

Swabbed Dogs and Beaches in Pizza Boxes: Crime Scene Alignment Work and Crime Scene Technicians' Professional Identity

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Abstract

This paper discusses the alignment work that Swedish crime scene technicians perform at the crime scene. It takes as its point of departure the understanding that the criminal justice system is a collaboration of very different epistemic cultures with at times different understandings of "the same" forensic evidence and its production. Nonetheless, the collaboration and the legal security of forensic evidence depends on knowledge in the form of forensic evidence(-to-be) moving easily and stably through it, despite epistemic differences. One way of attaining such stable movement, the article argues, is the crime scene technicians' alignment work when they recover and package traces from the crime scene – for example body fluids, fingerprints, and fibers – for transport to the forensic science laboratory. Their crime scene alignment work, the article shows, is not only a core part of the crime scene technicians' contribution to the collaborative production of forensic evidence, it is also a source of professional pride, identity, and community for them. Thus, the crime scene technicians' alignment work is not only important for the movement of knowledge through the Swedish criminal justice system, but is also an integral part of their professional self-understanding.

Keywords: alignment work, crime scene technicians, crime scene work, professional identity, movement of knowledge, forensic evidence

Introduction

This article examines Swedish crime scene technicians' recovery of traces from the crime scene and their movement to the forensic laboratory through the lens of alignment work (Kruse, 2021). This lens makes it possible to see not only the work of moving traces stably but also how this work is intertwined with and shapes crime scene technicians' self-understanding.

Alignment work is the work that makes it possible for knowledge – in this case, the traces that are to become forensic evidence – to be moved stably from one context to another. The notion takes its point of departure in thinking about the movement of knowledge across different epistemic cultures (Knorr Cetina, 1999) in terms of infrastructure and infrastructuring, that



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is, in terms of continuously bridging the gaps and resolving the tension between different sites (cf. Star and Ruhleder, 1996: 114) to create “an experience of seamlessness between different sites” (Kruse, 2021: 5). These ‘seams’ between sites are not the connections that hold together different pieces of fabric, but the gaps between different systems and infrastructures caused by technical incompatibilities (cf. Vertesi, 2014: 268ff).

In the criminal justice system, such seams are caused by different epistemic cultures collaborating; this article focuses on the seam between crime scene technicians at the crime scene and forensic scientists in the forensic laboratory. These epistemic cultures differ in focus – for example, on crime scenes in the context of an investigation compared to analyzing traces or sets of traces and evaluating the result (Kruse, 2016) – in working conditions – unpredictable crime scenes compared to a laboratory environment that can be subjected to order – and in understanding forensic evidence and its production. The traces’ move from the crime scene to the laboratory is thus not only a move from one site to another but also from one epistemic culture (Knorr Cetina, 1999) to another: from the crime scene technicians’ “machineries of knowing” (Knorr Cetina, 1999: 2) to those of the forensic laboratory with a different way of contributing to and understanding forensic evidence (Kruse, 2016: chapter 6, 2020a and 2020b).

However, for the criminal justice system to be able to produce as much and as nuanced forensic evidence as possible, traces must move seamlessly from the crime scene to the laboratory. In the interest of legal security, forensic evidence in court must be perceived as “the same” as the trace at the crime scene it originated from. In consequence, the traces that are moved from the crime scene to the laboratory must be understandable as unaltered, despite having changed shape from, for instance, a drop of what is presumed to be blood on a floor to a forensic swab tipped with dried blood and sealed into a paper bag. In addition, the traces must remain physically stable; that is, they must not be allowed to deteriorate, since deteriorated traces mean less detailed and thus less strong evidence. Finally, the traces’ decipherability must remain unaffected by their

recovery and transport; in other words, they must be recovered and transferred in a way that enables (or at least does not preclude) the subsequent laboratory analysis. To put it differently, forensic evidence in the making has to be moved across the seams (Vertesi, 2014) between epistemic cultures; more so, it must, in the interest of legal security, be moved stably or “with integrity” (Morgan, 2011: 12).

To ensure the traces’ stability as they are moved between the crime scene and the laboratory, the National Forensics Centre¹ (NFC), Sweden’s only and state-run forensic laboratory, has developed and continuously teaches standards for how different kinds of traces are to be recovered, packaged, and transported. These standards are meant to make it possible to treat the movement of traces from the crime scene to the laboratory as a practical matter: if the crime scene technicians follow the recommendations, the recovered traces will fit seamlessly into the laboratory’s work.

In practice, however, standards cannot and do not bridge all seams in crime scene work (or other enterprises). For one, the standards must always be actively applied to each particular crime scene and its circumstances. Secondly, standards have their limitations – as for example Susan Leigh Star (1990) has famously and eloquently discussed, it is impossible to devise standards that accommodate all possible variety. In her words, “there are always misfits between *standardized* or *conventional* technological systems and the needs of individuals” (Star, 1990: 36; *italics in original*). To (try to) design standards that accommodate every possible crime scene would be as futile as trying to devise standards that accommodate every possible body. In other words, the standards that are meant to bridge the seams between epistemic cultures – and do so most of the time – will, inevitably, on occasion, encounter a crime scene whose circumstances they will not fit. The misfits Star discusses are about fast-food standards facilitating a smooth restaurant meal for most people but making the seemingly same meal difficult for those with unusual allergies; in crime scene work, such misfits mean that the standards cannot resolve (or wholly resolve) the tension between the crime scene and the laboratory.

This is where the crime scene technicians' alignment work comes in. Their alignment work at the crime scene complements and completes the NFC's standards, allowing the traces to move from the crime scene to the laboratory and further to the investigation smoothly and seamlessly when standards alone are not enough. When the technicians recover and package traces – for example body fluids, fingerprints, and fibers – for transport to the forensic science laboratory, they at the same time align the standards for recovering traces with the circumstances at the particular crime scene; that is, they align the crime scene and the laboratory to facilitate the traces' stable movement from one to the other.

By making it possible to perceive the traces and, by extension, the forensic evidence produced from them as stable, the crime scene technicians' alignment work thus contributes to the validity of the forensic evidence produced by the criminal justice system and to its legal security. One could, cynically, say that by performing alignment work, the crime scene technicians prevent the seams between the crime scene and the laboratory from being noticed and their consequences from being discussed. A less cynical understanding is that, just like misfits, seams are inevitable in a collaboration between different epistemic cultures, and alignment work is what makes it possible for the criminal justice system to produce useful forensic evidence at all.

But, I will argue, this alignment work not only facilitates the stable movement of traces from the crime scene to the laboratory, it is also a source of professional identity and pride. When crime scene technicians talk about what they call "difficult cases" – i.e., cases that require extraordinary alignment work to result in potential forensic evidence – they simultaneously share crime scene experience and narrate themselves as competent, inventive, and dedicated members of their professional community. Thus, their crime scene alignment work is not only essential for the movement of knowledge (in the form of forensic evidence) through the criminal justice system but is also an integral part of their self-understanding.

Material

The main part of the empirical material for this article comes from an ethnographic study of Swedish crime scene technician training at the NFC, a site where two of the criminal justice system's epistemic cultures – forensic scientists and crime scene technicians – meet for half a year's course work on forensics spread out over a year. My fieldwork at the NFC's training facility took place with the class of 2013, consisting of ten men and ten women. With few exceptions, I observed the lectures, practical exercises, and crime scene examinations, listened to and participated in discussions over coffee and lunch, and conducted informal interviews with both teachers and students. Studying crime scene technician training means that the students' identities as crime scene technicians were still under formation – however, the issue of identity may conversely also be more prominent during its formation than later in the technicians' career. In addition, through their preceding and parallel work at a crime scene division, they were not complete novices; nor did they perceive themselves as such.

Apart from this study, the article also draws on material from an earlier ethnographic study in the Swedish criminal justice system as a whole. Between 2008 and 2012, I studied its collaborative production and use of forensic evidence (Kruse, 2016), moving between a public prosecution's office, a criminal investigation division, a crime scene division, and three units of the NFC. I also observed a number of trials in district court and conducted formal interviews. This earlier study provided valuable insight into the criminal justice system's different epistemic cultures and the seams between them.

Together, the two studies provide a rich material with which to think about the seam between the crime scene and the forensic science laboratory and about how practitioners deal with this – highly undesirable – seam. To do so, I have focused the analysis on the parts of my material dealing with the recovery of traces and their movement from the crime scene to the laboratory as well as on crime scene technician's perspectives on that movement and their role in it. Inspired by Grounded Theory (Glaser and Strauss, 1967), I have analyzed not only broader themes but also

patterns and contradictions of how this recovery and movement was discussed in different contexts and by different people in order to trace both the seams between the two sites and the alignment work they necessitate. The connection between alignment work and crime scene technicians' professional identity that this article discusses emerged through that analysis.

Crime scene technicians and their work

In the Swedish criminal justice system, the scenes of suspected severe crimes are examined by specialized police officers, called crime scene technicians (*kriminaltekniker* in Swedish; literally, forensic technicians). Unlike in other countries, Swedish crime scene technicians are almost exclusively police officers with police training and backgrounds;² typically, they begin their careers as police officers – civilian crime scene technicians are very rare – first working in uniform on the street, and then moving on to different specializations. From there, they apply to transfer to a crime scene division and receive both apprenticeship-like training from colleagues and formal training from the NFC (see Kruse, 2015, 2020a).

Crime scene technicians thus occupy an in-between position in the Swedish criminal justice system: Through their police backgrounds, they bring an understanding of police work and in particular investigative work to their crime scene examination; their training at the NFC gives them insight into the epistemic culture of forensic science and the forensic science laboratory. Organizationally, they are similarly in-between. The NFC – which is formally part of the police but whose employees have civilian, predominantly science backgrounds – is responsible for crime scene work, not only for the crime scene technicians' training but also for crime scene examinations and their quality. The crime scene technicians themselves, however, are under the responsibility of their respective police region.³

Like their counterparts in other countries, Swedish crime scene technicians examine and document crime scenes and recover materials and traces that they – on the investigation leader's decision – send to the forensic labora-

tory for analysis. Crime scene work has garnered only little scholarly attention (exceptions are, e.g., Kruse, 2016: chapter 5; Ludwig et al., 2012; Williams, 2007). Often, scholars have focused on very specific aspects such as how crime scene examiners deal with difficult or disgusting situations (Gassaway, 2007), how they are trained for crime scene work (Wyatt, 2014; Kruse, 2020a), or their personal attributes (Kelty et al., 2011). An exception is Robin Williams and Jason Weetman (2013) who have studied how the results of crime scene work fit into the overall investigation.

In addition to the documentation of crime scenes and the recovery of traces, Swedish crime scene technicians also mediate between the different epistemic cultures of the criminal justice system. This can be necessary because the different epistemic cultures entail at times different understandings of the forensic evidence. For example, for crime scene technicians, forensic evidence is the result of their crime scene work, each piece of it to be seen in the context of the crime scene and contributing to reconstructing what happened there. For the forensic scientists at the NFC who analyze the traces from the crime scene, forensic evidence is a probabilistic assessment for single traces or sets of them; for police investigators and prosecutors, forensic evidence is a tool in assembling more evidence and, eventually, a case that can be prosecuted; and for judges, forensic evidence is one bit, and not in all cases a central bit, in the whole of a case. Also the degree of familiarity with forensic methods and processes differs between epistemic cultures; after all, their collaboration on forensic evidence depends on their different contributions and qualifications. However, this can also sometimes lead to friction – precisely because members of the different epistemic cultures sometimes understand “the same” forensic evidence differently (Kruse, 2016).

To facilitate the collaboration, then, crime scene technicians translate questions from the pre-trial investigation into requests for laboratory analyses, “explain” (as they put it) laboratory results to police investigators and prosecutors, or give them advice on which analyses of which traces from the crime scene could provide useful answers to the investigation's questions (Kruse, 2020a). In other words,

they align the laboratory and the investigation by mediating or translating between them.

Similar phenomena in other criminal justice systems have been reported only implicitly and only from Britain. There, crime scene examiners seem to perform work that could be conceived of as alignment work away from the crime scene. For example, Paul Millen speaks about British crime scene investigators being “the glue between two surfaces” (Millen, 2000: 126), namely those of forensic science and the police investigation, and Dana Wilson-Kovacs mentions how crime scene examiners synchronize and coordinate different actors within an investigation (Wilson-Kovacs, 2014: 771).

The alignment work at the crime scene that this article focuses on has not been discussed in the scholarly literature at all. This scarcity probably has to do with the scarcity of social science studies of crime scene work in general. In addition, different criminal justice systems with different rules for the admissibility of evidence may also regulate crime scene work to different degrees. The Swedish criminal justice system practices freedom of evidence; that is, all evidence is admissible and the court decides whether it is valid and relevant to the case. A criminal justice system with stricter admissibility rules and thus more standardized evidence might conceivably regulate also crime scene work more strictly, granting crime scene investigators less freedom and discretion in their work. This may make alignment work at the crime scene specific for the Swedish criminal justice system (as the NFC, personal communication 2021, thinks); it is also possible that alignment work in other criminal justice systems takes different and perhaps less noticeable forms, contingent on the particular criminal justice system’s organization and circumstances.

In other words, the alignment work that Swedish crime scene technicians perform at the crime scene is shaped by the Swedish criminal justice system’s specific epistemic cultures, the crime scene technicians’ position, and how and against which background their cooperation is organized. The need for comparable alignment work may be present in other criminal justice systems or co-operations, as well – the need to deal with different epistemic cultures interacting

and the limitation of standards can hardly be unique to the Swedish criminal justice system – but *who* performs this alignment work *why* and *how* are shaped by the specific criminal justice system. This alignment work, however, not only facilitates the seamless movement of traces from the crime scene to the laboratory, but is also part of forming and maintaining crime scene technicians’ professional identity.

Professional identity

I use the term *professional identity* very loosely here. I do not aim at a discussion of whether or not Swedish crime scene technicians constitute a profession or an occupation but want to focus on how the crime scene technicians’ alignment work contributes to their sense of work-related identity. Identity, even if understood broadly as a sense of self in relation to others, is a somewhat elusive concept. Much more visible when it is contested or in upheaval (Lawler, 2014: 1ff; see also Elliott, 2015), it always harbors contradictions and tensions: It presupposes inclusion at the same time as exclusion, for example through demarcating the ones entitled to claiming an identity against an ‘other’ (e.g. Hall, 1996); there is tension between how a person perceives themselves – be it in terms of gender, ethnicity, class, or occupation – and how others “read” them (Lawler, 2014: 17f) as well as between identities that are understood as made versus given, for example through kinship (Lawler, 2014: chapter 3) or other characteristics; and a person’s multiple roles and identities raise the question of authenticity and the self (Lawler, 2014: 116ff). Identity is also simultaneously individual and collective: The individual constructs and performs (and presumably perceives) their identity in relation to a community and to existing structures and order (e.g., Elliott, 2015; Lawler, 2014: 160ff).

Here, I want to focus on the positional (Hall, 1996) aspect of doing or performing identity (see also Goffman, 1959; Butler, 1990). I understand identity as a continuous process, as “something achieved rather than something innate, as done rather than ‘owned’” (Lawler, 2014: 4). Performing identity has been connected to speech – for example in the use of sociolects – and narrative (e.g., Ochs and Capps, 1996; Lawler, 2014: ch 2;

Antaki and Widdicombe, 1998; for an overview, see Bamberg et al., 2007) as well as to bodily expression (famously, Butler, 1990) or habitus (Bourdieu, 1977). That is, identity is always under construction, as its performance and its construction are inseparable.

A professional identity, then, is continuously constructed, maintained, and performed in relation to one's work and professional community. Professions as a way of socially organizing and controlling work have been discussed for a long time in the sociology of work (for a comprehensive overview, see Barley et al., 2016: 126-129), in particular in terms of boundary work (Gieryn, 1983) between occupations and the more prestigious professions, with semi-professions (Etzioni, 1969) in between. There seems to be a bit of disagreement about what constitutes professionalism or a profession, but core characteristics comprise restricted admittance to the profession; special (and valued) expertise, also called a 'jurisdiction' or core activities and competencies (Abbott, 1988: 59ff); a connection to science; standardized methods and formalized training; credentialing or licensing; discretion and autonomy; and, typically, the power and status bestowed by a monopoly on valued expertise (e.g., Barley et al., 2016; Everts, 2013).

Swedish crime scene technicians exhibit some of these characteristics: Access to the occupation is restricted through the requirement of being employed by the police (which in turn typically means having been accepted into and graduated from the police academy) and having been sent to and completed the NFC's course. Through the course, crime scene technicians' training and subsequent work is standardized across the country, and the NFC's recent development of a model for crime scene work (Kruse, 2020b) connects this work with science in the form of mathematical-statistical models. Finally, crime scene work at the sites of suspected severe crimes⁴ is only performed by crime scene technicians; thus, they have a jurisdiction in Abbott's (1988) sense.

On the other hand, the technicians' training as well as their crime scene work is the responsibility of the NFC; thus, even though crime scene technicians are involved in the training, their autonomy

is limited. In addition, the NFC's responsibility means that the professionalization of crime scene technicians through the increasing standardization and connection with science is one from the outside.⁵ This is not unique to the Swedish criminal justice system; Wilson-Kovacs, for example, speaks about British crime scene examiners' "professionalisation from above" (Wilson-Kovacs, 2014: 774), i.e., through outside and superior institutions. This, she argues, affects both their autonomy and their self-image or identity – the crime scene examiners she interviewed were content with a supportive position "in the back" (Wilson-Kovacs, 2014: 770), namely a "place ... as technicians, facilitators, practitioners, and (less formally acknowledged) collaborators" (Wilson-Kovacs, 2014: 773). Others have described crime scene examiners as part of and subordinate to (the profession of) forensic science (Robertson et al., 2014). Parallels can be drawn to other groups of technicians (e.g., Barley and Bechky, 1994; Bechky, 2021; Orr, 1996) who also are understood as supporting others' work but not professions in their own right.

However, another strand of scholarship on professions and professionalism argues that the concept of professions in many respects functions as a gatekeeping or rhetoric device for practitioners rather than a useful analytic tool (e.g., Watson, 2002). As for example Christel Backman and Anna Hedenus (2022) demonstrate in their study of recruiters, 'professional talk' – i.e., talk that positions the speaker and their occupational group as professionals – can be a rhetoric strategy for adding weight to one's assessments and enhancing one's position. In this context, the distinction between contextual and formal knowledge and the subsequent secondary status of technicians despite their crucial role in for example producing scientific knowledge (Barley and Bechky, 1994) can be understood in terms of a struggle for power and recognition.

When I speak about crime scene technicians' professional identity, then, I do so loosely and closer to the second strand of scholarship than the first. Unlike Backman and Hedenus's interlocutors who explicitly called themselves "professional," the crime scene technicians I studied did not refer to professionalism – nor may they be, strictly speaking, classifiable as a profession – nonethe-

less, I argue, it is useful to speak about crime scene technicians' *professional identity* (as opposed to, for example, occupational identity) in connection with their alignment work. Their alignment work is, after all, one aspect of their core competence comparable to Andrew Abbott's jurisdictions (Abbott, 1988: 59ff) and an area of (relative) discretion. That is, I want to highlight that this part of crime scene technician identity is not only related to what crime scene technicians *do* at the crime scene but also to how their skill at and understanding of alignment work creates a space that is at least akin to a profession's jurisdiction and discretion. This identity was conveyed and acquired gradually in relation to both the professional community as crime scene technicians and the criminal justice system as a whole.

Performing crime scene technician identity through talking about alignment work

Professional identity can be – and is – shaped, transmitted, performed, and reinforced (as well as changed) in a number of different contexts and conversations. One way is through a shared frame of reference or repertoire – for example embodied in the expertise, methods, and training that constitute some of an occupation's core characteristics. This shared frame of reference can also be established and conveyed through textbooks, for example through the presentation of historical figures (Trawek, 1988: 77ff). One could argue that also scholarly journals are a site where a professional community shapes and negotiates its identity.

Professional identity can also be shaped, maintained, and reinforced through narratives (e.g., Bamberg et al., 2007; Antaki and Widdicombe, 1998). A well-known example are the stories with which, Julian Orr argues, photocopier technicians share experiences and reflect on their work (Orr, 1996). On the surface, these stories are a way of sharing experience (Orr, 1996: chapter 8): by being turned into stories about photocopiers – and the customers that operate them – the individual technician's experience becomes circulatable and thus shared. But, Orr continues, telling stories of particularly difficult repairs is also a way for a

photocopier technician to demonstrate their expertise, "a celebration of being a technician, able to cope with anything that either machines or customers or both can do" (Orr, 1996: 139). In other words, the photocopier technicians' stories are not only a means of exchanging knowledge but also a way of building professional identity and community.

In more theoretical terms, the photocopier technicians narrate *themselves* in their stories. As linguistic anthropologists Elinor Ochs and Lisa Capps point out,

Personal narrative simultaneously is born out of experience and gives shape to experience. In this sense, narrative and self are inseparable. ... We come to know ourselves as we use narrative to apprehend experiences and navigate relationships with others. (Ochs and Capps, 1996: 20f)

That is, through telling stories, the technicians both order their experience and place themselves in relationship to the machines, the customers, and each other.

In the same way, the crime scene technicians I studied narrated themselves both individually and collectively when talking about the cases they called "difficult." Analytically speaking, these "difficult cases" were cases that required alignment work out of the ordinary. The crime scene technicians often turned such cases into highly entertaining stories, much like the stories the photocopier technicians studied by Orr (1996) told among themselves.

One such story – a story about a presumed rape – was told by a crime scene technician student taking the NFC's training. The story was told during a break, in the hallway outside of the classroom, to an audience of her fellow students (and the visiting anthropologist), vividly describing how she and a colleague had been dispatched to an outdoor site. A dog trained for sniffing out semen was brought to the site to help look for traces, and it indicated a possible stain on the foliage of a bush. However, the student continued, the dog got somewhat overexcited at its success and proceeded to lick at the leaves, lapping up the potential evidence-to-be. "So," she concluded, "we swabbed the dog," mimicking pulling out the dog's tongue with one hand and applying a forensic swab to it with the

other. Her performance was met with laughter and questions for details.

There were more stories told during this and other breaks, most prominently one about another presumed rape case with which I have illustrated the necessity of alignment work elsewhere (Kruse, 2021), a case that also involved a dog. This dog had been brought to the site of the suspected crime – a beach – and had marked a spot that was much too large to recover with forensic swabs. So, the technicians scooped up the sand in question with pizza boxes from a nearby restaurant, piled the boxes in the back seat of a car, and drove them across the country to the NFC. Again, the story was received with laughter.

To the students, these and other stories of difficult cases were clearly highly entertaining. They were met with laughter and appreciation – and, like the photocopier stories discussed by Orr (1996) as a way of collectivizing experience and skill, they led to a discussion of how to handle such difficult cases more generally. But the stories did more than share and discuss experience in an entertaining manner. They were also, I argue, a way of shaping, conveying, and reinforcing individual and collective professional identity.

By telling 'war stories' (Orr, 1996: chapter 8) about extraordinary cases – and the tellers' animation as well as the listeners' amusement made it very clear that these were cases out of the ordinary – and about ways of dealing with the difficulties they posed, the crime scene technicians also narrated themselves and their listeners as a community. In these and other stories about difficult cases, the crime scene technician protagonists managed to salvage a possibility of forensic evidence despite the extraordinarily difficult circumstances – in other words, the stories celebrated crime scene technicians' alignment work. In the story of the overexcited dog, swabbing the dog's tongue was the punchline, accompanied by lively gesturing; the story situated on the beach culminated with scooping up sand and chauffeuring the pizza boxes across the country.

What made the stories so entertaining, then, was the combination of an especially unfavorable crime scene and the technicians' unconventional actions; they were an exaggeration, so to speak, of an everyday issue that members of the

community could relate to. Even if the listeners did not have personal experience of stains being eaten by dogs or spread out on sandy beaches, they were still familiar with suddenly coming up against unforeseen and unfavorable circumstances. At any crime scene, traces can overlap or intermingle, conditions can be adverse, or other circumstances can make it difficult to put the forensic scientists' recommendations into practice.

None of the stories reported how the traces were received or whether a laboratory analysis had yielded any usable results. None of the listeners asked – all they wanted to hear, laughingly, were details from the crime scenes. What the stories did, then, was to highlight – in a community of knowledgeable peers – how the crime scene technicians had handled adverse circumstances and managed to preserve a possibility for obtaining forensic evidence further on in the process. Moreover, they did so despite particularly unfavorable circumstances.

Through their extraordinariness, the stories illuminated the limitations of the standards taught by the NFC and highlighted the alignment work of the crime scene technician protagonists. It is probably no coincidence that both stories were of a severe crime that, like other crimes that affect people's life, health, or safety, is given priority and thus warrants extraordinary effort. This effort does not make the standards obsolete or questionable in any way – nor did the students question them, neither in their discussions of the stories nor on other occasions. Even in cases that certainly are not "difficult," crime scene work of necessity contributes to resolving or at least decreasing the tension between the crime scene and the laboratory. In the stories, however, circumstances were so unusual and difficult that they also highlighted the technicians' alignment work as unusual and extraordinary: The protagonists of the stories turned an initially hopeless situation into at least a possibility of forensic evidence later in the process.

Thus, the stories of difficult cases were a way for crime scene technicians to narrate themselves (Ochs and Capps, 1996); that is, to convey, maintain, and reinforce their identity as precisely crime scene technicians. Furthermore, they illustrate that alignment work – although the crime scene technicians did not and would not call it

that – is part of the community's self-image and a source of pride. Being able to deal with difficult cases – at worst salvaging a chance for forensic evidence and at best producing "a shared experience of seamlessness" (Vertesi, 2014: 277) – seems to be an appreciated and admired skill within the community.⁶

Even though these particular stories were told by comparative novices – the students on the course had worked for at least a year at a crime scene division but were far from seasoned crime scene technicians yet – they demonstrated that they already at this early point in their career could narrate themselves as proper crime scene technicians. That is, by telling stories about a core activity, they demonstrated their understanding and appreciation of alignment work.

The alignment work in the stories seemed to have a very personal component, both in terms of skill and in terms of taking pride in the work. It depended on the crime scene technicians' quick reaction (when catching the dog's tongue) as well as their creativity (when using pizza boxes) and dedication (when driving the boxes to the laboratory). Judging from how the stories were told and received, the crime scene technicians performed alignment work willingly, aiming for the common goal of solving crimes, and taking pride in their skill, dedication, and inventiveness. Paraphrasing Orr (1996: 139), the crime scene technicians' stories of difficult cases thus can be said to be a celebration of being a technician, able to cope with any kind of crime scene.

Crime scene technicians not only perform – skilled, dedicated and inventive – alignment work at the crime scene when standards are difficult to apply but also when there are no clear standards for the crime scene technicians to follow. This can happen with orders for uncommon analyses, such as the request for a DNA profile from a glass jar of urine that had come in while I did fieldwork at the NFC. This was a highly unusual trace – clearly surprised, the forensic scientist unwrapping the jar spent some time figuring out what to do with it. Since urine is not a frequently processed trace – probably due to its rarity at a given crime scene as well as its marginal usefulness – there were no standards for how to prevent bacterial growth and thus preserve a chance of producing a DNA

profile. Accordingly, the technician presumably (I was not present at their crime scene examination and thus could not observe and ask them) had recovered the trace as best they saw fit with the equipment they had at hand. In addition, as it turned out later, there was no other potential evidence in the case (a burglary); thus, the technician had tried to make the best out of rather bleak prospects by sending the jar.

An uncommon question does not always require a lot of alignment work and inventiveness, however. In one investigation during my fieldwork at the NFC, the investigative question was whether the stains on a bed sheet could corroborate (or contradict) a plaintiff's statement about being sexually assaulted. The crime scene technician had sent the sheet to the laboratory, together with the salient points from the plaintiff's and suspect's statements. This case was even more disruptive for the laboratory – the forensic scientist assigned the case spent quite some time working out whether and how they could possibly find an answer – but the disruption was due to the uncommon question, not the recovery and transport of the sheet. There, the crime scene technician could extrapolate from existing and familiar standards: when recovering and transporting clothing stained with body fluids, crime scene technicians are taught to let the garment dry before packaging it, so that the fluids containing the potential DNA traces do not rot and the DNA does not deteriorate. In this particular case, the question was not about DNA evidence, but by treating the bed sheet in the same manner, the crime scene technician preserved the stains that the question was about. That is, for them, the bed sheet was in all probability much more routine than it subsequently was for the forensic scientists – the crime scene technician could apply familiar standards.

In all of these cases, the crime scene technicians in question were confronted with a crime scene that did not lend itself easily to the routine recovery and transport of traces. In addition, in all of the cases, the stakes were high: they were severe crimes or there was a paucity of traces, making the few possibilities for forensic evidence more important. This also placed the crime scene technicians in a key role: the result of their

(alignment) work was the foundation of much of the criminal justice system's subsequent work – and thus success – with the case.

Like in the stories of difficult cases, fulfilling this key role required, besides inventiveness, also perseverance and skill. This ties in with other stories that crime scene technicians have told me about what they called "interesting" or "fun" cases, i.e., cases of which they were particularly proud. One case I was told about, by crime scene technicians respectively a prosecutor on separate occasions, was about finding specks of the victim's blood on a black piece of the suspect's clothing where they were very difficult to see: the technician's perseverance and skill had produced evidence that was crucial for achieving a conviction.

A case that only crime scene technicians talked about was one in which they had performed alignment work in the form of putting their knowledge of and skill with a forensic technology to an unusual use in order to produce evidence. In this case, an ambulance had been called to a residence to see to an unconscious woman. The woman later died in hospital, and a medical examination found, among other things, peculiar marks on one of her temples. The examination arrived at the conclusion that her unconsciousness and subsequent death were due to brain injury that in turn was caused by violence to the temple. Her partner was suspected, but there was no evident weapon. So, the crime scene technicians had searched the house and had found a pitcher whose rim pattern reminded them of the marks on the body. The way they told the story, it took quite some time to find the pitcher, not because it was hidden – it was in plain sight on the nightstand – but because there were, like in every household, many more likely objects for inflicting harm on a person.

However, it was one thing to suspect that the pitcher was the weapon and another to turn this suspicion into evidence. This was where the technicians' perseverance and imagination were coupled with their inventiveness: They brushed the pitcher's rim with fingerprint powder,⁷ pressed it against a volunteer's temple, and photographed the sooty marks left there. One of the photographs, they said, had been used in court and had

critically contributed to convicting the partner of killing the woman. In other words, the crime scene technicians had used their forensic skill and knowledge in new ways to solve a particular problem in a specific investigation – just as the technicians in the students' stories had done.

These were not narrated as difficult cases that had required extraordinary alignment work with uncertain outcomes, but as cases in which perseverance and inventiveness had been instrumental for convictions. Still, the qualities the narratives celebrated were the same as in the stories about the difficult cases, namely the skill, inventiveness, and dedication that make alignment work successful.

With their stories, crime scene technicians thus narrate themselves and their colleagues as skilled, inventive, and dedicated professionals who can salvage a possibility of forensic evidence and, by extension, of a legally secure conviction even from a seemingly hopeless crime scene. In other words, the ability (and willingness) to perform alignment work is narrated as a core component of their professional identity. Through focusing on a part of work that is left to the crime scene technicians' judgment and initiative, the narration also emphasizes their profession-like discretion as a part of that identity.

Unlike the invisible work in mitigation of the inevitable misfits between standards and individual needs or circumstances that Star (1991) discusses in terms of suffering – in her narrative, the misfits between for example a restaurant's standardized food and the consumer's individual body are dealt with through the allergic person's additional work of monitoring the food and scraping off onions to produce a passably seamless restaurant experience – crime scene alignment work does not appear to be dispiriting to practitioners. Here, misfits between standards for the recovery of traces and the circumstances of individual crime scenes do lead to additional work for the crime scene technicians, but misfits are also opportunities for demonstrating one's skill and performing oneself as a competent crime scene technician. Particularly difficult alignment work can be shared and celebrated (cf. Orr, 1996: 139) collectively through stories.

The same alignment work, however, is not always visible to or appreciated by others in the criminal justice system. As I will discuss in the next section, the appreciation in relation to the non-appreciation of alignment work is also a way of creating or maintaining a community – a community of those who are familiar with the challenges posed by the misfit between recovery standards and unstandardizable crime scenes, and who thus appreciate and are entertained by stories about alignment work out of the ordinary.

The (non-)appreciation of alignment work

As Stuart Hall (1996) points out, the inclusion inherent in a particular identity or community always goes hand in hand with the equally inherent exclusion of others who do not belong. To put it differently, identity work also has a dimension of boundary work (Gieryn, 1983), that is, of demarcating what or who does or does not belong.

In the case of the crime scene technicians I studied, crime scene alignment work and its appreciation constituted one such area of demarcating belonging: The crime scene technicians' inventive alignment work at the crime scene is not always appreciated by others, and thus this appreciation is something that is shared within the profession but not necessarily with others. In addition, the friction that at times arises around this alignment work, especially when it does not quite succeed in achieving seamlessness, might emphasize the boundary.

To be clear, the inventiveness itself that crime scene technicians celebrate in their stories about difficult cases seems to be a defining and valued quality for Swedish crime scene technicians also in the eyes of others. One crime scene technician, for example, who was retired by the time of my fieldwork, was famous (i.e., known to people in the criminal justice system other than his immediate colleagues) for inventing and developing some of the routinely used forensic products. He was known and referred to by his nickname – a diminutive of his first name – and was talked about with admiration by both the crime scene technicians and forensic scientists I met when studying crime scene technician training. One forensic

scientist for example described him with clear appreciation as "a real Gyro Gearloose." That is, by likening him to the Disney character, the speaker acknowledged him as an inventor and demonstrated her appreciation for his inventiveness and his contributions to forensics and, by extension, to criminal justice. While the students were not expected to become inventors on a par with him – he was clearly considered exceptional – they were expected to be able to cope with the unexpected at a crime scene and to adapt tools and methods if necessary. In other words, a certain amount of crime scene alignment work (although my interlocutors would not use the term) is not only accepted from but also appreciated and sometimes celebrated in crime scene technicians.

This expectation seems particular for the Swedish criminal justice system (NFC, personal communication 2021); in a different criminal justice system, if alignment work is at all possible and accepted, it may play a different role for its crime scene investigators' self-understanding, such as the British crime scene examiners who described themselves as "backroom boys" who happily "let somebody else take the glory" to Wilson-Kovacs (2014: 770). However, the *degree* to which crime scene alignment work is appreciated seems to vary between the epistemic cultures of the Swedish criminal justice system. That is, when it comes to inventiveness, the crime scene technicians' self-image seems to be at least in part picked up by others and ascribed back to them, as for example in the Gyro Gearloose remark. However, when it comes to inventive alignment work, the appreciation the crime scene technicians showed for stories of handling difficult cases would not necessarily have been shared outside the profession.

One factor in the non-appreciation of highly inventive crime scene alignment work is its relative invisibility,⁸ especially when the crime scene technicians succeed in achieving seamlessness. As long as the traces arrive at the laboratory in the expected form, the forensic scientists who receive the traces may never know or suspect that there has been a need for alignment work. To other epistemic cultures in the criminal justice system, successful crime scene alignment work is similarly invisible: when crime scene technicians

deliver traces or evidence that fit seamlessly into others' practices (e.g., the photograph of the sooty mark), other practitioners in the criminal justice system only see the results of the technicians' work – and may have an opinion on these results – but not the work itself.

This invisibility has to do with crime scene work being performed out of view. But it also has to do with the criminal justice system's different epistemic cultures: forensic scientists, police investigators, and prosecutors have – not surprisingly – little experience of crime scenes, especially of crime scenes that have not yet been processed by crime scene technicians. Thus, they may not be aware of the variability of crime scenes and of the work required to align that variability with the laboratory. When the crime scene technicians' alignment work has been successful in producing a shared experience of seamlessness it renders the seams invisible and thus also the necessity of the alignment work itself. Seeing the technicians' alignment work requires intimate knowledge of crime scene work, or at least close contact to the particular case (the prosecutor who talked about the blood specks had led the pre-trial investigation of that case).

In consequence, both the performance of and the necessity for alignment work are largely absent from official descriptions and understandings of crime scene technicians' work, as well as from their training (see Kruse, 2020a), making crime scene alignment work both unofficial and solely the crime scene technicians' concern. This invisibility also means that the ability to see and appreciate alignment work at the crime scene is, if not exclusive to crime scene technicians, at least distinctive to them. This may also play a part in why the crime scene technician students told their 'war stories' about crime scene alignment work in the hallway during a break: This way, they told the stories to an audience of connoisseurs as well as in a context that was just as unofficial as this particular kind of alignment work itself.

The non-appreciation of highly inventive alignment work is not only due to its invisibility, however. It also has to do with a concern that too much inventiveness – i.e., departure from standards – may jeopardize legal security. In its capability of being responsible for crime scene

work, the NFC wants, in the interest of quality and legal security, this work to follow the standards it has developed. These standards have been developed because traces recovered in accordance with them are best suited to laboratory analysis, and traces recovered in a different way may result in inferior or less evidence. In addition, the NFC emphasizes that minimizing variation between technicians – i.e., standardizing crime scene work – is also a matter of quality and legal security and thus not to be taken lightly.

In other words, the NFC has reasons to emphasize adherence to rules also when crime scene technicians encounter crime scenes that resist rules. In addition, one person's successful alignment work may well turn into another one's problem. In the case involving the pizza boxes, for example, the misfits (cf. Star, 1991) between the standards and the circumstances of the crime scene were not only glaringly obvious to the crime scene technicians, but they were also so severe that the standards could not resolve all the tension between this particular crime scene and the laboratory. That is, even with alignment work, the crime scene technicians could not fully attain the experience (or perhaps illusion) of seamlessness (cf. Vertesi, 2014): Even though the student telling the story did not mention the NFC's reaction to the boxes, it is reasonable to assume that the forensic scientist receiving the boxes noticed that they did not conform to the standards for recovering presumed body fluids.

This remaining seamfulness then affected the forensic scientists and the laboratory: Transforming traces into DNA profiles is usually a highly automated and high-throughput process – a process that is facilitated considerably by traces arriving in standardized form. Traces that arrive in non-standard form disrupt laboratory routine and turn the usually quick and routine work of entering – properly recovered – traces into the automated process into time- and thought-consuming work. In other words, if the boxes were to result in a DNA profile, they must have required quite some alignment work of the forensic scientist.

Also, the jar of urine clearly disrupted routine work at the NFC: Since it didn't correspond with the standard for DNA traces, either – that would be a forensic swab in a paper bag – it also required

alignment work to be brought into the to a large part automated (and thus highly standardized) trajectory for DNA traces. In addition, the forensic scientist assigned to the case wondered about the potential usefulness of the urine as a source of DNA – there are not a lot of cells in urine, she explained, so, at least at the time of my fieldwork, success required either “a bucketful of urine,” as she put it, or the “good luck” that the donor suffered from a urinary tract infection. Also, she added, by now there probably had been bacterial growth that had “eaten up” any DNA that might have been present. Accordingly, she telephoned the crime scene technician in question to discuss the case and, as it turned out, its lack of other traces before doing anything with – i.e., spending resources on – the jar.

In other words, remaining seams between the crime scene and the laboratory require the forensic scientists assigned the seamful traces to perform alignment work of their own to align the traces with the laboratory process. The resources this consumes, mainly in the form of the forensic scientist’s time, are then not available for other work in the already pressed for time laboratory. Thus, crime scene alignment work that is perceived as too inventive – i.e., departing too far from standards – may lead to frictions.⁹

In other words, different epistemic cultures may perceive crime scene alignment work quite differently – in one context, it can be celebrated as an inventive and dedicated practice of salvaging a possibility of forensic evidence in the face of very adverse circumstances, while it in another can be perceived as a disruption and a danger to legal security. Both perceptions are equally true, but their incompatibility also underlines the different epistemic cultures of the criminal justice system. The occasional frictions around recovered traces may be a contributing factor to telling stories about difficult cases without outsiders present – the other crime scene technicians could be expected to enjoy the stories, whereas the forensic scientists might have reacted differently. This may also have contributed to the stories’ ending with the recovery and transport of the traces – both tellers and listeners must have been aware that mentioning or asking for the NFC’s reaction might have detracted from the celebra-

tion of alignment work. Instead, the listeners, through showing their appreciation and asking the right questions, provided a knowledgeable and supportive audience, placing the stories and the alignment work they celebrated in a professional community.

In this way, crime scene alignment work and its appreciation can delineate a rather clear boundary between otherwise close epistemic cultures. Thomas Gieryn (1983) discusses boundary work in terms of demarcating ‘science’ from ‘non-science’ and securing resources as well as authority and prestige. Here, the boundary is connected to identity rather than to more tangible resources, but since identity is (also) constructed and performed through encountering and relating to others (e.g., Hall, 1996; Lawler, 2014: 138ff), the friction around alignment work at the crime scene can further strengthen professional identity: Crime scene technicians can thus be described as not only members of a community that is skilled at this kind of alignment work but also as members of the community in the criminal justice system that understands and properly appreciates that work – in contrast to those that do not. The occasional friction related to the recovery of traces may further underline differences and thus strengthen this identity – a shared experience of opposition, even if it is occasional and in the form of non-appreciation, can strengthen a community’s identity. That is, since identity is relational, occasionally fraught external relationships can lead to increased internal cohesion.

Conclusion: Crime scene alignment work, professional identity, and the movement of knowledge

The crime scene technicians’ alignment work at the crime scene is not only a way of facilitating the collaborative production of forensic evidence by dealing with the seams (Vertesi, 2014) between epistemic cultures (Knorr Cetina, 1999) and inevitable misfits (Star, 1990) between recovery standards and individual crime scenes. It is also part of their professional identity; alignment work is also identity work, performing oneself as a skilled member of a professional community.

Alignment work and its entanglement with professional identity are not specific for work at crime scenes. A connection between a profession's 'jurisdiction' (Abbott, 1988: 59), that is, what is perceived as its central expertise and competence, and its identity applies to many occupations and professions. So does drawing on themes of professionalism (such as skills, expertise, or discretion) to position oneself or one's occupation in relation to others (e.g., Watson, 2002; Backman and Hedenus, 2022). As discussed above, professionals both in- and outside the criminal justice system perform different kinds of alignment work, such as the forensic scientist trying to process the jar of urine. In a similar vein, Olarte-Sierra and Perez-Bustos (2020) and Schwartz-Marín et al. (2015) discuss how forensic geneticists in the Colombian criminal justice system carefully align different epistemic cultures and logics in their work (although they do not explicitly speak of alignment work). Also the contributions to this special issue demonstrate a breadth of alignment work in a variety of contexts. In other words, (an experience of) seamlessness (Vertesi, 2014) may be desirable for many collaborations, and the way in which a collaboration deals with the seams and how dealing with them fits into and affects identities and relationships is specific to each particular collaboration. In the Swedish criminal justice system, the seam between the crime scene and the forensic laboratory is dealt with through formalized standards for recovering traces at the crime scene that are supported and maintained by the crime scene technicians' inventive, informal, and often invisible alignment work.

The crime scene technicians' alignment work at the crime scene demonstrates, that such work may be invisible but can still have a tangible effect on the collaboration between different epistemic cultures. Friction around (too inventive) alignment work can for example, in the short run, cause additional work for others or evoke concerns for legal security or other shared goals. In a longer perspective, these frictions and concerns may negatively affect the relationships that shape the cooperation. The crime scene technicians' alignment work at the crime scene thus also suggests that the movement of knowledge may well depend on and be shaped at least in part by informal and

unregulated circumstances and work: Crime scene alignment work is not part of official descriptions and understandings of crime scene technicians' work or their training (see Kruse, 2020a); yet it is a constituent part of their professional identity which, in turn, also shapes the collaboration with other professions. In other words, a rather personal matter – namely one's (professional) identity – is one of the many components that together stabilize knowledge as it is being moved. Other personal or informal matters may be similar components in other contexts of moving knowledge.

My discussion of crime scene alignment work thus contributes to STS discussions of the movement of knowledge through showing how different epistemic cultures (Knorr Cetina, 1999) can collaborate and move knowledge stably (cf. Morgan, 2011) between them despite their differences. It does so through nuancing the notion of alignment work by showing how it not only facilitates moving knowledge but also shapes professional identities and through them interprofessional relationships and makes them part of the movement of knowledge. I thus also show how this movement depends on factors that elude formalization and regulation – professional identity, being (also) a personal process, is both dynamic and difficult to prescribe. In this, the nuanced notion of alignment work provides a lens through which to trace not only invisible alignment work (Kruse, 2021: 5), but also its entanglement with such elusive matters as identities and relationships.

In other words, while the crime scene alignment work discussed in this article is specific for Swedish crime scene technicians, it draws attention to how invisible work associated with the movement of knowledge shapes professional identity and how that identity, in turn, again affects the movement of knowledge, albeit perhaps indirectly. Using the notion of alignment work to trace both the work of stabilizing knowledge and how this work relates to professional relationships and identities can contribute usefully to understanding the movement of knowledge in other contexts, as well.

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Notes

- 1 Until 2015, it was called the Swedish National Laboratory of Forensic Science (SKL).
- 2 According to my interlocutors in the Swedish criminal justice system, there are a very few civilian crime scene technicians, most of them with a background in photography. However, current political ambitions to extend the police force may lead to more civilians being hired by the Police Authority – beyond the civilian investigators that today work alongside officer investigators – to fill positions that can be perceived as not strictly requiring a police background. This may also mean more civilian crime scene technicians in the future, which would reasonably change the profession's dynamic and self-understanding.
- 3 The Swedish police is divided into seven such regions.
- 4 The sites of crimes such as break-ins into cars or basements are often examined by "regular" police officers to conserve resources.
- 5 For more about crime scene technicians as a possible profession and their professionalization, see (Kruse, 2020a).
- 6 The question of whether the swabbed dog tongue or the pizza boxes led to usable forensic evidence was not part of the stories: the stories celebrated the inventiveness of the crime scene technicians at the site. This may have to do with crime scene technicians only rarely finding out what happens in a case after their reports are submitted.
- 7 Although this was not mentioned in the narrative, it is safe to assume that they did so after the pitcher had been processed for possible DNA and fingerprint traces.
- 8 Not all alignment work that crime scene technicians perform is invisible; aligning the reading of crime scene reports with their intended meaning by testifying in court (see Kruse, 2021: 12f), for example, is both visible and very public alignment work.
- 9 These frictions may, for example, take the form of the crime scene technician who sent in the trace getting their "fingers spanked" by the forensic scientist for not conforming to standards, as a crime scene technician student mentioned having happened in a case she had been involved in. She talked about receiving that telephone call in a light and joking tone, but it was clear that she had been (and still was) a bit embarrassed by the call and did not wish to receive more such calls in the future. A – probably very polite – telephone call may not sound like a harsh consequence, but in a work environment that values smooth interaction and mutual respect of competence, this kind of friction is still uncomfortable.