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Science in the red zone, by Tom Magner

Over-rev a car and you risk doing permanent damage to the engine, sending the needle of its dashboard rev counter well into the red zone. So it is with science in the legal system, take it over the limit and you risk the justice system coming up with the wrong answer. The only difference is that a car engine can be fixed, but the clock can never be put back on a miscarriage of justice, leaving the inevitable and indelible human scars.

UNCOMFORTABLE BEDFELLOWS

Two recent cases have thrown into sharp focus how the legal system and science can be uncomfortable bedfellows.

Barry George's recently successful appeal against his earlier conviction for the murder of TV presenter Jill Dando (see *R v George* [2007] EWCA Crim 2722, [2007] All ER

(D) 242 (Nov)) and, latterly in Northern Ireland, the acquittal of Sean Hoey in the Omagh bomb trial (see *R v Hoey* [2007] NICC 49) share an uncomfortable truth— that, in the search for justice, lawyers are pushing science too far, seeking certainty beyond reasonable doubt where only probability, possibility or uncertainty exist.

They have forced not only the science itself but also the messenger delivering the science, the expert witness who practises it, back under the microscope,

All this just as the dust was starting to settle on the statistical trials and tribulations of retired paediatrician Professor Sir Roy Meadow and the infamously and honestly misunderstood one-in-73 million chance of two cot deaths in one family.

Whether or not George is guilty of the murder of Dando is not for this article but for a court to decide when, as

is expected, he eventually faces a retrial.

The microscope in his appeal case focused on whether or not a single particle of firearm discharge residue, reportedly found in his coat when he was arrested a year after the shooting of Dando, was or was not, in the judgment of the court, an indicator of guilt.

After considering a scientific report conclusion that it was just as likely that there would have been a single gunshot particle in his coat whether or not he was the killer, the Court of Appeal decided that, if the jury had heard that evidence at trial, there would have been no certainty that they would have found George guilty and for this reason his conviction was quashed.

DNA PROFILES

The microscope in Hoey zoomed in on a small and invisible collection of human cells lifted by forensic officers and subjected to the relatively new technique of low copy number DNA profiling (LCN DNA).

I am no DNA expert but those who are tell me that the test can be based on invisibly tiny samples, as small as, for example, a millionth of the size of a grain of salt, equating to a few cells of skin or sweat left in a fingerprint. These tiny samples, maybe containing only one or two strands of DNA, are magnified by some form of biochemical copying process to a sample size around 50 times larger, enough to be tested.

This cellular copying is where critics of the techniques say the errors can appear. If the DNA is damaged in any way, the replicated or copied DNA will also include the damaged areas and may not reflect the original DNA. In the worst case scenario, it is believed by some experts in the field that the replicated DNA could correspond to an innocent person's profile. The conventional DNA profiling is not, as I understand it, affected by these concerns as it involves larger samples of genetic material.

Whatever the rights or wrongs of the science, Mr Justice Weir ruled in Hoey that the LCN DNA technique was not yet at a sufficiently scientific level to be considered evidence, and therefore that the prosecution did not meet the required standard of proof of certainty beyond reasonable doubt in his case. Use of the technique by police was on hold pending independent scientific examination of the method. However, the Crown Prosecution Service carried out an internal review of LCN DNA analysis, concluding on 14 January that the technique should remain available as potentially admissible evidence.

These types of situation clearly illustrate what happens when a scientific conclusion is allowed to be pulled this way and that by competing legal arguments. It is easy, in the aftermath of such court findings, to be drawn into thinking that it was either the expert or the lawyers who were to blame, one for giving the evidence and the other, for making too much of it.

TRIANGULAR RELATIONSHIP

To do so is, I believe, to fail to understand the triangular relationship at work behind every case, whether criminal or civil, between lawyers, expert witnesses and the court:

- It is courts (the jury in criminal cases and a judge in civil), not lawyers or experts, who decide cases.
- It is the expert witness's overriding duty to the court to give his professional opinion to assist the court by extending its knowledge in an area in which the court does not itself have the requisite knowledge, the basis for it and the assumptions behind it.
- It is the lawyers who have a duty to be partisan to put their client's case to best advantage.

Fundamental lack of understanding of these basic duties and the resulting interrelationship conceals the reality that the process is as much about lawyers as expert witnesses.

This relationship, played out in the drama of the courtroom, and often in the media spotlight, gives rise to systemic pressures that do not sit well with the inherently conflicting nature of scientific opinion. Out of this (singly or in combination), when the process fails, miscarriages of justice are prone to arise.

OBJECTIVITY

Against this background, it is critically important that, for his part, the expert witness, in all cases and especially when faced with old material, very limited or controversial findings, remains open-minded and steadfastly objective at all times. He must communicate both the positive and the negative, with clearly expressed limitations. This applies in the written report as much as in private conference with counsel and, in public, giving oral evidence before the court. In short, the expert witness, whatever the discipline or the court, must ensure that what he says, whether in writing, in discussion or in oral evidence is capable of being stand alone and does not rely on others to fill in the gaps.

“Lawyers are pushing science too far, seeking certainty beyond reasonable doubt where only probability, possibility or uncertainty exist”

The lawyer instructing the expert has to remember that it is not in the lawyer’s interests either to ask too much of the science, or to try to encourage the expert witness to go further than he reasonably feels that he can in his professional opinion.

MEADOW’S EXPERIENCE

In all of this, there remains the shadow of the experiences faced by Meadow. This time, it comes in the shape of a little reported but clearly voiced comment that I heard during proceedings at the final appeal by the General Medical Council, before Sir Anthony Clarke MR and Lord Justices Auld and Thorpe.

There came a moment during a cross-court discussion about Meadow’s presentation to the jury of a table of statistics, containing the now familiar one-in-73 million figure.

It transpired that he had, when asked by the court to produce the research on which he was basing his views, discussed the statistical table with the lawyers and, at that time, advised them about the caveats, or limitations and assumptions, relating to the table.

When it came to presenting this information before the jury, they had the table of figures but not the paperwork setting out the limitations and assumptions.

Meadow, it was said, did not refer to the caveats in his oral evidence because he thought that he had already covered that in his discussions with the lawyers beforehand and had assumed that the jury had both the table and its caveats.

When this aspect was discussed at the appeal, it was remarked by one of the judges that, whatever had happened beforehand, the expert witness should have made clear the caveats whether or not he was questioned on it, whatever discussions he may have had before giving the evidence.

This occurrence serves only to emphasise how the expert witness must seek to ensure that he presents his evidence, in its entirety, spelling out its limitations and assumptions, much as is required by the current and effective Civil Procedure Rules.

SYSTEMIC FAILURE

Examining the cutting edge of science only when a case gets into the dramatic arena of the courtroom is bound to lead to situations such as George, Hoey and Meadow. Such faith in the ability of cross-examination to always uncover the limitations and assumptions of the science, of whatever discipline it may be, is asking not only too much of the science but also of the dramatic legal environment in which that scientific evidence is given.

It reveals a systemic failure of the criminal court system, as it presently operates, to effectively handle scientific opinion, which, by its very nature, is conflicting and shifting as the state of knowledge in a given subject is advanced—the shifting sands of science.

FILTERING PROCESS

In criminal cases, for that is where the liberty and reputation of the individual is most at stake, what is needed is the introduction of a filtering process earlier on, before the entry into the dramatic spotlight of the courtroom.

Then, the necessarily conflicting scientific opinion can be examined in the pretrial stages by one or more judges whose task it is to define, in the context of the legal framework and issues involved in a given case, the nature of the conflict and, in particular, whether that conflict is such, in the absence of other witness evidence that does not involve the science, to mean that it should not be allowed into the trial and be put before a jury.

One can readily see that such a change would increase the responsibilities on the judge in a given case. But, from my experience of the courtroom, I believe that is a responsibility that they can bear because the abilities of judges to get to the nub of a case and its issues is nothing short of awe-inspiring and all too often underestimated.

The expert witness has an overriding duty to the court, is there to assist judge and jury to extend its knowledge and understanding on a given subject in which it is not readily versed, not to help one party or the other to win its case.

Unless science is allowed to take a step back from the legal drama, the fear remains that it will be pushed more and more beyond its limits, into the red zone that threatens the innocent with the real possibility of miscarriage of justice.

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