Surveillance & Society

Article

Criminal Investigation Through the Eye of the Detective: Technological Innovation and Tradition

Diana Miranda

CICS.NOVA—UM, Interdisciplinary Centre of Social Sciences, University of Minho, Portugal.
dianam@ics.uminho.pt

Abstract

Technological elements and scientific knowledge are steadily transforming both the traditional image of the detective and the nature of contemporary police work. However, despite the potential utility of scientific methods and new technologies in criminal investigations, there are many barriers surrounding their application. We explore these barriers through a qualitative and comprehensive methodology, utilising a set of semi-structured interviews and informal conversations with criminal investigators.

We use theoretical contributions from social studies of science and technology, Surveillance Studies and policing research to analyse how *soft* and *hard* forms of surveillance are applied in the practices of the Portuguese Criminal Investigation Police (*Polícia Judiciária*). The technological artefacts are both shaped *by* and shape *how* criminal investigators work. Consequently, it is necessary to explore how the collectives of human and non-human elements are constituted. By analysing the fusion of traditional methods of criminal investigation (*hard surveillance*) with new technologies of collection and use of information (*soft surveillance*) we see a *hybrid figure* of the contemporary detective emerging; a product of both the past and the present. In a context where innovation is sometimes constrained, traditional methods continue to endure. Nevertheless, the expansion of computerisation and police databases has had significant impact on how police information is collected and recorded.

Introduction: Technology, Police and Criminal Investigation

Trust in science and technology enables the implementation of new surveillance technologies as support tools in contemporary police work (Abe 2006; Byrne and Marx 2011; den Boer 2011; Ericson and Haggerty 1997; van Brakel and De Hert 2011). Defining surveillance as "any collection and processing of personal data, […] for the purposes of influencing or managing those whose data have been garnered" (Lyon 2001a: 2), these surveillance technologies can be exemplified by the growing use of databases which allow more efficient storage and processing of information related to suspects or convicted offenders (Aas 2006; Abe 2006; Byrne and Marx 2011; Ceyhan 2005; Cole and Lynch 2006; den Boer 2011; Lyon 2001a; Machado and Costa 2013; Machado and Prainsack 2012; Purenne 2012; van Brakel and De Hert 2011).

The widespread general use of digital information processing technologies by the police prompts us to inquire what impact these technologies are having on criminal investigations and how police information is collected and recorded; namely, by considering the expansion of computerisation and police databases in conjunction with the increasing use of forensic sciences in support of criminal investigations (Williams, Johnson and Martin 2004). In particular we are interested in the use of biometric identification technologies, where the body is assumed to be a source of information and an object of surveillance that

Miranda, D. 2015. Criminal Investigation Through the Eye of the Detective: Technological Innovation and Tradition. *Surveillance & Society* 13(3/4): 422-436.
http://library.queensu.ca/ojs/index.php/surveillance-and-society/index | ISSN: 1477-7487
© The author, 2015 | Licensed to the Surveillance Studies Network under a Creative Commons Attribution Non-Commercial No Derivatives license.

permits identification through science and technology (Aas 2006; Ceyhan 2006, 2008; Cole 2001; Lyon 2001a, 2001b; van der Ploeg 1999, 2003). Fingerprints and DNA technologies are key examples of identification technologies currently used in criminal investigations that can be collected and stored in computerised databases.

In this paper we explore the narratives of the Portuguese Criminal Investigation Police (*Polícia Judiciária*)[1] around the processes of identification of both crime suspects and convicted offenders. Through analysis of theoretical contributions from social studies of science and technology (Cole 2001; Cole and Lynch 2006; Latour 1992, 1999, 2001; Jasanoff 1995, 1998; Johnson, Williams and Martin 2003; Williams, Johnson and Martin 2004; Williams and Johnson 2008), Surveillance Studies (Abe 2006; Foucault 2007; Lyon 2001a, 2001b; Marx 2006) and policing (Byrne and Marx 2011; Ericson and Haggerty 1997; Ericson and Shearing 1986; van Brakel and De Hert 2011) we aim to understand the impact of science and technology in contemporary police practices, specifically the case of Portuguese criminal investigation. In Portugal, there are existing studies specifically focused on surveillants' perspectives towards the use of DNA in criminal investigation (Costa 2012; Machado and Costa 2013; Machado and Santos 2012; Santos, Costa and Machado 2012) and video surveillance in public spaces (Frois 2008, 2013). However, in this paper we take a wider perspective of the use of such technologies in policing practices.

When observing the relationship between technology and society, it is important to reflect on how social subjects both shape and are shaped by technological artefacts (Latour 1992). In this regard, it is necessary to explore how the collectives of human and non-human actors are constituted in the context of criminal investigation. By considering this perspective we can begin to understand the processes and obstacles to 'police scientification' (Ericson and Shearing 1986) in Portugal and the emergence of a *hybrid figure* of the contemporary detective as a product of both the past and present.

Methodology

Through an interpretative and qualitative theoretical-methodological perspective, we aimed to understand inspectors' views concerning police practices of criminal investigation. To explore the subjects' discourses around their representations and practices, we used both interviews and informal conversations. We conducted 14 semi-structured interviews with inspectors of *Polícia Judiciária* (PJ) between October 2012 and June 2013, and established informal conversations since March 2012.

The recruitment process of interviewees occurred through informal contacts in a snowball effect that was dependent on their availability. However, we devised a theoretical sample based on representativeness by diversity and exemplariness (Corbin and Strauss 2008; Hamel, Dufour and Fortin 1993). This allowed us to ensure the heterogeneity of our sample in terms of the following *criteria*: the organisational unit (a small, medium and large unit); the type of crime/sector they primarily deal with (economic and sexual crime, homicide, robbery, drug trafficking and strategic and operational information area); the length of their professional activity (between 3 and 32 years); and their sex (10 males and 4 females) (see *Table 1. Sample characteristics (PJ Inspectors)*.

The interviews were recorded[2] and lasted an average of 1 hour and 30 minutes. A request to obtain informed consent for the participation in the study was always made. In order to preserve the anonymity

[1] In Portugal, *Polícia Judiciária* is the national criminal police body responsible for investigating most of the crimes (Article 7. of Law no. No. 49/2008).

[2] This is with the exception of two inspectors that rejected audio recording. In these cases, the information was recorded at the end of the interview, through reliance on interviewer memory and notes made during the process. The negative reaction to audio recording occurred in the first two interviews, enabling a reflection about the construction of the object and the secrecy involved.

of the interviewees, all names used in the following excerpts are fictional. The collected data was systematically coded according to themes and categories, following closely the principles of *grounded theory* (Corbin and Strauss 2008; Glaser and Strauss 1967).

Police inspector	Years of service	Brigade/sector
Alberto	19	Robbery
Alexandra	9	Economic crime
Bruna	9	Economic crime
Baltasar	32	Economic crime
Carlos	23	Robbery
Daniel	9	Homicide
Filipe	12	Homicide
Guilherme	25	Drug trafficking
Joana	3	Economic crime
Manuel	24	Homicide
Paula	31	Sexual crimes
Rui	16	Information
Simão	13	Robbery
Tiago	10	Homicide

Table 1. *Sample characteristics (PJ Inspectors)*

In order to understand the socio-historical background of criminal identification technologies in the Portuguese context, we also conducted documental analysis, by collecting and examining historical and legislative materials related to these technologies from late 19th century to the present day. Online research, libraries and historical archives[3] were fundamental for such work.

The Role of Science and Technology in Criminal Investigation

> *[Sherlock Holmes] is a little queer in his idea—an enthusiast in some branches of science. [...] "Holmes is a little too scientific for my tastes [...] He appears to have a passion for definite and exact knowledge."*
>
> (*A Study in Scarlet*—Arthur Conan Doyle)

The empiricist views science as a mechanism that allows us to discover the truth in the world. This belief in science and technology as a way to attain the truth and effectiveness in criminal investigation (van Brakel and De Hert 2011; Williams and Johnson 2008) is revealed in the inspectors' discourse.

Science is seen as irrefutable as demonstrated by Inspector Baltasar who stated, "what is scientific is proven and no one can refute it, hence whenever possible the criminal investigator falls back on these elements [...] to justify and prove so there is no doubt".

This negative reaction vanished as the fieldwork developed through informal contacts and the presence of the interviewer became regular. However, the "dynamic of secrecy" (Ball and Haggerty 2005) involved and the (non-) sharing of information was sometimes invoked after the audio recording by the inspectors. Inspector Filipe even explained in one of these moments how there are a lot of things he did not say during the interview since there are "assets" that cannot be disclosed.

3 We must highlight the access to the historical archive of Portuguese Prison Services based in a prison in the north of Portugal (Santa Cruz do Bispo) between February and March 2012. The access to prison administration documents related to prisoners (records and personnel files) held with respect for personal data in accordance with Circular No. 3/GDG/2002 issued by Prison Services.

The police work is multidisciplinary and, according to Inspector Carlos, detectives need to "know a little bit of everything" since "it absorbs from various sciences". Ballistics, lofoscopy, chemistry and biology, among others, all enable tests with results that are seen as representing a scientifically proven argument. As Inspector Guilherme notes, "science allows us to determine with greater certainty that things are that way because it is scientific, it means that is proven". This leads us to the concept of the *black box* (Latour 1999, 2001) since the complexity of scientific and technological process remains invisible to non-scientists, its *aura* of infallibility (Byrne and Marx 2011) is accepted at face value. As Jasanoff says, "the facts of science may over time become so widely accepted that it is no longer possible to see how they were originally put together" (1995: 52-53).

Inspectors don't follow the proposition that "technology is neither good nor bad, nor is it neutral" (Kranzberg 1986). Due to the epistemic status of science and its symbolic power and authority (Bourdieu 1989; Jasanoff 1998), scientific evidence is perceived as a symbol of neutrality, objectivity and truth, taken by inspectors as something that can give credibility and legitimacy to their beliefs and actions (Ericson and Haggerty 1997; Ericson and Shearing 1986; Jasanoff 1995; Johnson, Williams and Martin 2003; Kruse 2010; Machado 2012). Consequently, it is a necessary tool to prove the police "version" of the *facts* (Kruse 2012; McCartney 2006), since the scientific artefact allows such *facts* to be taken for granted and assumed as truth (Jasanoff 1995).

Science and new technologies often generate great enthusiasm due to the scope to change how criminal justice institutions work, including the police. As Cole has said, police "will make their decisions based on scientific knowledge rather than guesswork, prejudice, or intuition" (Cole 2001: 303). Inspector Rui, a criminal intelligence analyst in the strategic and operational area confirms this, stating: "We no longer deal with intuition. That was long time ago, right?"[4]

When asked about the role of science and technology in criminal investigation, the inspectors would refer to how the capacity to obtain more information quickly assists in their work. Indeed, policing can shape or be shaped by the use of new technologies, with police work often being transformed by these new tools. As we will see, the information processing technologies, and the databases in particular, are examples of such tools. The inspectors now resort to sophisticated techniques that require science-based knowledge and the adoption of specific technologies, highlighting a professional culture based on 'scientification'. Ericson and Shearing (1986) define the scientification of police work as involving the adoption of technological elements that alter the work's nature, enabling a faster and more effective criminal investigation.

Through the proclaimed efficiency of new technologies in the "fight against crime" and its capacity to provide truth, inspectors can be seen as "technical agents of scientific rationality" (Ericson and Shearing 1986; Johnson, Williams and Martin 2003; Williams and Johnson 2008), subjugating themselves to the 'cognitive-instrumental' rationality of science (Machado 2012; Santos 2000). However, despite the potential utility of science and technology in criminal investigation, we face a set of obstacles and *local contingencies* (Costa 2003; Machado and Costa 2013) that expose the limits of the scientification of police work in Portugal (Costa 2012; Machado and Costa 2013; Machado and Santos 2012).

Science, Technology and Criminal Investigation: The Obstacles

[4] However, despite the belief in the objectivity and neutrality of science, we should add that this belief is usually guided by a version that already has a particular suspect as a target (Braga et al. 2011; McCartney 2006). In fact, "contrary to fictional portrayals, detectives do not work from facts to identification of suspects; they work from identification of suspects back to facts that are necessary to prosecute and convict them. The primary job of detectives is not to find unknown suspects, but to collect evidence required for a successful prosecution of known suspects" (Braga et al. 2011: 5). This is particularly evident in an inquisitorial legal system such as the Portuguese, where information seems to play a role in supporting the narrative built by detectives during criminal investigation.

Lack of technological and human resources are just one obstacle to using the evidence of science and technology (Costa 2003; Machado and Costa 2013). As inspector Rui explained, "*Polícia Judiciária* has not invested in technology for a decade, [because] there has been no money for it". The restrictive legislation and the lack of collaboration in the access and sharing of information are other obstacles (Machado and Costa 2013; Machado and Santos 2012; Santos, Costa and Machado 2012).

Inspectors highlight that information is the best "weapon" to their work but it is lacking due to such obstacles. Information is knowledge and it is seen as necessary to establish surveillance mechanisms (Ericson and Haggerty 1997) due to the "knowledge-based nature" (Ericson 1993) of a detective's work. It is still premature to claim that police are an information-based organisation (Ericson and Haggerty 1997; Manning 2008), and in the words of Detective Simão, "we have the data protection authority… We have an extraordinarily rigorous regime regarding the rights, freedoms and guarantees that hazes blindly our capacity for investigation and access to databases".

From a socio-historical perspective, science, technology and criminal investigation[5] began their path to convergence at the turn from the 19th to the 20th century. However, at this time the "scientification" of criminal investigation was still more discursive than applied in practice (Gonçalves 2007; Madureira 2005; Miranda 2014). There was a lot of rivalry and disarticulation between the police, its services and departments, and the institutions that studied crime. Hence, on the one hand it was difficult to incorporate the knowledge from institutions such as 'Institute of Forensic Medicine'[6] into police investigation practices and, on the other hand, the police wanted to preserve their autonomy by resisting sharing their role with those related to science (Madureira 2005; Miranda 2014). Interestingly these "old ideas", interactions and symbolic fights (Bourdieu 1989) between institutions are being reinvented today in a new historical context, as seen in the reality being described by inspectors.

It is noteworthy how the institutional culture of the police has led to a situation where each national police body has their own file and information system. Inspector Joana thinks that the "combination or compilation of all the information from the different police bodies" is extremely important, since "it seems that each police works for themselves [only]". This leads us to Peter Manning's case studies and his discussions about the disconnected or inaccessible databases (Manning 2008). As he mentioned, "these databases represented a sort of archaeology of systems, lying on top of each other yet not linked" (Manning 2008: 150). Inspector Carlos raised this point, stating:

> We have here a small farm, we have [...] information, we are very protective and it is ours. And in Portugal, this culture of sharing information […] does not exist. There is another [culture] made of closed circles, in which each one has its own information and since information gives us power it stays in our midst. And this happens with the relationship between the various police bodies, it succeeds in the relationship between the police and other authorities, including the Institute of Forensic Medicine, or very often between the police and the magistrates, there is a … [...] a lack of confidence from some authorities toward others.

5 The separation between public safety police and criminal investigation police at the beginning of the 20th century was in part due to the adoption of a specific knowledge and technologies for criminal investigation that required a "different professional culture" (Gonçalves 2007).

6 We will highlight the most important institutions in what matters to the context of criminal investigation and, in particular, forensic sciences: the Institute of Forensic Medicine (INMLCF—Instituto Nacional de Medicina Legal e Ciências Forenses) and the Forensic Science Laboratory (LPC—Laboratório de Polícia Científica).

The non-sharing of information also occurs within the institution itself, as sometimes there is a lack of knowledge about the capability of some units belonging to *Polícia Judiciária*, in particular the services of scientific and technical police. As Inspector Simão says:

> Very often our LPC [Laboratório de Polícia Científica—Forensic Science Laboratory] and some of our units [...] have options and capabilities that we do not know. [...] People have that capacity, the farm is theirs and they contain that information. There is not a culture of "this is mine, this is from everyone".

There is a mismatch between criminal investigation and science and technology, and this is highlighted by the discourse of inspectors, as Inspector Tiago pointed to:

> I support that we have more science and more technology here, since it always allows us to progress. Sometimes, however, the paths are a bit mismatched. Because [...] the investigation staff may not be aware to apply some things that already exist. At other times, they exist, but they are not applied easily, for example. It is a "hard nut to crack" to do anything.

Another example of this "hard nut to crack" situation is the 'backwardness' and resistance to innovation. Inspectors make clear that a detective from older generations is out of step with reality in cases where he does not "open himself to change". In the words of Ronald Corbett and Gary T. Marx (1991): "technical innovation becomes synonymous with progress. To be opposed to new technology is to be a heretic, to be old-fashioned, backwards, resistant to change, regressive, out of step".

For Inspector Daniel, "the legal world is a very adverse world to change. And if police are not that fond of change, [...] courts still appreciate it less". In this "legal world" there is usually a certain conservatism and it is only when the innovation starts to be used frequently that it is accepted. Effectively, innovations go through a trajectory involving contestation, contingency and adaptation (Johnson, Williams and Martin 2003; Williams and Johnson 2004). For Inspector Simão:

> Between judges and priests the difference is not that much, in what matters to the processes and scientific revolution it goes more or less in the same way and for them the DNA must be that thing … the interdiction and whatever.

Inspector Simão also states the possibility of using genetic profiles as illustrating the increasing use of biological information and the implementation of new biometric surveillance techniques. The genetic profile as a form of individual identification emerges in inspectors' discourses as being associated to resistance and distrust, pointing out how the database that holds such information is still in its beginning. In the words of inspector Carlos, "it is still very tender, it is still very green". Also, for detective Manuel: "There is no DNA database, the one that exists... poor thing".

If in the past the use of fingerprints appeared in popular culture as a symbol of "scientific policing" (even that in practice did not have such an impact right away) (Cole 2001), now we are in the presence of a new symbol and *truth machine* (Lynch 2003; Lynch et al. 2008): DNA. These technological devices are seen as irrefutable by inspectors, who demonstrate a constant belief in science and technology. DNA technology, in particular, is seen as unquestionable and as a proof of immense precision and high credibility by police inspectors. Inspector Carlos even said that it "leaves no room for doubt" and that "it is at the top of identification".

Despite the potential of forensic genetics and the growing presence of DNA technology as a symbol of "scientific policing" in popular culture (Cole and Dioso-Villa 2007; Huey 2010; Kruse 2010; Machado

and Prainsack 2012), police inspectors agree that we are still in an early stage and have not yet reached a "turning point" with regards to genetic identification (Machado and Prainsack 2012). Hence, as happened with the fingerprint in the past, DNA remains in a limbo of discourse and practice, subjected to a variety of constraints as we referred to (such as the lack of resources, the restrictive legislation, and the 'backwardness' and resistance to innovation).

> The contingencies associated with criminal investigation in Portugal reveal a complex interconnection of knowledge and practices [...]. They are indicative of an investment in the globalisation and harmonisation of procedures based on the experiences of other countries, but nevertheless grounded in a legal, professional and criminological culture with national and local features and particularities.
>
> (Machado and Costa 2013: 47)

As Helena Machado and Susana Costa (2013) mentioned, the experiences of other countries have an impact in the reality of Portuguese criminal investigation. Bearing in mind the considerations from Anthony Giddens (1997, 2002) in relation to the collection of information by the state as essential to the achievement of modernity, we can refer that in Portugal the political argument, *the great slogan* (Frois 2008), is precisely concerned with a modernisation project (Frois 2008, 2013). The technological devices are seen as a symbol of what is modern, meaning progress and development (Frois 2008, 2013; Machado and Frois 2014; Marques 2003).

Again, from a socio-historical perspective, it is interesting to realise that the arguments supporting the establishment of different identification technologies (such as fingerprints, genetic profiles and its databases) in the last two centuries demonstrate a political will of "being modern". The references to the fact that such technologies were already implemented in foreign countries and the necessity of being on a par with such technological developments have been constant (Miranda 2014), demonstrating a "political conception of technologically based modernization" (Frois 2013: 4).

In this regard, we must emphasise the paradigm of *techno-fallacy* and, in particular the *fallacy of novelty* (Byrne and Marx 2011; Corbett and Marx 1991) and *vanguard fallacy* (Corbett and Marx 1991), due to the emphasis on the appeal to "newness" and the effort to "appear up-to-date" and modern. In the words of Ronald Corbett and Gary T. Marx (1991): "if the big guys are doing it, it must be good". Such modernisation associated with technology and foreign models contrasts with a kind of *inferiority complex* (Frois 2013) that highlights ideas of backwardness in relation to Portuguese reality (Frois 2008, 2013)[7] and its *semi peripheral* condition (Nunes and Gonçalves 2001). In the words of Inspector Tiago, "whatever is happening in United States, we will have more or less [the same reality] in 20 years". Indeed, "the demand for modernization is accompanied by the parallel reification of 'backwardness'" (Frois 2013: 20).

Tradition and Innovation

> *There are two problems with the new surveillance technologies. One is that they don't work, and the other is that they work too well.*
>
> (Gary Marx 2006: 49)

[7] The dictatorship that ruled Portugal from 1926 to 1974, a period of intense control, repression and censorship, led to a position of resistance towards progress and modernity (Machado and Frois 2014). Such socio-historical and cultural aspects allow us to understand the particularities of contexts with an authoritarian past and, consequently, specific power dynamics (as is the case of Portugal and other countries in Southern Europe (Boersma et al. 2014)).

David Garland's "new culture of control" (2001) introduces us to the idea that contemporary societies face more intensive social control regimes. The processes of information collection and analysis play a fundamental role in these regimes, reinforcing such a culture of control (Byrne and Marx 2011; Marx 2002). In regard to surveillance and control practices, we can distinguish between *soft* and *hard* means for collecting personal information (Marx 2006). We relate these soft forms to the *ethos* of *new surveillance* (Marx 2002, 2005), associated with the growing automation, invisibility and the strategic use of information (Byrne and Marx 2011; Marx 2006). With *hard* we refer to *traditional surveillance* (Marx 2002, 2005), which is taken as more invasive and coercive. In the transformations of these practices we find that, "although hard forms of control are hardly receding, the soft forms are expanding in a variety of ways" (Marx 2006: 38).

Indeed, the use of traditional means of collection and management of information endures and these will not be replaced by more recent methods (Cole and Lynch 2006; Machado and Prainsack 2012; Marx 2006; McCartney 2006; Purenne 2012), despite their symbolism and perceived capacity to provide "truth". Inspector Joana said that despite the importance of "innovative methods [...], we will always absorb to the older [methods]". Thus, traditional surveillance is complemented by a new surveillance, automated and less visible (Lyon 2001a; Marx 2006), presenting a figure of a *hybrid detective*, a descendant of two different times: past and present.

The Traditional Figure of the Detective

There are certain constraints and obstacles associated with newer information collection and management methods. To situate these challenges we look back to the traditional processes and their role in criminal investigation to consider how new methods change or augment the role of detectives. These "older" means lead us to a whole panoply of traditional surveillance practices that involve "close observation by a person not a machine" (Marx 2005) in order to obtain information. These procedures require "street work" and strategies that seek the highest number of elements to identify individuals and to observe their behaviours and habits. This happens through a constant 'game of pushes and pulls of information' that is compared to a puzzle "where pieces are assembled together".[8]

Conducting covert surveillance, 'routinising' suspects or managing informants and witnesses exemplify these means of obtaining information. According to Inspector Filipe, "the everyday of the individual is dismounted. Of course, without him being aware of it [smile]". The discretion and "disguise" work coupled with the capacity of "being unnoticed" is regarded as fundamental (Ericson 1993). The 'street' information provides "clues" and is essential for developing a criminal case narrative, even if such information might not be admissible for the official prosecution.

Inspector Filipe noted that "in most cases when the paper [...] comes it is no longer needed, we already went the other way round to get the same information". In fact, it is the use of more informal means of obtaining information that allows to overcome some of the constraints and obstacles mentioned above, namely the bureaucratic difficulties to access information.

Even though it is not officially included in the process, such "marginal information" that tends to stay on the edge of the paper and that usually ends up in the drawer is fundamental. Hence the inspectors agree with its computerisation and, according to inspector Guilherme, the information can be subjected to treatment by a specific sector of the police. We find that the "traditional detective work" remains necessary even if combined with science and new technologies (Cole and Lynch 2006; McCartney 2006; Purenne 2012). Inspector Paula, after 31 years of service, states this necessary complementarity:

[8] This work requires "ingenuity" from the detective, especially in certain types of crime. For example, according to inspector Guilherme, working in drug trafficking area, this is a work of "a lot of gossip".

> They [traditional and innovative methods] complement each other, because we cannot wait that only the scientific methods do things. We also have to get going, to put the wheels in motion. I think that lately many people have turned to scientific methods: "let's hope that they [the forensic scientists/laboratories and its instruments/reports] do everything", we [the police] can not [...]. We also need to work in the 'street'... If we don't go to the street to collect [information], then we can't expect science to provide us what we didn't collect. Hence why I think there must be a complement of our steps along with science.

"Press the button and leave it searching, right?"

Rudimentariness, slowness and unreliability are usually associated with traditional means. Such a perspective leads us to the *fallacy of novelty* (Byrne and Marx 2011; Corbett and Marx 1991), since there is the *assumption* that *new means are better than the old* (Corbett and Marx 1991). While in the past everything had to be manually examined and at a local level, in the present computerisation allows automation at a national and even international level. As Inspector Filipe said, "everything that in technological terms can streamline, facilitate... hey, just press the button and leave it searching, right?" This Inspector referred to *Polícia Judiciária*'s integrated system of criminal information and its daily use:

> The first thing we do here is to go to our internal system, introduce nickname, enter nickname, introduce the name, and we see if we have any reference or not, if there are crimes with that same modus operandi, if there are similar situations in the country, that we do, it is routine.

The expansion of computerisation and communication technologies has an immense impact on the collection and recording of police information (Abe 2006; Byrne and Marx 2011; Ceyhan 2005; van Brakel and De Hert 2011). Thus computerisation has become an essential tool in the surveillance process due to its ability to permanently record knowledge (Foucault 2007). Databases stand out in this collection/recording process, as enabling "centres of calculation" (Latour 2001) i.e. sites of information accumulation and combination of power and knowledge. Control strategies are developed through such centres, as is the case of police or forensic laboratories (Haggerty and Ericson 2000), enabling action at a distance and information sharing. For Latour (1999, 2001), the act of combining mobile 'inscriptions' formed at a distance enables a type of calculation. In fact:

> The construction of the centres requires elements to be brought in from far away—to allow centres to dominate at a distance—without bringing them in for good—to avoid centres being flooded. This paradox is resolved by devising inscriptions that retain simultaneously as little and as much as possible by increasing either their mobility, stability or combinability. This compromise between presence and absence is often called information.
>
> (Latour 2001: 243)[9]

Indeed, technologies make it possible to act at a distance (Ceyhan 2005; den Boer 2011; Lyon 2001a, 2001b) and, as explored, databases illustrate this capability. They allow the gathering of information related to individuals, namely those deemed as suspects (Cole and Lynch 2006; Johnson, Williams and Martin 2003). Exemplifying with fingerprints, if in the past they were analysed manually by a naked eye, now AFIS (Automated Fingerprint Identification System) automatically sorts, stores and compares

[9] Latour also says: "if inventions are made that transform numbers, images and texts from all over the world into the same binary code inside computers, then indeed the handling, the combination, the mobility, the conservation and the display of the traces will all be fantastically facilitated" (Latour 2001: 228).

fingerprints (Cole 2001). In the opinion of inspectors it "made life much easier in terms of investigation", by making it faster.[10]

Besides databases, the *online* research and the access to social networks to obtain information (Trottier 2012) is a recent reality that is linked to a new generation of detectives. As Inspector Carlos explained, "a policeman from younger generations has other knowledge and […] an imaginative ability to look for information in more diversified circles". This contrasts with the already explored idea that a detective from an older generation can be considered *old-fashioned* and *out of step*. Inspector Rui, who works in the strategic and operational information area, referred to some of the possibilities:

> For example, in my work I resort to the integrated system of criminal information from Polícia Judiciária, I resort to the prisoner's database, I resort, for example, to the insurance database, I resort to Google [laughs]. It is true, I resort to Google. I resort to Europol, Interpol, all of them are tools.

Inspector Bruna was also optimistic about the role of social media technologies in criminal investigation:

> There is so much information at the level of internet, even in those websites, Facebook, all of these… If we can somehow take advantage of this information to have a larger file of citizens with more information … of course it is useful then to get to people, right?

Detectives remark on the greater capacity for collection and analysis of information, namely in terms of what is available online and, in particular, by using social networks (Byrne and Marx 2011; den Boer 2011; Trottier 2012). In fact, "it should come as no surprise that Facebook and other social media sites would be examined by investigators attempting to solve crimes and monitor the activities of known suspects" (Byrne and Marx 2011: 24). Inspector Guilherme, with 25 years of service, referred:

> Today, in the end, with the internet everyone puts everything about them online. [...] In the old days if we wanted to know some information we had to ask and go to the street to know [...]. Today we almost do not need that, right? Today almost everyone has their information on the computer [smile]. Almost everyone has Facebook [...] and it is everything there".

"The police is relying increasingly on (information) technology to take over certain parts of their tasks" (van Brakel and De Hert 2011: 165) and the *new surveillance* emphasises, precisely, automated data collection that involves machines instead of humans (Marx 2002, 2005). For detectives, the identification by the automated system is more efficient and the error is associated wih the human being, since the machine is viewed with greater confidence and reliability (Machado 2012; Machado and Prainsack 2012). The machines appear as instruments that can replace the senses, extending the natural capacities of the human being (Volti 1992; Yearley 1988). Thus, the technology represents the application of truth made possible by science. Inspector Guilherme commented that:

> The probability of error [in the past] was greater as it is logical, right? Everything that is made by men is, let's say, imperfect, and therefore the mistake is human too, right? [...] And it is easier to get mistaken than if it is prepared scientifically, right?

The use of automated systems can eliminate a human's responsibility, since there is "a system that guarantees him how it is, whereas before he had to guarantee it by himself" (Inspector Guilherme). Still in

[10] However, as previously explored, the scenario is different if we refer ourselves to DNA databases and its obstacles.

the opinion of this detective, the resort to these systems can not only simplify the work but also make detectives less insightful and lazier, because it is possible to obtain the answers by a machine.[11]

This imperative role of the machine in the identification process is balanced by the need to manually ascertain the results in the end. As Inspector Alberto reported in relation to AFIS, "the system presents a probability and then it is compared manually". However, when the inspectors refer to the automated systems' disadvantages necessitating manual checking, the infallibility is again associated with the human being. In this regard, Inspector Simão explained, "the computer only provides the results with the raw material that was placed there. If the raw material was not placed well, the computer does not deliver the correct result".

Future—The Great Expectations

> *Omar: The game is out there, and it's either play or get played.*
> (Television series *The Wire*, episode *Lessons* (#1.8), 2002)

When we explored detectives' expectations for the future management of information, we observed a discourse about the predicted difficulties of future criminal investigation, such as the higher complexity of crimes and learning process of the criminal. Science and technology continually emerged as the 'heroes' that will help them address such difficulties. The great expectations of their potential in criminal investigation are sustained, despite the obstacles and local contingencies we explored. As Inspector Filipe explained:

> We will increasingly use this stuff [technology]. You see, due to the bandits' intellectual evolution, since they also go to jail and they learn ... and learn. They see … "ok, if in this time I got caught by this, in the next they will not screw me again because then I will engender another crazy scheme".

Inspectors highlighted how criminals will commit more sophisticated crimes in the future, using innovative techniques and strategies and how the detectives will always stay a "step behind the criminal". This can be seen as a game and a dance between criminals and detectives. As Inspector Simão stated:

> Look, whatever the political will dictate, whatever new technologies will dictate, whatever our crime will dictate […] obviously this is always a dance for two. It depends on the evolution of the criminals. [...] All this has … is always changing. [...] And as things happen, we're here to dance.

Peter Manning (2008) discusses the adaption to innovations and the role of information technologies in the changes of police as *dance steps*. As he said, "transformative moments of change are like a new dance, but are always shadowed by the past, foresee the future, and move without direct rational guidance" (Manning 2008: 22).

Nevertheless, Inspector Manuel (24 years of service, homicides) and Inspector Rui (16 years and working on strategic and operational information area) envisage the future in different ways. The different areas of work and the length of professional experience seem to play a role in their perspectives. Even though Manuel referred to the necessity to evolve with technology, he still thinks criminal investigation will not differ that much from what it is today. He mentioned the traditional methods and how basic methods will

[11] It should be noted that the attitude of perspicacity is described as one of the main qualities that the detective must have. Baltasar, the detective interviewed with most years of service, said that "it is often not possible to resort to science to prove whatever it is, right? And there it has to be through the attitude, through perspicacity".

remain the same in their work. However, more technologies will be available coupled with a greater awareness of science application to criminal investigation. In contrast, Inspector Rui (information sector) envisions a future where the traditional figure of the detective will disappear. As he explained, "the traditional method of investigation, the inspector, the investigation, the magnifying glass, the pistol and the flashlight will end".

Conclusion

> *The adjective modern does not describe an increased distance between society and technology or their alienation, but a deepened intimacy, a more intricate mesh, between the two.*
>
> (Latour 1999: 196)

> *In our societies there are two systems of appeal: nonhuman and superhuman—that is, machines and gods*.
>
> (Latour 1992: 167)

In this paper we have discussed how the paradigm of *techno-fallacy* is emphasised in the use of technology to deal with social issues, in particular the *fallacy of novelty* (Byrne and Marx 2011; Corbett and Marx 1991), which assumes that new means are better than the old. This appeal to "newness" and to "appear up-to-date" is associated with the "*vanguard" fallacy* (Corbett and Marx 1991) and the efforts to appear modern. As Catarina Frois (2008) said, "the 'great slogan' in Portugal is, effectively, the modernization" (2008: 113). This political conception of modernisation based on the use of technology emerges as a symbol of progress (Frois 2008, 2013).

Portugal's desire to modernise is reflected in police perspectives in relation to new technologies. Addressing the *hard nuts to crack* for technology adoption within police work and criminal investigation requires an understanding of different national contexts and realities (Jones and Newburn 2002), as our work context highlights.

Exploring the (in)dependence of technology in criminal investigation by understanding the meaning attributed by inspectors to their practices, we find how the adoption of technological elements has impacts on the nature of police work. Notwithstanding the adoption of these elements being subjected to many obstacles, technological innovation emerges as one of the elements of a *new professionalism* (Stone and Travis 2011) in policing and in the metamorphosis of the *traditional figure* of the detective.

This figure is being supplanted by a *hybrid*, capable of combining *harder* and older means with *softer* and newer means of obtaining information. This *hybrid detective* emerges as a product of *traditional* and *new surveillance* (Marx 2002, 2005), combining past and present, connecting actors and artefacts. The dissolution of human/technical binary opposition draws attention to actor network theory and the need to consider how collectives of human and non-human elements are formed and how the competencies are distributed (Latour 1992, 1999, 2001). Furthermore, it is necessary to reflect on the role of the human actors and their impact on the development and application of technology or how it can replace/shape human action (Latour 1992). As Byrne and Marx say, "the aura of science and technology as infallible […] ignores the role of humans […] in shaping what technologies are developed and how they are designed and applied" (2011: 33).

This process of co-construction should be scrutinised, since the machine reunites human allies capable of renouncing their own agency and "technology is seen to have agency in much the same ways as human elements of the organization" (van Brakel and De Hert 2011: 172).

Acknowledgements

This draws on a paper presented at the 6th Biannual Surveillance & Society Conference, *Surveillance: Ambiguities & Asymmetries,* at the University of Barcelona, 25th April 2014. I would like to thank the Foundation for Science and Technology (Portuguese Ministry of Science, Technology and Higher Education) for supporting this research through a PhD fellowship (SFRH/BD/70055/2010) and my thesis supervisor, Professor Helena Machado. I am also grateful to the reviewers and Lachlan Urquhart for the useful critical comments.

References

Aas, Katja Franko. 2006. "'The Body Does Not Lie': Identity, Risk and Trust in Technoculture." *Crime, Media, Culture* 2 (2): 143–158.

Abe, Kiyoshi. 2006. "Technologies of Surveillance." *Theory, Culture & Society* 23 (2-3): 265-267.

Ball, Kirstie S., and Kevin D. Haggerty. 2005. "Doing Surveillance Studies." *Surveillance & Society* 3 (2/3): 129–138.

Boersma, Kees, Rosamunde van Brakel, Chiara Fonio, and Pieter Wagenaar. 2014. "Introduction – Histories of state surveillance in Europe and beyond." In *Histories of State surveillance in Europe and beyond,* eds Kees Boersma, Rosamunde van Brakel, Chiara Fonio and Pieter Wagenaar, 1-14. Abingdon: Routledge.

Bourdieu, Pierre. 1989. "Social space and symbolic power." *Sociological Theory* 7 (1): 14-25.

Braga, Anthony, Edward Flynn, George Kelling, and Christine Cole. 2011. "Moving the Work of Criminal Investigators Towards Crime Control." *New Perspectives in Policing*. https://www.ncjrs.gov/App/Publications/abstract.aspx?ID=255091

Byrne, James, and Gary Marx. 2011. "Technological Innovations in Crime Prevention and Policing. A Review of the Research on Implementation and Impact." *Journal of Police Studies* 3 (20): 17–40.

Ceyhan, Ayse. 2005. "Policing by Dossiers: Identification and Surveillance in an Era of Uncertainty and Fear." In *Controlling Frontiers—Free Movement into and within Europe*, eds Didier Bigo and Elspeth Guild, 209–232. London: Ashgate.

Ceyhan, Ayse. 2006. "Enjeux D'identification et de Surveillance À L'heure de La Biométrie." *Cultures & Conflits* 64: 33–47. http://conflits.revues.org/2176.

Ceyhan, Ayse. 2008. "Technologization of Security: Management of Uncertainty and Risk in the Age of Biometrics." *Surveillance & Society* 5 (2): 102–123.

Cole, Simon A. 2001. *Suspect Identities: A History of Fingerprinting and Criminal Identification*. Cambridge: Harvard University Press.

Cole, Simon A., and Michael Lynch. 2006. "The Social and Legal Construction of Suspects." *Annual Review of Law and Social Science* 2 (1): 39–60.

Cole, Simon A., and Rachel Dioso-Villa. 2007. "CSI and Its Effects: Media, Juries, and the Burden of Proof." *New England Law Review* 41 (3): 435 – 470.

Corbett, Ronald, and Gary T. Marx. 1991. "Critique: No Soul In The New Machine: Technofallacies In The Electronic Monitoring Movement." *Justice Quarterly* 8 (3). http://web.mit.edu/gtmarx/www/critique.html.

Corbin, Juliet, and Anselm Strauss. 2008. *Basics of qualitative research—Techniques and procedures for developing grounded theory.* London: Sage Publications.

Costa, Susana. 2003. *A justiça em laboratório: A identificação por perfis genéticos de ADN. Entre a harmonização transnacional e a apropriação local*. Coimbra: Almedina.

Costa, Susana. 2012. "Saberes e práticas dos órgãos de polícia criminal na gestão da cena de crime." In *A ciência na luta contra o crime: Potencialidades e limites,* eds Susana Costa and Helena Machado, 69–97. Vila Nova de Famalicão: Húmus.

den Boer, Monica. 2011. "Technology-Led Policing in the European Union: An Assessment." *Journal of Police Studies* 3 (20): 39–57.

Ericson, Richard. 1993. *Making Crime—A Study of Detective Work*. Toronto: University of Toronto Press.

Ericson, Richard V., and Kevin D. Haggerty. 1997. *Policing the Risk Society*. Oxford: Clarendon Press.

Ericson, Richard, and Clifford Shearing. 1986. "The Scientification of Police Work." In *The Knowledge Society. The Growing Impact of Scientific Knowledge on Social Relations*, eds Gernot Bhöme and Nico Stehr, 129–159. Dordrecht: D. Reidel Publishing Company.

Foucault, Michel. 2007. "Panopticism." In *The Surveillance Studies Reader*, eds Sean P. Hier and Joshua Greenberg, 67–75. Maidenhead: Open University Press.

Frois, Catarina. 2008. "Bases de Dados Pessoais E Vigilância Em Portugal: Análise de Um Processo Em Transição." In *A Sociedade Vigilante—Ensaios Sobre Identificação, Vigilância E Privacidade*, ed. Catarina Frois, 111–133. Lisboa: Imprensa de Ciências Sociais.

Frois, Catarina. 2013. *Peripheral vision: Politics, technology and surveillance*. Oxford: Berghahn.

Garland, David. 2001. *The Culture of Control: Crime and Social Order in Contemporary Society*. Chicago: The University of Chicago Press.

Glaser, Barney, and Anselm Strauss. 1967. *The discovery of grounded theory: Strategies for qualitative research*. New York: Aldine de Gruyter.

Gonçalves, Gonçalo Rocha. 2007. *A Construção de Uma Polícia Urbana (Lisboa, 1890-1940): Institucionalização, Organização E Práticas*. Lisboa: Instituto Superior de Ciências do Trabalho e da Empresa.

Haggerty, Kevin D., and Richard V. Ericson. 2000. "The Surveillant Assemblage." *British Journal of Sociology* 51 (4): 605–622.

Hamel, Jacques, Stéphane Dufour, and Dominic Fortin. 1993. *Case study methods*. London: Sage Publications.

Huey, Laura. 2010. "'I've Seen This on CSI': Criminal Investigators' Perceptions about the Management of Public Expectations in the Field." *Crime, Media, Culture* 6(1): 49–68.
Jasanoff, Sheila. 1995. *Science at the Bar—Law, science, and technology in America*. London: Harvard University Press.
Jasanoff, Sheila. 1998. "The eye of everyman: Witnessing DNA in the Simpson trial." *Social Studies of Science* 28(5-6): 713–740.
Johnson, Paul, Robin Williams, and Paul Martin. 2003. "Genetics and Forensics: Making the National DNA Database." *Science Studies* 16 (2): 22–37.
Jones, Trevor, and Tim Newburn. 2002. "The Transformation of Policing? Understanding Current Trends in Policing Systems." *British Journal of Criminology* 42: 129–146.
Kruse, Corinna. 2010. "Producing Absolute Truth: CSI Science as Wishful Thinking." *American Anthropologist* 112 (1): 79–91.
Kruse, Corinna. 2012. "Legal Storytelling in Pre-Trial Investigations: Arguing for a Wider Perspective on Forensic Evidence." *New Genetics and Society* 31 (3): 37–41.
Latour, Bruno. 1992. "Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts." In *Shaping Technology/building Society: Studies in Sociotechnical Change*, eds Wiebe E. Bijker and John Law, 151–180. Cambridge: MIT Press.
Latour, Bruno. 1999. *Pandora's Hope: Essays on the Reality of Science Studies*. Cambridge: Harvard University Press.
Latour, Bruno. 2001. *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge: Harvard University Press.
Lynch, Michael. 2003. "God's signature: DNA profiling, the new gold standard in forensic science." *Endeavour* 27(2): 93–97.
Lynch, Michael, Simon Cole, Ruth McNally and Kathleen Jordan. 2008. *Truth machine: The contentious history of DNA fingerprinting*. Chicago: University of Chicago Press.
Lyon, David. 2001a. *Surveillance Society: Monitoring Everyday Life*. Maidenhead: Open University Press.
Lyon, David. 2001b. "Facing the Future: Seeking Ethics for Everyday Surveillance." *Ethics and Information Technology* 3 (3): 171–180.
Machado, Helena. 2012. "Crime, Bancos de Dados Genéticos E Tecnologia de DNA Na Perspectiva de Presidiários Em Portugal." In *Ciências Na Vida. Antropologia Da Ciência Em Perspetiva*, eds Claudia Fonseca, Fabiola Rohden and Paula Sandrine Machado, 61–85. São Paulo: Editora Terceiro Nome.
Machado, Helena, and Barbara Prainsack. 2012. *Tracing Technologies. Prisoners' Views in the Era of CSI*. Farnham: Ashgate.
Machado, Helena, and Filipe Santos. 2012. "Entre a Polícia Ficcional e a Polícia Real: os usos do DNA na Investigação Criminal em Portugal." In *Polícia, Segurança E Ordem Pública. Perspetivas Portuguesas E Brasileiras*, eds Susana Durão and Marcio Darck, 154–166. Lisboa: Imprensa de Ciências Sociais.
Machado, Helena, and Catarina Fróis. 2014. "Aspiring to modernization—Historical evolution and current trends of state surveillance in Portugal" In *Histories of State surveillance in Europe and beyond,* eds Kees Boersma, Rosamunde van Brakel, Chiara Fonio, and Pieter Wagenaar, 65-78. Abingdon: Routledge.
Machado, Helena, and Susana Costa. 2013. "Biolegality, the Forensic Imaginary and Criminal Investigation." *RCCS Annual Review* 5(5). http://rccsar.revues.org/490?lang=pt
Madureira, Nuno Luís. 2005. "Policía Sin Ciencia: la investigación criminal en Portugal: 1880-1936." *Política Y Sociedad* 42 (3): 45–62.
Manning, Peter. 2008. *The technology of policing—Crime mapping, information technology, and the rationality of crime control.* New York: University Press.
Marx, Gary. 2002. "What's New about the 'new Surveillance'? Classifying for Change and Continuity." *Surveillance & Society* 1 (1): 9–29.
Marx, Gary T. 2005. "Surveillance and Society." In *Encyclopedia of Social Theory*, ed. George Ritzer. Sage Publications.
Marx, Gary T. 2006. "Soft Surveillance: The Growth of Mandatory Volunteerism in Collecting Personal Information—"Hey Buddy Can You Spare a DNA?" In *Surveillance and Security—Technological Politics And Power In Everyday Life*, ed. Torin Monahan, 37-56. London: Routledge.
McCartney, Carole. 2006. "The DNA Expansion Programme and Criminal Investigation." *British Journal of Criminology* 46 (2): 175–192.
Kranzberg, Melvin. 1986. "Technology and History: 'Kranzberg's Laws.'" *Technology and Culture* 27 (3): 544-560.
Miranda, Diana. 2014. "O trajeto histórico dos métodos de identificação criminal em Portugal." In *Bases de dados genéticos forenses—tecnologias de controlo e ordem social*, eds Helena Machado and Helena Moniz, 307–345. Coimbra: Coimbra Editora.
Nunes, João Arriscado, and Maria Eduarda Gonçalves. 2001. "Introdução." In *Enteados de Galileu? A semiperiferia no sistema mundial da ciência*, eds João Arriscado Nunes and Maria Eduarda Gonçalves, 13–31. Porto: Afrontamento.
Purenne, Anaik. 2012. "Police and surveillance in Paris: are the French police becoming knowledge workers and risk managers?" In *Crime, Security and Surveillance,* eds Gudrun Vande Walle, Evelien den Herrewegen and Nils Zurawski, 163-176. The Hague: Eleven International Publishing.
Santos, Boaventura de Sousa. 2000. *A Crítica Da Razão Indolente: Contra O Desperdício Da Experiência*. Porto: Afrontamento.
Santos, Filipe, Susana Costa, and Helena Machado. 2012. "A base de dados de perfis de DNA em Portugal: Questões sobre a sua operacionalização." In *A ciência na luta contra o crime: Potencialidades e limites*, eds Susana Costa and Helena Machado, 99–118. Vila Nova de Famalicão: Húmus.

Stone, Christopher, and Jeremy Travis. 2011. "Toward a New Professionalism in Policing." *New Perspectives in Policing* (Executive Session on Policing and Public Safety). https://research.hks.harvard.edu/publications/digest/citation.aspx?PubId=7776&type=PT&LookupCode=WP.

Trottier, Daniel. 2012, *Social Media as Surveillance: Rethinking Visibility in a Converging World*. Farnham: Ashgate.

van Brakel, Rosamunde, and Paul De Hert. 2011. "Policing, Surveillance and Law in a Pre-Crime Society: Understanding the Consequences of Technology Based Strategies." *Technology-Led Policing: Journal of Police Studies* 3 (20): 163–192.

van der Ploeg, Irma. 1999. "Written on the Body: Biometrics and Identity." *Computers and Science* 29 (1): 37–44.

van der Ploeg, Irma. 2003. "Biometrics and the Body as Information: Normative Issues in the Socio-technical Coding of the Body", In *Surveillance as Social Sorting: Privacy, Risk, and Automated Discrimination*, ed. David Lyon, 57-73. New York: Routledge.

Volti, Rudi. 1992. *Society and Technological Change*. New York: St. Martin's Press.

Yearley, Steven. 1988. *Science, Technology and Social Change*. London: Unwin Hyman.

Williams, Robin, Paul Johnson, and Paul Martin. 2004. *Genetic information and crime investigation. Social, ethical and public policy aspects of the establishment, expansion and police use of the National DNA Database*. London: Official Report. https://www.dur.ac.uk/resources/sass/Williams_Johnson_Martin_NDNAD_report_2004.pdf

Williams, Robin, and Paul Johnson. 2004. "'Wonderment and Dread': Representations of DNA in Ethical Disputes about Forensic DNA Databases." *New Genetics and Society* 23 (2): 205–23.

Williams, Robin, and Paul Johnson. 2008. *Genetic Policing—The Use of DNA in Criminal Investigations*. Cullompton: Willan Publishing.