

The hero is never solely responsible for success stories

Criminalistics in the Netherlands in 1900-1930 through an actor-network perspective

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Abstract

This thesis explores the reconstruction of crime scenes in the Netherlands in 1900-1930.

Criminalistics and the study of the crime were still relatively new in this age and depended on a web of forensic and investigative pioneers, new techniques for identification, and also a new attention for the material elements of crime scenes: the silent witnesses. The history of criminalistics also shows a recurring theme of strict separation between the human world and the natural world. Although investigators had to literally reconstruct crime scenes, they also had to refrain from interfering with it. In this thesis I use insights from Actor-Network Theory (ANT) and apply them to two criminal cases in which the famous criminalist C. J. van Ledden Hulsebosch featured as a forensic consultant. By analysing these cases through a material-semiotic view, I argue that, in practice, investigators had to compromise their ideal of separation if they were to stand up to the challenges of modern crime scene investigation.

Introduction

During the last twenty years of the nineteenth century criminalistics emerged as a new field of study. This new field was closely related to the slightly older discipline of criminology, which emerged in the second half of the nineteenth century and was inspired by human sciences such as anthropology and psychology. While criminologists sought to understand the nature of criminals, criminalists were more concerned with the facts of a crime and sought to gain knowledge of criminal events by applying techniques from natural sciences. The goals of both disciplines differed from each other as practitioners of criminalistics were concerned with solving crimes that had already been committed, while the goal of criminology was to eventually be able to prevent crime itself.

The emergence of these two fields in the late nineteenth century is closely related to reforms in investigative police work, usually at the hands of pioneers in forensic science. These scientists would apply insights from several fields, such as biology, zoology, and anthropology, but also from chemistry and physics. Important pioneers in this period were the French police bureaucrat Alphonse Bertillon (1853-1914) and the Italian criminal anthropologist Cesare Lombroso (1835-1909). During the last twenty years of the nineteenth century, both men devised ways of measuring certain features of criminal bodies in order to make their identification easier. While Lombroso had the ambitious goal of discovering a hereditary disposition for crime, Bertillon was merely looking for a way to identify individual criminals. Other pioneers were Bernard Spilsbury (1877-1947), an English pathologist who was responsible modernizing British criminal investigation by, amongst other things, introducing murder kits, and Austrian detective Hans Gross (1847-1915).¹ The latter is perhaps the quintessential founding father of modern police investigation, as he literally wrote the leading book on it.²

In this thesis I will look at the early years of modern criminalistics in the Netherlands (1900-1930s). My research question is “How was knowledge produced on crime scenes in the early twentieth century in the Netherlands?”. To answer this question, I will look at the way crime scenes were reconstructed by police investigators and forensic experts. For my theoretical approach, I will use insights from actor-network theory, hereafter abbreviated as ANT. This theory was developed in the 1980's by, amongst others, the influential French sociologist Bruno Latour. ANT as a theory is concerned with how both the human and the material world shape and define each other. Probably best known for its claim that material objects also have agency, ANT lends itself excellently for

¹ Ian Burney and Neil Pemberton, 'Bruised Witness: Bernard Spilsbury and the Performance of Early Twentieth-Century English Forensic Pathology', *Medical History*, 55 (2011), 41-60.

² Ian Burney and Neil Pemberton, 'Making space for criminalistics: Hans Gross and fin-de-siecle CSI', *Studies in History and Philosophy of Biological and Biomedical Sciences* 55 (2013) 16-25.

studying the place of material objects in history. It fits especially well with the field of criminalistics as, much like ANT, crime scene investigation is also concerned with inspecting material details on a local scale.

The primary objects of study will be two murder cases that feature in the memoirs of one of the Dutch pioneers of criminalistics; C. J. van Ledden Hulsebosch (1877-1952). Furthermore, these cases will also be studied via the media attention they received in the newspapers. Additionally, I will use several police handbooks on crime scene investigation that were written from 1900 to 1930.

Historiography

The role of criminalistics in the history of Dutch police work has not received much attention compared to the neighbouring field of criminology.³ Cyrille Fijnaut, who is one of the more well-known historians specialized in the history of the Dutch police, has pointed out that after the turn of the nineteenth century both criminology and criminalistics started to flourish in the Netherlands. However, Fijnaut's study 'Over de traditie van de politiewetenschap in West-Europa' (1983) mostly explores the history of the role that police would play in the modern state, an issue for political scientists.⁴ The author does acknowledge that in the beginning of the new century new fields of science, such as chemistry and anthropology, inspired the scientification and specialization of the Dutch police. Also, in his book *De Geschiedenis van de Nederlandse Politie*, Fijnaut describes that in the final years of the nineteenth century the Dutch police were sometimes consulted by photographers in the investigation of crime scenes. Additionally, they would employ specialists to handle material evidence. However, there is no real attention to the details of crime-solving; the investigators, the material traces they researched, and the techniques that they used during the investigation.

In contrast to the history of the crime scene, some techniques, like fingerprinting and "Bertillonage" have received detailed histories. Named after the French criminologist Alphonse Bertillon (1853-1914), the practice of carefully describing the external features of criminals gained prominence in the Netherlands in the late nineteenth century. In a way, using Bertillonage as a way of storing information on suspects was easier than by using judicial photography, a technique that emerged in the same period. As Bertillonage was based on measurements and numbers, the archives

³ Willemijn Ruberg and Nathanje Dijkstra, 'De Forensische Wetenschap in Nederland (1800-1930): Een Terreinverkenning', *Studium* 9 (2016) 121–143, 131.

⁴ Cyrille Fijnaut, 'Over de Traditie van de Politiewetenschap in West-Europa', in: P. J. P. M. van Lochem and P. van Reenen (eds), *Theoretische Opstellen Rondom de Politie* (Apeldoorn 1983) 21–42, 28.

were in theory more easily managed. The history of these techniques is closely related to body history as it concerns the transformation of human bodies into objects of scrutiny and identification.⁵

Furthermore, the subject of criminalistics has also been approached through biographical studies into its pioneers. As was the case in other Western countries, criminalistics in the Netherlands were inspired by certain founding fathers. Among the more prominent Dutch pioneers were C. J. van Ledden Hulsebosch and W. F. Hesseling, both originally chemists, who consulted for the police as experts witnesses. Van Ledden Hulsebosch quickly shifted from merely being a specialist advisor to the police to becoming an influential criminalist himself. Fijnaut claims that the influence of specialists like Van Ledden Hulsebosch on the Dutch police can be concluded from the emergence of police laboratories and the introduction of specialized literature for forensic policemen in the late 1940's.⁶

The investigators, their techniques, and scientific ideals are explored by historians Willemijn Ruberg and Nathanje Dijkstra. The authors argue that, in the late nineteenth and early twentieth centuries, Dutch criminalistics went through great developments.⁷ Ways of identifying criminals, like police descriptions, were now more broadly used than in the first half of the nineteenth century. Also, methods of forensic research were expanded by applying chemistry and photography. Finally, the beginning of the twentieth century even saw the introduction of sniffer dogs in the Netherlands. In this, the Dutch were actually ahead of the English police, who only started structurally using dogs in the 1950's.⁸

Another approach to studying crime is by looking at the effects of police work on crime itself. During the first thirty years of the twentieth century, crimes that resulted in the death of victims were in decline in the Netherlands.⁹ Whether this was because of the growing monopoly on violence by the Dutch state, as suggested by Herman Franke, or by institutional and technical developments as described by Fijnaut is unclear. However, it's interesting that the number of violent and deadly crimes decreased during the same period that marks the foundation of modern crime scene investigation in the Netherlands.

Another development that is of relevance to the field of criminalistics is the change in scientific ideals in the nineteenth century. Science has its own history, and as we shall see later on,

⁵ C. O. van der Meij, *In kaart gebracht: de mens als object van beschrijving in de 19e eeuw* (Master thesis Archiefwetenschap, Universiteit van Amsterdam 2012).

⁶ Fijnaut, 'Over de traditie van de politiewetenschap in West-Europa', 34.

⁷ Ruberg and Dijkstra, 'De forensische wetenschap in Nederland', 132.

⁸ *Ibidem*, 133.

⁹ Herman Franke, 'Geweldscriminaliteit in Nederland. Een historisch-sociologische analyse', *Amsterdams Sociologisch Tijdschrift* 18 (1991) 13–46, 18.

scientific experts like Van Ledden Hulsebosch embodied a certain type of objectivity that required a strict separation between the natural world and human intervention. This type of objectivity has been termed 'mechanical objectivity' by historians of science Lorraine Daston and Peter Galison and appeared during the latter half of the nineteenth century.¹⁰ In the same period, human perception and memory were considered flawed. Therefore, material evidence was much more valuable than human testimonies. This required the police to have more attention to the details of crime scenes. However, they also had to refrain from interfering with the scene so as not to contaminate it.

Considering both the technical and scientific changes in crime scene investigation (CSI) in 1900-1930, it is interesting to look at how investigators reconstructed crime scenes, whilst also trying to stay true to the ideal of minimal intervention. New techniques enabled investigators to scrutinize more types of evidence, but at the same time crime scenes could be extremely precarious places. It was up to the investigator to carefully manage the crime scene.

Theoretical approach

To answer my research question, I will use insights from ANT to analyse the reconstruction of two crime scenes. I will shortly explain ANT here, as Chapter 2 is entirely dedicated to it. So what exactly is ANT? It is a material-semiotic approach, a method to analyse the relationships between objects and concepts. It emerged in the 1980's in the field of Science and Technology Studies (STS). The most important people who were involved with the development of ANT were Bruno Latour, Michel Callon, and John Law. The first thing that is important to know about ANT is that its users like to play with terms. According to Dutch philosopher Annemarie Mol, who has worked with John Law, the people responsible for the development of ANT actually find the name quite misleading, as it isn't really a theory at all.¹¹ It can better be seen as a set of ideas that may be used to find out society's relationship to technology and objects, but it does so in a descriptive way. Rather than explaining, ANT seeks to transform and offer new insights.¹² Also, the terms actor and network themselves aren't given clear definitions either and are used interchangeably.

Another important thing to know about ANT is that it denies the existence of social forces and treats both people and inanimate objects in the same way. Both can be considered actors in the sense that they have agency, which is the ability to affect things around them. Again contradicting its name, ANT prefers to speak of actants instead of actors. This is because the word actor has a more human connotation to it. An actant can be anything, both human and inhuman. In the case of a crime

¹⁰ Lorraine Daston and Peter Galison, *Objectivity* (New York 2007) 19-21.

¹¹ Annemarie Mol, 'Actor-Network Theory: Sensitive Terms and Enduring Tensions', *Kölner Zeitschrift für Soziologie und Socialpsychologie* 50 (2010) 253-269, 254.

¹² Mol, 'Actor-Network Theory', 255.

scene, a lifeless body may be an actant. The body isn't alive anymore so it has no goals or aims, but it is able to influence the people and things in its vicinity. The body in this example may provide the police with certain clues that point them in the way of the murderer. Actants are also continuously shaped by things around them. For example, a pathologist is needed for a lifeless body to tell the police anything. So, actants continuously interact with their surroundings, thereby making up a network of interaction.¹³ In this thesis I will approach the reconstruction of a crime scene as an ANT network in order to find out how knowledge of a crime was constructed by investigators and forensic experts.

Apart from building networks, ANT is also concerned with the durability. When are networks considered to be successful? When do they fail? Some networks lose their coherence when certain actants are removed from the equation. Other networks can be unfit to deal with outside threats. Additionally, some networks do not only depend on the presence or absence of certain actants, but also need them to work in a perfect sequence for the network to retain its functionality. A laboratory can be considered a good example of this, according to Mol.¹⁴ There are also more adaptable networks, which Mol calls fluid networks.¹⁵ She prefers the name fluid since they are able to retain their functionality once subjected to influences from the outside. Some networks may be so fluid that they are able to re-attain their shape over time.

Why use ANT instead of other theories to analyse Dutch CSI? Some theories have already been used to approach this subject. For example, Claire Valier applies the conjectural model to the history of crime scene investigation¹⁶. This model was coined by historian Carlo Ginzburg who argued that, in the nineteenth century, experts in several fields were able to reconstruct hidden knowledge through careful observation of certain clues. Ginzburg argues that this was practiced by priests, hunters and doctors.¹⁷ In this text, Ginzburg describes the similarities in the methods between several prominent historical detectives. Between 1874 and 1976, the Italian art historian and critic Giovanni Morelli (1816-1891) claimed that many of the paintings in museums had been attributed to the wrong painters. Morelli argued that, instead of concentrating on the defining features of a painting, experts who want to identify the correct painter should rather focus on small details like the way in which earlobes and fingernails are painted. Both Sigmund Freud (1856-1939) and Sherlock Holmes, the protagonist of Arthur Conan Doyle's books, have in common with Morelli that they focus

¹³ Mol, 'Actor-Network Theory', 258.

¹⁴ Ibidem, 257.

¹⁵ Ibidem, 258.

¹⁶ Claire Valier, 'True Crime Stories: Scientific Methods of Criminal Investigation, Criminology and Historiography', *The British Journal of Criminology* 38 (1998) 88–105, 92.

¹⁷ Carlo Ginzburg, 'Morelli, Freud and Sherlock Holmes: Clues and Scientific Method', *History Workshop Journal* 9 (1980) 5-36.

on the small details in order to reconstruct knowledge. Holmes also uses earlobes and even cigarette ashes as clues, while Freud in his psychoanalysis, also tended to focus on details beneath notice, like the shape of hands.

Although it's easy to see how Ginzburg's conjectural model can perfectly be applied to CSI, the ANT approach will yield different results. Both the conjectural model and ANT focus on minor details, this is true. However, where Ginzburg's experts were more concerned with using clues to access a secondary, hidden reality of truth, I wish to look more closely to the role of the so-called silent witnesses in the larger scheme of things. Material evidence at a crime scene isn't just a magical portal for the expert to access hidden information, it also has agency of its own. Silent witnesses are able to define people and objects around them. Instead of getting to an underlying truth, ANT can be used to "make specific, surprising, so far unspoken events and situations visible".¹⁸ ANT also refuses to accept that underlying powers are at work in moving people. It doesn't speak about invisible hands or magic wands. Every relation between objects should be considered unique. Instead of forming an underlying theory of things, ANT stresses the importance of studying what makes up individual relationships and how they function.¹⁹ By keeping all relationships unique, we end up with a really messy world. But this is the great thing about ANT as there are always new things to explore.

Source analysis

In this thesis I propose that the forensic experts of the early twentieth century were constructing networks of knowledge. The goal of these experts was to reconstruct a crime by using both their scientific knowledge and the physical traces left at the crime scene. This idea resonates with what Van Ledden Hulsebosch writes in his memoirs *Veertig Jaren Speurderswerk*. He argues that criminalistics is all about studying various sorts of material evidence; the silent witnesses. Starting from these witnesses, their presence, their absence, and their specifics, the experts are able to draw conclusions needed for the reconstruction of a crime scene. According to Van Ledden Hulsebosch, in order to get a full view of a crime, investigators and forensic experts must use all the traces at the crime scene to extract data and literally build their deduction.²⁰

By using ANT, I will show how this process of construction works. I will do this by looking at two murder cases in which C. J. van Ledden Hulsebosch was consulted as an expert both at the scene and later as a witness in court. For this, I will use his memoirs, written in 1945, as well as newspaper coverings of the cases during the investigation and in court. The book covers cases in which the

¹⁸ Mol, 'Actor-Network Theory', 255.

¹⁹ Bruno Latour, *Assembling the Social. An Introduction to Actor-Network Theory* (Oxford 2005) 47-48.

²⁰ C. J. van Ledden Hulsebosch, *Veertig Jaren Speurderswerk* (Utrecht 1945) 1.

author consulted during the first thirty years of the twentieth century. Most of the cases are described as short stories, usually four or five pages in length and mainly deal with what exactly transpired at the crime scene from the moment Van Ledden Hulsebosch was brought in.

Historical research of autobiographies became important in the 1980's, when the term live-writing arose.²¹ Life-writing encompasses all the narrative forms like journals, memoirs, correspondence, autobiographical fiction, and poems. Although historians of science are still uneasy when dealing with biographies, they have realized that these works certainly have potential as they can help penetrating the complexity of creative processes and discoveries. What sets apart autobiographies from other forms of life-writing like diaries is that autobiographies have an ideological intention to it, they are written to be shared.²² The scientist who writes an autobiography selects certain memories to make public and structures them towards a certain goal. It can be argued that this goal is a defence of the author him- or herself.²³ If this is the case, a book will explain why certain choices were made. However, it can also be argued that the goal is to look back on the complexity of events. In the introduction of *Veertig Jaren Speurderswerk*, the author admits to editing the stories in a minor way, to make the book more readable for laypeople.²⁴ However, he doesn't explicitly tell us what his goal is.

Lesley Graham argues that scientists write a their own stories, knowing fully well that theirs is not the only possible version of events. It is this subjectivity that makes a scientific autobiography interesting for historians.²⁵ By studying their arguments, inclusions, omissions, and language we can find out a lot about the context in which scientific knowledge is created and popularized. Graham also confirms that there are myriad reasons for scientists representing themselves in autobiographies.²⁶ It can be that the author just wants to tell an exciting story, one where tension builds up to the point where a scientific discovery is finally made. It can also be because they want to set the record straight or want recognition and prestige both inside and outside the scientific community. Another reason for writing a scientific autobiography is to promote public understanding of science and to further the cause of the scientific community as a whole.²⁷ These works may ensure

²¹ Paola Govoni, 'Crafting scientific (auto)biographies' in: Z. A. Franceschi and Paola Govoni (eds), *Writing about lives in science: (Auto)biography, gender, and genre* (Bologna 2014) 7-30, 7-10.

²² Zeldia Alice Franceschi, 'Women in the field: Writing the history. Genealogies and science in Margaret Mead's autobiographical writings' in: Z. A. Franceschi and Paola Govoni (eds), *Writing about lives in science: (Auto)biography, gender, and genre* (Bologna 2014) 161-189, 169-172.

²³ Ibidem, 169-172.

²⁴ Van Ledden Hulsebosch, *Veertig Jaren Speurderswerk*, 2.

²⁵ Lesley Graham, 'Scientific autobiography: some characteristics of the genre' *Asp* 43-44 (2004) 57-67, 57.

²⁶ Ibidem, 59.

²⁷ Ibidem, 59.

the advancement of the writers and also the survival of the discipline, which depends on public support.

Unlike scientific discourse, the scientific autobiography is written inclusively. It has to be understandable even to laypeople. However, there is still technical language in these works which usually serves the purpose of convincing the reader of the author's scientific competence.²⁸ *Veertig Jaren Speurderswerk* is not written to teach the reader about the workings of chemical or microscopic analyses. The language used by the author is also not very technical. The narrative mostly stresses the importance of modern CSI to police investigation. To bolster this, Van Ledden Hulsebosch has carefully selected events that transpire in the field, not in the laboratory or in the courts. He does this to underline the importance of the role of material evidence in crime-solving and to promote the discipline of criminalistics.

Next to Van Ledden Hulsebosch's memoirs, I will also be using historical newspapers. Jane-Louise Secker discusses the problems and values of using historical newspapers as a source of information. A common problem with researching newspapers is that it can be very time-consuming.²⁹ This can be linked to the fact that newspapers are only rarely indexed. Therefore it's quite difficult to find the right information. Secker also notes that newspaper articles on crime can be very distracting, also contributing to the time spent researching.

One of the most important things historians should know about using newspapers is that they are by nature selective and biased.³⁰ This is also stated by Jesse Léger, who writes on framing in historical newspapers in the Netherlands during the First World War. According to Léger, journalistic framing can be understood as using a very specific form of truth to explain the news. This can be purposely highlighting, or leaving out, certain personal qualities, details, or events.³¹ For example, Carolyn A. Conley has shown that nineteenth century newspapers from the United Kingdom had the tendency to portray killers as Other.³² Newspapers would sometimes even exaggerate certain personal qualities of killers to show readers that they were radically different to the regular citizens. This meant that killers were framed as either insane or from a separate breed completely. Secker

²⁸ Lesley Graham, 'Scientific autobiography', 65.

²⁹ Jane-Louise Secker, *Newspapers and historical research: a study of historians and custodians in Wales* (Doctoral thesis, University of Aberystwyth 1999) 175.

³⁰ *Ibidem*, 176.

³¹ Jesse Léger, *De werkelijkheid van kranten. Een frameanalyse van de Duitse oorlogsinspanningen in de Eerste Wereldoorlog gepresenteerd in het Rotterdamsch Nieuwsblad* (Master thesis Cultuurgeschiedenis, Universiteit Utrecht 2012) 81.

³² Carolyn A. Conley, *Certain other countries: homicide, gender, and national identity in late nineteenth-century England, Ireland, Scotland, and Wales*, 206.

confirms that even crime news could be influenced by either the newspaper's editorial policy or individual editors themselves.³³

It's difficult for historians to estimate the accuracy and truthfulness of historical newspapers. Therefore, it's important that historians consider newspaper articles critically. A good example of this is given by Clive Emsley who studied newspaper accounts on violent crimes by World War One veterans.³⁴ Emsley notes that several English experts expected that the men who returned from the violent war would also be violent at home. He looks critically into the fact that newspapers started referring to suspects in criminal cases as former soldiers. Emsley concludes that this wasn't a way for the newspapers to explain the behaviour of these men and sensationalize a new folk devil.³⁵ The men being labelled as former soldiers was rather a description than the newspaper trying to frame the news. Emsley points out that for newspapers to sensationalize news, they need a receptive audience. In the case of the war veterans, the people and newspapers still viewed the Great War as 'the war to end all wars'. Newspapers wouldn't have dared to create a stigmatized stereotype from these veterans. This demonstrates the importance of critically looking at information in newspapers and also to contextual information.

On the other hand, historical newspapers can also be considered a great source of information since they contain vibrant and detailed accounts of certain events. Secker notes that this is especially true in the case of court proceedings. For example, newspapers can give us things like an indication of the testimony of a witness or the reaction of the court.³⁶ Newspapers can also be used as complementary sources. Researchers often use newspapers to verify information from other sources.³⁷ Verifying information from the memoirs of Van Ledden Hulsebosch is one of my reasons for using historical newspapers. The second reason is because the newspapers have a great attention for detail, especially when reporting what happens during court proceedings. Secker also confirms that nineteenth century newspapers are remarked upon for their amount of detail.³⁸

Since networks are made of multiple people and objects instead of a single hero, I will not only look at sources written by Van Ledden Hulsebosch. I will also look at the role of the investigating police officers in general. For this, I use a number of police manuals that cover the basics of forensic science at the scene of the crime. These manuals, *Eerste Optreden Op De Plaats Eens Misdrijs* (1930) by W.H. Schreuder and *Handleiding Bij De Nasporing Van Het Strafbare Feit* (1922) by W. Polzer were

³³ Secker, *Newspapers and historical research*, 226.

³⁴ Clive Emsley, 'Violent crime in England in 1919: Post-war anxieties and press narratives', *Continuity and Change* 23 (2008) 173-195, 189-191.

³⁵ Ibidem, 189-191.

³⁶ Secker, *Newspapers and historical research*, 184.

³⁷ Secker, *Newspapers and historical research*, 186.

³⁸ Ibidem, 187.

both written and published in the same years that C. J. van Ledden Hulsebosch was active as an expert witness. Not only do these booklets cover forensic techniques, but they also instruct police officers how to manage a crime scene and to handle objects of evidence with extreme care. The so called 'chain of evidence' is of utmost importance for both the forensic and the legal success of reconstructing a crime. These books help us gain insight in all the people, techniques and objects present at a crime scene, and also the precariousness of the investigation.

Proposition and research question

In the introduction of their book *Murder and The Making of English CSI*, Ian Burney and Neil Pemberton note that little attention is given to the foundational years of English crime scene investigation. While there has been work on the history of techniques such as fingerprinting, anthropometry, and later, DNA profiling, not many studies are devoted to outlining forensics as "a network of institutions, concepts, and practices".³⁹ The idea behind this thesis is the same, in the sense that it focuses on the region where all the techniques, concepts, practices, and objects of CSI come together, namely at the crime scene itself. The crime scene is a unique region which is reconstructed by investigators, experts, and objects solely for the purpose of producing new knowledge.

Fijnaut presents the late nineteenth and early twentieth centuries as an age of professionalization in which the institutional reorganization of the police and the invention of new forensic techniques made crime solving more successful than the previous age. I argue that, while reconstructing a crime scene could be done successfully or unsuccessfully, it is a messy process, a process of both opportunities and challenges, and a process of interplay between humans and objects in which there might even be margin for error. My research question is "How was knowledge produced on crime scenes in the early twentieth century in the Netherlands?". I aim to answer this question by taking an ANT approach. The process of crime scene investigation has an end product, namely the reconstructed crime scene itself. This product is a mental construct that aims to explain to a judge or a court what transpired during the crime itself.

In order to answer my research question I will first answer various sub questions per chapter. In chapter one I will take a closer look at all the persons, objects and techniques that are involved with the reconstruction of a crime scene. As Annemarie Mol states, the hero is never solely responsible for success stories.⁴⁰ Although many French cities have streets named after heroes such as Louis Pasteur, there are never streets named after the petri dish that was so important to his

³⁹ Ian Burney and Neil Pemberton, *Murder and The Making of English CSI* (Baltimore 2016) 2.

⁴⁰ Mol, 'Actor-Network Theory', 256.

research. According to Mol, whole armies of people and things were needed for the process of Pasteurisation. So, the sub question for this chapter is “What army of people and things were responsible for effective forensic research in the late nineteenth and early twentieth century?”. I will use information from the police handbooks in this chapter as a way of priming the reader for the actual analysis in the third chapter.

In chapter two I take a closer look at ANT itself, in order to find out what makes up these networks and how they can either be strong or vulnerable. I will do this by looking at practical examples of ANT research. Here I will answer the sub question “What are the key concepts that are needed to build a successful network in ANT?”. This question needs to be answered in order to build an ANT analysis for the two murder cases in the third chapter.

The third, and final, chapter will be my analysis of two murder cases both described in *Veertig Jaren Speurderswerk* and in the newspaper coverage these cases received. In the analysis I will look closely at how all the actants at a crime scene are able to shape and define each other and how, together, they can be formed into a reconstruction of the crime itself. We will see how one case was strategically made very durable and was able to deal with threats from the outside. The other case is an example of the many problems that are involved with reconstructing the scene of a murder, long after it had happened. The sub question for this chapter is “How does an actor-network perspective help us understand the relevance of all elements involved in the investigations of the murder on Celebes street and the death of Tonia Schovers?”.

Chapter I: Our army of people and things

The historical elements of crime scene investigation

In this chapter I will answer the question “What army of people and things was responsible for effective forensic research in the late nineteenth and early twentieth centuries?”. As not much has been written on the history of Dutch criminalistics, I will also involve accounts from other Western countries. We will look at the histories of two forensic professionals: the expert and the investigator. We will see that both of these professionals claimed their own place in the world of crime-solving during the nineteenth century. Next, using information from police manuals, I will take the reader through the main categories of silent witnesses and explain how these objects relate to the reconstruction of a crime scene. Additionally, a number of crime-solving techniques that were used by forensic experts in the early twentieth century will be explained. These techniques were all geared towards the identification of criminals. However, we shall see that the perception of how techniques could be used, changed over time. First, as an introduction, I will start with a historical background of science and criminalistics around 1900.

Criminalistics and objectivity

In 2007, Lorraine Daston and Peter Galison, both historians of science, co-authored the book *Objectivity*. By using visual images from atlases as examples, Daston and Galison are able to show the reader that objectivity, as a scientific virtue, has a history of its own. Through this history the meaning of this term has evolved. The authors classify three epistemic virtues.⁴¹ The first they call truth-to-nature, an eighteenth-century ideal which heavily relies on the scientist’s or artist’s input. As an example, an image is added of a perfectly drawn species of flower. However, the illustrator has removed all the characteristics of the specimen that was drawn, as he wanted to capture the underlying type of species. The second virtue is called mechanical objectivity. In this mid-nineteenth century ideal, the scientist tries to capture nature with as little human intervention as possible. The example given here is a microphotograph of a snowflake with all its peculiarities and asymmetries. The final epistemic virtue is named trained judgement and became more popular during the end of the nineteenth century. This again involved subjectivity, as it was found to be unavoidable.⁴² However, subjectivity was no longer a practical reason, but an intervention of either defence of defiance. This is exemplified in an image depicting the magnetic field of the sun by sophisticated equipment where instrumental information was later smoothed out by the scientists in order to make the image clearer.

⁴¹ Daston and Galison, *Objectivity*, 19-21.

⁴² Ibidem, 189.

Although the goal of mechanical objectivity was gaining an accurate depiction of nature, its allegiance was to morality as it required the scientist to practice restraint.⁴³ In their exploration of Dutch forensic science between 1800 and 1930 Willemijn Ruberg and Nathanje Dijkstra argue that the Dutch forensic expert C. J. van Ledden Hulsebosch embodied the ideal of mechanical objectivism. However, Van Ledden Hulsebosch was active during the first half of the twentieth century, which meant that this form of objectivism was rather outdated.⁴⁴ According to Van Ledden Hulsebosch, only the investigative scientist could reconstruct a crime scene by doing experiments, using scientific instruments, and through logical and deductive reasoning. In his perspective, Van Ledden Hulsebosch's success depended on him explaining the natural world through scientific and technological means.⁴⁵

In another text by Lorraine Daston, she describes a different form of objectivity that is relevant to criminalistics, namely 'a-perspectival objectivity'. This type of objectivity is about eliminating individual or group idiosyncrasies. Daston tells us that the idea of detaching oneself from a personal perspective is now a hallmark of the natural sciences, although it originated in moral and aesthetical philosophy in the late eighteenth century.⁴⁶ David Hume's comments on observing a painting are given as an example. Hume stated that, when a work was directed at the public, the viewer had to distance himself from any form of friendship or enmity he had with the painter. The ideal of detaching oneself was also featured in the writings of Hans Gross, one of the founding fathers of crime scene investigation. In his handbook, written in 1891, Gross stressed that pre-conceived theories are the investigator's "most deadly enemies".⁴⁷ To combat this, the investigator needed to detach himself in a psychological way.

An additional quality of using the concept of a-perspectival objectivity is the ideal of communicability. In the late eighteenth century, scientists started working together much more closely, overcoming geographical barriers.⁴⁸ Although Daston argues the group of scientists became more important than the individual, scientists were far from embracing the ideal of the interchangeable observer. They still held the skills and scientific integrity of individual experts in very high regard.⁴⁹ Trust in the experts' skills is also heavily featured in 'True Crime Stories' by Claire Valier

⁴³ Daston and Galison, *Objectivity*, 185.

⁴⁴ Ruberg and Dijkstra, 'De forensische wetenschap in Nederland', 137.

⁴⁵ *Ibidem*, 137.

⁴⁶ Lorraine Daston, 'Objectivity and the Escape from Perspective', in *Social Studies of Science* 22 (1992) 597-618, 597.

⁴⁷ Burney and Pemberton, *Murder and the making of English CSI*, 15.

⁴⁸ Daston, 'Objectivity and the Escape from Perspective', 609.

⁴⁹ Daston, 'Objectivity and the Escape from Perspective', 610.

who argues that the nineteenth century saw an increase in trust in the forensic expert's skills.⁵⁰ At the same time as trust in the observations and testimonies of human witnesses waned, the expert's opinions actually gained credibility. Still, the ideal of communicability and the trust in expert's opinions should not be overestimated as, especially in adversarial trial systems, experts were often pitted against each other by the prosecution and defence.⁵¹ As individual experts could become the subject of personal scrutiny, their main line of defence would ideally be the strict separation of nature and human intervention. Therefore, mechanical objectivity applies more to the expert's situation than a-perspectival objectivity. In the next paragraph we will see how the role of forensic experts developed in the Western world. We will also see how a new professional, the crime scene investigator, gained his own place in the world of CSI.

Forensic experts and crime-solving

As we have read earlier, criminalists weren't always around for crime scene investigation. Before the emergence of professional crime scene investigators, other professionals were responsible for investigating the material elements of a crime. Historian of forensic medicine Katherine Watson argues that, before the modern period, the medico-legal practice was characterized by three features.⁵² The first one is that, due to absence of a clear legal directive, forensic practice was almost non-existent in early modern England where the jurors were the primary fact finders. This is in sharp contrast to the continent where forensic pathologists were responsible for fact-finding and medico-legal activities were supported by governments and universities. A second feature was that, up until the early twentieth century, forensic practice was mainly concerned with the victim's body. This was chiefly due to the absence of techniques that enabled investigators to focus on other evidence such as fibres, bullets, and insects. The final characterizing feature was that while medical practitioners who were called to testify weren't always particularly distinguished, they did have more knowledge than the average person, thereby gaining the status of expert witnesses. In contrast to normal witnesses, expert witnesses didn't testify about things they had direct knowledge of, but rather gave evidence of both facts and opinion in order to help juries and judges come to a decision.⁵³ The term expert itself changed in the eighteenth century from someone with good practical experience to a more intellectual connotation. An expert became someone who knew how and why things work.⁵⁴

⁵⁰ Claire Valier, 'True crime stories', 92.

⁵¹ Kathrine D. Watson, *Forensic Medicine in Western Society* (New York 2011) 50.

⁵² Ibidem, 43-44.

⁵³ Watson, *Forensic Medicine*, 46-47.

⁵⁴ Ibidem, 69-70.

The shift in meaning of the term expert went together with a reorganization and growing influence of medico-legal professionals. Throughout the nineteenth century the role of medico-legal expert witnesses was institutionalized in many Western countries. In post-revolutionary France, for example, legal medicine was recognized as an important part of learning and became a compulsory subject in a medical degree.⁵⁵ In the early nineteenth century, judges could appoint expert witnesses who were graduates in medicine and who had completed a course in forensic medicine. The Parisian morgues also became places for learning forensic medicine. Police were reorganised into groups who would prevent crimes by patrolling the cities and those who would investigate crime. The police could call upon medical experts in order to evaluate toxicological evidence, and to perform autopsies. Additionally, from 1888 the French police could call upon the services of experts who could identify criminals using Bertillonage.

The development we can see during the early years of the nineteenth century is that in several Western countries, experts gained influence in matters that were too complicated for laypeople to understand like in cases of insanity and poisoning. On the continent, the role of experts was closely linked to the state and they managed to gain a position of authority. This was in contrast to the situation in England where the government failed to integrate the experts until the mid-nineteenth century. There, experts were regarded as people invading the legal system and were controversial figures.⁵⁶

This changed during the first three decades of the twentieth century. As a result of public debate on the qualifications of medico-legal experts, it was recognized that skilled pathologists were the cornerstone of criminal investigation. These times also saw the rise of official morgues instead of using public house outbuildings and the composition of an official list of experienced pathologists who were eligible for testifying in court. It was also in the first years of the twentieth century that Bernard Spilsbury, a forensic pathologist who held both roles of investigator and expert witness, introduced the first English murder kit. At first, the kit itself contained gear mostly for protection of the investigator in his dealings with remains of diseased people, but during the 1920's the gear became more oriented towards spatial capture and setting up the chain of custody.⁵⁷ These developments show how medico-legal experts started to distance themselves from general medical practitioners and started focussing on detection and developing their own professional discipline.

⁵⁵ Watson, *Forensic Medicine*, 50-54.

⁵⁶ *Ibidem*, 69-70.

⁵⁷ *Ibidem*, 78-79.

Also, Spilsbury, as one of England's forensic pioneers, brought laboratory-based forensic pathology together with crime scene investigation. Thereby both combining the two practices in a professional capacity and also making clues from the crime scene equal in importance to clues derived from researching the corpse.⁵⁸

The reformation of the English CSI didn't end with Spilsbury's actions. While English CSI was still mostly the domain of forensic-pathologists, police investigators also had to be trained in the detection of clues. Brochures and police manuals were also part of the education of the English detectives. In the 1930's, every single police detective in England and Wales received a pamphlet that introduced the readers to locating, examining and handling trace evidence. The fact that this paper was distributed throughout the entire English and Welsh police forces, shows u how far the principles of CSI had penetrated the English forensic landscape in the 1930's.⁵⁹

In the nineteenth century, Dutch scientific experts like chemists, psychiatrists, and physicians could be asked by the courts to testify as expert witnesses. These experts were mostly asked for advice in cases of homicide, poisoning, infanticide, suicide, manslaughter, drowning, rape, and arson.⁶⁰ However, Ruberg and Dijkstra point out that during the first half of the nineteenth century, Dutch forensic medicine was in a poor state.⁶¹ Experts complained on multiple issues like education, the legal framework, and certain practical things like the cost of instruments for conducting autopsies and chemical experiments. Change gradually came after the 1850's when a number of academics started to specialize in forensic medicine. It was also during these years that more Dutch literature on forensic medicine started circulating in the form of journals and handbooks for judicial medicine. Still, the role of experts in court was modest. This changed with the rise of criminalistics around the turn of the century. However, for this we need to take a detour to Austria, where another type of professional would rise to manage the newly conceptualized area of the crime scene: the investigative officer.

The investigative officer

In order to explain the role of this new type of forensic professional, we must first look at the life and work of Hans Gross, who is regarded as the founding father of modern criminalistics and an inspiration to later generations of investigators.⁶² Born in the Austrian city of Graz in 1847, Gross

⁵⁸ Watson, *Forensic Medicine*, 98-99.

⁵⁹ *Ibidem*, 125.

⁶⁰ *Ibidem*, 130.

⁶¹ Ruberg and Dijkstra, 'De forensische wetenschap in Nederland', 124.

⁶² Van Ledden Hulsebosch, *Veertig Jaren Speurderswerk*, 1-5.

studied criminal law and after graduating took up the vocation of Examining Justice, a specially appointed type of judge who was responsible for the detection of crime. The reason a modernizing man such as Gross was badly needed in this age was because criminal investigation was mostly done in a very theoretical way, as the investigators only had their legal knowledge to rely on.⁶³ The main body of the police force in Austria was made up of ex-soldiers who only relied on their wit and capacity for violence. They had no training or techniques to help them gather facts about a crime. Also, the realization that human perception was fallible, posed another problem for Western police in the nineteenth century.⁶⁴ Testimonies of a crime by witnesses would often be exaggerated, contradict the testimony of others or even contradict themselves over time. According to Gross, the human mind stored information in a very inaccurate way. Recounting this inaccurate information may lead to witnesses giving false statements. The human mind did receive some credit from Gross as he argued that our dealing with incomplete information can also lead us to thinking creatively.⁶⁵ The realization of Gross and his peers led to them establishing a hierarchy of evidence in which material evidence was regarded as more accurate, and therefore more objective, than the evidence that was given to them by human witnesses.⁶⁶

Gross realized that the investigative officer needed both a practical and an objective way in which he would establish the facts that were required for him to form his legal judgement. He set out to write a treatise on the investigation of crime, which nearly took him 13 years to complete. Gross meticulously studied everything he deemed even remotely relevant for the investigative officer. He studied texts on physics, psychology, medicine and general science. Also, he gathered knowledge about techniques that would be useful, such as microscopy, photography and the early development of x-rays. Apart from writing on the applied sciences related to crime-solving, Gross extensively wrote on the character of the investigator.⁶⁷ One of the most important things that made the investigator stand out, was his ability to refrain from interfering with the crime scene. In this, we can see the ideal of mechanical objectivity. Interestingly, for a person who was defined by his ability to refrain from involvement, Gross' heroic protagonist is portrayed as the lynchpin of an investigation.

Although a number of investigative manuals circulated through Western Europe at the start of the twentieth century, none had lived up to the amount of detailed description that went into their predecessor, Hans Gross' handbook *Criminal Investigation: A Practical Handbook*, first

⁶³ Roland Grassberger, 'Pioneers in Criminology XIII—Hans Gross (1847-1915)', *Criminal Law, Criminology and Police Science* 47 (1956-1957) 398.

⁶⁴ Burney and Pemberton, 'Making space for criminalistics', 17-19.

⁶⁵ Burney and Pemberton, *Murder and the making of English CSI*, 15.

⁶⁶ Burney and Pemberton, 'Making space for criminalistics', 17-19.

⁶⁷ Burney and Pemberton, *Murder and the making of English CSI*, 13.

published in 1893.⁶⁸ Gross wrote extensively on the awareness an investigative officer must possess to notice even the smallest detail of a crime scene. Once every trace had been both secured and recorded, what we now call the chain of custody, or the chain of evidence, would commence. Gross' chain was made up by protocols for labelling, packaging, storing, transporting and receiving evidence. The importance of a good chain of custody was that it secured the continuity and thereby the authenticity of evidence.⁶⁹ As we have seen earlier, the scientific ideal of mechanical objectivity required a minimal amount of human involvement. Therefore, evidence had to be fixed in the way that it was found at the crime scene. The better this was done, the more value it had in court. As the managers of the crime scene, the investigators gradually gained a place for themselves in the field. This didn't mean that they took over the place of forensic experts, as they still had their own responsibilities in the process of crime-solving. Gross's work inspired many criminalists in other countries. Van Ledden Hulsebosch was one of those criminalists and recognizes the role Gross played in the rise of CSI.⁷⁰ In Chapter 3 we will read more about the rise of Dutch investigators and the modernization of Dutch police. Now we will go to another part of our army of things: the silent witness.

The silent witnesses

The next part of our army of things are the silent witnesses. These came in many shapes and forms and in this sub-chapter the most common ones will be described. This part also covers in which way the silent witnesses should be handled by investigators. For this, I will look at instructions from several Dutch police manuals, all dating from 1900-1930. In order to receive insight into what happened at a crime scene, the inspector had to answer a number of questions: Who, what, where, with, why, how, and when? All the early twentieth century police manuals I've studied, start with these "golden questions".⁷¹ It stands to reason that the question "What?" pertains to the silent witnesses. Although, in a way, all the questions are related to the silent witnesses. These golden questions don't have to be answered in the same sequence as they are given, but as Hesselink correctly notes, the question "who?" usually comes later on in the investigation.

The question "what" refers to material traces at the scene. It was important for investigators to answer this question in the utmost detail. For example, where were these traces located? How

⁶⁸ Burney and Pemberton, *Murder and the making of English CSI*, 39-41.

⁶⁹ *Ibidem*, 23.

⁷⁰ Van Ledden Hulsebosch, *Veertig Jaren Speurderswerk*, 1.

⁷¹ W.F. Hesselink, *Eerste optreden op de plaats eens misdrijs* (Arnhem 1909) 7, W. Polzer, *Handleiding bij de nasporing van het strafbare feit* (z.p. 1922) 5, W.H. Schreuder, *Eerste optreden op de plaats eens misdrijs* (Bilthoven 1930) 4.

were they placed in their specific location? What could be learned from their presence at the scene? These material traces could be any number of objects like chips of paint, shards of glass, burned pieces of paper, and even human excrements.⁷² This last type of material evidence was also covered in Schreuder's manual. Unknown to the perpetrators, human excrement could be highly valuable to investigators as deductions can be made into the perpetrator's diet.⁷³ In one case, experts were able to retrieve a sausage skin from the excrements in which the experts were able to see the unique dental marks of a suspect. This man was missing a single tooth, which made his dental marks match exactly those on the sausage skin. Upon being confronted with this fact, the baffled suspect immediately confessed his crime.⁷⁴

Apart from the more obscure sorts of evidence, according to Burney and Pemberton, specific attention had to go to blood, hair and dust and fibres. Blood was always valuable to the investigator, as experts were able to gain insight into the act of wounding by the location, formation, and the amount of blood at the scene.⁷⁵ However, as blood was not always visibly present at the scene, investigators should carry both a source of artificial light and a magnifying lens. Also, they should inspect all the places at a crime scene that we might usually miss to scrutinize, such as pockets inside of clothing, places concealed by a carpet, and of course the fingernails of suspects. Another warning given to us by the manuals is that by all sorts of weather influences, blood could change its shape and colour and therefore become unrecognizable. As we can see in figure 1, blood found at a crime scene could come in several shapes and forms such as puddles, spatter, drips, and smears. Puddles usually indicated major, and often fatal, blood loss. Spatter usually indicated a major vein being opened after a strike or stab. Drips and spatter would also indicate movement of the body or the object that struck the body.

⁷² In *Veertig jaren speurderswerk* C. J. van Ledden Hulsebosch takes us through a case in which he describes research done by both him and his father into the relation between a specific diet and the resulting coloration of human excrements.

⁷³ Schreuder, *Eerste optreden op de plaats eens misdrijs*, 25.

⁷⁴ Schreuder, *Eerste optreden op de plaats eens misdrijs*, 26.

⁷⁵ Polzer, *Handleiding bij de nasporing van het strafbare feit*, 63, Hesselink, *Eerste optreden op de plaats eens misdrijs*, 23.

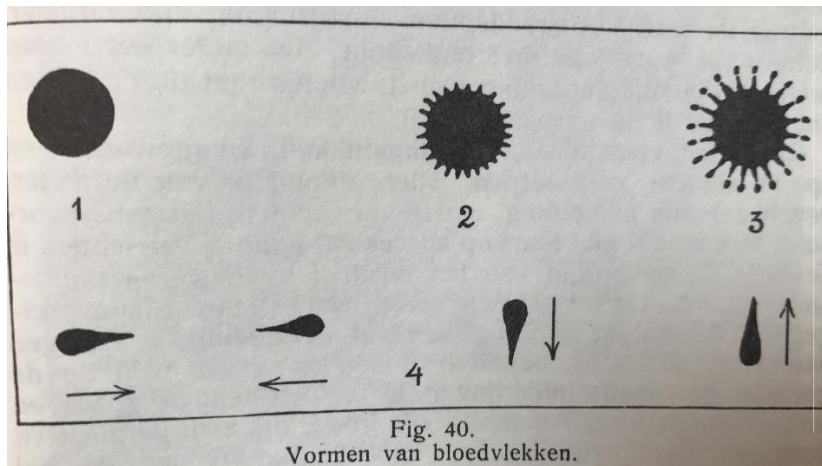


Figure 1: Depiction of the various forms and shapes of bloodstains. Source: Schreuder, W.H., *Eerste optreden op de plaats eens misdrijs* (1930) 75.

Although fresh blood could easily be identified due to its colour, consistency, and odour, dried blood becomes brown and is less distinguishable from other stains. From 1853 onwards several tests were developed to differentiate blood stains from other materials. For example, by heating blood in the presence of chloride, iodine and bromide in acetic acid, haemoglobin would be converted into microscopically distinctive crystals.⁷⁶ Later tests would be easier to conduct and would rely on colour-change reactions involving peroxide and colourless compounds like benzidine (1904).

In 1901, two immunologists, Austrian Karl Landsteiner (1868-1943) and the German Paul Uhlenhuth (1870-1957) respectively discovered ABO blood groups and a technique for differentiating blood stains of one mammal from another, including humans.⁷⁷ The latter technique was used in a forensic case in the same year for the identification of a German carpenter who had murdered four small children and seven sheep. The suspect claimed that the stains on his clothes were from wood dye. By mixing extracts of the stains with an antiserum, produced by specific species, Uhlenhuth was able to determine that the stains were indeed of human and sheep's blood.

Hairs were also an excellent type of material trace as hairs belonging to the murderer are often found in the hands of the victim.⁷⁸ On this phenomenon, Van Ledden Hulsebosch noted that it's uncanny how often a murder victim grabs the hairs of their assailant. Therefore, the investigator should always directly check the hand of the victim.⁷⁹ Gross states that the presence of hair on a crime scene should be recorded thoroughly. This does not just involve pointing out where the hair is

⁷⁶ Watson, *Forensic Medicine*, 141-142.

⁷⁷ Ibidem, 142.

⁷⁸ Hesselink, *Eerste optreden op de plaats eens misdrijs*, 23.

⁷⁹ Van Ledden Hulsebosch, *Veertig Jaren Speurderswerk*, 60.

found, but also how they are found. As we can see in figure 2, if a single hair was found in the hand of the victim, the investigator should record how the hair was lying inside of the palm. By using a magnifying glass, an inspector could see which end of the hair is the stem, as it contains a small amount of fat coming from the scalp. Although in criminal cases in the late nineteenth and early twentieth centuries, it seemed quite difficult for prosecutors to charge a suspect solely by presenting hair as evidence, it could be used during the initial investigation to identify subjects. For example, Schreuder notes that the police were once able to identify a suspect of a burglary by using hairs that were found inside of a hat that the burglar left while raiding the house. The victim's hair could also yield valuable insights as hair has the ability to absorb various gasses and odours. In a case where a victim had been drugged with a cloth of chloroform, the investigator should be able to smell traces of the substance in the victim's hair.⁸⁰

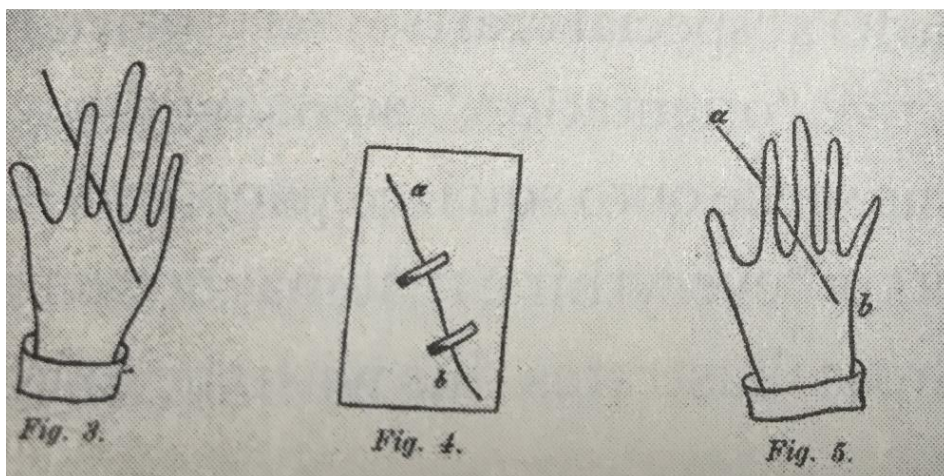


Figure 2: Depiction of the correct Grossian registration of a single hair found in the victim's left hand. Source: Ian Burney and Neil Pemberton, *Murder and the Making of English CSI* (2016) 21.

Dust was used as a collective term for all sorts of microscopic evidence. According to Burney and Pemberton, Gross was overshadowed in his appreciation of dust by Edmond Locard (1877-1966).⁸¹ Where Gross instructed the inspector to merely collect dust for microscopic analysis, Locard advised that the distribution of dust itself should also be carefully examined. So, by going through all the individual layers of dust found underneath a shoe, the expert could find out where a person had successively been. For example, the presence of flour between two other layers of dust could indicate the person having been in a mill. Also, in Schreuder's manual, dust is cited as one of the more useful sources in the detection of arson.⁸² Usually, tiny particles of burned wood could be

⁸⁰ Schreuder, *Eerste optreden op de plaats eens misdriijfs*, 36.

⁸¹ Burney and Pemberton, *Murder and the making of English CSI*, 34.

⁸² Schreuder, *Eerste optreden op de plaats eens misdriijfs*, 42.

found at the place of a fire. By picking up an amount of these particles in both hands, and rubbing those hands together, an inspector could deduce if petrol was used to start the fire. If the hands got greasy, this indicated that some form of artificial form of fuel was used.

Of course, the police who were present at the scene always had to isolate and fix all the material evidence present at the scene. In order to keep others from contaminating it, police officers were instructed to protect evidence by placing things over them such as crates, vases, and baskets.⁸³ If things such as bloodstains were to be isolated and transported, the police could consider cutting out blood-stained surfaces in order to transport them more easily. Also, prints of any kind could be turned into casts by using plaster or even gum. Burney and Pemberton argue that, effectively, the police were isolating evidence in a temporal frame.⁸⁴ The act of isolating evidence can also have consequences for suspects as their bodies can also be viewed as evidence. Thus the body of a suspect can be converted into an object of scrutiny. The same, of course, applies to the body of the victim, which, during an investigation, could be converted into an object of research either through Bertillonage, or medical or microscopic examination.

The evolution of crime-solving techniques

Now we shall look at several crime-solving techniques that gained prominence during the last decades of the nineteenth century and early years of the twentieth century in the Western world. These techniques, also a part of our army of people and things, weren't simply discovered in one moment and applied to crime scene investigation in the next. Each technique has its own history of discovery, application, and acceptance. As we shall see, the validity of a technique was often the subject of a discussion on the boundaries of science, law and society.

The nineteenth century was the age of urbanization and growing social and geographical mobility. Before this age people had sufficient local knowledge to know who could or couldn't be trusted. This all changed during the nineteenth century.⁸⁵ A number of things contributed to this change, namely the criminological interest in habitual offenders, the realization that prisons were also co-responsible for making criminals, and the rise of several technologies for identification. These technologies were photography, Bertillonage, and fingerprinting.

According to Jens Jäger, the history of judicial photography can be divided into three periods of implementation. The first is an experimental period from the 1850's to around 1870. In this period, some prisons in England, France, and Switzerland started experimenting with photographing

⁸³ Burney and Pemberton, *Murder and the making of English CSI*, 20-21.

⁸⁴ *Ibidem*, 9.

⁸⁵ Simon A. Cole, *Suspect identities: a history of fingerprinting and criminal identification* (Harvard University Press, 2001) 31.

prisoners, mainly recidivists. The idea behind these experiments was that recidivist prisoners should be treated separately from others. Not only should they be punished harder for repeating their crime, but also they had to be kept away from first time prisoners, on which they seemed to have a bad influence. In order to separate them from others and give them a proper punishment, recidivists first had to be identified through photography.⁸⁶ However, Jäger states that these experiments weren't successful and were even considered to be impractical, expensive, and possibly contrary to law.⁸⁷

The second period marked the adoption of photography by the newly established police forces from 1870 to 1890. In the third quarter of the nineteenth century, detection and apprehension of criminals was deemed to be a task for the local police force. A photographic archive of offenders was not needed as the local police thought they already knew the criminal elements of the population. Therefore, the detection of crime depended on local knowledge.⁸⁸ However, during the 1870's, developments in photography, society, and policing were responsible for the adoption of photography by the police. Photography became easier and more reliable. Society accepted that photography could be used to record and represent an increasing number of things. Also, reorganization of the police resulted in the creation of new urban departments that were primarily concerned with the prevention of crime and the detection of criminals by scientific means. Slowly, the police started to concern itself with habitual offenders who, as the police realized, were quite mobile and therefore very unknown to them.⁸⁹ Still, there weren't many instructions or literature on the subject of police photography. The police would outsource the task of photographing criminals to commercial photographers instead of the specialists that would emerge several years later.

A change came during the 1890's when the police realised they needed a proper system to manage their photographs. By this time in France, Bertillon had already proposed his system of identification based around a number of measurements of certain parts of the adult human body which couldn't be altered. By moving towards measurements instead of aesthetic values, criminals could now be identified with scientific precision. Also, this system offered possibilities for organising the police's collections of information on offenders.⁹⁰ The introduction of Bertillonage resulted in a reevaluation of police photography. At Bertillon's suggestion, police photographs would be taken by specialists and not resemble a portrait by a commercial photographer. The first professional police

⁸⁶ Jens Jäger, 'Photography: a means of surveillance? Judicial photography, 1850 to 1900', *Crime, History & Societies* 5 (2001) 27-51, 27-33.

⁸⁷ Ibidem, 33.

⁸⁸ Ibidem, 33.

⁸⁹ Ibidem, 34.

⁹⁰ Ibidem, 38.

photographers were employed in the 1890's. Even after the decline of Bertillonage in favour of the more practical fingerprinting, judicial photography still persevered as a technique as police officers had grown so accustomed to them.

Apart from the identification of criminals, photography was also used during crime scene investigation. The main problem with photography was that it didn't always represent exactly what the human eye would see, it had ambiguities and deceptions. This is something that Hans Gross also realized. On one hand photographs weren't always impartial and objective, but on the other hand they may also show certain things that the human eye fails to pick up. Bruising marks, for example were more clearly visible on a photograph than with the naked eye.⁹¹

The technique of Bertillonage was also used to identify criminals after its conception in 1879-1880. Using individual measurements was both more precise than simply describing criminals with subjective terms like 'average looking' or 'medium length' and the results were more easily managed. While Bertillon himself focussed on the detection of individual criminals instead of groups, his contemporaries sought to solve the problem of recidivism by looking for certain aesthetic marks by which they could tell if someone was 'born criminal' or not. Thereby using the technique in a less factual way.⁹²

Fingerprinting was a contemporary technique to Bertillonage, and was subject to the same problem. The discipline of criminal anthropology and the theory of fingerprinting both came from Darwinian evolutionary theory, which sought to explain social behaviour through biology. Also, due to the imperial experiences with criminal castes in India, British anthropologists sought for physiological signs for hereditary predispositions to criminality.⁹³ Fingerprinting was eventually favoured over Bertillonage in the 1920's. This was because fingerprinting examiners were able to disassociate the identification of criminals from diagnosing them.⁹⁴ No longer would experts regard fingerprints as a stigma of criminality, but rather as an indexical sign that proved a link between a human body and the criminal record. Here we see how the understanding of fingerprints shifted from something rich in meaning to something more factual and actually devoid of meaning.⁹⁵ In the history of fingerprinting, we can see how the technique moved towards the scientific ideal of minimal human intervention and speculation.

⁹¹ Burney and Pemberton, 'Making space for criminalistics', 23-24.

⁹² Cole, *Suspect identities*, 57-59.

⁹³ *Ibidem*, 96.

⁹⁴ *Ibidem*, 118.

⁹⁵ *Ibidem*, 117-118.

In practice, the technique of fingerprinting didn't always guarantee success. In his brochure on dactyloscopy, written in 1922, the German criminologist Robert Heindl (1883-1958) remarked on the questionable science behind fingerprinting.⁹⁶ According to Heindl, science had not yet proven why fingerprints naturally grew to be unique. Experts and investigators who relied on this technique often had to expect harsh opposition in court due to the lack of scientific evidence. On the success of collecting and using fingerprints in criminal cases, Heindl concludes that very often, experts found too many prints at a crime scene for them to be very useful. He even laments that in many cases the fingerprints police were investigating, turned out to be the fingerprints of careless medical examiners and prosecutors.⁹⁷

C. O. van der Meij has written about the history of techniques of identification in the Netherlands. According to Van der Meij, descriptions of persons have been circulating in the Dutch judicial world since the eighteenth century.⁹⁸ However, these descriptions were often very general and were mainly concerned with facial shapes. Van der Meij also concludes that these descriptions lacked standards of measurement. During the nineteenth century, descriptions became more specific. This was due to the attention scientists had for the makings of individual criminals.⁹⁹ In the late 1870's, judicial photography was used for criminal investigation and registering criminals in prisons. The visual image slowly took over as the dominant form of describing a person.¹⁰⁰ Van der Meij points out that the Netherlands were one of the only countries in which the system of Bertillonage actually failed. This was due to problems with classification and archiving of information.¹⁰¹ In 1906, only ten years after its introduction, the technique was replaced by fingerprinting.

As we have seen with the techniques used for identification of criminals, the scientific expert was usually portrayed as a proponent of new methods of truth-finding and eager to put them into practice. On the other hand there were the legal professionals who were supposed to be the gatekeepers of legal knowledge. Their aim was to decide if technical evidence could be admitted into court or not. Bruno Latour also writes on this relation between scientists and legal professionals in contemporary times. He argues that, although scientists and legal scholars are the same in many aspects, one of their main differences is that scientists are always writing "continus" while a judge

⁹⁶ Robert Heindl, *De Dactyloscopie: Eenige opmerkingen betreffende de techniek der justitieele politie* (Alphen aan de Rijn 1922) 6.

⁹⁷ *Ibidem*, 12-14.

⁹⁸ Van der Meij, *In kaart gebracht*, 14.

⁹⁹ *Ibidem*, 34.

¹⁰⁰ *Ibidem*, 50.

¹⁰¹ *Ibidem*, 62-67.

writes “arrêts”.¹⁰² In other words, the scientist always looks towards the future. His claims may be refuted, but this is only for the improvement of science in general. Judges don't have the time that scientists have and must make things come to a halt as soon as possible.

A reversal of the relationship between scientific experts and legal professionals comes up in Tal Golan's text on the emergence of x-ray evidence in the USA. Golan shows us how medical experts felt that their position of authority was threatened.¹⁰³ Until the emergence of x-ray photography in the last decade of the nineteenth century, only medical experts could tell what was going on inside of a body. This was often done, in a way that reminds us of Ginzberg, by examining superficial "clues" such as deformity or altered mobility. The introduction of x-rays not only meant that medical experts lost their authority, but could also be liable for malpractice by clients who felt that they had been treated poorly.¹⁰⁴ This caused for a campaign by the medical experts against the use of x-ray evidence which was only settled by judges in the 1920's.

As we can see in this paragraph, new techniques had to deal with both scientific, social, and practical challenges before they could be fully integrated into the process of crime solving. However, from most of these accounts we can conclude that dealing with these challenges helped turning these techniques into more grounded and factual ways of crime-solving.

Conclusion

What army of things and people were responsible for effective crime scene investigation in the late nineteenth and early twentieth centuries? As human testimonies were found to be lacking in the nineteenth century, the first thing needed was a clear agreement on what could be considered objective. The ideal of mechanical objectivity meant that material objects were to be presented in their “natural” way, without human interference. Another essential part of the investigation were the experts and investigators who embodied this form of objectivity. As forensic experts gained their own place in the medico-legal world, attention started to shift to the investigation of a new space; the crime scene. It was up to a new breed of investigators who would apply insights from the natural sciences in order to capture this new area of investigation. The investigator's role was characterized by its duality. On one hand they needed to manage the crime scene by getting involved and on the other hand they needed to show restraint and inspire others to do so as well. During the management of the scene, every single detail needed to be scrutinized to see if it could be of any

¹⁰² Bruno Latour, ‘Scientific Objects and Legal Objectivity’, in: Allain Pottage and Martha Mundy (eds), *Law, Anthropology, and the Constitution of the Social: Making Persons and Things* (Cambridge, 2004) 73–114, 73-79.

¹⁰³ Tal Golan, ‘The Emergence of the Silent Witness: The Legal and Medical Reception of X-rays in the USA’, *Social Studies of Science* 34 (2004) 469-499, 477.

¹⁰⁴ Golan, ‘The Emergence of the Silent Witness’, 480.

value and serve as a silent witness, a third element of effective crime scene investigation. These silent witnesses came in many shapes and forms. The more prominent material traces were blood, hair, dust and of course bodies. These objects all had their own peculiarities and their presence, absence, and distribution could be highly valuable for an investigation. Apart from providing clues to the investigator, silent witnesses were also of great value in court. Again, minimal interference of humans was necessary for evidence to retain its value. Therefore, traces were to be carefully fixed in the chain of custody.

Techniques for identification and crime-solving were also an essential part of any investigation. Many of these techniques were developed to deal with an ever-growing group of geographically and socially mobile people who could no longer be identified through regular means. These techniques didn't always guarantee successful identification as they faced social, scientific, and practical challenges along the way. However, because of facing these challenges, these techniques slowly became more factual and thus moved towards the ideal of separation of the natural world and human intervention.

In the next chapter we shall explore the key features of networks in actor-network theory and discover what makes a network successful. For this, I will describe several case studies where ANT analyses are applied. We will return to the subject of crime-solving in the final chapter in order to analyse two murder cases.

Chapter II: Permanence and mobility

Key features of Actor Network Theory

“What are the key concepts that are needed to build a successful network in ANT?”. In order to answer this question, we must first look at ANT itself. I will start this chapter with some theoretical background information about the theory, before moving on to key ideas of ANT itself. Also, I will explain some challenges to ANT and how the theory deals with those challenges. This chapter will also explain the nature of objects and networks in ANT and how networks can become successful.

The development of ANT

As the cultural turn became the dominant form of historiography in the 1990's, it enabled historians to include new topics, such as everyday life, gender, and the history of the body.¹⁰⁵ However, the cultural turn also led historians to relativism, from which they started to distance themselves at the end of the millennium. In the historiography of science, we can see the same trend. In the 1990's, the study of the history of science moves away from the normative epistemological view.¹⁰⁶ There was to be more attention for the local level of questions instead of the truth-claims of answers. This, in turn also led to relativism and the fragmentation of knowledge. Ed Jonker notes that a current trend in the history of science is the need for judgement. Without historical judgement, even the actions of the Nazi biologists could become exempt of criticism. In response to this, historians now require meaning. There is a demand for historical evaluation in order to combat the pitfalls of naïve hyper-historicism.¹⁰⁷

Another way of moving past the cultural turn is to turn to matter and the material world.¹⁰⁸ Hans Schouwenburg argues that there are two different ways of dealing with the material world. The first approach, which he calls the material turn in cultural history, sees objects as things that are made by, or modified by humans. This could either be consciously or unconsciously, thereby reflecting the intentions and beliefs of the people involved and on a larger scale the society of which these people are a part.¹⁰⁹ However, this approach doesn't seem to completely move past the cultural turn, rather it includes objects as texts. The second approach is called new materialism and tries to break free of the dualist way of thinking of previous schools of thought. Where previous schools of thought have always positioned themselves as opposite of each other, new materialists try

¹⁰⁵ Hans Schouwenburg, 'Back to the future? History, Material Culture and New Materialism', in *International Journal For History, Culture and Modernity* 3 (2015) 59-72, 60.

¹⁰⁶ Ed Jonker, 'Van relativisme naar oordeelsvorming. Recente tendensen in de wetenschapsgeschiedschrijving', in *Studium* 4 (2011) 2-15, 6.

¹⁰⁷ Ibidem, 13.

¹⁰⁸ Schouwenburg, 'Back to the future?', 60.

¹⁰⁹ Ibidem, 61.

to re-read texts through one another. These can be both classical and marginal texts from different paradigms and disciplines.¹¹⁰ Schouwenburg refers to the American feminist theorist Karen Barad as one of the most prominent new materialists. According to Schouwenburg, Barad's work is centred upon the notion that humans and nonhumans, matter and meaning, are co-constitutive. As humans and nature are both of the same world, they are both able to influence each other. In this view nature, and thereby objects, are no longer empty vessels through which humans perform.¹¹¹

The view that humans and objects both are co-constitutive is also a main feature of ANT. This theory was developed a bit earlier than the material turn, namely in the 1980's, by a number of sociologists. Among them Bruno Latour, Michel Callon, and John Law were the most prominent ones. It is a material-semiotic approach: a method to analyse the relationships between objects and concepts.¹¹²

The practical nature of ANT

What is it exactly? According to John Law, while ANT can be explained in the abstract, it is grounded in empirical case studies and can best be understood by practical examples.¹¹³ I will illustrate this with a quote from 'On the Methods of Long Distance Control: Vessels, Navigation and the Portuguese Route to India' by John Law in which he describes an excellent case study:

How did the Portuguese reach India? How did they maintain their imperial control? Conventional histories talk of spices, trade, wealth, military power and Christianity. With some exceptions they treat technology as an essential but ultimately uninteresting infrastructure. Maritime history talks of innovations in shipbuilding and navigation, but is usually little concerned with the politics and economics of imperialism. In 1986 Law brought the two narratives together. He asked how the Portuguese generated a network that allowed them to control half the world. His answer was that ships, sails, mariners, navigators, stores, spices, winds, currents, astrolabes, stars, guns, ephemerides, gifts, merchants' drafts were all translated into a web. That web, precarious though it was, gave each component a particular shape or form that was to hold together for 150 years. He added that result was a structure of asymmetry. Like Pasteur's lab in Paris, Lisbon became an obligatory point of passage for a whole set of tributaries. Law also argued, like Latour, that the ships became 'immutable mobiles'

¹¹⁰ Schouwenburg, 'Back to the future?', 64.

¹¹¹ Ibidem, 64.

¹¹² Mol, 'Actor-Network Theory', 255.

¹¹³ John Law, 'Actor Network Theory and Material Semiotics' in: Bryan S. Turner (eds), *The New Blackwell Companion to Social Theory* (Hoboken 2009) 141–158, 2.

*circulating to and fro in space whilst holding their form and shape constant. This, he said was crucial to the success of the system.*¹¹⁴

From this example, we are able to discern some key features of ANT like the combination of semiotic relationality, heterogeneity, materiality, process, precariousness, power and space.¹¹⁵ As ANT is known to play with terms, it is important that we understand what these terms mean in an ANT-context. In ANT, networks are comprised of heterogeneous elements, both human and non-human. All these human and non-human elements are actants and they constantly define and shape each other. They can influence each other in a material way and also give each other meaning. In other words, they have both material and semiotic relationality.¹¹⁶

Now, an important part is that networks only exist when they are performed. ANT doesn't concern itself with groups, only with the formation of groups.¹¹⁷ One of the foundational aspects of ANT is that it recognizes that networks or groups are constantly being performed.¹¹⁸ Group formation is an ongoing process and the resulting networks are often precarious at best. Every single actant in the network needs to play its part, or else the entire network is in danger of collapsing. This is best illustrated by another one case-study:

*Callon describes how a science of scallops is created with its own researchers, a science that leads to an experimental technology for rearing young scallops. He shows as a necessary part of the experiment, fishermen are tamed too: they agree not to trawl near the larvae collectors. This, then, is a web of relations that makes and remakes its components. Fishermen, scallops and scientists are all being domesticated in a process of translation that relates, defines and orders objects, human and otherwise. Callon adds that they hold themselves together but they do so precariously. All it takes is for one translation to fail and the whole web of reality unravels. And indeed this is what happens. One winter night the fishermen invade the protected areas, trawl the larval grounds, and destroy the collectors.*¹¹⁹

In this example we see the fragility of the networks as all its elements need to work together in perfect harmony for it to be successful. ANT looks at whether networks are successful or unsuccessful. In order for all the elements in the example to interact properly, the actants need to be

¹¹⁴ John Law, 'On the Methods of Long Distance Control: Vessels, Navigation and the Portuguese Route to India', in *Power, Action and Belief: a new Sociology of Knowledge? Sociological Review Monograph*, 32 (1986) 234-263.

¹¹⁵ Law, 'Actor Network Theory and Material Semiotics', 7.

¹¹⁶ *Ibidem*, 7.

¹¹⁷ Latour, *Reassembling the social*, 27.

¹¹⁸ Law, 'Actor Network Theory and Material Semiotics', 7-9.

¹¹⁹ Law, 'Actor Network Theory and Material Semiotics', 6.

tamed or domesticated. Fishermen are told, by either the authorities or the scientists themselves, to modify their behaviour. In this case a human agent is responsible for the domestication of the other elements and seems to take centre stage. However, ANT recognizes that all the actants in a network can be responsible for domesticating things around them. For example, if we want to see how an object can take centre stage in an ANT network, we can look at Latour's Berlin key. In this example a symmetrical two-bladed key, which is used in Berlin and its suburbs, forces the tenants of apartment buildings to never lock their outer doors during the daytime, but always lock their doors at night.¹²⁰ Through its design, the key is able to mediate the social relations between tenants and owners, or inhabitants and thieves, or inhabitants and delivery people, or co-owners and concierges.¹²¹ The example shows us that objects too can have agency.

We have now seen how objects too are able to influence things around them. Of course, objects can influence things around them by human design. In the case of the Berlin key, Latour acknowledges that the key and lock were first designed by an unnamed Prussian locksmith. Does this mean that the key as a material object can still be regarded as an extension of the subject's, or in this case locksmith's will? Does the human again receive a special position in the scheme of things? Latour rejects this as, according to him, there can only be a dialectic relationship between subject and object if we abandon the idea that they are direct opposites. Humans are as much a part of the material world as objects are of the social world. Both subject and object are always related to each other in ways of circulations, sequences, transfers, translations, displacements, crystallisations, and other motions.¹²² As soon as we start to interact with an object, there is a chain of association. In this case, we shape the tools that in turn shape us. The Berlin key is more than just a human command to lock your doors at night and leave them unlocked during the day. The command is only an intermediary, it can only carry meaning, but never create meaning by itself.¹²³ The key itself is a mediator. It doesn't simply carry over meaning, it actually co-constitutes it.

Finally we must consider that networks in ANT are generative. Apart from describing the network itself as it is constituted by all these interconnected elements, ANT strives to describe what is produced or generated by the network. "Being connected, being interconnected, or being heterogeneous is not enough. It all depends on the sort of action that is flowing from one place to

¹²⁰ Bruno Latour, 'The Berlin Key or How to Do Words with Things', in: Paul Graves-Brown, *Matter, Materiality and Modern Culture* (2000) 10–21, 17.

¹²¹ *Ibidem*, 18.

¹²² *Ibidem*, 10.

¹²³ Latour, *The Berlin Key*, 10–21.

the other, hence the words 'net' and 'work' (..) It's the work, and the movement, and the flow, and the changes that should be stressed."¹²⁴

Crime scenes were made up of heterogeneous elements: people, objects, and techniques. Of course, these elements had semiotic relationality as they defined each other. As we have seen in the previous chapter, material evidence could also be fragile. For example, blood traces could be affected by weather conditions, thereby making them useless to the investigation. Finally, crime scenes were generative as well. They produced information on what happened during the crime itself. Also, crime scene investigation produced the labels: victim, innocent, suspect, and eventually it helped produce a conviction by a judge.

Challenges for ANT

As we could see in the case of the Berlin key by Latour, ANT treats humans and objects as equals and preferably approaches everything as a hybrid of both human and material elements. For this reason, ANT has received criticism from cultural historians for failing to provide attention to subjects that are strictly human such as sex, race and Otherness. Furthermore, critics point out that ANT has a managerialist character, as it supposedly sees the organisation as the fundamental unit of society. Other critics find that the theory isn't very reflective and also not aware of its own political agenda.¹²⁵ This is because its early proponents occupy a very centred and normative point of view and refuse to approach the world from a marginal perspective. Sociologist John Law, one of ANT's developers, defends the theory by pointing out that in one of Latour's more well-known works, Pasteur is shown to be a network effect rather than a manager. Managers are not heroes in ANT but rather the product of their environment.¹²⁶ An environment that may very well be dominated by material elements instead of humans. Also, Latour plays with the idea of Othering. He applies certain techniques which originated in French colonial anthropology to a Western laboratory, thereby showing the reader that there is no real difference between the West and the Rest, save for a series of small and practical techniques that generate an advantage. Lastly, to deal with the critique that they aren't aware of the effects of their own writing, Latour and Law have taken up the challenge to write reflexively on what the political effects of their work may be.¹²⁷

¹²⁴ Latour, *Reassembling the social*, 143.

¹²⁵ Law, 'Actor Network Theory and Material Semiotics', 11.

¹²⁶ *Ibidem*, 11.

¹²⁷ Law, 'Actor Network Theory and Material Semiotics', 11.

The nature of objects and networks

In ANT, the terms objects and networks can be used interchangeably. The reason why sometimes the word network is used instead of object is mainly because of scale. Single objects in large networks can also be approached as networks themselves, as they in turn too are comprised of smaller objects. The case study 'Object Lessons' by John Law and Vicky Singleton speaks of objects, but what they learn about the nature of objects also applies to the nature of networks. In the text, the authors describe how they were invited by a British Hospital Trust to study the management of a disease called alcoholic liver disease. They soon found out that, although the symptoms of the disease are quite straightforward, a single account of the trajectory for diagnosis and treatment of this disease couldn't be given by the hospital's staff. Law and Singleton argue that the disease can be classified as a messy object.¹²⁸ The nature of these objects can't be grasped easily as they have different meanings to different groups of people. The authors argue that several responses can be made to this problem, one of which is the managerial approach. The diagnosis and treatment of the disease needed coordination, the disease as an object needed to be made fit to being known to social scientists.¹²⁹ However, the definition given of a messy object is that it can't be known. Therefore, Law and Singleton need other strategies, both epistemological and ontological. The epistemologically approached explanation is that objects appear to be messy because people have multiple perspectives on them. In classic Science and Technology Studies (or STS), these items are called boundary objects.¹³⁰ Different social groups with different cultures see objects in different ways. Therefore, an object can become a region, or an intersection between multiple people, in this case patients and all sorts of doctors. The ontological approach, on the contrary, concerns itself with the nature of objects. Law and Singleton ask themselves what actually counts as an object. According to the authors, objects can be seen as regions, networks, fluids and fires.¹³¹

As a network, an object must hold its relational shape. It needs both stability and mobility. However, as objects may have a stable set of internal relations, externally, different sets of relations with different cultures may also produce different objects.¹³² In this case, alcoholic liver disease may become another object in surgery than it is in the laboratory. Fluid objects and fire objects are the results of later generations of STS thinking. Objects as networks were considered by many to be too

¹²⁸ John Law and Vicky Singleton, 'Object Lessons', *Organization* 12 (2005) 331–355, 333.

¹²⁹ *Ibidem*, 333.

¹³⁰ *Ibidem*, 334.

¹³¹ Law and Singleton, 'Object Lessons', 335.

¹³² *Ibidem*, 336-337.

rigid. Fluid objects are capable of change, instead of being immutable, they are mutable.¹³³ The concept of the Zimbabwe Bush Pump, by Annemarie Mol and Marianne de Laet, is given as an example of fluid objects. The waterpump's physical shape changes over time as parts of it are replaced by the villagers. From the designers' point of view, this is invisible work as the pump still retains its capability to produce water. The end product may also change as definitions of cleanliness change over time. The quality of the water is not always measured in laboratories, but is also judged by the absence of disease amongst the population that uses the pump. Unlike the gentle changes of fluid objects, fire objects can transform more radically. They depend on difference, on otherness, which can be seen as fuel for the fire. In the case of alcoholic liver disease the diagnosis and treatment constantly changes depending on the presence or absence of outside factors.¹³⁴

As investigating a crime scene depends on slowly gathering transformative evidence, it could be argued that a reconstruction of a crime scene is a fluid object. In the analysis of the two murder cases, we shall see how small bits of evidence could slowly transform the overall knowledge that inspectors gained from a scene.

When is a network successful?

Now let's get back to the example of the Portuguese overseas empire. The analysis that this empire is a network can be applied to different levels of scale.¹³⁵ Apart from the empire itself, its ships sailing the oceans can also be regarded as networks with hulls, spars, sails, ropes, guns, food stores, sleeping quarters and crew. Again, the relation between these elements keeps the ship together. However, apart from these internal elements we must also consider external elements that make up the ship as it also relates to several neighbouring entities.¹³⁶ In this case the external elements may be winds, currents and Arab competitors. The vessel remaining intact is an effect of its relations with both internal and external elements. These relations constantly have to be performed as a process for it to generate a ship. From this perspective, an ANT network can be seen as the result of an ongoing performance by internal and external elements.

Bruno Latour has coined the term immutable mobiles to describe objects that can be transported through space without being deformed.¹³⁷ Latour uses the concept to show how information is passed between agents. In the case of the Portuguese ships, John Law uses it to

¹³³ Law and Singleton, 'Object Lessons', 337-338.

¹³⁴ Marianne de Laet and Annemarie Mol, 'The Zimbabwe Bush Pump: Mechanics of a Fluid Technology', *Social Studies of Science* 30 (2000) 225-263.

¹³⁵ John Law, 'Objects and Spaces', *Theory, Culture & Society* 19 (2002) 91-105, 93.

¹³⁶ Law, 'Objects and Spaces', 93.

¹³⁷ Latour, *Reassembling the social*, 223-226.

describe how a ship can have both mobility, as it travels from Lisbon to Calicut, and permanence.¹³⁸ An interesting observation is that these ships are also moving through time. Leaving point A and arriving at point B implies that time has passed in between. By repeating these voyages, ships show that they are also able to move through the fourth dimension whilst continuously holding their forms.

Another concept introduced by Law is that networks occupy multiple spaces. The first space is what we consider to be regular or Euclidean space. A ship could move through Euclidean space by sailing from point A to point B. It is only held in place because of its secure and stable relation to its surroundings. It has to borrow winds and currents for it to work. A less obvious type of space is network-space, the space within the networks themselves.¹³⁹ It also remains stable because of the syntax of relations between its internal elements. The ship needs proper sails, a stable hull, and so on. All these things, both internal and external have to be enrolled and continuously stay enrolled for the ship to work. So in conclusion, immobility within the network space allows objects to move through Euclidean space.

According to John Law, a network can be durable in two ways.¹⁴⁰ There is material durability, which alludes to the lifespan of the non-human objects within a network. If properly built, and with the right materials, a house should last longer than one lifetime. However it's not just the material arrangements that make an object durable. For example, the panopticon prison model as suggested by Jeremy Bentham is not only successful just because of its stone walls. The setting works because the inmates are domesticated by the idea that a watchman could at any time be watching them. The second form of durability is strategic durability, which is where intention comes into play. The Portuguese ships were designed to move through space without losing their form. Again, this doesn't mean that a strategic network only represents human agency as it also has to borrow and incorporate external elements that have agency of their own, like stars or the tides.

So, networks are successful when they are durable from a material and strategic perspective. Successful networks are also able to adapt to outside challenges while still retaining their form. The reconstruction of a crime scene also depended on the material durability of its silent witnesses. This meant that crime scenes had to be carefully managed by investigators. It was also up to them to build a strategically sound network of knowledge that would survive outside threats, like contradictory evidence.

¹³⁸ Law, 'Objects and Spaces', 93

¹³⁹ Ibidem, 95.

¹⁴⁰ Law, 'Actor Network Theory and Material Semiotics', 9.

Conclusion

What makes an ANT network and how is it successful? In this chapter we saw that a network is comprised of heterogeneous elements, both human and non-human. These actants are constantly formed and defined by their relations to other actants within the network. In ANT, humans do not receive a special position and are considered a part of the material world. Objects are rarely viewed as mere artefacts, but should always be considered as working together with humans. In order for both the actants and the network itself to remain stable, both internal and external elements have to be domesticated. Outside elements, like the winds and currents in the case of the Portuguese ships, need to be borrowed and included into the networks. A network is successful once it retains its form upon moving through Euclidean space. This means that it has to be both mobile and permanent at the same time.

As we have seen with the Portuguese ships, they are moving through both space and time while retaining their integrity. The passing of time also forms a significant challenge to the investigators who are tasked with the reconstruction of a crime scene. In the next chapter I will apply the insights from ANT to two criminal cases in which C. J. van Ledden Hulsebosch was consulted as an expert investigator, the murder on Celebes street and the murder of Tonia Schovers. I will identify network elements and show how knowledge about a crime that has been committed in the past can be produced by these elements.

Chapter III: Tying things together

Dutch CSI and the reconstruction of two murder cases by C. J. van Ledden Hulsebosch **Crime and police investigation in the Netherlands**

The organization of the modern Dutch police finds its origin in 1810, when the Netherlands were incorporated into the French empire.¹⁴¹ A key feature of the new police force under the French regime was that it was organized as a separate entity on a national level. The police were meant to control the local population and suppress any forms of uprising that might occur. After the French period, in 1814-1815, this part of the police, renamed the Royal Marshalls, remained intact as it was necessary for King William I to quell any forms of protest in the southern parts of the newly created United Kingdom of the Netherlands. In the northern parts of the Kingdom a corps of patrolmen were appointed for the same task. Apart from these two entities, the police were no longer separately organized as they had been during the Napoleonic times and for the greatest part of the nineteenth century police were a part of the municipality's responsibilities. According to Fijnaut, these municipal police forces were poorly manned and poorly trained. Very often, the Dutch army responsible had to assist the police in guarding the public order in places they were stationed.¹⁴²

Reforms came during the 1880's and 90's when investigative police units were created in several major cities. These investigators were recruited from the army, patrolmen and municipal police and were tasked to solve cases of theft, arson, and also international crime.¹⁴³ However, the impact of these reforms wasn't particularly great as the freshly trained investigators weren't held in very high esteem by the municipal police. This was due to the fact that they were already using the services of experts since the second half of the nineteenth century. Especially in Amsterdam and Rotterdam, local police were already using techniques such as photography and they regularly received help from consultants in the investigation of material evidence. One of the consultants who assisted the police with the investigation of material traces was M. L. Q. van Ledden Hulsebosch, the father of C. J. van Ledden Hulsebosch. As in other Western countries, the development of new techniques for identification led to the modernization of police investigation. In the final years of the 1890's, the Dutch police started to learn about Bertillonage. However, this system was quickly abandoned in the Netherlands and replaced by fingerprinting in the early years of the twentieth century.

It's difficult to estimate how successful the Dutch police was in the prevention and solving of crimes. A number of socio-historical studies have shown that there is a noticeable downward trend found in the number of homicide and manslaughter cases. However, this trend shows that the

¹⁴¹ Cyrille Fijnaut, *De geschiedenis van de Nederlandse politie* (Tilburg 2007) 13.

¹⁴² Ibidem, 14-15.

¹⁴³ Ibidem, 37-46.

number of violent and deadly crimes has been slowly diminishing since the early modern period. To explain this, historians refer to the civilizing process by the famous sociologist Norbert Elias (1897-1990) in which state formation and the division of labour brought a relative amount of peace to an ever-growing group of people.¹⁴⁴ In other words, violence was gradually monopolized by the state so that people were less confronted with violence and at the same time became more sensitive to it.

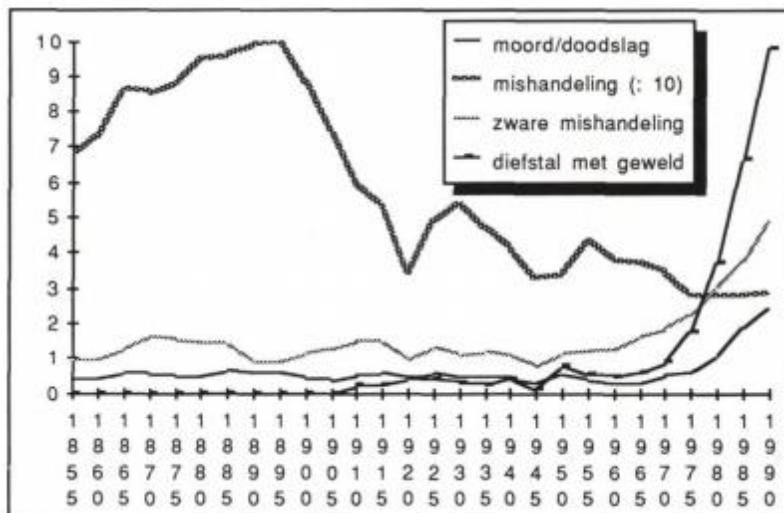


Figure 3: Convictions per 100.000 citizens per account of murder/manslaughter, abuse, heavy abuse, violent theft. Source: Herman Franke, *Geweldscriminaliteit in Nederland: een historisch-sociologische analyse* (1994) 21.

Apart from the larger trend, which may be attributed to Elias’ civilizing process, another downward trend can be discovered in Figure 3. Here we can see that the number of violent cases from 1900-1920 has also decreased. Still, it’s hard to say if this decrease was solely the result of better criminal police investigation. It can alternatively be argued that better criminal investigation would lead to a greater number of violent events being labelled as crimes. In the next chapter, we will look at two of these violent events between 1900-1930 which were investigated and labelled as crimes. Both cases are featured in C. J. van Ledden Hulsebosch memoirs *Veertig Jaren Speurderswerk*. I will apply insights from the previous chapter to these cases in order to show how ANT can help us understand the relevance of all the elements involved in Dutch crime scene investigation. First, however, we will briefly look into the life of the pioneer of Dutch CSI, C. J. van Ledden Hulsebosch.

¹⁴⁴ Pieter Spierenburg, ‘Lange termijn trends in doodslag: Theoretische overdenkingen en Nederlands bewijsmateriaal, 15de- 20ste eeuw’, *Amsterdams Sociologisch Tijdschrift* 20 (1993) 66-106, 67.

A Dutch Sherlock Holmes?

Christiaan Jacobus (also abbreviated as Co) van Ledden Hulsebosch (1877-1952) was the son of the famous pharmacist M.L.Q. van Ledden Hulsebosch. His father also aided the police on occasion by researching material evidence, which also included human excrements. Or as Van Leden Hulsebosch junior called them, the “business cards” of criminals.¹⁴⁵ In March 1902, Van Ledden Hulsebosch junior consulted the police of Alkmaar for the first time since his father was abroad at the time.¹⁴⁶ After successfully helping the police on his first case, Van Ledden Hulsebosch started consulting for the police on a broad number of cases, ranging from accidents to serious crimes. In order for him to specialize more in the field of criminalistics, Van Ledden Hulsebosch enrolled at the *Institute de Police Scientifique* at the University of Lausanne. After 1910 Van Ledden Hulsebosch completely focussed on criminalistics and converted his father’s pharmacy into a criminalistics laboratory. He established the first Dutch school for scientific police investigation, and taught University of Amsterdam. Van Ledden Hulsebosch was also a guest lecturer at the police school in Hilversum and was cofounder of the *Academie Internationale de Criminalistique* in Vienna.



Figure 4. Co van Ledden Hulsebosch in his pharmacy. The text on the windows also reads laboratory for chemical and microscopical research. Source: ‘Karakterschets: C.J. van Ledden Hulsebosch’, *De Hollandsche Revue* (25-07-1915) 7.

Co van Ledden Hulsebosch left us a lot of archive material consisting of newspaper articles and clippings. These were either about him and his exploits, or about cases in which he featured as an expert. Among this material is a photocopy of an edition of the magazine *De Hollandse Revue* in which Van Ledden Hulsebosch is hailed as the Dutch Sherlock Holmes, a comparison he himself cared

¹⁴⁵ Fijnaut, *De Geschiedenis van de Nederlandse Politie*, 37, Van Ledden Hulsebosch, *Veertig Jaren Speurderswerk*, 96.

¹⁴⁶ Van Ledden Hulsebosch, *Veertig Jaren Speurderswerk*, 3.

little for as he had no fantastical powers of observation or deduction.¹⁴⁷ Unlike Conan Doyle's protagonist, Van Ledden Hulsebosch viewed himself as a real investigator who could only come to conclusions by working meticulously.¹⁴⁸

We will now proceed to two cases that Van Ledden Hulsebosch recollects in his memoirs: the murder on Celebes street and the death of Tonia Schovers. The first case will show us how all the heterogeneous actants in a network shape and define each other. This case is about organization and domestication. The second case is about the success of a network as it defies both time and space. I have added newspaper clippings to the description of these cases in order to offer multiple perspectives on the cases. It's important to remember that Van Ledden Hulsebosch and the newspapers didn't always agree on certain details. These discrepancies will also be addressed below.

The murder on Celebes street

In the beginning of his career, in 1903, Van Ledden Hulsebosch was asked to consult on a murder case in Amsterdam. Earlier that day, the police were asked to investigate a building which housed an apartment and a small shoemaker's workshop. While earlier that day the shop was open for customers, the doors had remained closed during midday. The neighbours had found this very suspicious and had informed the police. Upon forcing the lock, the police found a gruesome scene. The lifeless body of a woman was lying at the end of a small hallway. The body was lying in a pool of blood and the adjacent walls were nearly completely covered in blood spatter. The police had immediately closed the door in fear of contaminating the crime scene. Van Ledden Hulsebosch notes that this was a good decision, as often the police themselves try to solve the case without calling for the aid of an expert and thereby silencing the silent witnesses for good.¹⁴⁹

Fortunately, the scene on Celebes street had remained untouched. After entering the premises and closely observing the body, Van Ledden Hulsebosch studied the different footprints that were visible in the blood-soaked floor. From the neighbours, the police had learned that both a shoemaker and his wife, the victim, were living in the house. Also, the shoemaker's brother had been living with them for a while after being released from prison. The shoemaker had promised to take his brother in and teach him his profession. Apparently, the shoemaker and his wife had had a recent falling out after which the shoemaker left for his family in Groningen.

Upon being asked to describe the features of the shoemaker, one of the neighbours replied that he was a tall, thin man with brown curly hair. Immediately Van Ledden Hulsebosch replied that

¹⁴⁷ 'Karakterschets, C.J. van Ledden Hulsebosch', *De Hollandse Revue*, 25 juni 1915.

¹⁴⁸ Van Ledden Hulsebosch, *Veertig Jaren Speurderswerk*, 1.

¹⁴⁹ *Ibidem*, 195.

that man couldn't have been the murderer. The man they should be looking for was short of stature and had straight blonde hair. Van Ledden Hulsebosch was also quick to point to the murderer's workstation and the fact that he was a resident of the house. Lastly, our consultant stated that both the first and last name of the suspect started with the letter "L". Upon hearing this, the neighbour quickly replied that the shoemaker's brother fitted this description perfectly.

When the police asked our consultant how he had come to this detailed description of the suspect, he gladly explained his deductions. Whilst examining the ring the victim was wearing, Van Ledden Hulsebosch noticed a blonde hair lodged in between the small pearl and the place it was mounted on. With a magnifying lens he was able to make out the root of the hair still covered in grease from the scalp. The hair was perfectly straight and hadn't come into contact with anything else. This meant that the hair had been lodged in the ring in the final moments of the victim's life. Here, Van Ledden Hulsebosch notes how quaint it is that victims often grab their assailants' hair and thereby giving the investigators one of their first clues within the victim's hands.¹⁵⁰

The way in which the victim had been wounded, indicated that the murderer was left-handed. These suspicions were soon validated as a shirt was found lying under one of the beds. The left sleeve of this shirt was also soaked with blood. Also, this shirt had the letters "L.L." made custom onto it. The shirt was small in size which went along perfectly with a set of small footprints visible in the blood. Van Ledden Hulsebosch remarks that after the initial investigation at the scene, the prints were isolated and later on compared to footprints of the suspect. Ink was used on the sole of his shoes in order to make a comparable print. The blood-soaked shirt that was found also matched other shirts found in one of the bedrooms both in size and the fact that they also had the letters "L.L." on them. The final evidence was found at one of the workstations in the shop. The chair belonging to this station was set up for a small, left-handed person. All the tools and equipment were also lying on the left-hand side of the workstation.

At our consultant's directions a police description was sent around. Interestingly, Van Ledden Hulsebosch writes that there was more material evidence present at the scene from which he was able to deduce both the motive and other details. Unfortunately, the author had decided to leave them out of his recollection of the case.¹⁵¹ After some time, the suspect turned himself into the police. According to Van Ledden Hulsebosch, the suspect must have seen the posters with his description and realised that it would be impossible to escape. The suspect initially confessed only partially, but after being confronted with Van Ledden Hulsebosch's testimony based on the material

¹⁵⁰ Van Ledden Hulsebosch, *Veertig Jaren Speurderswerk*, 60.

¹⁵¹ *Ibidem*.

evidence, adjusted his story and confessed the entire crime. The man was convicted for lifelong imprisonment.

Newspaper coverage of the case

As it was such a bloody murder in the middle of the Dutch capital city, the murder on Celebes street received plenty of attention from the newspapers. Although Van Ledden Hulsebosch gives us the impression that the victim's husband was immediately cleared of all suspicion, the Catholic newspaper *De Tijd* reported that the man, who was missing when the body was found, was later apprehended into police custody for a short while (as we can read in Figure 4). The article also contained the official police description of the suspect. In the same article, the newspaper also apologizes for an earlier description they distributed through their papers. Apparently the police had already received some information in reaction to the faulty description of the suspect. Along with this rectification, they write that they don't want to be of disservice to the police.¹⁵²



Figure 5. Article stating that the victim's husband is completely innocent of the murder. He has been released by the police and has given them information pointing them further into the direction of his brother. Source: 'De moord in de Celebesstraat', *De Tijd* (30-07-1903), 6.

The article below in figure 5 reads that the funeral of the victim was attended by a large number of interested people, demonstrating that murder was always a spectacle for the public. This again highlights the importance of the police domesticating innocent, but inconvenient bystanders at the crime scene.

¹⁵² 'De moord in de Celebesstraat', *De Tijd*, 30 juli 1903.

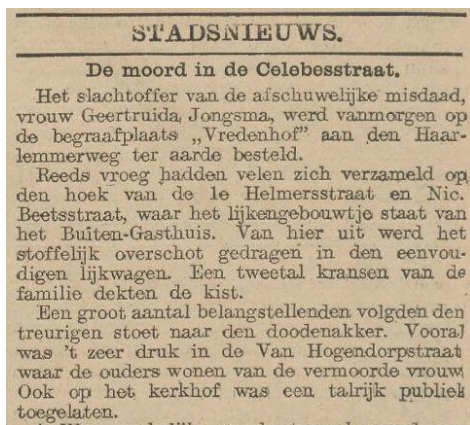


Figure 6. Source: 'De moord in de Celebesstraat', *Het Nieuws van den Dag: Kleine Courant* (01-08-190), 8.

The newspaper *Bataviaasch Nieuwsblad* extensively covered the proceedings of the trial of suspect Luije van der Laan. The suspect himself testified to killing the victim without an understandable motive as he just felt the sudden urge to murder someone. Apparently he had felt this urge both before and after the crime. Although psychiatric experts Waller and Jacobi had concluded that Van der Laan was definitely a degenerate individual, he was of sound mind enough to be held accountable for his deeds. Van der Laan also elaborated in detail that after killing his sister in law, he moved the body, washed himself clean, and was tempted to take some cash with him from the register, but decided against it. He fled to Tilburg where he read that his brother was initially the main suspect of the crime. As this wasn't right in his eyes, he therefore decided to turn himself in to the authorities.

During the trial, several eye witnesses were called to testify seeing the suspect around the workshop at the day of the crime. One witness claimed she heard a woman screaming in the afternoon. Also, the family of the victim testified that the victim had openly suspected Van der Laan of stealing money. Van Ledden Hulsebosch was called, amongst others, as an expert witness. He produced items from the residence that were all subjected to chemical analysis. Both clothes of the victim and of the suspect were shown. Interestingly, the newspaper reports state that the hair that was found in the victim's hands turned out to be her own hair (see figure 6). This is in contrast to what Van Ledden Hulsebosch writes in his memoirs.¹⁵³

¹⁵³ 'De moord op de Celebesstraat te Amsterdam', *Bataviaasch Nieuwsblad* (16-03-1904) 9-10.

Na de schorsing werd als deskundige gehoord de scheikundige Chr. J. van Ledden Hulsebosch die verschillende voorwerpen uit de woning van Van der Laan scheikundig had onderzocht. De bogen bloedstralen langs de muren in de gang toonden aan dat de verslagene zeer hard door de gang moet hebben geloopt, met een snelheid van 2.8 à 3 meter per seconde. Overal had de deskundige bloedsporen geconstateerd: op den grond, in de keuken, op de aanrechtbank, op en in een geëmailleerd keukenvoorwerp, op de muren, deuren enz.

De vermoorde vrouw had haren in de handen, doch gebleken was dat dit haren van haarzelf waren. De deskundige spreide verschillende kleedingstukken met bloed gedrenkt en behorende tot de stukken van overtuiging, over den grond uit en beklaagde keek met onverschilligheid, of liever met eenige nieuwsgierigheid er naar; zoo had hij ook des morgens met onverschilligheid de fotografiën bekeken, van de gang in de woning en met de vermoorde vrouw er op, zooals zij gevonden is. Ook de eene deur die tegen den wand stond en vol bloedstralen en bloeddroppels was, bekeek hij nu en dan onverschillig zonder dat zijn gelaat ook maar eenige ontroering deed blijken. De scheikundige apotheker H. Th. de Groot legde een gelijklopende verklaring af, als de vorige deskundige.

De verdediger, mr. M. A. H. L. van Lier, deed eenige vragen aan de deskundigen; zij bleven bij hun rapport en hun verklaringen volharden.

Figure 7. Van Ledden Hulsebosch testified as an expert witness. Contrary to his statement in *Veertig Jaren Speurderswerk*, the hair found on the victim, belonged to the victim herself instead of the suspect. Source: *'De moord op de Celebesstraat te Amsterdam'*, *Bataviaasch Nieuwsblad* (16-03-1904), 9.

Analysis of the murder on Celebes street

Through an ANT scope, the case of the murder on Celebes street can be seen as a network of several heterogeneous elements. Present at the scene were witnesses, policemen, investigators, consulting experts, and a victim. Although absent at the time, the two brothers would also be incorporated in the reconstruction of the crime scene. Also, the scene had some important silent witnesses, such as shoeprints in the victim's blood, a hair found in the victim's hand, a blood-stained sink, the blood-stained shirt, and of course the victim's body itself. Other material elements present at the scene would be used for reference, like the suspect's workstation and his clean clothes which bore the same personalized markings as the blood-stained one.

By interacting with their surroundings, these elements were able to convey and also transform meaning. For example, upon being stabbed, the victim's body released blood. Although it was the intention of the suspect to murder the victim, the amount of blood being released at the scene was a result of the workings of the body itself. Given that he both washed himself and put on some clean clothes, the murderer clearly didn't intend for himself to be linked to the crime. This means that the body releasing blood was not an intermediary that simply conveyed the killer's action to the police, it actually transformed the killer's action by generating the blood. As the murderer walked through the blood afterwards, he unintentionally placed his own shoeprints at the crime

scene, thereby helping the experts in identifying him. This example demonstrates how material objects could be seen as a medium rather than intermediaries.

Although the victim's family would later testify in court that the victim had suspected her brother-in-law of stealing money, this motive alone wouldn't be enough to get the suspect convicted. As we know, human evidence was of less value than material evidence. However, this case shows us how both the human and non-human elements of the crime scene could be linked together to generate knowledge. This is exactly what Van Ledden Hulsebosch does when he arrived at the crime scene. By combining the silent witnesses with each other, he was able to construct a description of the suspect. This, in turn, was combined with the information given by the neighbour to confirm that the brother of the shoemaker was their primary suspect. The network of people and things was not only generative in that way that it produced knowledge of what had transpired, it also produced a suspect, a criminal.

This case also shows us how elements outside and inside networks had to be domesticated. The police officers who first entered the house, luckily decided to refrain from contaminating the scene. But there were other threats and opportunities out there. Witnesses showed up with information pertaining to the time of the murder and the suspect's possible motive. It was up to the investigator to evaluate this information. Furthermore, the public's interest into these matters is also evident from the large number of people attending the funeral of the victim. During every step of the investigation, these people needed to be kept at bay.

As crime scenes could be messy objects, they had to be carefully managed and made suitable for being investigated by the experts. The newspapers coverage of the court case demonstrates that items from the residence were isolated and transported to Van Ledden Hulsebosch's laboratory where the evidence was subjected to chemical analysis. As the experts were able to produce the evidence in court and stay with their expert opinion after being questioned by the defence, this case shows us that the evidence was handled soundly.

An interesting element in this reconstruction is the single blonde hair that was found in the victim's hands. This hair was important in linking the suspect to the crime scene and the victim's body. However, as Van Ledden Hulsebosch fails to notice us in *Veertig Jaren Speurderswerk*, the hair turns out to be from the victim instead of the murderer. As the integrity of networks also depends on every object continuously playing its part, this could have proved a serious problem for the investigation. However, this is where the fluidity of the network comes into play. Like the Zimbabwe Bush Pump, the reconstruction of a crime scene also needs adaptability. The abundance of evidence present at the crime scene means that, while a single piece of evidence could be removed from the network, another piece of evidence would take its place. In this case, the reconstruction would still

generate enough knowledge to link the suspect to the murder because the bloody shirt and the shoeprints would still implicate him. Therefore, it was so important for investigators to collect as much evidence as they could. This case demonstrates both the precariousness of crime scene investigation and the strategy behind the durability of the network. These reconstructions were intentionally set up this way, with as many links between actants as possible, should one link fall out due to threats inside and outside of network space.

So, what does the ANT approach to this case provide us with? ANT shows us that the human and material world are both co-constitutive. Human action can be overtaken and transformed by material objects just as how silent witnesses can be combined and transformed through witness interrogation. Contrary to the ideal of mechanical objectivity, human and nature don't need to be separated but rather combined. The combination of these two, displayed by numerous links between silent witnesses and human testimony, along with the careful domestication of both internal and external elements is what gave the reconstruction its ability to survive from the crime scene all the way to court. This is how it gained both permanence and mobility.

An interesting observation can be made in this case as Van Ledden Hulsebosch seemed to claim insight into the psyche of the suspect. During the investigation of the crime scene, he claimed that the silent witnesses were able to tell him the suspect's motive to murder his sister-in-law. Unfortunately, he didn't elaborate further in his memoirs. However, in court the man claimed to have murdered the victim because a sudden urge overtook him. This could hardly have been deduced from the silent witnesses. Even if there was material evidence confirming the suspect's motive, it would have been presented in court. Another time when our consultant claimed insight into the suspect's psyche was when the suspect turned himself over to the police. Van Ledden Hulsebosch claims this was because the suspect realised the police had his description, something with which Van Ledden Hulsebosch of course helped. However, during the court case the suspect testified to having turned himself over to the police when he realised that his brother was also suspected of murder. In both instances our consultant seems to have gone a little bit too far in his interpretation of the facts, something that seems rather uncharacteristic for someone who embodies the virtue of mechanical objectivity.

The next case will be about material durability and real threats to the reconstruction of a crime scene. We will see how Van Ledden Hulsebosch nearly fails to produce a reconstruction and has to resort to more desperate measures.

The death of Tonia Schovers

In autumn 1906 a gamekeeper was walking through the woods in the Dutch province of Overijssel. Following a fresh trail, he stumbled upon a large open space in the woods where the remains of a human body, in a severe state of decomposition were found. The flesh on the head had already been eaten by various bugs, leaving only a skull that was lying a couple of feet away from the torso. There were still some pieces of clothing present at the scene. Also, a nearby sack contained other clothes and a letter, from which the body could be identified as Antonia Schovers. The woman, also known as Tonia, was a pariah without relatives, travelling from farm to farm in order to find temporary employment. Since she had no relatives, nobody had notified the authorities that she was missing.

After inquiries, the police found out that Tonia was last seen during Pentecost. There was initially no reason for the police to suspect murder. However, a prosecutor toyed with the idea that murderers tend to revisit the body of their victims after the crime is committed. This reminded Van Ledden Hulsebosch that in the United States the police had a habit of making pictures at funerals of murder victims in the hopes of finding suspects at the scene.¹⁵⁴ After more inquiries, the police found out that Tonia was last seen in the company of a certain Johannes R., a man known to behave violently towards women. This man was seen in the vicinity of the crime scene around Pentecost, but since had quickly fled the Netherlands. The case seemed to be at a dead end. The remains of the clothing were stored by the local court and the remains of the body were buried at the cemetery in a small box.

In the spring of 1908 Johannes R. returned to the Netherlands. Van Ledden Hulsebosch made an assumption here that mister R. felt enough time had passed for him to still be connected to the crime.¹⁵⁵ However, the police still remembered the case well and took the suspect into custody. After this a message was sent out to Van Ledden Hulsebosch asking him to consult on the investigation. Although a bit wary that no silent witnesses could be found after such a long time, Van Ledden Hulsebosch promised to give it his best effort. During this time the suspect denied all accusations.

In his laboratory, our consultant received the box with the remains of Tonia and her clothes. Although the clothing had probably been scruffy to begin with, and various insects had already started eating them, Van Ledden Hulsebosch called in help as a woman's eye was needed to identify to which piece of clothing the remains belonged. After the identification of the pieces, they were carefully attached to a mannequin made of woodwool fibre. The reconstruction of the clothing Tonia was wearing when she was murdered showed that they had been pierced around the chest area with a sharp knife.

¹⁵⁴ Van Ledden Hulsebosch, *Veertig Jaren Speurderswerk*, 195.

¹⁵⁵ *Ibidem*, 195.

A ruse was thought up by Van Ledden Hulsebosch to tie the still denying suspect to the scene of the crime. In the winter of 1907 he had visited a performance by the famous telepath Rubini, who had inspired Van Ledden Hulsebosch to reproduce some of his illusions. In the presence of the suspect, two armed policemen, the prosecutor, and psychiatrist Dr. Le Rütte, Van Ledden Hulsebosch was led to the woods where the remains were found. In the presence of all these people, with Le Rütte as an expert, our consultant declared that he had never been in these woods before. However, he also stated that the suspect would be able to subconsciously lead them to the scene where the remains were found! Van Ledden Hulsebosch took the suspect by the wrist and started walking. Each time the path split up, the suspect's heartbeat and breathing was able to tell Van Ledden Hulsebosch which way to go. Indeed, after a while they arrived at the scene. Unfortunately, the scene itself didn't yield any evidence after such a long time. The suspect, now even denying he had ever held a knife, was taken back into custody.

Research of the skeletal remains of Tonia also indicated that she was stabbed with a knife in the chest as scratches were found on the victim's sternum. With this, the prosecutor had enough evidence to have Johannes R. convicted for heavy abuse resulting in death. He was sentenced fifteen years in prison.

Newspaper coverage of the case

In the newspaper coverage of this case we shall see that there are several inconsistencies with the story as presented by Co van Ledden Hulsebosch. One of the more important differences is that the newspapers report nothing of our consultant's ruse. While this was a central element of Van Ledden Hulsebosch's presentation in the book, it didn't come up during court. Also we will see inconsistencies in the conclusiveness of the material evidence our consultant presents and also in the prison sentence that was given to mister Roode.

On the twentieth of November, 1906, the Dutch newspaper *Nieuwsblad van het Noorden* printed a small article concerning the death of Tonia Schovers, in which they wrote that the remains were found on the 25th of October and had been identified as those of Antonia Cornelia Schovers. The clothes found on the scene have, for the most part, been recognized by the owner of a local guesthouse. The police were looking for a man who was last seen in the company of Tonia, a certain mister J. Roode.¹⁵⁶

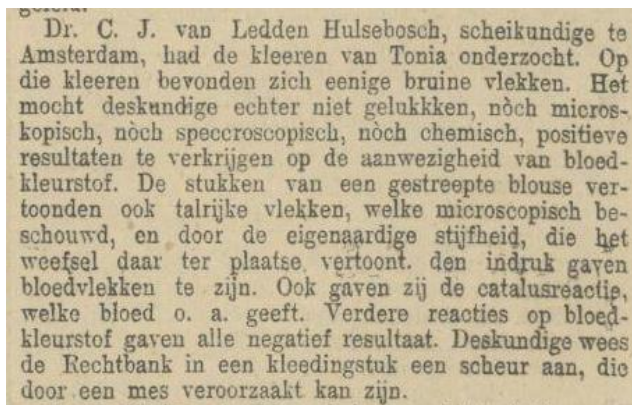
¹⁵⁶ 'Herkend', *Nieuwsblad van het Noorden*, 2 november 1906.



Figure 8. Source: 'Herkend.', *Nieuwsblad van het Noorden* (20-11-1906) 1.

Two years later, on the 23rd of October 1908, an article in the judicial section of the *Provinciale Overijsselsche en Zwolsche Courant* reported the ongoing trial of Johannes Roode, who had been charged with the murder of Tonia Schovers. The victim had left a local guesthouse in the company of both mister Roode and a certain mister Hofman during Pentecost. Only the latter had returned to the guesthouse. Another forensic expert, the pathologist dr Kwitser, had performed the post mortem. Kwitser concluded that the victim was likely murdered five months before being discovered. Although the police initially didn't think that Tonia had been murdered, they still set up an investigation in which Johannes Roode came up as a suspect. Roode had apparently fled the country, which encouraged the police in their suspicions. On the 13th of February 1908, mister Roode was arrested and put into custody. The director of the mental hospital Brinkgreve in Deventer, dr le Rutte, had interviewed mister Roode multiple times after which he concluded that the suspect was mentally retarded, but could be held accountable for a crime. During these interviews, Roode had also confessed to killing Tonia Schovers and had even demonstrated to le Rutte how he performed the stabbing. During an official police interview Roode denied killing Schovers and claimed he had been forced to make his earlier confessions. Van Ledden Hulsebosch's investigation of the victim's clothing is also referred to as being inconclusive, something he seems to leave out of the case description in his memoirs. Several brown stains found on the clothes were subjected to microscopic examination and chemical analysis. However, Van Ledden Hulsebosch was not able to determine if these were blood stains. The expert did present a tear in a piece of clothing which could be the result of a stab with a knife. A number of eye witnesses had testified to seeing two people who fitted the description of Tonia and Johannes in the vicinity of the crime scene. Also, J.W. Hofman had testified that Roode and Tonia had left him at a certain moment during Pentecost. Roode had returned alone to the guesthouse without Tonia and claimed to have lost her when he was suddenly chased and

beaten by three unknown men. In order to outrun them, he had to go through a creek. Roode's clothes were apparently wet when he spoke to Hofman. The defence wanted the court to look into the forced confession and the lack of convicting evidence. Eventually the prosecution settled for a conviction of abuse but couldn't link the death of Tonia to her abuse at the hands of Roode. Another Dutch newspaper, *Het Nieuws van den Dag: kleine Courant*, reported after the trial that Johannes Roode received a sentence of only one year and three months.¹⁵⁷ This is in contrast to Van Ledden Hulsebosch's claim in *Veertig Jaren Speurderswerk* that the suspect was convicted to 15 years in prison.



Dr. C. J. van Ledden Hulsebosch, scheikundige te Amsterdam, had de kleeeren van Tonia onderzocht. Op die kleeeren bevonden zich eenige bruine vlekken. Het mocht deskundige echter niet gelukken, noch microscopisch, noch spectroscopisch, noch chemisch, positieve resultaten te verkrijgen op de aanwezigheid van bloedkleurstof. De stukken van een gestreepte blouse vertoonden ook talrijke vlekken, welke microscopisch beschouwd, en door de eigenaardige stijfheid, die het weefsel daar ter plaatse vertoont, den indruk gaven bloedvlekken te zijn. Ook gaven zij de catalusreactie, welke bloed o. a. geeft. Verdere reacties op bloedkleurstof gaven alle negatief resultaat. Deskundige wees de Rechtbank in een kleedingstuk een scheur aan, die door een mes veroorzaakt kan zijn.

Figure 9. Van Ledden Hulsebosch failed to produce conclusive evidence in court. Source: 'Rechtszaken', Provinciale Overijsselsche en Zwolsche courant (23-10-1908) 9.

Analysis of the death of Tonia Schovers

This case clearly demonstrates how precarious the reconstruction of a crime case could be. Van Ledden Hulsebosch was already sceptical at the beginning of this case, as so much time had already progressed that both the crime scene and the remains of Tonia's body didn't seem to yield any more evidence. However, there was still a very small army of people and things present, which we can now examine more closely. The victim's remains, clothes, and the letter found on the scene make up the silent witnesses in this case. As the victim and the suspect had been seen together near the scene of the crime around the time that Tonia was probably killed, they were also part of our army of people and things. Also, the human witnesses: the owner of the guesthouse and Hofman, the suspect's friend, should also be incorporated.

The human and non-human witnesses in this case helped with the identification of the remains, determining the time of death, and finding a possible suspect. Identification of the remains could have been difficult, as the victim turned out to be a tramp with no known relatives. Luckily, the

¹⁵⁷ 'Rechtszaken, rechtbank te Almelo', *Het nieuws van den Dag: Kleine Courant*, 2 november 1908, 22.

letter found close to the remains contained information on Tonia. However, such a letter alone would not confirm the identity of the remains. The medical examiner would be able to confirm that the remains belonged to a woman of a certain age, thereby confirming the police's suspicions that the remains did indeed belong to Tonia. The information from the body and the letter would later be confirmed by witnesses who had reported the victim to have gone missing around Pentecost. During the medical examination of the remains, the medical expert was able to conclude the approximate date on which the victim had died. As we saw in the previous case, the victim's body can be seen as a mediator. It didn't simply convey the murderer's action but also transformed it. The murderer had probably fled the country because he didn't want to be linked to the death of Tonia. However, the victim's body, a material object, was able to transform his action and provide the investigators with information on the time of death of Tonia. By then, the police had enough information to establish both the identity and the probable time of death. This was combined with information given by human witnesses that Tonia was last seen in the company of mister Roode during Pentecost, thereby labelling him as the prime suspect. Even after such a long time, the network of people and things was still able to produce enough information on the case to label two people as victim and suspect.

Unfortunately, the most important silent witnesses had decayed so far that they weren't able to yield solid information on how the victim had died. By reconstructing the clothes and finding the tear that was probably the result of a stabbing, Van Ledden Hulsebosch had put up a good effort. The marks on the victim's sternum confirmed, to a certain point, that she was stabbed. However, as we read in the newspaper article on the court case, the material evidence was deemed not be convincing. This was also due to the fact that microscopic examination and chemical analyses weren't able to confirm that the stains on the clothes were bloodstains. This failure to come up with more convincing information demonstrates the lack of material durability of this network.

Also, the reconstruction of this case was so vulnerable because it relied so heavily on the little evidence that was available. In the previous case, we saw that the falling out of a certain piece of evidence was compensated by the abundance of other silent witnesses that could take its place. As this case was already so precarious, the fact that analysis of the clothes yielded no concluding evidence was a real setback. This might have been the reason for Co van Ledden Hulsebosch to resort to his ruse.

The observation of the suspect's pulse and breathing by our consultant was very smart, as it provided the investigators with something they could actually measure. Still, the objectivity of this trick was questionable. It wouldn't have held up to the standards of mechanical objectivity, which argued for depicting nature without human intervention. During the performance, the suspect's

body became multiple things.¹⁵⁸ First, it was converted by Van Ledden Hulsebosch into a pseudo-material object that was made fit to being known by science. Measuring someone's pulse and breaths could have been done quite objectively simply by counting them. Secondly, the body remained human as the investigators still needed the suspect's perception and memory. The suspect's body was both a human and non-human object.

In 'The Berlin Key' Latour argued that every network, object, and technology can be seen as a chain of association between human and non-human elements. He codes human as (H) and non-human as (NH). Combinations of (H) and (NH) indicate how much a thing is composed of human and non-human elements. For example, H-H-H-H-H resembles social relations; NH-NH-NH-NH-NH a machine; H-NH a person-machine interface; NH-NH-NH-NH-H the impact of technology on a person; H-H-H-H-NH the tool shaped by the human and NH-NH-NH-H-NH-NH-NH the humans crushed by automatisms.¹⁵⁹ What if we were to apply this to the suspect's body during the "magic trick"? Would it have been comprised mostly of (H) or (NH)? In any case, the answer shouldn't have sufficed to someone who embodies the strict separation between human and non-human like Van Ledden Hulsebosch. An ANT perspective on this case helps us understand how far our consultant would let go of his scientific ideals to tie the suspect to the scene of the crime.

Although questionable in terms of mechanical objectivity, the performance by our consultant did tie everything together nicely. The scene where the remains had been found now became a crime scene and Roode was probably the last one to see Tonia Schovers alive. Why else would this area invoke such a response of the suspect? This was enough for the prosecution to at least reconsider the suspect's previous denial. From this point of view the magic trick can be seen as an element that reinvigorated the network as it linked everything together and provided the inspectors with a plausible narrative of what happened.

Another interesting thing to note in this case is that Van Ledden Hulsebosch again tried to deduce the motives of his suspect. In *Veertig Jaren Speurderswerk* he made the assumption that the suspect had returned to the Netherlands mainly because so much time had passed after the crime was committed. Van Ledden Hulsebosch couldn't resist claiming insight to the suspect's psyche again. This could have been due to showmanship, a trait he certainly had in common with Conan Doyle's protagonist. This is also hinted at by the way Van Ledden Hulsebosch described the role he

¹⁵⁸ Unlike case studies into the enactment of diseases in hospitals like the one we have seen earlier by John Law and Vicky Singleton, or Annemarie Mol's *The Body Multiple*, the object in this case is not enacted separately by different parties. It can rather be argued that the same party used the object in multiple ways that are closely interrelated. In this setting, the body couldn't be used separately as a human and a non-human object as both approaches depended on the other.

¹⁵⁹ Latour, 'The Berlin Key', 11.

played in this investigation. In his memoirs, our consultant seems to lead and coordinate the entire investigative effort, while in the newspapers he is merely presented as an expert witness.

Conclusion

How does an actor-network perspective help us understand the relevance of all elements involved in the investigations of the murder on Celebes street and the death of Tonia Schovers? First of all, ANT helps us understand that a silent witness was a medium rather than an intermediary. Rather than simply carrying over meaning, these objects also transformed it. The body in the Celebes street case is a great example of this as it transformed the murderer's message in such a way that it actually gave more information to the police than was intended. So silent witnesses could overtake and transform the action of humans. In this sense, they were both responsible for the construction of information.

An ANT perspective also helps us see how these reconstructions could be fragile or well equipped to deal with outside or inside threats. Due to carefully managing the crime scene at Celebes street, the investigators were able to collect an abundance of evidence, making the network so strong that it could even deal with the falling out of an important clue. The reconstruction of this crime scene was fluid in the sense that over time, certain elements within the network, like the hair found in the victim's hands, could be taken out of the equation and replaced while the network's output still remained the same. In other words the network itself was robust enough to survive losing certain pieces of evidence. This case also demonstrates how elements outside of network-space had to be domesticated in order to make a more robust reconstruction. Witnesses with valuable information were incorporated into the army of people and things while bystanders who could potentially contaminate the scene were kept at bay. Therefore, the Celebes street case was a testament to careful management and strategic durability.

The importance of material durability is shown in the case of Tonia Schovers. As there was hardly any material evidence anymore, due to the decay of the body and clothes, this case proved to be difficult to solve. This was the reason Van Ledden Hulsebosch had to resort to the trick of measuring the suspect's pulse. Again, ANT provides us insight into the nature of this trick as it had both human and material elements to it. Although it certainly didn't fit with his ideal of mechanical objectivity, the performance by Van Ledden Hulsebosch shows us how successful networks depend on heterogeneous elements, which is also the most important thing that ANT learns us.

While experts like Van Ledden Hulsebosch were more concerned with the objective information that only material evidence could give them, it was actually the combination of human and non-human elements that provided the greatest information. In both cases, the best evidence

used in court came from information that was first gained from examining silent witnesses and afterwards being confirmed by human witnesses. This is the answer that ANT provides. All the things present at a crime scene were actants, they were all equal in value because they shaped and defined each other.

Conclusion

I will start the conclusion to this thesis by shortly revisiting the answers to all my sub-questions, after which I will answer my main research question and justify my application of actor-network theory. I will end this thesis with a reflection and a recommendation for further study.

What army of people and things were responsible for effective forensic research in the late nineteenth and early twentieth centuries? The first thing needed was a clear agreement on what could be considered objective. This was the ideal of mechanical objectivity which argued for a strict separation of the natural and human world. Burney and Pemberton argued how forensic experts, like pathologists, played an important role in crime-solving in the Western world. However, at the end of the nineteenth century, the investigative officer also emerged as a new type of forensic professional. Both the forensic expert and the investigative officer embodied the virtue of mechanical objectivity as it was important for them to practice restraint in dealing with the crime scene. At the same time, they were responsible for capturing the more fleeting elements of a crime; the silent witnesses. As Katherine Watson's account on the history of forensic medicine showed, before the rise of certain techniques, like microscopy, the human body was the main form of material evidence at the crime scene. However, during the nineteenth century, more techniques emerged to analyse other silent witnesses like blood, hair, and dust. For them to yield information in court, as well as on the crime scene, material traces had to be carefully fixed in the chain of custody, again restricting human intervention.

Simon A. Cole and Jens Jäger argued that crime-solving techniques, such as judicial photography, Bertillonage, and fingerprinting all revolved around the identification of unknown people. The techniques emerged during the latter half of the nineteenth century, a time wherein people became more mobile and the knowledge of local police officers was no longer sufficient. These techniques weren't perfect and didn't always guarantee the apprehension of criminals. There were social, scientific, and practical challenges for these techniques along the way. By dealing with these challenges, techniques for crime solving became more factual around the turn of the century.

What are the key concepts that are needed to build a successful network in ANT? Networks are comprised of heterogeneous elements, human and non-human. All these elements constantly define and shape each other, and are co-constitutive. Another important lesson of ANT is that material objects also have agency. They can overtake and transform meaning, thereby serving as a medium. Networks are always precarious and in order for them to remain stable, both internal and external elements have to be domesticated and sometimes even included into network-space. Also, networks are generative. This means that they have a certain output. Successful networks are both mobile and permanent at the same time. They can travel through space and time while retaining their

form and function. Also, successful networks need both material and strategic durability. A good example of a successful network is a fluid network that is able to adapt to its surroundings.

How does an actor-network perspective help us understand the relevance of all elements involved in the investigations of the murder on Celebes street and the death of Tonia Schovers? In a way, this is already part of my main research question. An ANT approach helps us see silent witnesses as mediums, which are transformative. This is where the ANT approach differs from the using the conjectural model like Claire Valier does. While Valier's approach treats material evidence as simply a means to convey a message, ANT shows that silent witnesses could also add additional information which could be useful to the investigators. It furthermore demonstrates the precariousness of a crime scene reconstruction. There were many threats to the crime scene as its materials weren't exactly durable. Still, thanks to good management a reconstruction could be made strategically durable. Enough so that it could survive all the way from the crime scene to court, withstand threats along the way, and still yield valuable knowledge in court.

Now to answer my main research question: How was knowledge produced on crime scenes in the early twentieth century in the Netherlands? The texts by Burney and Pemberton, Watson, and Cole show us that criminalistics emerged as a new field during second half of the nineteenth century. Although certain pioneers led the way, a web of people, things, and techniques were also needed for effective crime-solving. Human witnesses, suspects, victims, investigators, silent witnesses, and techniques of identification were also needed.

Lorraine Daston's description of the ideal of mechanical objectivity, or the strict separation of the natural world and human intervention, can be detected in many elements in this web of this. For example, it could be seen in the favouring of testimonies of forensic experts who, unlike eye witnesses, had no direct knowledge of events and instead gave their scientific opinion on how things worked. The ideal could again be seen during the end of the nineteenth century, when investigative officers emerged as a new group of players on the crime-solving field. This investigators had to refrain from interfering with the crime scene and had to guarantee the authenticity of evidence by securing it in the chain of evidence. The gradual shift in crime-solving techniques from interpretative at first, to more factual later also points to the ideal of separating the human and the natural worlds. So, the new field of criminalistics was characterized by a strict separation of human and material elements.

However, an ANT perspective demonstrates that looking at both the human and material elements of a crime scene was needed for a solid reconstruction in 1900-1930. As all the actants in a network define and shape each other, a successful reconstruction could only be made by combining information gained from the material elements with human testimonies. This goes against the strict

separation of the human and natural worlds. Also, due to the challenge of material durability, it was sometimes necessary for investigators to compromise their ideal of mechanical objectivity. C. J. van Ledden Hulsebosch demonstrates this by combining human and non-human elements several times to come to new insights. The best example of this being the “magic trick” he performs at the crime scene in the case of Tonia Schovers, where the consultant uses the suspect’s body as both a human and a non-human witness. In the case of the murder on Celebes street our consultant also demonstrates this by having witnesses at the scene confirm the information yielded by the silent witnesses before combining it into an official police description of the suspect.

Knowledge was produced by the investigators recognizing that human and non-human elements could co-constitute meaning. As these actants were all shaped by each other’s actions, they all became mediums or hybrids. This recognition might not have fitted their ideal of a strict separation of human and non-human, but the actions of investigators like Van Ledden Hulsebosch tell us otherwise. This is also evident in the fact that our consultant at times even dabbles into understanding the psyche of suspects. While his claims of understanding the motives of suspects could also be erroneous at times, Van Ledden Hulsebosch did acknowledge that silent witnesses could provide insight into the minds of people. In short, investigators and experts did approach people and things as hybrids.

This is also what makes ANT of great value for studying the subject of criminalistics in the early twentieth century. While the ideal of mechanical objectivity ignores the role of human actants and approaches from the cultural turn tend to overlook the materiality of history, ANT recognizes that humans are an equal part of the material world. It shows us the importance of looking at matter for the role it plays in history. As said earlier: The hero is never solely responsible for success stories.

Reflection and recommendation

For my research I have analysed the memoirs of C. J. van Ledden Hulsebosch, as well as several Dutch newspapers, and finally a number of police manuals. Most of these sources were found in the depot of the PIT museum in Apeldoorn. The museum also has the personal archives of C. J. van Ledden Hulsebosch in their possession. Judging by the size of these archives, it seems that Van Ledden Hulsebosch collected clippings from every single newspaper article or journal that mentioned his name. As van Ledden Hulsebosch was extremely active in the world of criminalistics during the first half of the twentieth century, these archives are quite extensive and it’s easy to get distracted while going through them.

As I have chosen an ANT approach, I had to search for detailed accounts on Dutch CSI that involved attention to material evidence. I expected the memoirs of van Ledden Hulsebosch to be

very detailed, since he is basically promoting his own work to the general public. As said earlier, in his memoirs, Van Ledden Hulsebosch represents the field work on the crime scene itself as the most important part of criminal investigation, rather than what takes place in the laboratory and courts. The author gives the most attention to the hunt for silent witnesses and the deductions that can be made from them. As expected, the police manuals were also concerned with techniques and evidence, but in a very practical way.

The newspaper articles that covered the proceedings in court actually provided the most surprising sources as I didn't expect them to be so detailed. The articles contained references to material evidence that was presented, the arguments of the defence, and testimonies by regular and expert witnesses. Because of these detailed accounts, I have found that the networks of people and things involved with these criminal cases were actually a lot bigger than Van Ledden Hulsebosch portrays them to be.

Also, I have managed to find an interesting number of inconsistencies between the newspapers and Van Ledden Hulsebosch's memoirs. The first one being the hair in the first case which turned out to be the victim's instead of the suspect's. This information was omitted in *Veertig Jaren Speurderswerk*. Something else that doesn't completely add up in this case is the author's claim that he was able to deduce the killer's motives. From the newspaper we learn that the killer suddenly felt the urge to kill someone. He had felt this urge at earlier times which seems to suggest he wasn't completely of sound mind. It's difficult to imagine how Van Ledden Hulsebosch was able to deduce such a thing from the material evidence alone. Lastly, and most importantly, there is a very big inconsistency between the way in which the case of the death of Tonia Schovers ended in the memoirs and in the newspaper article. Van Ledden Hulsebosch presents us with a case that is eventually successful as the suspect confesses and is sentenced for fifteen years in prison. The newspapers present us with a case in which material evidence is deemed lacking. Therefore Mr. Roode only received a sentence of one year and three months. We don't know Van Ledden Hulsebosch's motives for leaving out this information. However it's quite convenient for the criminalist as this information could have undermined his position of authority.

What's new about this thesis is that it looks at the role of material evidence in Dutch CSI. Although I have shown that knowledge was produced by a network of heterogeneous actants, the material elements of a crime scene were still very important. When Dutch criminalistics fully emerged in the early twentieth century, a great number of silent witnesses became viable for investigation. The body was no longer the only object worthy of scrutiny. Unfortunately, not much has been written yet about the material aspects of Dutch CSI in this timeframe. Therefore, I recommend that more research can be done on the subject of the historical crime scene in the early

twentieth century. The historical crime scene is perfectly compatible with the goal of new-materialism to show how the world was co-constituted by human and non-human objects alike. Apart from that, the history of criminal investigation is also a very exciting history that draws many people to it.

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