CASES / VONNISSE

EAR PRINT EVIDENCE

R v Kempster (No 2) [2008] 2 Cr. App. R. 19 (CA)

1 Introduction

> "The law, according to Jennings, walks a respectful distance behind science. Law enforcement, in contrast, tries to keep abreast. The modern criminal makes use of science when appropriate to his purpose, and the police must be no less innovative." (Haward and Ashworth "Some Problems of Evidence Obtained by Hypnosis" 1980 *Criminal Law Review* 469.)

The battle between criminal methods and criminalistic science is ongoing. As criminals become more knowledgeable about forensic techniques (with the aid of dissemination of such techniques in the media), it is becoming more difficult to find fingerprints at crime scenes (López de Arcaute and Navarro "Ear Print as an Identification Method" 2006 57(7) *Acta Otorrinolaringol Esp* 329 330). In this context the use of ear print evidence, typically as a result of an intruder pressing his ear against a window, in order to hear tell-tale sounds of someone's presence within the dwelling, has come to the fore. It has been estimated that ear prints are reported to be found at up to 15% of crime scenes (Rutty, Abbas and Crossling "Could Earprint Identification be Computerised?" 2005 119 *International Journal of Legal Medicine* 335). Although the idea of using ear prints as a means of identification is not novel, ear print identification has not featured previously in the courts of a number of jurisdictions, including the United Kingdom and South Africa. Acceptance of the validity of a new form of evidence is, however, invariably a controversial matter. Ear print evidence has proved to be a particularly thorny issue, as it has been accepted (according to López de Arcaute and Navarro 2006 *Acta Otorrinolaringol Esp* 330) in jurisdictions such as Holland (where by 2006 there had been more than 200 instances of forensic ear print identification), Spain (where the first conviction based on occurred in 2001, and where, by 2006, 20 identifications had been made) and Switzerland (where the first ear print identification of a criminal was made in 1965), but rejected in the United States.

In the case under discussion the question of the probative value of ear print evidence arose for consideration. The context for this case in the English law was provided by the case of *R v Dallagher* [2003] 1 Cr. App. R. 12 (CA), where a murder conviction founded upon an identification obtained

by means of ear print evidence was overturned on appeal. The court of Appeal held, in the light of evidence from expert witnesses expressing doubt as to the reliability of ear print identification obtained subsequent to the trial, that the trial jury may have decided otherwise had this evidence been before it. The court therefore concluded that the conviction was unsafe, and ordered a retrial. In the course of the new investigation, however, it was discovered that the DNA profile obtained from an ear print found on a window at the crime scene, which had been unequivocally linked to the accused, did not in fact match that of the accused. (For research questioning the correctness of the use of DNA profiling in the case, and suggesting that in the light of this the DNA evidence could not be held to be proof that an individual did not deposit a questioned ear print, see Graham, Bowyer, Martin and Rutty "Investigation into the Usefulness of DNA Profiling of Earprints" 2007 47 *Science and Justice* 155).

After setting out the relevant facts pertaining to the case at hand, this note will proceed to discuss the nature of ear print evidence. The latter part of the discussion will briefly examine the nature of the rules relating to expert evidence in certain jurisdictions, in order to place the admissibility of this particular form of evidence in context.

2 Facts

The appellant was convicted of three counts of burglary and one of attempted burglary in the Crown Court at Southampton, and was sentenced to 10 years imprisonment for each of the burglary offences and 5 years imprisonment for the attempted burglary. All the sentences were to run concurrently. After initially being refused leave to appeal against conviction (although granted leave to appeal against sentence) by a single judge, such leave to appeal was granted by a Full Court. Both appeals were, however, dismissed by the appeal court. This was not, however, the end of the matter as the Criminal Cases Review Commission referred the case back to the Court of Appeal pursuant to section 9 of the Criminal Appeal Act 1995. Three grounds formed the basis of this reference, and the subsequent appeal against conviction, the most important of which (and the basic issue before the Court of Appeal) focused on the reliability of the ear print evidence found at the crime scene, which was the basis of the identification of the appellant.

The ear print evidence was connected to count 1, which was related to a nocturnal burglary at the home of an 89-year-old lady. Although the complainant saw the intruder, his head was covered by a hood, and so she was unable later to make a positive identification of the intruder. The point of entry into the premises was the rear kitchen window, which had been forced. An ear print was recovered from the fixed window pane to the side of the window which had been forced. The prosecution led evidence from a Miss McGowan, a fingerprint expert of 15 years' standing, who also had some experience in analysing ear prints, and who testified that no two ears left the same mark, and that it was her opinion that the ear print found at the scene matched ear prints subsequently taken from the appellant.

The appellant did not admit the ear print was his, but offered an explanation that he had done some work at the complainant's address some four or five weeks previously. The prosecution argued that the work had in fact been completed some four months previously, and since the complainant had her windows cleaned on a monthly basis, even if the appellant had left a print at the time of doing the work it would have been removed long before the date of the burglary.

On count 1 the jury returned a unanimous guilty verdict, as well as majority guilty verdicts on counts 2, 3 and 4 (which related to offences committed some two weeks after the burglary). The sentence was based on the appellant's previous convictions, and his targeting of elderly and vulnerable victims.

After the initial refusal of leave to appeal against the conviction by the single judge, the appellant renewed his application before the Full Court, fortified by the Court of Appeal's judgment in *Dallagher* as well as an expert report from Professor Champod, on the basis that "the ear print evidence was inadmissible, or of no probative value, and in particular that it was impossible to make a positive finding as to the identity of the maker of an ear print" (par 14). Leave to appeal against conviction having been granted by the Full Court, Champod gave evidence at the hearing, testifying that though he had not compared the ear print found at the scene with the impressions provided by the appellant, he was prepared to assume that certain features of the print corresponded with that of the impression. However, he nevertheless concluded that

> "in the light of the fact that this area of science was in its infancy, and developing, ear print comparison was a valuable investigative tool and could be properly used to exclude a person as a suspect, but that it could not provide a positive identification of a suspect" (par 14).

The court, having regard to McGowan's evidence and the *Dallagher* judgment, rejected Champod's view that all that could be concluded was that ear prints were consistent. The court held ear print evidence to be admissible, and held that such evidence could be used by the jury to establish positive identification.

Though the Court of Appeal certified a point of law of general public importance (in terms of s 33(2) of the Criminal Appeal Act 1968), which questioned whether ear print evidence could be admissible beyond a finding that the ear print at the scene and a later impression are consistent. Leave to appeal to the House of Lords was refused, and the House of Lords itself refused to grant leave to appeal on the certified question. The appellant then applied to the Criminal Cases Review Commission, basing his application primarily on an expert report produced by Dr Ingleby, a mathematician who had been involved in a European research project known as FearID, the aim of which was to evaluate the use of ear print evidence and to set up protocols regulating procedures and reports in this regard. Ingleby concluded that

> "the prints used in appellant's case were not of sufficient quality to conclude safely that there was a match; on the contrary, the gross anatomical features of the ear, visible in the crime scene mark did not accord with the reference prints provided by the appellant" (par 18).

The Commission, after considering all the expert evidence, came to the conclusion that a real possibility existed of the conviction on count 1 being overturned. Although the Commission took the view that the same possibility of reversal did not exist in relation to the other charges, the appellant argued that if the conviction on count 1 were overturned, this would have a knock-on effect in relation to the other convictions, which could similarly be regarded as unsafe.

Hence the matter came before the Court of Appeal.

3 Judgment

After setting out the facts of the appeal, and its somewhat lengthy procedural history, the Court of Appeal (per Latham LJ) considered the basic issue before it: what weight should be given to ear print evidence? The court noted the sound (though rather different) credentials of the expert witnesses McGowan and Ingleby (par 22). Further, the court noted that the expert witnesses were in agreement on a number of matters: that in certain circumstances ear print evidence could indeed allow a positive identification of the perpetrator; and that ear print evidence poses somewhat different and more difficult problems than fingerprint evidence, due to the flexible nature of the ear and the possibility of distortion of print as a result of pressure or movement (par 23). The court then noted the way in which ear print comparison typically takes place (par 24), before examining the differences between the approaches of the expert witnesses.

Ingleby criticised the evidence led on behalf of the Crown on the grounds that there was a significant mismatch between the print obtained at the scene and the later impression which could not be explained in terms of difference of pressure, or movement. He sought to demonstrate this by means of transparencies in which the impressions left by the ear were differently coloured, so as to highlight discrepancies. Ingleby further stated that all that could be identified from the prints was gross detail, in other words the main cartilaginous folds of the ear, whilst in his view the only reliable indicators for a match would be the minutiae, that is the "small anatomical features such as notches, nodules or creases in the ear structure" (par 25). In Ingleby's view, there were only two such minutiae to be seen on the prints, a nodule and a notch on the upper rim of the helix (the outside rim of the ear), and he further stated that the distance between these differed between the ear print at the scene and the later impression (par 25).

McGowan argued that the evidence clearly identified the presence of the appellant at the scene, and that the "shape and size of the ears that made the prints were so closely matched that any small difference could be explained by a variation in pressure" (par 26). Further, it was argued that the fact of the existence of the two minutiae in itself was probative of the match

between the prints, and that any difference in distance between them could be conclusively explained in terms of a variation such as a difference in pressure (par 26).

The court noted that it was evident from Ingleby's evidence that ear print comparison *could* be the basis of a positive identification, particularly where minutiae can be identified and matched. However, where only gross features are evident, the court accepted, following Ingleby's view, that a reliable match could only be made "where the gross features truly provide a precise match" (par 28). Thus, although the court accepted that the ear print at the scene was consistent with that of the appellant on the basis of gross features such as shape and size, and the identified minutiae, there was no such precise match. Whilst the court accepted McGowan's view that the differences could be explained by differences in pressure or movement, it held that "the extent of the mismatch is such as to lead us to the conclusion that it could not be relied on by itself as justifying a verdict of guilty" (par 28). Therefore, the court concluded, the guilty verdict in relation to count 1 was unsafe, and ought to be quashed (par 29).

The court, however, refused the appellant's application to appeal against conviction on the remaining counts, holding that the judge had made it clear to the jury that the conviction on count 1 could not be taken into account in making a finding on the remaining charges. In addition, the court held, the appellant's explanation was "far-fetched" and his further evidence spurious (par 31). Given the context in which the offences were committed, the court did not further see fit to alter the sentence handed down by the trial court (par 32).

4 The nature of ear print evidence

The idea of using ear print evidence is not new. Alphonse Bertillón, who served as chief of criminal investigation for the Paris police force from 1880, devised a system of identification known as the anthropometric method, in which the statistics of offenders were recorded by means of a system of photographs and meticulous measurements (Dean "Forensic Science Overview and the Development of Earprinting" 1997 21(1) *The Criminologist* 33 34). The measurements included those of the body, limbs and head including the ear. It seems that Bertillón was the first scientist to use the ear as a means of identification (López de Arcaute and Navarro 2006 *Acta Otorrinolaringol Esp* 330). The unwieldy and time-consuming nature of the anthropometric technique meant that it was never fully adopted, and the rise of fingerprinting as a form of forensic identification, and its universal adoption by police forces, resulted in Bertillón's methods being consigned to a historical footnote. Owing to the overwhelming success of fingerprinting, early attempts to develop the use of ear prints were discontinued (Graham *et al* 2007 *Science and Justice* 155; an example of such attempts is Evans's paper entitled "The External Ear as a Means of Identification" read to the Medico-Legal Society of Great Britain in 1910; and Warren "Earprints in Identification" 1996 64(2) *The Medico-legal Journal* 82).

However, relatively recently, there has been something of an upsurge of interest in the description of ear prints and in identification by means of ear printing. The author who must take the credit for raising the profile of ear print identification is Alfred Iannarelli. Trained as a policeman rather than a scientist, Iannarelli became interested in ear print identification, and proceeded to develop his own system of classification which he used to classify some 7 000 ears over a 14-year period. He published his findings in a book entitled *Ear Identification*, the second edition of which appeared in 1989 (for a synopsis of his methods, see Lammi "Ear Biometrics" (http://www.it.lut.fi/kurssit/03-04/010970000/seminars/Lammi.pdf (accessed 2008-11-13) 5), and for a critical perspective on such methods, Egan "Are Dutch Ears Different from American Ears?" http://forensic–evidence. com/site/ID/ID00004_1.html (accessed 2008-11-13)). Subsequent to the publication of Iannarelli's work, there have been a number of different, more scientific methods for ear identification proposed (the discussion of each of these goes beyond the scope of this note, but see Lammi (*supra*); Hurley, Arbab-Zavar and Nixon "The Ear as a Biometric" in EUSIPCO 2007, Poznan, Poland (http://eprints.ecs.soton.ac.uk/14771 (accessed 2008-11-23)) for further details of this research). The potential for such research is underlined by the fact that the European Union has funded a research project known as FearID ("Forensic Ear Identification", which started in February 2002), which was established to evaluate the use of ear print evidence, and to attempt to produce a protocol in order to standardise procedures and reports (interestingly enough, as indicated above, Ingleby, the expert witness for the appellant in *Kempster*, worked on this project). This project seeks to establish

> "a standard process of detection, recovery, storage and identification of earprints and a computerized pan-European database of earprints that would allow a statistical calculation and increase the value of the evidence, giving scientific and judicial validity to earprint identification" (López de Arcaute and Navarro 2006 *Acta Otorrinolaringol Esp* 332).

Why use the ear as a biometric (as Lammi *supra* points out, "biometrics" is the "science of identifying or verifying the identity of a person based on physiological or behavioural characteristics")? Hurley *et al* (*supra* 26) note that the ear structure is rich, changes little with age, and is unaffected by facial expressions. Despite the possibility that the ear may be occluded by hair or a hat, ear prints, the immediate background is predictable, unlike that of the face. Unlike fingerprints, there is not an associated hygiene issue, and unlike iris and retina measurements, it will not cause anxiety. Compared with the iris, retina and fingerprint, the ear is relatively large, and so can be more easily captured at a distance (Hurley *et al supra* 26). Moreover, it may be possible to determine the height of the person leaving an ear print, on the basis of floor-to-print distance, with certain corrections (López de Arcaute and Navarro 2006 *Acta Otorrinolaringol Esp* 330).

An earprint may be defined as follows (in the words of Meijerman, Sholl, De Conti, Giacon, Van der Lugt, Drusini., Vanezis, Maat 2004 140 *Forensic Science International* 91):

> "An earprint is a two-dimensional reproduction of the parts of the auricle [the external part of the ear] that touched a surface, like the print of a rubber stamp. Unlike the regular print surfaces on a stamp, the elevation and the flexibility of the various morphological structures of the auricle vary. Some structures will therefore leave an imprint, while others may not, or do so only partly. This will depend on the position and elevation of each morphological structure in relation to the position and elevation of the other structures. Also, the amount of oil that is naturally present on the various parts of the auricle may play a role. Absence of a feature in a print may therefore be informative of both the condition of the listener and the morphology of the live ear."

Ear prints, like fingerprints, are produced by the remains of desquamation, sweat and grease that the skin leaves on contact with a surface, and although not visible to the naked eye, are easily recovered with physical or chemical developers (López de Arcaute and Navarro 2006 *Acta Otorrinolaringol Esp* 330). Once the latent print from the crime scene has been developed, it must be compared with a print of the suspect's ear. Typically this is done in one of three ways: placing one print over another by means of transparencies and comparing them (superposition); dividing the print into sections and interchanging them to check coincidences and superpositions (dissection); and direct comparison (López de Arcaute and Navarro 2006 *Acta Otorrinolaringol Esp* 331).

There are some basic questions underlying the reliability of ear print identification. The first relates to whether the human ear is indeed unique (whether the so-called snowflake paradigm applies – that "nature never repeats itself"). Can two different ears create similar ear prints? Critics have pointed out that it has never been established that all human ears are unique (Moenssens "Handwriting identification evidence in the post-*Daubert* world" 1997 66 *UKMC Law Review* 251 293; Egan "Are Dutch ears different from American ears?" http://forensic-evidence.com/site/ID/ID00004_1.html (accessed 2008-11-13)). Whilst the individuality of the ear has not been empirically established, it is contended that the variability between ears is so large that one may be able to distinguish between ears on a limited number of features or characteristics (Meijerman *et al* 2004 *Forensic Science International* 94; and López de Arcaute and Navarro 2006 *Acta Otorrinolaringol Esp* 331). The results of the analysis will inevitably be expressed in terms of whether the probability of two different ears leaving indistinguishable prints is reasonably small (López de Arcaute and Navarro 2006 *Acta Otorrinolaringol Esp* 331).

Even if there is sufficient evidence that ears are distinguishable, a further query arises regarding the stability of the features of the auricle. It is clear that a single ear can leave varying prints, depending on factors such as the amount of pressure, the angle at which the ear was applied to the surface, as well as anatomical modifications of the auricle (López de Arcaute and Navarro 2006 *Acta Otorrinolaringol Esp* 331). Therefore, to justify the claim that an ear print can be matched uniquely to an ear, it must be established that a particular print resembles prints from the same ear significantly more than it resembles prints from another ear (in other words, that the inter-individual variation (between ears) is significantly greater than the intra-individual variation (between the prints of a particular ear)) – Meijerman *et al*

2004 *Forensic Science International* 93, for more detailed discussion of these factors, see further discussion in this source). Once again, this analysis will be expressed in probabilistic terms.

Critics have doubted whether, even if one assumed that all ears are individual, such uniqueness could "be recognized and demonstrated from a distorted, incomplete, and blurred impression of a few visible features of the outer ear" (Moenssens 1997 *UKMC Law Review* 294; and see also Egan *supra*). However, research concluded in the context of the FearID project, suggests that ear prints found at crime scenes do exhibit a "high degree of stability" (comparable to that of fingerprints), that is, that "the gross morphology … is very similar in prints from the same individual, and such minutiae as creases and papules register consistently, in a way analogous to Galton minutiae in the gross morphology of fingerprint loops, whorls and arches" (Kieckhoefer, Ingleby and Lucas "Monitoring the Physical Formation of Earprints: Optical and Pressure Mapping Evidence" 2006 39 *Measurement* 918). The longer the listening time at a window, the greater the chances of force and pressure variations, and the more skin grease deposited, which will then be spread more evenly on the listening surface (Kieckhoefer *et al* 2006 *Measurement* 932). These factors clearly have negative implications for the quality of the print. In addition, there can be high local variation of pressure when the listener fidgets, and the longer the listening time, the greater the chances of fidgeting. Despite these variations in pressure, the experimental results are promising (Kieckhoefer *et al* 2006 *Measurement* 933):

> "[T]he listening ear acts like a plunger stuck to the surface. Its flexible parts that are not in contact with the surface can take up much of the stochastic fidgeting motion of the listener's head, without slippage of the contact area and consequent blurring of the print."

Ear prints can be used in forensic research in various ways. Apart from being used to eliminate a person as a possible suspect (where there is no match between prints), an ear print can be used to increase evidence against a particular suspect. In such a case, having established that the print obtained at the crime scene and the print obtained from the suspect are for all practical purposes identical, it must further be established that "the probability of two similar prints being made by different ears is sufficiently close to zero in order for the latent print to be accepted as evidence" (Meijerman *et al* 2004 *Forensic Science International* 93). The ear print can further be used, where there is no immediate suspect, to compare it to a database in which other ear prints have been collected, to establish a possible link with that of a known individual (Meijerman *et al* 2004 *Forensic Science International* 93).

5 The admissibility of ear print evidence

The assessment of the weight of forensic evidence presents a challenge for all legal systems (for a discussion of some of the difficulties inherent in this process, see Broeders "Of Earprints, Fingerprints, Scent Dogs, Cot Deaths

and Cognitive Contamination – A Brief Look at the Present State of Play in the Forensic Arena" 2006 159 *Forensic Science International* 148). It follows that as new developments occur in the realms of science and technology, which can assist the process of adjudication and reduce the possibility of judicial error, that these developments should form part of the evidence presented to the court. This begs the question of how a judicial officer without scientific training is to determine whether such expert scientific evidence should be presented to a court or not: how is a judge to decide upon the admissibility of such evidence? Meintjes-Van der Walt expresses the problem in the following terms:

> "Courts are charged with the responsibility of not admitting invalid evidence, for to do so would violate the fundamental principle of evidence that only relevant evidence may be admitted. Equally, a court may not exclude valid information, for to do so would violate the corresponding fundamental principle that all relevant evidence is admissible. The law is challenged to devise an admissibility test that will allow legitimate expert evidence, while withholding invalid expertise" (*Expert evidence in the criminal justice process* (2001) unpublished DJuris thesis, Leiden University (2001) 8).

In the United States, the case of *Frye v US* framed the following influential test to regulate the admissibility of novel scientific evidence in criminal trials:

> "Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field to which it belongs" ((1923) 54 App DC 46, 47; 293 F 1013, 1014).

Thus this test excludes scientific testimony which rests on methods or techniques that are not shown to be generally accepted in the relevant scientific community (Kaye "Choice and Boundary Problems in *Logerquist*, *Hummert*, and *Kumho Tire*" 2001 *Arizona State Law Journal* 41). For seventy years this test provided the standard for the admissibility of expert testimony, and in fact it still provides a lodestar for the majority of states in this regard (Coppage "The Revolution of the Admissibility of Scientific Evidence with Print Identification Evidence as a Model" 2001 24 *American Journal of Trial Advocacy* 609 611). The *Frye* approach requires, in essence, that the court must address whether: (i) scientists have accepted the evidence; (ii) the evidence is within the proper fields; and (iii) the qualities of the expert presenting the testimony are sufficient (Coppage 2001 *American Journal of Trial Advocacy* 612). In 1976, the US Federal Rules of Evidence came into force, and provided, in respect of expert evidence (in Rule 702) that

> "[i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise …"

The emergence of this rule gave rise to some uncertainty in the courts as to whether it provided a different approach to the "general acceptance" test in *Frye*, and if so, whether it ought to be followed in preference to *Frye* (see Coppage 2001 *American Journal of Trial Advocacy* 612). Thus, when the Supreme Court had occasion to address the issue of expert evidence again in *Daubert v Merrill Dow* ((1993) 125 L Ed 2d 469; 113 S Ct 2786) it seized the opportunity to do so, holding that, as there is no mention of general acceptance being a prerequisite for admissibility anywhere in the Federal Rules, the test in *Frye* must be held to have been impliedly overruled by Congress. The court then proceeded to hold that in order to be admissible expert evidence must be reliable and relevant, and that the following criteria should be adverted to in particular by the trial court in assessing admissibility: (i) whether the theory or technique underpinning the evidence has undergone testing and withstood the scientific process of falsifiability; (ii) whether it has been subjected to peer review and publication in refereed journals; (iii) its known or potential error rate; and the method or technique's general acceptance by the scientific community (see Roberts and Zuckerman *Criminal Evidence* (2004) 324; and see further the succeeding discussion on the subsequent legal development post-*Daubert*). The *Daubert* test, the "scientific soundness" test, thus excludes scientific testimony that rests on methods or techniques that are "not shown to be valid in that they have not survived testing and scrutiny in the scientific community" (Kaye 2001 *Arizona State Law Journal* 41).

In this context the issue of ear print identification arose in *S v Kunze* (97 Wash App 2d 832 (Ct App 1999)). In the result, although the ear print evidence was accepted in the trial court, applying the *Frye* "general acceptance" standard, leading to a conviction (based on the expert evidence of *inter alia* Alfred Iannarelli, and Cor van der Lugt, a Dutch policeman who had made hundreds of ear print identifications), the Washington Court of Appeals, also using the *Frye* test, rejected the ear print evidence as not being "generally accepted in the forensic science community". Coppage points out that had the court in *Kunze* applied the *Daubert* approach (as amplified by the Supreme Court in *Kumho Tyre v Carmichael* (1999) 119 S Ct 1167), the "gatekeeping function" of the *Daubert* test (as opposed to the "lax" test in *Frye*) would have ensured that the ear print evidence would have been deemed inadmissible from the beginning of the trial (2001 *American Journal of Trial Advocacy* 621).

In contrast the English approach to expert evidence has been characterised as "wide-open receptiveness to expert opinion" (Gold *Expert Evidence in Criminal Law: The Scientific Approach* (2003) 36). Roberts and Zuckerman (316) describe the English approach as follows:

> "[T]here does not appear to be any specific rule of English law restricting the scope of expert testimony to recognized branches of science, institutionalized disciplines, or formally authenticated fields of knowledge or research. All that the court requires is some guarantee that proffered scientific evidence is valid, relevant, and likely, on balance, to be helpful to the fact-finder. Whilst a particular expert's authority may be rooted in his or her membership of an established scientific discipline, it need not be."

Hence, not only in relation to ear print evidence (as demonstrated in *Dallagher* and *Kempster*) but in relation to such disparate matters as interpretation of photographs and videos, the effect of weather and lighting conditions on visual identification, and stylometric analysis of handwriting, the English courts have focused on relevance rather than requiring a proven field of expertise as a prerequisite for admissibility (Roberts and Zuckerman 318, see footnotes 94-97 for reference to case law). Roberts and Zuckerman note that the uncertainty and laxity of the English law relating to matters of admissibility of expert evidence are attributable to the fact that "the question of which rules should govern the admissibility of expert evidence in criminal trials has never been systematically addressed" (323). Gold comments (36) that the "UK law of expert opinion evidence has demonstrated little movement towards modernization" (as opposed to the *Daubert* approach, which emphasises the demands of science as a standard; for support of a similar approach to the *Daubert* test in English law, see Ormerod "Expert Evidence: Where Now? What Next?" 2006 *Archbold News* 5). Roberts and Zuckerman, however, note the "resilience, and indeed the ingenuity and flexibility, of the common law's pragmatic approach" (325; and Scots law adopts a similar approach – see Chalmers and Ross *Walker and Walker: The Law of Evidence in Scotland* 3ed (2009) 298ff).

Although there are no South African cases dealing with the admissibility of novel forms of scientific expertise (Meintjes-Van der Walt (156 fn 52) refers, however, to the cases of *R v Trupedo* 1920 AD 58 and *S v Shabalala* 1986 (4) SA 734 (A), where the admissibility of the behaviour of tracking dogs, and how the reliability of the procedure could influence the admissibility of the evidence, were considered), it seems that a similar approach would be adopted to that of the English law. Expert witness evidence is assessed according to the rules of opinion evidence, and therefore the crucial consideration is relevance. As stated in *Hoffmann and Zeffertt's South African Law of Evidence* (4ed (by D Zeffertt) (1988) 85, cited in *Holtzhausen v Roodt* 1997 (4) SA 766 (W) 776F):

> "Opinion evidence is accepted if relevant; rejected if irrelevant. An opinion will be relevant if it can assist the court, it is irrelevant if it cannot assist the court. A witness' opinion may assist the court if the witness is better qualified to form an opinion than the court: if the court is in as good a position to form an opinion as the witness, the witness' opinion is unhelpful, irrelevant, and consequently, inadmissible."

Thus, where the court is lacking the special knowledge or skill to enable it to draw properly reasoned inferences from the facts before it, expert evidence may be admitted to enable an expert with the requisite knowledge or skill to testify so as to "advance, reject and comment upon certain inferences in order to assist the court" (*Holtzhausen v Roodt supra* 777I). In order to establish the relevance of opinion evidence, the party seeking to adduce such evidence from an expert witness must satisfy the court (and it is the court that is the final arbiter in this regard) that (i) the witness not only has "specialist knowledge, training, skill or experience" but can assist the court in deciding the issues in the light of such competencies (whether or not the witness has formal qualifications); (ii) the witness does indeed have

expertise in relation to the matter regarding which he or she is testifying; and (iii) the witness does not or will not express an opinion on hypothetical facts (*ie*, facts which have no bearing on the case or are not consistent with the other evidence in the case (Schwikkard and Van der Merwe *Principles of Evidence* 2ed (2002) 92).

Meintjes-Van der Walt (171) argues in favour of the South African approach, that since South Africa has unitary courts (where the judge determines not only the admissibility of evidence, but also acts as trier of fact) staffed by professional judges, a strict application of the rules of expert evidence (as in the United States) is not warranted:

> "Where expert evidence is likely to assist the trier of fact and therefore logically relevant, it should be admitted. If during the course of the trial it appears to be unreliable, the trier of fact is free to disregard such evidence …"

Thus it seems that ear print evidence would be *prima facie* admissible in South African courts, with the impact of such evidence on the outcome of the trial being dependent on the reliability of the evidence itself. The novel nature of the evidence would not detract from its admissibility.

6 Concluding remarks

Whither ear print evidence? The current Achilles heel of this type of evidence is the lack of support in scientific literature (López de Arcaute and Navarro 2006 *Acta Otorrinolaringol Esp* 331), in the form of validation of the methods employed in evaluating such evidence. It could be argued that there is still some doubt whether one could refer to ear print identification as a scientific discipline in its own right (Nijboer "Het gekooide denken – over de rol van discipline binnen feitenonderzoek en bewijs in het recht" Inaugural lecture, Leiden University, 18 October 2002, 7 (https://openaccess.leiden univ.nl/dspace/handle/1887/5339 last accessed 2008-11-13). Nevertheless, there are some promising aspects. The ear is seen as an excellent method of personal identification, due to its morphology and characteristics, and this has led to European police in particular seeking to make use of ear print identification (López de Arcaute and Navarro 2006 *Acta Otorrinolaringol Esp* 331). Recent research has indicated that despite the flexible nature of the human ear, latent ear prints are stable (Kieckhoefer *et al* 2006 *Measurement* 919). Moreover, the use of ear prints in association with DNA profiling offers potential for better forensic identification (Graham *et al* 2007 *Science and Justice* 159). The FearID project has produced a growing body of research, and with the development of databases and computerized analysis systems the current weaknesses in ear print evidence can be resolved.

The admissibility of such evidence is dependent on the evidential rules applied to regulate expert evidence. It is evident that in the United States, and particularly in those states applying the *Daubert* rule, ear print evidence will not be regarded as admissible. In jurisdictions like the UK and South Africa such evidence will be admissible, for any weaknesses in the evidence to be exposed through cross-examination and opposing evidence, that is (to

use Cross and Tapper's words, cited by Gold 37), the usual "adversarial forensic techniques".

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