JUDICIARY OF
ENGLAND AND WALES

HIS HONOUR JUDGE ANDREW GOYMER

THE IMPORTANCE OF FORENSIC SCIENCE TO THE COURTS

It is about six years since I was appointed to the FSAC as the Lord Chief Justice's nominated representative. I am almost at the end of my term of office and I had rather hoped that I could see it out without having to say too much that might reveal that I knew too little. The story is told of President Harry Truman of the USA that when he was first elected to the Senate an old hand one took him aside one day and offered him a piece of advice. "Harry, my boy, you'll spend the first six months wondering how you got here and the rest of your time wondering how everybody else got here." Wise advice, no doubt. If only .....

What I am going to speak about are not the scientific details but how scientific and indeed other expert evidence is treated by the courts. Time is limited and I do realise that I have a very large canvass on which to paint. The result is likely to be something that resembles the later works of Turner or Monet, in other words a pastel coloured blur with a few specks or hints of more definite colour.

I do not have a scientific background myself and therefore am in the same position as many other judges and almost all juries when having to evaluate disputed scientific evidence. Most non-scientists see scientific evidence as providing a rock of certainty in a choppy sea of conflicting and frequently mendacious eye-witness evidence. One has to learn that it can sometimes be an illusion. Scientific facts may not lie or forget but they have to depend ultimately on probabilities. I can well understand the scientist's frustration when the lawyer asks "Can you give me a black or white yes or no answer?"

History

It is difficult to know exactly when scientific evidence really began to have an impact on the courts. Fingerprints began to be used in the late 19th.century.

Pathology became highly developed in the mid 20th. century. As a schoolboy I learnt about DNA the chemistry of life a discovery made in Coronation year. It seemed to me at the time that it would be interesting from a theoretical and philosophical viewpoint in much the same way as Darwin's theory of evolution. In other words it was without doubt logically correct but one could not immediately see a practical everyday use for it. How wrong I was. Of all the scientific advances in the courts in my professional lifetime DNA profiling must rank as one of the most significant in the criminal justice system. Let us just remember where we about 40 years ago in the early 1970's. The tools available were fingerprints and blood grouping. One was thought to be almost infallible while the other was a very broad classification.

Then DNA profiling came upon the scene. What it achieved was a precise way of identifying the link between the accused person and the victim or the scene of the crime or both. Not only that but it no longer depended on leaving body fluid or hair at the scene. Skin contact or cellular contact would suffice. I recall trying a case involving a tie-up robbery where the twine used on the victim had the defendant's profile. He was actually acquitted which is a very good illustration of the fact that scientific evidence does not always provide all the answers.

1. Quality

Scientific evidence must be of the highest quality. That goes without saying. We depend very much on the honesty of eye witnesses. No justice system can be safe against deliberate perjury and it is less easy to detect than might be imagined. But we are perhaps even more at peril from the honest but mistaken eye witness. We look if we can to the scientist to offer some protection from that in the hope that science will be able either to confirm or refute the eye witness. That in turn depends on the scientist observing the highest standards of competence and integrity. The two go hand in hand. A competent scientist approaches the task with an open mind and ensures that every line of enquiry is considered and every investigation thoroughly carried out. Integrity demands that the scientist does not overstate his or her conclusions and is ready to concede the limitations and drawbacks. All scientists have a heavy responsibility because their conclusions can make the difference between justice being done and some appalling miscarriage of it.

Our system of criminal justice remains fundamentally an adversarial one in the sense that it essentially an exercise in proof. The question is not so much "did

the defendant do it?" as "can it be proved that the defendant did it?" This is rooted in our belief in the presumption of innocence, the burden and the standard of proof. We do not differ in these beliefs from other systems. It is a question of how and by what means we achieve the objective of a fair trial. One disadvantage of our system as far as experts are concerned is that in the past it has produced a gladiatorial contest between them that sometimes seemed to be based more on reputation than specific findings. The judge and jury were hapless and sometimes helpless spectators of this battle with the judge trying to identify the issues and the jury to resolve them as best they could.

Much of this has now changed. Speaking for myself I have never favoured the idea that some have of a single court-appointed expert. It is incompatible with a system that rightly permits a defendant to deploy whatever evidence he wishes so long as it is relevant to the issues in the trial and admissible in law. The solution has been a procedural one through the mechanism of case management. The provision is Rule 33 of the Criminal Procedure Rules

CPR 33. Duties of experts

33.2. (1) An expert must help the court to achieve the overriding objective by giving objective, unbiased opinion on matters within his expertise.

(2) This duty overrides any obligation to the person from whom he receives instructions or by whom he is paid.

(3) This duty includes an obligation to inform all parties and the court if the expert's opinion changes from that contained in a report served as evidence or given in a statement.

33.3. (1) An expert's report must—

(a) give details of the expert's qualifications, relevant experience and accreditation;

(b) give details of any literature or other information which the expert has relied on in making the report;

(c) contain a statement setting out the substance of all facts given to the expert which are material to the opinions expressed in the report, or upon which those opinions are based;

(d) make clear which of the facts stated in the report are within the expert's own knowledge;

(e) say who carried out any examination, measurement, test or experiment which the expert has used for the report and—

(i) give the qualifications, relevant experience and accreditation of that person,

(ii) say whether or not the examination, measurement, test or experiment was carried out under the expert's supervision, and

(iii) summarise the findings on which the expert relies;

(f) where there is a range of opinion on the matters dealt with in the report—

(i) summarise the range of opinion, and

(ii) give reasons for his own opinion;

(g) if the expert is not able to give his opinion without qualification, state the qualification;

(h) contain a summary of the conclusions reached;

(i) contain a statement that the expert understands his duty to the court, and has complied and will continue to comply with that duty; and

(j) contain the same declaration of truth as a witness statement.

2. The jury's role

The jury is the final arbiter of all questions of fact including expert evidence. The proposed direction in the Judicial College's Bench Book is to the effect that the expert evidence is usually only part of the evidence and that the jury must reach their verdict on the whole of the evidence. In addition the jury are not obliged to act upon expert evidence that is unchallenged or even admitted.

A witness called as an expert is entitled to express an opinion in respect of his findings or the matters which are put to him. You are entitled and would no doubt wish to have regard to this evidence and to the opinions expressed by the expert when coming to your own conclusions about this aspect of the case.
You should bear this in mind. If, having given the matter careful consideration, you do not accept the evidence of the expert, you do not have to act upon it. Indeed, you do not have to accept even the unchallenged or agreed evidence of an expert. Where two or more experts have given conflicting evidence, it is for you to decide whose evidence, and whose opinions you accept, if any. You should remember that this evidence relates only to part of the case, and that whilst it may be of assistance to you in

reaching a verdict, you must reach your verdict having considered all the evidence.
One possible exception to this arises in the case of diminished responsibility in murder trials. There are two principles that apply:

a) If there are no other circumstances to consider, unequivocal uncontradicted medical evidence favourable to a defendant should be accepted by a jury and they should be so directed
b) Where there are no other circumstances to consider, the medical evidence even if unequivocal and uncontradicted must be assessed in the light of the other circumstances.

3. Presentation.

Lord Rutherford the atom scientist is reputedly famous for saying that physics is the only science and that everything else is stamp collecting. Like all reputedly famous quotations he didn't actually say it quite like that. Whether the more pithy version, "science is either physics or stamp collecting" is less abrasive may be open to debate. I want to remind or inform you as the case may be of something less wel known but more important. A few years ago before the dreadful earthquake that devastated Christchurch in New Zealand I visited his "Den" in the old university building and heard a recording of one of his lectures. He said this "If you cannot make the person who cleans your floor understand it then you probably don't understand it yourself." That is a valuable lesson for both scientists and lawyers alike. Care must be taken not that the readers or listeners may understand if they choose to but that they must understand whether they choose to or not. In some ways lawyers are the worse offenders perhaps because they feel on their own territory. Try if you can to make complex topics understandable. One of the things that I have tried to encourage is the production of primers that contain the basic science that the jury needs to know for the case that is before them. It is not an encyclopaedia of all the available learning on the topic but a summary of the basics that the jury needs to know in order to understand the basic science that underlies the expert's conclusions. I also urge experts to use language that ordinary folk such as the jury (and me!) will understand. It was said that one of the reasons why Sir Bernard Spilsbury had such an effect on juries was that he used ordinary language. He did not talk about a laceration a contusion or a haematoma but a cut or a bruise. He probably does not deserve now the admiration that he received during his career, but that is for another reason. He is justifiably

criticised for being too dogmatic and inflexible and unwilling to modify his opinions but he was I suppose a product of the age and culture in which he lived, a man of his time. The disturbing thing is that it was one in which an expert's conclusions were literally a matter of life and death. These days the expert witness who presents his or her conclusions with restraint and moderation and is prepared to make whatever concessions can be made will be listened to with much greater respect on the controversial matters if these are based on sound reasons.

A lot has changed and much of it within my own professional lifetime. The Criminal Procedure Rules now encourage the narrowing of issues where there is disputed expert evidence. All Crown Court cases now start with a plea and case management hearing several weeks or more usually months before the trial. As its name suggests it involves not only the taking of the plea ("arraignment" in legal terms) but also assuming that the plea is not guilty, the making of various directions for the trial. In a case where there is likely to be expert evidence on each side the direction is that the experts shall meet and confer together and produce a summary of their points of agreement and disagreement. It is extraordinary how few areas of dispute are left after this process. Probably in about 80% of cases that potentially involve conflicts between experts the result is a document setting out a series of agreed facts which is then placed before the jury. Even in the remainder of those cases the experts are called on the very narrow points and even these may become ones of emphasis.

CPR 33.6. (1) This rule applies where more than one party wants to introduce expert evidence.

(2) The court may direct the experts to—

(a) discuss the expert issues in the proceedings; and

(b) prepare a statement for the court of the matters on which they agree and disagree, giving their reasons.

(3) Except for that statement, the content of that discussion must not be referred to without the court's permission.

(4) A party may not introduce expert evidence without the court's permission if the expert has not complied with a direction under this rule.

Formal admissions or agreed facts as they are sometimes called have been a feature of the criminal justice system since 1967. They have expanded as a matter of practice. The difference between the two is this. A D can only make a positive admission of something if it is actually within his own knowledge. If it is not something of which he has direct knowledge he cannot strictly speaking make an admission of it. That is so even if in fact he does not dispute it. But the jury can be directed that if they think it right they can take it as proved if there is no evidence to contradict it. In very many cases the scientific evidence is reduced to a series of agreed facts which make absolutely clear any limitations it may have and how it is that certain facts remain inconclusive.

4. Acceptance of new scientific discovery

Surprisingly one has to go to Australia for the definitive statement of conditions for admissibility of any expert evidence whether scientific or otherwise. Expert evidence is admissible if three conditions are satisfied. R. v. Bonython (1984) 38 SASR 451 is the case.

1. The matter must be one upon which the members of the jury cannot reach conclusions of their own from their ordinary knowledge and experience of the world.
2. The matter is a sufficiently recognised scientific discipline . It is described as "a body of knowledge or experience which is sufficiently organised or recognised to be accepted as a reliable body of knowledge or experience"
3. The expert is sufficiently qualified in the particular discipline.

How does new scientific discovery gain acceptance in the court? We need to ensure that quality is maintained and that "junk science" is banished from the courtroom. At the same time we need to be constantly alert to and abreast of new scientific developments so that the law and in particular criminal justice is not left behind by them. The old established academically based sciences such as medicine geology or metallurgy present no problem. Expert evidence of fingerprints handwriting comparison and accident reconstruction is regularly given. On the other hand the courts would not accept the evidence of an astrologer soothsayer or alchemist. Nor would the evidence of an amateur psychologist be accepted. There is a risk that if in a criminal case the Crown is permitted to call evidence from an expert witness of some but tenuous qualifications the burden of proof may imperceptibly shift and a burden be cast on the defendant to rebut a case that should never have been before the jury at

all. The defendant cannot fairly be asked to meet the evidence of a quack a charlatan or an enthusiastic amateur.

The test for admitting new scientific evidence is almost certainly that in the American case of Daubert v. Merrell Dow (1993). The earlier case of Frye v. US (1923) no longer represents current practice. There is no longer an additional test of admissibility of acceptance generally by the scientific community. When I attempted to analyse the case law I found it difficult to find an English case that expressly followed it but there is a tacit acceptance of the principle in a number of recent cases. The Court of Appeal has in several cases approved the following statement of principle from Cross and Tapper on Evidence (12th. edition) "The better and now more widely accepted view is that so long as the field is sufficiently well established to pass the ordinary tests of reliability and relevance, then no enhanced test of admissibility should be applied, but the weight of the evidence should be established by the same adversarial forensic techniques applicable elsewhere."

However, there is no closed category where evidence cannot be placed before a jury. As was said in one case "it would be wrong to deny to the law of evidence the advances to be gained from new techniques and new advances in science."

Although at one time a more conservative approach had been adopted, the policy of the English courts has been to be flexible in admitting expert evidence and to enjoy the advantages to be gained from new techniques and new advances in science.

5. The cases

R. v. Hoey This case as is well known arises out of the trial of the defendant for the Omagh bombing of 1998. It took place in a so-called "Diplock" court before a judge sitting alone. In non-jury trials in Northern Ireland the judge is required to deliver a reasoned judgment in place of the conventional summing-up and a general verdict of either guilty or not guilty. The case was said at the time to amount to a general condemnation of the science of low template DNA. It is no such thing and never was. The case was decided at first instance (i.e. trial). It was decided on its facts. First instance decisions are not binding in law on other courts and depend on their own facts. The judge based most of his findings on the lack of care in preventing cross-contamination and the finding of DNA inside timers that came not from the caravan occupied by the defendant but from one next door.

R. v. T footwear

R. v. Smith Fingerprints

i) Most forensic science services have for some time been provided by organisations wholly independent of police forces. There are also a number of private providers of forensic science services. In contradistinction, fingerprint experts are organised in Fingerprint Bureaux which fall within the organisational structure of each police force. This may be a distinction that is justified; it may be possible for independence to be assured by strict standards of control on quality and by accountability.

ii) There is no opportunity for a person outside a police Fingerprint Bureau to become fully qualified as a fingerprint expert by training in England and Wales or for having that person's competence recognised by the police forces.

iii) Police forces do not recognise the qualifications or competence of those who have obtained these overseas. It is for a judge to decide whether a person is a competent expert, not the police. Because of the course the trial took, the judge did not have to rule on whether Ms Tweedy, who obtained qualifications overseas, was a competent expert.

iv) It is essential for the proper administration of justice that there are independent persons expert in fingerprint examination; almost all who do this are retired from police Fingerprint Bureaux. The position is in marked contrast to other forensic science disciplines. There may be good reason for this distinction; for example the fingerprint bureau of other forces may be able to provide expert evidence for the defence.

v) No competent forensic scientist in other areas of forensic science these days would conduct an examination without keeping detailed notes of his examination and the reasons for his conclusions. That universal practice of other forensic scientists was not followed by the Nottinghamshire Fingerprint Bureau. There may be reasons for this, but they were not explained to us.

vi) As neither the original examiner nor those who confirmed his examination made any notes of their reasons and did not identify the points of comparison contemporaneously on a chart, it was not possible to see whether their reasoning was the same. We were told that this was not done because those who made the subsequent identification should make that identification without knowing the views of those who had previously examined the print. Although we accept that

identification by two other persons who do not know the conclusions of the original examiner or the other examiner form an important safeguard, we do not understand that reasoning. There would be nothing to prevent the earlier examiners sealing their conclusions until the completion of all the examinations. We do not know whether there is any other justification for examiners not making detailed contemporaneous notes that can be the subject of transparent examination in court where the identification of the mark is in issue.

vii) The quality of the reports provided by the Nottinghamshire Fingerprint Bureau for the trial reflected standards that existed in other areas of forensic science some years ago and not the vastly improved standards expected in contemporary forensic science.

viii) The presentation of the evidence to the jury made no attempt to use modern methods of presentation. The presentation to this court was similar; a large amount of time was wasted because of this. It was incomprehensible to us why digital images were not provided to the jury; the refusal of NAFIS (to which we have referred in paragraph 43) to permit a digital image to be supplied to the court was a further example of the lack of a contemporary approach to the presentation of evidence. The presentation to the jury must be done in such a way that enables the jury to determine the disputed issues.

R. v. Reed Low template DNA

As the court observed in the case of R. v.Doheny (1997), "the significance of DNA evidence depends to a large extent upon the other evidence in the case. By itself such evidence, particularly if based on a partial profile, may not take the matter far, but in conjunction with other evidence it may be of considerable significance."

The judgment affirms the principle that in effect the Daubert test is the applicable one. "Expert evidence of a scientific nature is not admissible where the scientific basis on which it is advanced is insufficiently reliable for it to be put before the jury. There is, however, no enhanced test of admissibility for such evidence. If the reliability of the scientific basis for the evidence is challenged, the court will consider whether there is a sufficiently reliable scientific basis for that evidence to be admitted, but, if satisfied that there is a sufficiently reliable scientific basis for the evidence to be admitted, then it will leave the opposing views to be tested in the trial." The court approved the

statement of principle contained in Cross and Tapper as indeed had previous decisions on ear prints and lip reading.

It can now be said with confidence that if the stochastic level reaches 200 picograms it is not open to challenge as such. There must be some special circumstances to warrant it. There remains some dispute within the scientific community whether 100 to 200 is acceptable. Paragraphs 74 and 111 of the judgment summarise the position. I have summarised the effect of paragraph 111 and I have reproduced paragraph 74 in full below:

On the evidence before us, we consider we can express our opinion that it is clear that, on the present state of scientific development:

i) Low Template DNA can be used to obtain profiles capable of reliable interpretation if the quantity of DNA that can be analysed is above the stochastic threshold – that is to say where the profile is unlikely to suffer from stochastic effects (such as allelic drop out mentioned at paragraph **Error! Reference source not found.**) which prevent proper interpretation of the alleles.

ii) There is no agreement among scientists as to the precise line where the stochastic threshold should be drawn, but it is between 100 and 200 picograms.

iii) Above that range, the LCN process used by the FSS can produce electrophoretograms which are capable of reliable interpretation. There may, of course, be differences between the experts on the interpretation, for example as to whether the greater number of amplifications used in this process has in the particular circumstances produced artefacts and the effect of such artefacts on the interpretation. Care may also be needed in interpretation where the LCN process is used on larger quantities than that for which it is normally used. However a challenge to the validity of the method of analysing Low Template DNA by the LCN process should no longer be permitted at trials where the quantity of DNA analysed is above the stochastic threshold of 100-200 picograms in the absence of new scientific evidence. A challenge should only be permitted where new scientific evidence is properly put before the trial court at a Plea and Case Management Hearing (PCMH) or other pre-trial hearing for detailed consideration by the judge in the way described at paragraphs **Error! Reference source not found.** and following below.

iv) As we have mentioned, it is now the practice of the FSS to quantify the amount of DNA before testing. There should be no difficulty therefore in ascertaining the quantity and thus whether it is above the range where it is accepted that stochastic effects should not prevent proper interpretation of a profile.

v) There may be cases where reliance is placed on a profile obtained where the quantity of DNA analysed is within the range of 100-200 picograms where there is disagreement on the stochastic threshold on the present state of the science. We would anticipate that such cases would be rare and that, in any event, the scientific disagreement will be resolved as the science of DNA profiling develops. If such a case arises, expert evidence must be given as to whether in the particular case, a reliable interpretation can be made. We would anticipate that such evidence would be given by persons who are expert in the science of DNA and supported by the latest research on the subject. We would not anticipate there being any attack on the good faith of those who sought to adduce such evidence.

Reed itself is a good illustration of how the importance of DNA depends on the rest of the evidence. The Reeds were two brothers accused of the murder of local man who lived near them on Teesside and who had been stabbed to death several times in his own home. There was some general circumstantial evidence of sightings of the defendants in the vicinity of the deceased's house shortly before the likely time of the murder and a possible motive on their part for the crime. There was one other interesting piece of evidence. One of them had been seen wearing a red Adidas top. The following evening he purchased one of identical appearance from a local sports wear shop. The prosecution case on this was that not only had he needed to dispose of the original one because it was bloodstained but he had also wanted to conceal the fact that he no longer had it because its disappearance would in itself attract suspicion. The essential evidence was the finding of two pieces of plastic near the body of the deceased. These were identified as knife handles and the blade of one was recovered from a nearby drain. The handles both bore low template DNA of the defendants. It was in fact admitted at the trial that it was their DNA although no explanation for its presence was ever put forward. The defence was an alibi. The appeal was on the basis that low template DNA was generally inadmissible in evidence. Without the DNA there would have been grave suspicion but possibly no more than that. Can I leave you to ponder on this thought? If you were on the jury and the only evidence had been the DNA would you have been sure of guilt?

It is a measure of the success of scientific evidence that so much of it such as DNA is now a matter of routine in criminal trials. In the overwhelming majority of them it features without controversy. The cases that lead to appeals are often high profile ones of public importance and interest. Numerically, however, they are a minority.

6.Looking to the future

A. Statutory powers for the Regulator

1.1 The question of giving statutory powers to the Regulator has been discussed at recent meetings of the FSAC. The Regulator has produced a Code of Practice which seems to work well. It has for the most part been complied with by the forensic science providers. Where there have been incidents of non-compliance these have resolved by agreement and guidance.

1.2 I will admit to a degree of initial scepticism about the need for statutory powers. Having read the Home Office proposals I am now persuaded that statutory regulation in the manner proposed would be beneficial. It strikes an appropriate balance between maintaining proper standards and imposing an excessive and possibly crippling burden of regulation. It is to be hoped that the Regulator's compulsory powers will rarely be needed but are there to deal with rogue providers.

B. Potential deficiencies in the current position

2.1 Although the existing code is not statutory this does not mean that there are no sanctions for failure to comply with it. Criminal courts can refuse to admit evidence obtained in breach of it. The power to do so has its limitations. Under section 78 of the Police and Criminal Evidence Act 1984 ("PACE") a court may refuse to admit evidence on which the prosecution seeks to rely if it would have such an adverse effect on the fairness of the proceedings that the court ought not to admit it. At common law there is a residual discretion to exclude evidence if its prejudicial effect outweighs its probative value.

2.2 This power and discretion does not however extend to excluding evidence for the defence. Defence evidence is subject to the basic legal tests of relevance to the issues in the case and admissibility under the legal rules. In particular for example in a case involving co-defendants there is no discretion to exclude prejudicial or damaging evidence that one defendant seeks to adduce either in his own favour or against the other defendant. If it is relevant and admissible it cannot be excluded.

2.3 In these circumstances the statutory basis will not be effective unless the statute gives a court general power to refuse to admit evidence obtained in breach of the Code where it would be contrary to the interests of justice to admit it. Automatic exclusion for a breach is too inflexible. Each case may turn on its

own facts so there must be a measure of judicial discretion to enable justice to be done. If it is not considered there is a real risk of large amount of unsatisfactory defence scientific evidence being admitted which a court would have difficulty in controlling.

3. I have responded in these terms to the recent Home Office consultation paper. I have been fortunate to have my response overseen by both the Lord Chief Justice, Lord Thomas and by Lord Justice Beatson both of whom support my proposals. If the Government does not act upon them there is a real danger to quality from spurious scientific evidence being admitted for the defence. This real danger would come from those who may see commercial advantage in producing conclusions that their clients want to hear. In this way quality and rigorous dispassionate objectivity would be subordinated to objectives of a far baser kind. We must not allow this to happen. We must remain vigilant to ensure that standards are maintained.

7. Envoi

When I was appointed to this position nobody ever asked me what qualifications I had. Perhaps the one thing to which I ought and can now safely admit is that I never managed to pass O Level Physics. Somehow I don't think that when I do come to retire I shall try a re-sit, quite apart from the fact that the exam no longer exists. If I recall Rutherford there is always stamp collecting but I was never much good at that either. The trouble with the advice given to Truman is that it hasn't really worked for me. After six years I may have almost reached the point of ceasing to wonder how I got here but I shall never be anywhere near wondering how the rest of you did. My advice to my successor is what I said when asked for the job description. "Just sit and listen. Let the scientists do all the talking because they know far more about it than you." With that I thank all those who have sat with me on the FSAC over the years and impressed me with their learning as well as all of you who have listened to me this afternoon and bid you all farewell.