes one to discern and distinguish that which is the object under scrutiny from that which is not the object itself but rather an artifact produced by the instruments that make the object visible. One has to determine: what is the effect of the scientific translation itself and what is nature?

As we said earlier when describing the process of producing a DNA profile, at the amplification stage, the use of the polymerase chain reaction (PCR) technique generates data noise. One form of noise is called a «stutter» and it looks just like an allele. This means that some of the peaks visible on the electropherogram have to be eliminated as by-products of the typing process itself. A stutter is a false allele with one less repetition than an authentic allele (Waye 2004: 2-14). Such noise can be especially puzzling when the sample is of mixed origin. This was the case with the bodily sample recovered under the rock of T.'s ring. As the DNA expert for the Defense, John Waye, explained: «[...] in a complex mixture of DNA from three or more contributors, true alleles from minor contributors might be mistaken for ‹stutter› (*op. cit.*: 2004, 2-29).

The result of the comparison between two DNA profiles will be greatly affected depending on whether «stutters» are or are not excluded from the profiles' comparison. In the T. case, the expert for the Crown excluded many patterns as «stutters», restricting the number of people who could be considered as

a «contributor» to the sample[8]. The expert for the Defense was more conservative in his judgement and included many of those patterns as proper alleles. The effect of such a judgement increased the number of people who could be considered potential sources of the sample.

Expressing probabilities

To add to the complexity of the trained judgement at work, the correspondence (similarities and differences) between two profiles are evaluated through probabilistic calculations. What we commonly term a «match» is in fact a probability, a statistical statement, not an exact biological correspondence[9]. The match is a «frequency of occurrence» of a DNA profile in a said population.

The laboratory report used in court does not just contain inscriptions such as the eletropherogram and the allelic table shown above. It is also accompanied by the interpretation of those inscriptions – a probabilistic statement that explains the significance of the match between columns in an allelic table[10] (Table 1). Through this further translation, the technical laboratory work officially becomes an expertise: «The interpretation of DNA typing results for human identification purposes requires professional judgment and expertise» (Scientific Working Group on DNA Analysis Methods 2010: 1).

In the adversarial legal system prevailing in Canada, much of the judge's role involves deciding on the best procedure to be followed by the parties. In the case of a jury trial, as in the T. case, the judge might have to meet with the parties to decide if and how such or such element of proof should be presented to the jury. In other words, a DNA proof is not limited to a scientific interpretation; it involves the judge's or jury's understandings as well. The judge must translate a scientific fact into lay language, a language that is likely to be understood by the «average person». In the T. case, the main difficulty involved negotiating the meaning to be attributed to a statement. Such a debate pertains essentially to the realm of mathematical semiotics.

The police laboratory report that the Crown wanted to introduce as evidence in court stated that the DNA from the ring was «[...] consistent with having originated from» three people: the deceased, the suspect T. and T.'s girlfriend (Kennedy 2001: 3). Further analysis conducted three weeks later by the same laboratory added that there was a trace amount of DNA from another unidentified person. The report concluded that «Based on the Canadian Caucasian data base, it is estimated that only 1 in 1 200 individuals could be a contributor to this profile. In other words, based on this data base, 99.91 % of the population can be excluded as having contributed to this mixture» (op. cit.: par. 50). Interestingly, the judge ruled that the expression «was consistent with having originated from donors» would mislead the jury. Additionally, the use of «99.91 %» was also thought to be confusing. Rather, the judge favoured the use of the probability expressed as «1 in 1 200».

The defendant was allowed to present its own expert report in which the probabilistic statement «1 in 1 200» was challenged by another probability: «1 in 12». From the Defense's point of view, the «1 in 1 200» probability was an overstatement. While everybody could agree that these 9 alleles (see Table 1) could come from the victim, the accused and his partner, they obviously could also come from other people.

After the «voir dire» in January of 2001, the Crown's expert eventually agreed with the more conservative probability suggested by the Defense (Kennedy 2004: 6).

Building neutrality into the narrative

A last component in the enactment of DNA as a proof is the translation of the inscriptions and their statistical interpretation into a narrative. The narrative issue revolves around this question: How much of the police investigation context and scenario should the interpreter of the inscriptions (scientist) be familiar with? If the interpreter comes from a police forensic laboratory and understands the investigation context, the police scenario may act as a triage device for him and he then runs the risk of being both judge and party (Waye 2004: 2-22). Depending upon the social distance between the investiga-

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[8] The RCMP has its own guidelines for determining the point at which a peak can be interpreted as a stutter artifact. See Waye (2004: 2-28).

[9] In scientific language, a match is the expression of a statistical probability that someone else's profile would show similar results. Therefore, the less statistically probable it would be to find another person with a similar profile, the more it would look as though the accused were guilty. There is no such thing as an absolute proof that a given profile came from the same person.

[10] A distinction between purely technical and interpretive operations is recognized by a division of labour. See Pollanen et al. (2012: 86). See also SWGDAM (2010: 2).

tion and laboratory work, the interpreter's purposes might be framed differently: a) to determine if exhibit X and Y could come from the same person or b) to verify whether exhibit X matches the DNA of the suspect Y. The latter case leads to errors since DNA analysis involves subjective interpretation (Kennedy 2004, Thompson 2011)[11]. The contextual bias issue has been the subject of a heated debate recently in the United States. It was also raised in T.'s case, where the Crown's expert was thought to be trying very hard to find biological evidence of a link between the victim and the accused.

In the end, the defence lawyer, Jerome Kennedy, maintained that: «The T. [...] case illustrates an inappropriate attempt by the Crown and the police to bolster an otherwise weak case through the use of sketchy DNA evidence» (Kennedy 2004: 21). The jury concurred and T. was found not guilty of first degree murder. The Crown chose not to appeal the decision. Still, «[t]he RCMP has closed the case, citing that the original investigation had correctly identified the murderer and that further investigation would not alter their conclusion» (Waye 2004: 2-34).

Conclusion

DNA has entered the criminal justice system in triumph. Like Lynch et al. (2008), its proponents saw it as a truth telling machine and thought it would be the end of unresolved crimes. Others were more sceptical as to its success but, in the end, DNA interested and enrolled most of the criminal justice stakeholders. The police, the forensic community and the courts were soon mobilized and became transformed in the process. With DNA it was thought that crime would now be processed smoothly. After all, if we were able to identify pieces of a perpetrator at a crime scene, with this powerful tool, it would have to be relatively easy to find who the piece was originally attached to. Once that was done, the crime would be solved. Such a scenario rests upon the assumption that there is one stable and knowable world.

Relativists would be quick to reduce DNA to a representation and point out that the representations of the world are multiple and relative to specific contexts. Hence, the police, laboratory and tribunal see DNA in different lights, based on their different constraints and specific cultures. They all have a different and incommensurable version of DNA (Paleček & Risjord 2013).

Rather, the ontological turn hints at the multiplicities of DNA, not as a series of representations but as a series of objects, for they *do* different things and they *are* different relational beings (*op. cit.*: 11). In the same case, we are faced with three different actor-networks: a sign in a crime investigation scenario built upon common sense and experience; a scientific result produced by a series of instruments following the evolving standards of a negotiating community; a linguistic and mathematical statement made comprehensible to the «average person» according to the imperatives of the legal system. Each of those DNAs ascribes roles, dictates actions and hierarchies, and connects humans and non-humans in a certain way.

DNA «holds together» and helps to produce a coherent crime control apparatus. From afar, DNA unites the need to resolve a puzzling death, the struggle to identify the most appropriate manipulation to extract a molecule from a cell and the correct expression of the significance of a proof. DNA is a strong forensic actor that has been associated with certainty, stability and truth. Like the close look at the materiality of an investigation all the way to the courtroom via the laboratory shows, those characteristics are essentially made possible by DNA's multiplicities. Looking for the various enactments of DNA makes it possible to dissolve the essentialism often associated with it and shed light on the quantity and variety of work it accomplishes as well as the endless decisions, selections and evaluations in different registers that define the dust that we shed.

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[11] For Waye, DNA analysis is akin to following the scientific method. He insists that interpreting an STR profile should be done in isolation without knowledge of the comparison STR profile. See Waye (2004: 2-22 to 2-24).

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