

The 'Opinionization' of Fingerprint Evidence

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Every man has a right to his opinion, but no man has a right to be wrong in his facts.
(Bernard Baruch)

Perhaps the seminal moment in the now celebrated Shirley McKie fingerprint misidentification case that has preoccupied Scotland from 1997 until the present came in 2002 when Justice Minister Jim Wallace told the press that a fingerprint identification is 'not an exact science' (*BBC News*, 2002a). Shirley McKie, an officer in the Strathclyde Police Department, had been assigned to investigate the murder of Marion Ross at her home in Kilmarnock. McKie was not authorized to enter the crime scene, and she denied that she did. But four Scottish Criminal Records Office (SCRO) latent print examiners identified her as the source of a latent print found on a doorframe inside the house. A builder named David Asbury was eventually convicted of the crime, based primarily on the latent print evidence. With the Asbury conviction hinging on the latent print evidence, McKie was eventually charged with perjury. McKie sought assistance from other experts, and a British examiner and two American examiners concluded that she was not the source of the print. The same experts and others later concluded that the identification of Asbury, made by the same

four SCRO experts, was also false, and his conviction was quashed (Jofre, 2002). McKie was acquitted, but her and her father's demands for investigations, apologies and compensation from the government have embroiled Scotland in what is now a decade-long scandal that shows few signs of abating (McKie and Russell, 2007).

Wallace's remark prompted widespread outrage. One member of Scottish Parliament called Wallace 'scientifically illiterate', said his remark was 'the forensic equivalent of the flat earth theory' (*BBC News*, 2002a), and said that he had turned Scottish justice into 'a laughing stock throughout the world' (*BBC News*, 2002b). Critics of the government read Wallace's remark as an exercise in scandal management, a cynical attempt to minimize or even excuse the apparent incompetence, and perhaps even malfeasance, on the part of the Scottish Criminal Records Office. Members of the community of latent print practitioners, on the other hand, read the remark as a direct attack on what was perhaps their most cherished epistemic artifact: the perceived 'facticity' of fingerprint identifications. A British latent print examiner replied 'It is not opinion. It's a fact in black and white. Either it is or it isn't or it's inconclusive, nothing else' (*BBC News*, 2002b).

However, Wallace's remark may also be read as an understandable response to the epistemological trap in which he found himself. This trap was composed primarily of the extraordinarily strong epistemological claims—to 'facticity', to 'reliability' and even

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to ‘infallibility’—that had by then surrounded the practice of latent print identification for nearly a century. If fingerprint identifications were indisputable facts, independent of operator judgment, and immune to error, then the apparent dual misidentifications in the Ross investigation could only be explained by gross incompetence or even fraud on the part of the SCRO. If on the other hand, the misidentifications were simply entirely predictable, if regrettable, outputs of a normally functioning system of biometric identification relying on biological markers as perceived by experientially skilled human operators—in essence, ‘normal accidents’ (Cole, 2005; Perrow, 1984)—then blame would fall not on the SCRO, but rather on the hyperbolic nature of the claims that had historically surrounded latent print evidence. While supporters of the McKies saw Wallace’s remark as a cynical effort to defuse scandal, latent print proponents saw it as choosing the latter poison—that is, of adopting the short-sighted strategy of sacrificing the epistemic authority of the entire discipline of latent print identification for the short-term goal of managing the scandal that was rapidly enveloping the SCRO (McDougall, 2005; McKie and Russell, 2007: 252). One MSP noted that Wallace’s remarks would have ‘far-reaching implications’ for all past criminal convictions that rested ‘on the basis of fingerprinting being an exact science’ (*BBC News*, 2002a). On the other hand, critics of the McKies viewed the reaction against Wallace’s characterization as an equally cynical effort to preserve their legal action against the government, given that an admission that fingerprint identifications are opinions ‘would immediately abort their case for monetary compensation’ (Innes, n.d.).

Although there is nothing admirable about endeavoring to protect government officials from accountability, Wallace’s

characterization of latent print evidence as ‘opinion’ was, in many senses, correct, to the extent that any meaningful distinction can be drawn between an ‘opinion’ and a ‘fact.’ Similarly, it will be difficult for anyone with serious training in either science or social studies of science to take seriously the idea of being offended by being *denied* the label ‘exact science’, a term that is at best a caricature and more likely an oxymoron—a term, moreover, that is most commonly invoked as a disavowal in precisely the way Wallace used it: ‘*not* an exact science’. Few, if any, disciplines even claim to be ‘exact’ sciences anymore. Indeed, one report on the McKie case noted that: ‘While there is a view that fingerprint identification is a science, it is not’ (Mackay, 2000: 36). Wallace’s remark, however, ran up against a long history of rhetoric that has obscured this situation, rhetoric that had enveloped not only the lay public and criminal justice system actors, but even the practitioners of the technique themselves. As Euan Innes, head of the Scottish Fingerprint Service (SFS) noted:

... it is evident that a majority of experts within the SFS believe that they do not present expert *opinion* on identification but in fact present the identification as fact. It would seem that a majority of our FP [fingerprint] experts agree that fingerprint identification properly carried out and verified is an absolute fact not an opinion. (n.d.)

Wallace’s characterization of fingerprint identifications as opinions was subsequently supported in Innes’s report (n.d.). Latent print examiners who supported the McKies reacted with outrage to this report, calling it ‘astonishing’ and ‘outrageous’. Critics suggested that Innes’s position ‘will put the whole of forensic science at risk’, ‘undermines the reliability of fingerprint evidence in Scottish courts’,

‘makes court cases involving fingerprint evidence very dodgy indeed’ and was ‘opening a Pandora’s box’ (McDougall, 2005).

Despite the outrage that followed Wallace’s remark, the Nuffield Report (Nuffield Council on Bioethics, 2007) quietly normalizes Wallace’s characterization of fingerprint evidence. Thus the Nuffield Report may be seen as the final step in what we might call the ‘opinionization’ of fingerprint evidence, especially when viewed in conjunction with a recent statement by the International Association for Identification to a US National Research Council Committee that: ‘Fingerprint examiners state their conclusions as a matter of opinion’ (International Association for Identification, 2007a).

In the United States, the gauntlet regarding ‘fact’ and ‘opinion’ in relation to fingerprint evidence was laid down quite early on. In the first American fingerprint case that generated a published precedent, in 1910, expert witness Edward Foster, chief of the Bureau of Identification of the Canada Dominion Police (who had been trained in fingerprinting by Detective John Ferrier of Scotland Yard), answered the question, ‘In comparing these it is your opinion that the lines in those photographs were made by the same person?’ with the rejoinder: ‘I am positive. It is not my opinion’ (*People v. Jennings*, 1910). Twenty years later, however, the Iowa Supreme Court ruled ‘that while an expert may be permitted to express his opinion, or even his belief, he cannot testify to the ultimate fact that must be determined by the jury’ (*State v. Steffen*, 1930). Although the court’s ruling appeared to ban latent print examiner testimony as to the ‘ultimate fact’ (the fact to be decided in the case), it did not really resolve the fraught issue of whether a fingerprint identification was an opinion or a fact. Indeed, the dissenting judges argued that fingerprint evidence was at once ‘opinion evidence’ and

‘a question of fact for the consideration of the jury’. And, indeed, US courts since then have generally allowed latent print examiners ‘to testify about identity as if it were fact, not opinion’ (Mnookin, 2001: 30).

This ambiguous formulation points to a fundamental difficulty with legal evidence, like fingerprints or DNA, derived from what the Nuffield Report calls ‘bioinformation’, data from which bodily presence may be inferred from biological traces. Fingerprint evidence is an expert opinion (‘in my expert judgment, the print from the crime scene and the print from the suspect originated from the same source finger’) that impinges on a physical fact (the suspect either touched the object or did not). The *Steffen* dissenters were probably correct in assigning the rendering of opinion to the expert and the determination of fact to the jury. As Innes (n.d.) notes, if fingerprint identifications were facts, then cross-examination would be ‘irrelevant’. In the UK, this formulation also finds support in the case *R v. Buckley*, which holds that fingerprint evidence ‘is evidence of opinion only’ (*R v. Buckley*, 1999). Historically, however, latent print examiners have tended to blur this boundary, as evidenced by their habit of testifying that the suspect ‘made’ the crime scene print (Cole, 2007).

The opinion solution

The Nuffield Report presents itself as dealing with ‘the proper balance between police powers and individual rights to liberty autonomy and privacy’ (Nuffield Council on Bioethics, 2007: v). The report acknowledges that it addresses only a small portion of the larger issues raised by the rapidly increasing exploitation of biological information that increasingly characterizes the contemporary ‘surveillance society’ (Van

Der Ploeg, 2003). Among many possible applications, including medicine, migration, security and consumption, the report focuses on criminal justice. Among many possible modalities, including iris, voice, RFID, smart cards, and so on, the report focuses on two biometric applications: fingerprinting and DNA. But the choice of technologies was far from arbitrary; the report says:

We have confined ourselves to an old (fingerprinting) and a new (DNA) technology in the context of criminal justice, both to keep the discussion within manageable proportions, and because this is currently the area of greatest controversy, but of little informed, in-depth study. Our aim is to provide a sound, principled analysis based on the available evidence. (2007: v)

Indeed, the report suggests that DNA and fingerprinting will be the dominant modes of bioinformation, both currently and in the foreseeable future. While the importance of DNA is well understood (Lazer, 2004), the report notes that fingerprinting will also remain important:

The advent of DNA technology, with its discriminatory power and its lesser reliance upon human interpretation, has not diminished the use of fingerprints. Not only are they still used more frequently than DNA, but the development of mobile technology and of IDENT1, with its future capacity and capabilities, mean that fingerprints remain, and are likely to continue as, the dominant type of bioinformation in use in the criminal justice system. (2007: 7)

Given these assertions of the importance of fingerprinting, the asymmetry of the report

is striking. The report's discussion of fingerprinting is dwarfed by its discussion of DNA. This is particularly apparent in the chapter of greatest relevance to our discussion here, on the use of biometric identification evidence in criminal trials (2007: ch. 5).

The trial is, of course, 'where the rubber meets the road' (Cole, 2007) in the use of forensic evidence. The entire process of collecting, databasing and analyzing biometric evidence has as its *telos* the enacted or threatened testimony of an expert witness at a trial. And yet, there has been perhaps less attention than there could be to the actual words spoken in this testimony (Cole, 2007).

The Nuffield Report's discussion of the use of fingerprint evidence at trial is admirably succinct. It echoes the Wallace/Innes/*Buckley*/International Association for Identification (IAI) formulation that 'Expert evidence that identifies marks linking an accused person to a scene of crime is evidence of opinion' (2007: 68). The report then advocates that:

... fingerprint evidence should be presented in a similar way to the presentation of handwriting evidence... We recommend that in presenting their opinion regarding a positive match or otherwise to the investigating officer, prosecution authority or court fingerprint experts should make it clear that their conclusion is always one of expert judgment, and never a matter of absolute scientific certainty. (2007: 68)

It is this statement which suggests that the Nuffield Report, along with the recent IAI position statement (IAI, 2007a), might be read as a final step in the march toward the 'opinionization' of fingerprint evidence. If this is the case, however, it becomes necessary to ask whether 'opinionization'

resolves the problems revealed by what the report calls the recent ‘critical scrutiny’ (Nuffield Council on Bioethics, 2007: 7) of fingerprint evidence, scrutiny the report occasionally alludes to but never directly discusses.

To be sure, the ratcheting down of the expert’s language from ‘fact’ to ‘opinion’ must be viewed as a positive change. There are several problems with presenting a latent print examiner’s conclusion to a jury as a ‘fact’. First, it seems to extend beyond the purview of the expert witness, not on old-fashioned procedural grounds, which barred witnesses from speaking to the ‘ultimate fact’, but on more fundamental epistemological grounds. A forensic expert witness should be expected to tell the jury about the results of some sort of scientific analysis.¹ Those results may show that a crime scene sample and a sample known to come from a suspect are consistent with one another and therefore may have come from a common source. The further inference, that the suspect is the source of the crime scene sample, is not a product of the analysis. Rather, it is an inference made from the results of the analysis in conjunction with other facts in the case and, therefore, is properly within the purview of the jury, not the expert.

Second, fingerprint identification is, in fact, a process of subjective, experience-based observation. Every stage of the pro-

cess is essentially the rendering of an experience-based opinion without reference to measurements or even to documentation,² including:

1. the determination of whether a pair of characteristics in the latent print and the known print are to be considered ‘consistent’;
2. the determination of whether a discrepancy between the latent print and the known is to be considered ‘explainable’ (that is, susceptible to explanation that would prevent the discrepancy from becoming grounds for immediate exclusion, such as a printing artefact or the overlay of the latent on top of another latent print that might account for the inconsistent detail) or ‘unexplainable’; and
3. the determination of whether the amount of purportedly consistent detail is ‘sufficient’ to warrant a conclusion that the arrangement of details is so rare that it could only appear once among the population of friction ridge skin in the universe (thus allowing for the conclusion of ‘individualization’, that all possible sources in the universe other than the suspect can be eliminated as potential sources of the latent print).

Third, the characterization of fingerprint identification as a ‘fact’ or an ‘exact science’

1 In using the term ‘scientific’ here, I am not intending to engage in the well-worn debates over whether fingerprinting conforms to ‘the scientific method’, debates that are doomed to founder on the familiar difficulties of defining that ‘method’ (Cole, 2004). Instead, I am accepting the loosest possible definition of science, as ‘that which is part of the investigator’s effort to gain knowledge about the world’—in short, the product of the physical or metaphorical ‘laboratory’. Under this definition, the conclusion that the defendant ‘made’ a particular print is ‘not science’—it is not a product of scientific investigation, but rather an inference made from those investigations in conjunction with other facts.

2 Currently some efforts are being made toward increasing documentation. Despite these efforts, it remains safe to say that, historically, there was almost no documentation of latent print identifications, and even today it remains rare. The absence of documentation makes cases of disputed identification, like the McKie case, particularly fraught because it becomes difficult to determine what led the original examiners to what would become a disputed conclusion. Indeed, one of the interesting things about the McKie case is that it generated a host of rarely seen *documented* conclusions, in which various examiners laid out in detail their reasons for reaching their conclusions, rather than merely couching them as opinions based on training and experience.

would seem to preclude the possibility of error. Obviously this is misleading, as the McKie case and others demonstrate (Cole, 2005). It is this attribute of the ‘fact’ formulation that seems to have most bothered the Nuffield Council, which deplored the fact that ‘fingerprint officers continue to assert that if three experts agree on a match then it is a “100% correct” match’ (2007: 68). As the report notes, ‘Such a conclusion may not in fact be justifiable.’

Finally, the McKie case itself demonstrates an indeterminacy surrounding fingerprint evidence that supports characterizing it as ‘opinion’. Although the vast majority of examiners who have viewed the evidence appear to hold that the attribution of the doorframe mark known as Y7 to McKie was erroneous, the attribution remains disputed. Recent revelations have shown that there was dissent in both camps—there were examiners within the SCRO who doubted the McKie attribution, and examiners retained by both McKie and Asbury who believed they were the sources of the latent prints attributed to them (*McKie v. Strathclyde Joint Police Board*, 2003; Russell, 2005). Although the underlying events surely have a ‘factual’ nature—McKie either touched the doorframe or she did not—these ongoing disputes cast doubt on the capacity of expert judgments about these events ever reaching ‘factual’ status.³

For all these reasons, ‘opinion’ is certainly a better characterization of fingerprint evidence than is ‘fact’. However, it is still not clear that the difficult issues raised by the

use of bioinformation in criminal trials are entirely resolved by opinionization. To begin with, there is a sense in which ‘opinion’ can become an all-encompassing shield that deflects all accountability. For example, ‘It turns out I was wrong about that? Well, it was just my opinion all along.’ As Wallace’s critics have noted, jurors who have sentenced people to prison, or even death, over the past century based on latent print evidence might be taken aback by the bland admonishments that it is ‘not an exact science’ and just an ‘opinion’. Indeed, as Iain McKie himself noted, when the latent print examiners testified at Shirley McKie’s trial, latent print identification was, as it usually is in criminal trials, ‘evidence of fact’. Only in the dispute over possible misidentifications and misconduct did it become ‘opinion’ (McKie and Russell, 2007: 167). Although public witnesses can be criticized for uttering falsehoods in the guise of ‘fact’ (Latour, 2005: 18), the testifier seems less morally culpable for being ‘wrong’ if the conclusion was just an ‘opinion’ (Wells, 1992).

As a practical matter, however, as Innes noted above, most latent print examiners believe that their conclusions are ‘facts’ and, if transcripts of their testimony are any indication, this belief is compatible with linguistic framings in terms of ‘opinion’ at least in the US. Indeed, it would appear that latent print examiners do not readily distinguish between expressions of ‘opinion’ and ‘fact’, but rather move seamlessly between them (Cole, 2007).

3 Wertheim, in a report on the McKie case, argues that fingerprint evidence is ‘opinion only in the sense that “opinion” in court relies on a different meaning of the word ‘opinion’ than that used in normal conversation’. Wertheim bases this on the binary factual nature of the underlying event: ‘if two [fingerprint] scientists present different “opinions” in court, one is correct and the other is quite simply wrong’ (Wertheim cited in McKie and Russell, 2007: 276). But the binary factual nature of the underlying event is not necessarily inconsistent with an expert opinion on physical evidence which pertains to this event being properly framed as an ‘opinion’. Indeed, Wertheim’s argument would seem to deny altogether the probabilistic nature of expert evidence.

'Bioinformation' as evidence

There is more to it than that, though, and to see what it is we need look no further than the remainder of the Nuffield Report chapter on trial testimony, which is devoted to DNA evidence. As the report notes, the presentation of DNA evidence at a trial has been characterized by 'difficulties' (2007: 72) both historically and even in the present day. Specifically, 'What can be properly inferred from forensic bioinformation evidence may be either exaggerated or understated by those who are called upon to make a judgment based upon such technical evidence' (2007: 68). The report particularly emphasizes the necessity of 'reporting how rare the profile was in the population (known as the "random occurrence ratio")' (2007: 69), or in the US the 'random match probability' (RMP). Even the reporting of the random occurrence ratio, however, can engender 'difficulties with the presentation of complex statistical information' (2007: xix). The most pernicious, in the Nuffield Council's view, is the 'prosecutor's fallacy' (Thompson and Schumann, 1987), in which the barristers or jury conflate the random occurrence ratio with the probability of innocence and which, the report contends, 'has bedevilled the use of DNA evidence in courts' (2007: 70). Still more 'difficulties' can be generated by mixed samples, the use of low copy number DNA, and other complications (2007: 71).

What is astonishing about the juxtaposition of this sophisticated discussion of DNA evidence with a succinct 'opinionization' solution to fingerprint evidence, is the Nuffield Council's apparent failure to recog-

nize that fingerprint and DNA evidence are, by their nature, the same kind of evidence, characterizable by the Council's term 'bioinformation'. In each case, a finding of consistency between a crime scene bioinformation sample and a known bioinformation sample is used to generate an inference about the likelihood that the source of the known sample was present at the crime scene. In each case, a crucial question is how rare the characteristics that are found to be consistent between the two samples may be expected to be in the population. The difference between the two forms of evidence is that, in the case of DNA, this rarity is relatively easy to calculate because allele measurements can be rounded off to integer values. Such calculations are much more difficult for 'the more humble fingerprint' (2007: 15), so difficult in fact that they have not yet been done (Stoney, 2001), though efforts are now being made (Neumann *et al.* 2006, Neumann *et al.* 2007). This difficulty has been invoked to exempt fingerprinting from the necessity of presenting such rarity estimates to juries, and to support fingerprint proponents' claim that it is fundamentally different from DNA evidence.⁴ But this is a difference in the ease of doing the necessary research to generate rarity estimates, not a difference in the nature of the evidence itself. It is not clear why the difficulty of doing research should be viewed as legitimate grounds for simply omitting the rarity estimate, especially when, as the report notes for DNA but not for fingerprints, the rarity estimate is so crucial to evaluating evidence.

In the absence of data for calculating rarity estimates, it has been left to individual latent print examiners themselves to purportedly make subjective estimates of

4 Indeed, in a recent letter to the US National Academies of Science, the IAI took the extraordinary position that it is DNA's 'business model, not the science based model, which needs to be fostered for the remaining forensic sciences' (International Association for Identification, 2007b). I take this to mean that what is superior about DNA evidence is not that its rarity estimates are based on actual data and calculations rather than subjective estimates and implicit calculation, but merely that it has been more successful in securing funding from the state.

the rarity of the consistent detail in each latent print within the population of friction ridge skin (in the case of fingerprints of the living, for example, the population is 60 billion fingers) (Interpol European Expert Group on Fingerprint Identification II, 2004). This is, of course, yet another way in which a latent print examiner's conclusion that the defendant is the only possible source of crime scene print is an 'opinion', not a 'fact'; but the problem is still more serious than that. Questions may be raised about the propriety of allowing a jury to rely on a rarity estimate subjectively generated *by the very same individual* who has made the determination of the match in the first place, as well as about the psychological ability of anyone, let alone a latent print examiner, to generate accurate estimates of the frequency of complex pattern arrangements within a population of 60 billion (or more) patterns of which that individual has observed only a small portion (Champod *et al.*, 2004; Thompson and Cole, 2007; Zabell, 2005).⁵ To paper over the inadequacy and implausibility of this procedure under the bland guise of 'opinion' would seem to be a solution that obscures more than it reveals.

In short, what the Nuffield Report does *not* tell us is that fingerprint evidence—and, for that matter, nearly all non-DNA trace evidence—is characterized by the same 'difficulties' that pertain to DNA evidence; that, despite its longer history, the fingerprint community has done *less* to address these 'difficulties' than the DNA community; and that, as a consequence, in courtroom presentations the 'difficulties' are rendered *less* visible to the jury and other lay actors. The Nuffield Report itself

mirrors this invisibility, by juxtaposing its extensive discussion of the statistical issues raised by forensic DNA profiling with a terse discussion implying that fingerprinting raises no statistical issues at all, rather than stating that fingerprinting raises precisely the same statistical issues, but that no data with which to address these issues has been assembled. This is a problem that 'opinionization' cannot resolve.

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5 In this case of tool mark identification, which relies upon the same process, one court described this process—apparently without irony—as the creation of 'mental databases' in each individual examiner's brain, as opposed to the creation of a more conventional, physical population genetic database by DNA scientists. (*United States v. Diaz*, 2007: 175–180).

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