

## **Lord Neuberger at the annual Bond Solon Expert Witness Conference**

### **Expert Witnesses**

**7 November 2014**

1. In some of my spare time (such as it is), I am fond of reading books about history. And my favourite history books are often those which take a particular event (often a rather obscure or limited event) and use it to cast a light on the overall flavour and nature of the character and society of the period and the country in which the event occurred. What, you may wonder, has that got to do with expert witnesses? Well, many of the problems of expert evidence which seem to me to throw light on and illuminate a number of broader features of human experience and nature, of science and technology, and, more particularly, of litigation and the judicial process. And, as you have a packed, focussed and practical series of sessions ahead of you on the topic today, I thought that I might say one or two things about a few of those wider aspects today.
2. At first sight, such a conceptual and indirect approach to the topic of expert evidence may seem a little theoretical, even highfalutin', for what is meant to be a practical conference on the topic. However, it seems to me that it is right in principle for people who are or who aspire to be expert witnesses, and indeed any other people who are in any way involved with expert evidence, to be able to see the function of the expert witness in its broader context. Furthermore, if those people appreciate the role of the expert witness and expert evidence in its wider context, they are likely to perform their role as expert witness, or whatever function they may have in connection with expert evidence, more effectively, confidently and authoritatively.
3. An expert witness is a witness who gives opinion evidence to the court on technical, scientific or other specialist issues, which the court considers appropriate for expert

evidence, and any such evidence should represent the expert's honest independent opinion based on his knowledge and experience. As Saunders J said long ago in a case heard in the reign of Mary Tudor, "if matters arise in our law which concern other sciences or faculties we commonly apply for the aid of the science or faculty which it concerns"<sup>1</sup>. And, as the great Lord Mansfield CJ said more than two hundred years later, "in matters of science the reasoning of men of science can only be answered by men of science"<sup>2</sup>. So, expert witnesses are a well-established feature of litigation, but they are unusual in that they are entitled to give evidence not of fact but of opinion, based on knowledge and experience.

4. The first point I want to make concerns the nature of knowledge, an epistemological point if you like. Experts and their views are very much creatures of their time, even in a field which may seem to be as black and white as elementary physics. An expert's view on what is, in principle, a timeless issue may be perceived as being "right", because it complies with the generally accepted contemporary view of the time, even though it will be thought to be completely wrong-headed later. Thus, what now appears to be the crazy medical practice of bleeding, or drawing blood from all ill or weak patients, was generally accepted as self-evidently beneficial for over two millennia. Galen's medical writings, although containing much rubbish, were treated as almost a sacred tract for nearly fifteen hundred years from around 200 AD. That was so even though we now know (or should I say "strongly believe"?) it to be harmful in most cases and fatal in some. Yet an expert witness who denied the value of the practice even in an 18<sup>th</sup> century trial would have found his evidence unceremoniously rejected.

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<sup>1</sup> (Buckley v Rice-Thomas (1554) 1 Plow 118, 124

<sup>2</sup> Folkes v Chadd (1782) 3 Doug 157, 159

5. Or take a fundamental and apparently wholly objective and binary issue: does light consist of waves or particles? From around the middle of the 11<sup>th</sup> century, the leading work on optics by the Arabic scientist Alhazen appeared to establish that it consisted of tiny particles, and that is what any educated natural philosopher would have said for the next 500 years or so. But, at least in Western Europe, from about 1630, the generally accepted view among educated people was that the philosopher Descartes had shown that light to consist of waves not particles. However, by the end of the 17<sup>th</sup> century, there were two competing views, both strongly held by respectable scientists: followers of the great Isaac Newton believed that he had shown that Descartes was wrong and that light was made up of particles, whereas followers of Christiaan Huygens equally strongly believed that he had demonstrated that light was waves: an expert could have held either view, although the wave theory seemed to have more adherents.
  
6. A century later in 1803 the experiments of Thomas Young appeared to show pretty clearly that light consisted of waves not particles, and subsequent experiments during that century seemed to clinch the point. So any respectable 19<sup>th</sup> century expert would unhesitatingly rejected the notion that light was made up of particles. However, hardly was the point apparently clinched when along came the quantum theory and Louis de Broglie's work established that light not merely consisted of both waves and particles but did so at the same time – so-called wave-particle duality. So from about 1930, any expert would have said that light was both waves and particles – or maybe that it was neither and that waves and particles were each merely an incomplete metaphor as to the nature of light.
  
7. But myths are not merely something which existed in the distant, or even not so distant, past. Let me refer to two more recent examples. In 1901, a Harvard psychologist, who

went under the faintly memorable name of Edwin Boring, translated a German paper<sup>3</sup> rather ineptly, as a result of which it became received wisdom in the English speaking world that different parts of the tongue, as shown on a rough plan of the tongue, detected different tastes. This belief continued unabated until 1974, when a certain Virginia Collings published findings<sup>4</sup> which conclusively showed that all parts of the tongue were equally sensitive to different tastes.

8. And to move forward to the present day, according to the *Wall Street Journal* of 28 October 2014, “[t]he top scientist guiding the U.S. government’s nutrition recommendations made an admission last month that would surprise most Americans. Low-fat diets, Alice Lichtenstein said, are ‘probably not a good idea.’ It was a rare public acknowledgment conceding the failure of the basic principle behind 35 years of official American nutrition advice.” And it turns out that the famous five a day fruit and vegetable intake recommendation is not only baseless but unsound, as ten a day, according to a UCL study last year, is what is required<sup>5</sup>.
  
9. Expert witnesses and indeed the courts would do well to bear this sort of potential development, change of tack and correction of mistakes in mind. And it is clear that some judges at least are well aware of the potential for shifting sands when it comes to expert evidence. Dame Elizabeth Butler-Sloss P observed in one case<sup>6</sup>:

"The judge in care proceedings must never forget that today's medical certainty may be discarded by the next generation of experts or that scientific research will throw light into corners that are at present dark."

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<sup>3</sup> Hänig, Zur Psychophysik des Geschmackssinnes (1901) *Philosophische Studien* 17: 576–623

<sup>4</sup> Collings, Human Taste Response as a Function of Locus of Stimulation on the Tongue and Soft Palate (1974) *Perception & Psychophysics* 16: 169–174

<sup>5</sup> *J Epidemiol Community Health* doi:10.1136/jech-2013-203500

<sup>6</sup> *In re U (A Child) (Department for Education and Skills intervening)* [2005] Fam 134, para 23

10. We are said to live in a rational and scientific age, and compared with the world before the 17<sup>th</sup> century, we do. But it is by no means a world of absolute rationality: indeed, if it was, it would not be a human world. We live in an environment which is heavily influenced in its thinking and environment by physics - energy, transport and communications being three obvious examples of vital ingredients of modern life which are only possible because of strict application of the rules of pure and applied mathematics. However, one of the problems of the modern age, which feeds into expert evidence, is the unsatisfactory way in which figures are used and understood by the great majority of people. Most people, for instance, do not understand the enormous importance of statistical evidence, and, if it is available, they do not understand how to test its reliability, or even what it really means. And let me make it clear that I do not pretend to have a particularly deep knowledge or understanding myself.

11. Statistically reliable information at its best can be very powerful, even conclusive, as evidence. However, statistical information is potentially susceptible to pitfalls for the unwary. Thus, if one is to say that a particular medical procedure is not one which a competent doctor should have performed in certain circumstances, the best evidence on the issue might be thought to be reliable statistics showing that the treatment does more harm than good or is much less effective than the alternative treatment. But how often is such evidence available? And, when it is, do we know whether it is reliable? Those two questions reveal a conflict. On the one hand, statistical evidence, if reliable, can show pretty clearly whether a particular view about the procedure in issue is in fact properly based on hard evidence.

12. On the other hand, there are so many potential hidden pitfalls in the form of false assumptions or other explanations that the figures can be positively misleading. Thus,

what are in fact the best hospitals for a certain procedure may have worse mortality rate than the less good hospitals, because GPs and indeed the less good hospitals refer the most difficult patients to the best hospitals leaving the less good hospitals with the more routine cases.

13. And the general public understanding of statistical evidence is pretty woeful. Take the opinion polls which we frequently see in the newspapers. If last month's figures showed Labour on 35 and the Conservatives on 32, a 3% Labour lead, and this month's figures showed Labour on 32 and the Conservatives on 34, a 2% Conservative lead, the headlines would trumpet an enormous change. Yet the margin of appreciation on the figures in most of these polls, assuming that they are properly representative, is, I believe,  $\pm 3\%$ ; therefore the two sets of figures are wholly consistent with no change during the month in question. Indeed, 5% of the time I believe that the figures are not even within the  $\pm 3\%$  range. One can understand why newspapers do not mention that fact: it draws the sting from the story, but even most otherwise well-informed people don't appreciate it, because we are not particularly well educated in mathematics and science.

14. Another good example is the TV interviewer who incredulously challenged a statistician's evidence that once there are more than 23 people in a room, the chances are more than 50% that two people in the room will share the same birthday, and with 70 people in the room the chances are over 99%. The presenter pointed out that there are 80 people in the audience, and then said "anyone who shares my birthday of 10 January, put your hand up", and nobody did. He then turned to the statistician triumphantly. Of course, the interviewer made an elementary mistake. It is one thing to say ask whether any two people out of 23 or 70 have the same birthday; it is quite another to ask whether any of

the remaining 22 or 69 people share a particular person's birthday – ie have their birthday on a specified day.

15. Failure to understand figures was, I think at the root of the problem in the sad case of Professor Meadow, the expert witness who famously told a jury in the Sally Clark case that the chances of one couple losing two children through cot deaths was 73 million to 1. The primary error in this was that it wholly ignored the possibility of the two deaths being connected – both from what has loosely been called a cot death gene, and because of something in the environment in which the two babies were sleeping. However, it also suffered from another more subtle statistical error, namely an error appropriately labelled prosecutor's fallacy.

16. Professor Meadow's evidence also reveals another cause of expert fallibility, namely emotional commitment to a theory or principle. Professor Meadow had been responsible for developing and publishing the theory of Munchausen Syndrome by Proxy in 1973, which made him famous, and led to him giving evidence in 1993 at a trial of a nurse who was convicted of poisoning several of her patients to death. He thereafter became an acknowledged, indeed renowned, expert witness in cot death cases where foul play was suspected, and gave expert evidence in relation to several such cases which resulted in conviction. In those circumstances, he would scarcely have been human, if he had not become emotionally attached to his topic. He was eventually found guilty of professional misconduct and struck off, but, on appeal, while the finding of a degree of misconduct was accepted, striking off was held to be too severe a sentence and it was quashed<sup>7</sup>.

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<sup>7</sup> *General Medical Council v Meadow* [2006] EWCA Civ 1390, [2007] 1 QB 462

17. Quite apart from not understanding figures, many people, including some judges and arbitrators, are over-impressed with figures: they give a respectability to evidence, even when they are in fact are wholly subjective. My practice at the bar involved quite a few property valuation cases. The surveyors had to come up with a figure, and they normally did this by looking at comparables, that is transactions in relation to other properties – ideally as similar as possible to the subject property. However, the comparables had to be adjusted to allow for differences between them and the subject property. A favourite exercise was to identify various factors and then add and subtract percentages depending whether the comparable was better or worse than the subject property. Now, this had the appearance of being objective, but an enormous amount depended on the factors which the expert surveyor chose, the weight he decided to give them, and the percentage adjustments he chose to make. The choice of factors was entirely subjective, although it is fair to say that common sense played a large part. As to weight and adjustments, they had to be expressed in figures, ie in an apparently objective quantitative way, but of course they almost always represented the subjective and qualitative views of the surveyor.

18. This again reflects general human experience: we clothe subjective assessments with an apparent, but specious, respectability by purporting to quantify them in figures. If a lawyer says to a client that she thinks that the client has a 75% chance of winning the case, that would be meaningless; it would merely be a colourful way of saying that she thought that he would win but there was a real chance, but not a very great one, that he would lose. Logically, I suppose, it would mean that, if the client was going to get £1m if his claim succeeded, he should settle for £750,000. In a more principled sense, I suppose that, if the lawyer's advice was reliable, she should have won three-quarters and lost one-



quarter of all the cases where she had advised that her clients had a 75% chance of winning.

19. More generally, the notion of dispassionate, detached scientist is something of a myth.

Anyone who has read about Einstein's visceral dislike of advanced quantum theory, with his well known (if questionably attributed) observation that "God does not play dice" will appreciate the role of a scientist's moral or instinctive feeling. So too, there is a degree of political instinct observable in many, but by no means all, of those involved on either side in the debate about climate change. Anyone who has read about the current debate about the validity of the string theory (or, more properly, hypothesis) will be able to detect the passionate nature of the commitment to the correctness of the hypothesis by certain scientists who have given up fifteen years of their working lives on the basis that it is correct. And anyone who has sat on a patent case will appreciate that some scientists, even eminent scientists, can become very committed in their emotions and very one-sided in their approach to evidence, either because of their instinctive quasi-proprietary feeling towards a particular view or because of a commitment to their clients' case – or both.

20. In this connection, it is relevant to mention the work of the great philosopher, Karl Popper. One of his two great contributions was his insight into the way in which scientific discoveries are made. The popular view is that a research scientist investigating a problem will start with the currently available information and knowledge and work through a series of logical steps to arrive at an answer to the problem. Far from it said Popper. The scientist conceives of a possible answer and then works backwards to justify it – if he can. That makes sense when you think about it. Remember those puzzles we had as children: there are six entrances to the maze, and only one of them leads to the

centre. The natural and instinctive thing to do is to start with one entrance and then, when and if it doesn't work, move onto the next and so until you find the right entrance. But of course we quickly realise (or some clever clogs tells us) that the best and quickest way to solve the problem is to start at the centre and work outwards till you get to the right entrance.

21. The trouble with that approach may be that it can be more likely to lead to errors. The scientist who has the bright idea immediately has a vested interest in proving it is right, and when he thinks he has proved it, he has an even more vested interest in defending the idea and his proof. That's human nature. (It didn't worry Popper because he relied on falsification, namely the rule that any hypothesis was good so long as it was not and could not be shown to be wrong – eg the sun always rises is a hypothesis which seems to be right, and should only be discarded when the sun doesn't rise – at which point none of us will be there to enjoy the falsification). However, when an expert is instructed to act for a client, I suspect that he may very well adopt the Popper approach, and start with what he hopes or expects will be his final position and then work backwards to prove that it is right. Human nature being what it is, it is almost inevitable that he will start with the proposition that his client is in the right.
  
22. Another feature of human nature which surfaces in the field of expert witnesses is the human desire to clothe our instincts in respectable quasi-scientific terms and to express our feelings as if they were based on logic rather than emotion. There is no doubt that DNA matching by reference to statistical databases is reliable and can and should be the subject of expert evidence, which can evaluate the statistical probabilities of a particular sample of DNA (eg that from a criminal defendant) having the same source as another sample of DNA (eg that found at a crime scene). However, DNA, although a very

complex molecule consisting of a double helix, each of the two helices is made up of a very long series of four different and easily identifiable bases, and therefore each sample of DNA is recordable by reference to an objective and clear criterion, namely the sequence of the bases in the helices.

23. The same is not true of footwear marks, as the Criminal Division of the Court of Appeal pointed out and decided in *R v T*<sup>8</sup>. As the Court pointed out at para 80, an “approach based on mathematical calculations is only as good as the reliability of the data used”. And when they turned to examine the database, there was a woeful shortage of evidence as to the number or geographical distribution of different types of relevant styles and sizes of shoes available. The Court therefore ruled out the presentation of evidence which purported to express a mathematical or statistical assessment of the evidence.

24. Connected with this is the question of fingerprint evidence. The whorls and other patterns we are all so familiar with cannot be analysed and categorised in the same way as DNA with its different sequences of identifiable and classifiable bases. Yet, as Sir Brian Leveson put it a few years ago<sup>9</sup>, “the language of certainty that examiners are forced to use hides a great deal of uncertainty.” That is not, of course, to say that fingerprint evidence is inherently questionable in terms of its value. People experienced in looking at and analysing fingerprints can give important evidence upon which convictions can properly be justified. But the probative value of fingerprint evidence cannot safely or properly be expressed in mathematical terms, in the same way as DNA evidence.

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<sup>8</sup> [2010] EWCA (Crim) 2439

<sup>9</sup> In a speech to the Forensic Science Society in London, November 2010

25. In case what I have said so far sounds rather negative, fingerprints provide a useful topic on the back of which to bring in another aspect of science and technology, which is not merely a more positive point than those which I have been making so far, but is also a much wider point. It is to draw attention to the enormous amount of hard work, ingenuity and sheer intelligence and commitment which have resulted in the ever-accelerating scientific and technological advances over the past 350 years. In March 2012, a paper was published<sup>10</sup>, which suggested that the reliability of fingerprint evidence could be expressed in qualitative terms. Now I am not suggesting that this was the most impressive piece of scientific research ever published or even that it is correct: I am not qualified to say. But it is splendidly typical of the scientific world to worry away at problems and seek to come out with an answer. It is interesting to note, in the light of the Court of Appeal's observations in the *R v T* case, that great weight was given by the authors of the article to the existence of a large and reliable database.

26. We expect expert witnesses to be independent and balanced, even though they are paid by one of the parties. And the rules of court and a succession of judgments reinforce and re-emphasise the requirement of independence, despite the inevitable pressure that expert witnesses face from their clients, who are paying them, and the desire to win. It can be said that the decision of the Supreme Court in *Jones v Kaney*<sup>11</sup>, which removed the expert's immunity from suit when giving evidence, may have served to increase that pressure, as even when giving evidence to the court the expert not only needs to bear in mind his duty to the court, but also his duty to his client.

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<sup>10</sup> Neumann, Evett and Skerrett, *Journal of the Royal Statistical Society Series A*, Vol 175 (2012)

<sup>11</sup> [2011] UKSC 13

27. Having discussed a few concerns, I am bound to say that it does not seem to me that one should simply concentrate on expert witnesses, when considering expert evidence. In this connection, it is an incontrovertible fact that it is the lawyers who make the rules, and so the more cynically inclined might say that this is why expert witnesses are subject to the rule that they have to be strictly impartial and tell the truth in an unbiased way when advocates are free to advance any argument they wish, however little they believe in it, provided that they think that it will advance the interests of the client. I think that such a view is a little harsh, and in the end untrue, but one can well see how the unworthy thought might float to the surface of some people's minds. However, whatever the fair or justified analysis, I do think that improving the value and dependability of expert evidence does not depend solely focussing on expert witnesses.

28. Thus, to pick up a thread I started on earlier, although there is no doubt that Professor Meadow's performance in some cases, including the Sally Clark case, was open to criticism and gave rise to serious concerns, the fact that no one in court seems to have seriously set about challenging his unreliable statistical evidence also seems worrying. That is not meant as a criticism of any individual, but it does demonstrate that, if we are to improve the standards of expert evidence, we have to look at all those involved in litigation and not just the experts. Practitioners and judges have to understand the relevant technicalities and statistics better than they currently do.

29. In the field of patents, to which I was a judicial newcomer in 1998, there were a couple of valuable procedures in complex scientific cases. The first was to provide the Judge at the start with a detailed primer whose contents were approved by both sides. The second was for the Judge to sit with an assessor, that is a wholly independent expert whose job

was to educate the Judge on any general issue, without expressing views as to the appropriate outcome.

30. I also think that equality of arms as between the experts is also a factor which helps ensure a higher quality of impartiality. The fact that an expert witness, witness 1, knows that he has to face an expert witness, witness 2, on the other side, and that witness 2 will presumably be briefing the advocate who is to cross-examine witness 1, should help concentrate the mind of witness 1 on ensuring that his evidence is at least credible. Unless there is equality of arms when it comes to expert witnesses, witness 1 will be sorely tempted, sometimes sub-consciously no doubt, to over-egg his evidence, or at least not to take quite as much care as he might have done if he knew that there was someone as expert as he was testing and challenging his evidence. It is for that reason that I am a little nervous about a single joint expert. However, as I indicated when I was a first instance judge in the early days of the CPR, in *Pattison v Cosgrove*<sup>12</sup>, limiting the parties to a single joint expert against the will of one of the parties was a course which can and should be adopted if it is proportionate, bearing in mind, inter alia, the amount of money involved. Further, while the 2011 Supreme Court decision in *Jones v Kaney* has its downsides, it should help to ensure that the expert witness does his homework before giving his evidence, both in his report and in the witness box.

31. I also would join Sir Rupert Jackson<sup>13</sup> in wondering whether the present system of consecutive cross-examination of expert witnesses is always the best way to go about testing the expert evidence. The formal cross-examination of witness 1, following which he can hardly ever be recalled, followed by the formal cross-examination of witness 2 is

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<sup>12</sup> [2001] CP Rep 68

<sup>13</sup> Jackson Report chapter 38

fun for the advocates and can be good theatre, but the rather gladiatorial and artificial nature of the cross-examination process may not be the best way of arriving at the truth, although it sometimes can be. At least in some cases, I can see much for hot-tubbing or concurrent evidence as it is more respectably, if less evocatively, known. Under the chairmanship of the judge the lawyers and experts get round a table and discuss the evidence and their views on it. Of course, particularly in the light of what I said earlier, it would be wrong to form any sort of clear view that we should either avoid, or go over to, hot-tubbing generally, until we have gathered a statistically meaningful number of cases with hot-tubbing experts, and a statistically meaningful number of cases where the normal adversarial approach is adopted. With such evidence it should be possible to assess the relative merits of the adversarial and hot tubbing systems.

32. There is much criticism of litigation both by those inside and those outside the litigation world – and indeed there is much mystification about litigation among those inside and outside the litigation world. I have always thought that much of the criticism could be met and much of the mystification blown away by making the simple point that litigation reflects human nature. Take the example of the frequently cited fact that many expert witnesses are frequently accused of bias in favour of the client. Of course, there is an enormous temptation to an expert to be biased. The expert is paid by the client – often handsomely; the expert sees documents which support the client’s case or excite sympathy for the client; the expert may well have given initially optimistic advice (not least because otherwise he would not have got the job), and will want to stick with that advice if at all possible; the expert frequently attends meetings so that he or she feels part of, or sucked into, the client’s team, and therefore regards himself as having to advance the client’s case; the adversary nature of litigation will atavistically influence the expert to fight the other side.

33. All this may sound rather gloomy. It is not meant to. It is merely meant to identify some of the potential challenges with expert evidence arising out of human nature and the nature of the trial process, and to suggest how we might address and mitigate those problems. The great majority of experts do their best to be objective and professional, and for most of those experts their best is really pretty good. In any event, litigation, at least according to Sybille Bedford in the memorable title of her excellent little book on the Bodkin Adams trial is “The Best We Can Do”<sup>14</sup>. In doing our best in this connection, we should accept that we cannot eradicate the vagaries and imperfections of the human condition or of the nature of the trial process, but that does not exonerate us from ensuring that we do as good a job as possible in discouraging or neutralising these vagaries and imperfections. Our common law traditions and practices, of which we have every reason to be proud, are well adapted to do this, given that they are based at least as much on pragmatism and experience, as they are on principle and theory.

David Neuberger

Church House, 7 November 2014

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<sup>14</sup> 1958, Penguin Books 1989