



Select Committee on Science and Technology

Corrected oral evidence: Forensic Science

Tuesday 15 January 2019

3.25 pm

[Watch the meeting](#)

Members present: Lord Patel (The Chairman); Lord Borwick; Lord Griffiths of Fforestfach; Lord Kakkar; Lord Mair; Baroness Manningham-Buller; Baroness Morgan of Huyton; Baroness Neville-Jones; Lord Oxburgh; Lord Thomas of Cwmgiedd; Baroness Young of Old Scone.

Evidence Session No. 17

Heard in Public

Questions 182 - 197

Witness

Dr Sheila Willis, National Institute of Standards and Technology, United States.

USE OF THE TRANSCRIPT

This is a corrected transcript of evidence taken in public and webcast on www.parliamentlive.tv.

Examination of witness

Dr Sheila Willis.

Q182 **The Chairman:** Good afternoon Dr Willis. Thank you for coming today to help us with our evidence, particularly with your expertise and knowledge about how the forensic science provision works for the criminal justice system in the United States and Ireland. For the record, perhaps you would introduce yourself. If you want to make an opening statement, please feel free to do so. If not, I shall crack on with the questions.

Dr Sheila Willis: I have been a forensic scientist for most of my career. I studied chemistry a long time ago, but most of my time was spent in Forensic Science Ireland, where I was the director-general from 2012 to 2017. Since then, I have been a guest researcher at the National Institute of Standards and Technology in the US, where I am part of a team looking at the scientific foundations of DNA mixture interpretation.

I thank you very much for the opportunity to be here, because I feel very strongly about forensic science and how it should develop. That said, I rather hope that I can be of some assistance, because I do not believe that there is any such thing as an ideal model—not one that I am aware of. I say that partly on the basis that we do not agree across the world about what constitutes forensic science—indeed, we do not even agree about it within some countries—and that, of course, makes progress difficult.

I am particularly concerned about the possibility that in the future we might end up having a race to the bottom and ignoring the fact that the most fundamental thing about forensic science is that it is produced by forensic scientists, and they need to be nurtured and progressed as scientists if we are to get value from the system.

Q183 **The Chairman:** Thank you very much. With that as background, perhaps I might kick off with the first question. Can you tell us something about the forensic science provision for the criminal justice system in the US and Ireland? With your knowledge, how do England and Wales compare with that?

Dr Sheila Willis: That is a really big question, although of course I anticipated it, so I have been thinking about it. First, you asked me about forensic science in the US. That is a huge question, because it is so varied. One of the negative aspects is that it varies from almost a one-person band to big federal organisations and everything in between. As a result, it is really difficult to get an agreed standard for what is sensible. There is no regulation as there is in this jurisdiction, and there is no uniformity.

That said—I do not know whether this is to do with economy of scale—there is a wider interest in forensic science in the science community outside of forensic science and in the legal community. However, as I said, that might be a scale effect. Often this focus is negative—there is a lot of negative commentary—and little enough in the way of mechanisms

for improving it. One exception is that the organisation I am working with at the moment has resources to look at scientific foundations and research for forensic science. That is a positive aspect. There is no fixed mechanism for implementing any output from that, so it would be done by influence.

Obviously the jurisdiction that I know most about is Ireland. There, the exact opposite applies, in that it has a very small forensic science service staffed by possibly higher-qualified people than is the norm in many jurisdictions. A lot of my colleagues had PhD qualifications. We benefited by working in partnership with investigation, which was a big plus and we also had the trust of the courts.

On the negative side, we did little enough in the way of fundamental research. Any research that we did was of a developmental nature. To my regret, similar to most other organisations, I never found satisfactory performance indicators other than turnover and time, which have unintended consequences that, in my opinion, do not help the customer service aspect.

The Chairman: You were director of the forensic science service in Ireland. Is that right?

Dr Sheila Willis: That is correct.

The Chairman: Was that a statutory role?

Dr Sheila Willis: No, it was not a statutory role as such. I was a civil servant.

The Chairman: But it was established by Parliament.

Dr Sheila Willis: Yes, by the Dáil.

The Chairman: So what authority and responsibility did you have?

Dr Sheila Willis: I was answerable to the Minister for Justice via the Department of Justice. From a scientific point of view, I had total independence, with no interference in what science or policy I produced at a particular time, but I did not have the authority to hire and fire. It was an associated office of the Department of Justice.

The Chairman: You said that your role now in the United States is a standard-setting role.

Dr Sheila Willis: The organisation is part of the United States Department of Commerce, which is responsible for standards across the piece. I happen to be working with a small group that is looking at the scientific foundation of DNA interpretation.

Q184 **Baroness Neville-Jones:** If, as director-general, you did not have the authority to hire and fire, who did appoint people who worked for you?

Dr Sheila Willis: I had some input into the appointment, but it was a constant struggle through most of my career to get the resources necessary to deliver on the service. One of the aspects that characterised the service was that the demand always outstripped the resource that we

had to deliver, which might be one reason why, to my regret, we had no research arm.

I think I should have made a stronger argument that that was a vital part of the service, but we had the advantage of being next door to what I consider to be the world leaders at the time, this country. Because of the innovation coming out of this country we had the ability to tap into this country at that time.

Baroness Neville-Jones: And that time was—

Dr Sheila Willis: Prior to changes to the market.

Baroness Neville-Jones: Right, so before the public services disbanded.

Dr Sheila Willis: Yes.

Baroness Neville-Jones: Who was the guardian of standards then?

Dr Sheila Willis: I guess I was, really.

Baroness Neville-Jones: So you could say, “I don’t think this candidate’s good enough”.

Dr Sheila Willis: Yes. Obviously there was a board. The public service committee had a mechanism for recruiting staff, but my input was taken to be very much part of that. If I had something crazy, it was unlikely to run, but if I had a reservation, it was settled.

Q185 **Baroness Young of Old Scone:** What proportion of the service in Ireland is provided by state-appointed folks? Are there any commercial providers?

Dr Sheila Willis: There are no commercial providers in the same way as there are here. The service is divided in an illogical manner, similar to very many other countries where the provision is almost accidental, depending on when different services crop up.

The Garda Síochána—the Irish police force—provided services in fingerprints, ballistics and photography. The laboratory that I headed up provided services in chemistry, trace evidence, drug analysis and DNA, and housed the DNA database. Another service dealt with road traffic offences, because it was under a different ministry.

Baroness Young of Old Scone: How about digital? Where is that dealt with?

Dr Sheila Willis: That is a good question.

Baroness Young of Old Scone: What is the good answer?

Dr Sheila Willis: I do not know. One of the local universities had a department that was beginning to promote the use of digital, but I would not say it was a robust service. I had considered that it should have been housed in Forensic Science Ireland. I still feel that, because one of the drawbacks of any new development is that there is a tendency to reinvent the wheel as though it is a completely new set of standards.

It would be better if we had an integrated approach, rather than thinking, "Here's the new shiny toy that's going to solve everything", and we develop a whole new set of standards for it. That is what is happening with digital, which is a shame.

The police also provide some service.

Q186 Lord Oxburgh: You have experience of the operation of forensic science markets in different parts of the world and different legal environments. There is a problem with procuring advice or professional assessments anyway in almost any field.

Can you from your experience elsewhere suggest ways in which we should go ahead in this country, or not go ahead?

Dr Sheila Willis: Obviously the marketplace is here to stay and there have been lots of advantages from it. The downside with it is the methods of procurement, which are as you say. The methods seem to follow a commodity approach, which seems to me to be totally unsuited to the forensic science world. It gives an appearance of independence but actually puts the entire service in the hands of the police, which is understandable: forensic science is there to assist in the investigation of crime, so of course the police have an integral part.

However, if you think of forensic science as being of any assistance to the adjudication at the court stage, there are other needs. I would see an advantage in having a mechanism whereby the scientists advised as to what services might be useful in a particular example or a particular case. The police are entitled—of course they are—to reject that and not accept it, but we are losing some of the value of science in that mechanism not being built in in some way to the procurement.

A much earlier committee—I do not remember the format—followed the case of the Yorkshire Ripper. I think Lord Byford was the chairman. Its recommendation was that the scientists should be embedded with the investigation. That never progressed to any significant extent. For big investigations I still see value in that, as opposed to routine cases, where the needs are probably well known.

Lord Oxburgh: Does any country seem to you to have got this absolutely right, or close to it?

Dr Sheila Willis: I do not believe that anybody has it absolutely right. I am quite impressed with Switzerland. The university at Lausanne has an undergraduate course in the fundamentals of police science in all its ranges, as opposed to a course in chemistry that tags on some forensic science. It has a research programme and it seems to people a lot of the police and science roles in Switzerland, which gives them greater coherence. I am familiar with the university but not so much with the workings of it, but I think it is quite a good mechanism.

Q187 Lord Griffiths of Fforestfach: In the first sentence in your response to the first question from Lord Oxburgh, you said that the market had some advantages. In addition to that, the institution that you are now involved

with in the US has a mission to promote innovation and industrial competitiveness. Can you expand on what you think the advantages of the market may be?

Dr Sheila Willis: The advantages were that the discipline moved from one that was a bit lackadaisical as to when the service might be delivered to one where there was professionalism in the delivery of the service: you say you are going to do it now, and you do it now. That may not have happened without the market.

There has also been investment, but probably insufficient investment. As I understand it, there is a decreasing spend on forensic science in the UK. In a way, you get what you pay for, and if we continue to shrink the amount of money—

This is where I flagged up my concern about the future, because we can probably produce commodities in a speedy fashion, but if we want real scientific advice feeding into complex cases, it takes time, money and expertise, and it takes time to grow that expertise. The US model¹ is a very academic environment. There is no money going into it at the moment, but ordinarily a lot of money is spent on a wide range of scientific activity. The section that I am involved with is a very small part, and the innovation at NIST is primarily an aid to commerce.

We should be able to modify the market so that the amount of money is spent and we see the advantages from the various stakeholders. There is almost a slight adversarial approach to the procurement of services here, and I do not think that is beneficial.

Baroness Neville-Jones: You used the phrase “embedded with the investigation” a couple of times. Could you kindly unpack that phrase and say exactly how that worked?

Dr Sheila Willis: One of the parameters that you flagged up that you might like to speak about was responsiveness. That prompted me to think about what responsiveness looks like. We sometimes mix that up with speed and with everything having to be done now. In fact, the investigation needs different things at different times. My experience at home and what I know from when I worked with providers here is that there is tendency to say, “We want it now. We want everything now”. That is not possible.

A more trusting situation should be built up so that people can say, “At this stage of the investigation, we are looking at this”. By tomorrow or in six hours’ time, that lead may have gone dead and the police may no longer be interested in it. If there is a big gap between the science and the investigation, the scientists can be beavering away on something that has been rejected for some other reason, so you need a close working relationship. For major cases in Ireland, that is the way that we worked.

¹ The witness sent this extra information following the session: I was referring to NIST at this point. Its misleading to suggest that forensic science in the US is in an academic environment – quite the contrary.

We had an individual who was in regular contact with the main investigator.

Baroness Neville-Jones: What about the court as a whole? This is not just about the prosecution; there is obviously the defence as well.

Dr Sheila Willis: What do you mean when you say, "What about the court as a whole?"

Q188 **Baroness Neville-Jones:** It sounds to me, from what you say, as if this relationship existed between your team and those investigating, who are potentially preparing evidence for prosecution. Were your services available to the defence as well? I am thinking about the impartiality of the court.

Dr Sheila Willis: It was something that we were conscious of and I want to come back to it. We did not have a situation where the defence used the laboratory for services, although there was no reason why it could not do that if it wished. On occasion, the defence contacted individuals in the laboratory and looked for advice on some aspect of a case. The defence saw us, on some aspects, as being available for consultation, but we did not have the same service offering to both.

Baroness Neville-Jones: The prosecution or the police would be expected to disclose.

Dr Sheila Willis: Yes. I want to continue on that line a little. I feel strongly that forensic science should have that impartial role. It is not just about the prosecution. Again, we have to be careful of unintended consequences. If we have a commodity procurement system, we might be ignoring instances where we might have negative results that are not disclosed because people are not aware of them. I think the way around that is a strong science culture within the forensic science community.

What do I mean by that? I mean expectation, experimentation and evaluation. If you are going to look at something—this goes back to the point about procurement—and if you are going to test a theory, you have some expectation as to whether you will find something. If you find a negative, that needs to be reported into the system. If the scientific expectation is not built in up front, it is unlikely that the significance of the negative finding will be evidenced.

I also think that in the courts there was a tendency for us to be conservative. There are pluses and minuses to that, but that was our culture, which perhaps meant that there was more likely to be trust if we said that something had some significance.

Baroness Neville-Jones: You said that, at the time when the UK still had a public forensic science service, a lot of innovation came out. Are we to understand, by implication, that that is no longer the case?

Dr Sheila Willis: No. I would not claim that it is no longer the case, although I do not know. When it was a public service, there was a great sharing of knowledge and information. Clearly, in a commercial environment, that is not as easy. I am not an expert in any way on

intellectual property and how it operates, but prior to the marketplace there was a great sharing of information and we in Ireland benefited from that.

Baroness Neville-Jones: It is a sharing issue rather than necessarily a scientific advance issue.

Dr Sheila Willis: Yes, although I imagine that, in a shrinking market, it must be challenging to have innovation and a good service.

Q189 **Lord Kakkar:** I would like to turn to the research base that underpins forensic science. In the different jurisdictions in which you have worked, are there gaps in the science driving some of the validation of forensic techniques, in terms of what would be considered robust scientific methodology and evaluation? Who has responsibility for identifying those gaps and identifying how the research questions should be answered?

Dr Sheila Willis: When we say the research questions, there are lots of gaps in almost trivial issues, which do not attract funding or interest from academia or granting bodies. I should say as background information that we have made great strides in the detection of DNA, for example, but we do not know enough about how frequently it transfers in certain circumstances.

A body of work has been carried out in different parts of the world, but not in a systematic way that means that we can give the courts good information on the activity that gives rise to the DNA or a probability of what you would expect in that situation. Anyone who thinks about or reads about the topic sees gaps. Who should identify who is responsible for delivering it? There is nobody. We depend on the academic community, I suppose. It is not the type of work that attracts big multinationals to engage in it.

As regards validation, people sometimes talk about the same gaps. The organisation that I work with is very conscious of this. There has been a lot of criticism in the US that some traditional areas of forensic science lack a scientific foundation. NIST is carrying out a number of studies to underpin some of the traditional areas, such as pattern evidence. Again, whose responsibility is that? I think it is a gap in the present system in the UK.

A solution that I would recommend is to beef up a central body to have responsibility to ensure that there is some oversight, particularly when a novel technique is introduced—by “novel” I do not necessarily mean a new paradigm; I mean some variation on the existing items. It is incredibly challenging for the courts to be in a situation where they have to properly assess that, so it would be useful if there were some stamp of approval prior to its going into court.

Lord Kakkar: Do you think that the current gaps in the evidence base that underpins the reliability of forensic science and forensics evidence are well understood by those using the courts—the courts themselves, counsel and so on?

Dr Sheila Willis: It is a bit of a curate’s egg. Some do and some do not.

Q190 Lord Thomas of Cwmgiedd: Your CV refers to the fact that you are currently carrying out research on reviewing the scientific foundations of DNA mixture interpretations. This has been quite a controversial subject. In the US, where there are lots of different providers, how do you get the data necessary to assess mixture interpretation? Are there problems in this? Are people happy to give away their intellectual property? How does it work?

Dr Sheila Willis: No, they do not give away their intellectual property. The organisation with which I am working carried out a study back in 2013—a proficiency trial—to which a number of laboratories throughout the United States contributed. It showed quite a bit of variation. It would be fair to say that there is an aggressively adversarial system in operation in the US, at almost all levels, including in relation to the providers of software products that give rise to mixture interpretation. We are looking at what is present in the literature in any principled ways that underpins those interpretations; we are looking for basic scientific literature foundations.

Lord Thomas of Cwmgiedd: How do you get at the data that ultimately will help to determine which of the software products is correct?

Dr Sheila Willis: We are not actually carrying out an assessment of the different products. That is not the idea. It is a broader approach than that.

Q191 Baroness Morgan of Huyton: Following on from what Lord Kakkar was asking about research, when you talked about your long experience in Ireland, you made it clear that research was not a strong part of the function there, so although you think that other parts of the service worked well, it was not strong on research. I do not know what your experience of the States is at the moment, but have you experience of anywhere where the structure enables research and underpins and facilitates research in a better way?

Dr Sheila Willis: I wish I had gained more information about it, but as far as I can make out, New Zealand seems to have a model. Based on the output in the literature, research is coming from New Zealand and presumably case working is continued as well. When I asked one of the members of that laboratory how it was operating I was told that the research was rewarded. It is the reward system. People were rewarded for carrying out research.

Baroness Morgan of Huyton: Is that a state-run apparatus, a market or a mixture?

Dr Sheila Willis: I think it charges for services, but I do not think there is competition. I do not have personal experience of it.

Baroness Morgan of Huyton: That is the only one that you are aware of that you feel is promoting research.

Dr Sheila Willis: The University of Lausanne is promoting research. It also carries out some casework.

Q192 **Lord Mair:** Continuing the line about research, what is the role of the National Science Foundation in the US? Does it encourage research in forensic science?

Dr Sheila Willis: As far as I can make out, most of the fundamental research seems to happen in commercial companies. There are economies of scale there and you can get some benefit from that. This again is based on limited experience of being there. That seems to drive development. A new method of developing DNA is developed and promoted, and gradually it works through the laboratories. That is not regulated in how it is implemented. You may well get a completely different result from one laboratory to another. There is no oversight body checking how that is implemented.

Lord Mair: In terms of university research groups, are there any interactions between private organisations and university groups in innovation, or is it all entirely in the private sector?

Dr Sheila Willis: There certainly are universities. I am trying to think of a good example that would help me to answer that question. I know that some research is happening in universities, but I am less clear about whether it is in co-operation or co-ordination with commercial companies.

Lord Mair: In the UK we have the UKRI, which is the grouping of research councils that encourages innovation, university research, grant applications and innovation involving companies. Is there no equivalent of that in the US?

Dr Sheila Willis: There could be, but I am not familiar with it.²

In relation to the encouragement of innovation, I suggest that there is not enough linking to the real-life issues with research. You can do blue-skies research looking for the ideal question, but we do not have a method of collating the ongoing gaps and issues that arise on an everyday basis. It would be useful if there was some co-ordinating mechanism for that.

At the moment, the regulator's office has a number of specialist groups, and I presume they co-ordinate in some way, but I see a big advantage in beefing up that role somewhat with experienced forensic scientists who would be in a position to assist, whether that be the courts in particularly difficult situations where we are not sure about innovation or companies that wonder whether there is any point in trying to get a product from an innovation stage to a case-working stage. That piece is missing here at the moment.

Lord Mair: We read that the mission of NIST, where you are currently working in the US, is to promote innovation and industrial competitiveness. How does it promote innovation?

Dr Sheila Willis: Not in forensic science; I do not think that the mission is so obvious in forensic science. In forensic science it seems to be more

² The witness sent this extra information following the session: It was very remiss of me not to highlight the National Institute of Justice which has a funding scheme for research through the US.

focused on producing the fundamentals and the validations for existing systems. People are working on Nobel prize projects on time and space and a wider range of areas that presumably end up having spin offs. People clearly see the value in really good-quality measurement. Measurement is king in that organisation, and I think that is how the forensic science base ends up being aligned to it: because people see it as measurement.

Of course, I adhere to the idea that we have to have measurement, but I am bit concerned that as forensic scientists we are focusing too much on test results and are not seeing the context. That is a reservation I have about the approach of focusing just on the test. The test has different meaning in different cases, which is why I am also concerned about the idea that we think about science and forensic science as stand-alone. We need it to be robust, and we need the measurement to be good, but in lots of situations in forensic science we have complex samples and separating the signal from the noise is the biggest challenge rather than the fundamental measurement.

Lord Mair: Are new questions being asked about the whole digital world and the new sorts of innovations, such as mobile phone data?

Dr Sheila Willis: NIST has a strong group working on digital, but I am not so familiar with it. I know that research is going on in that area. There is no doubt that it is going to be a big part of the future. I worry that we do as we did with DNA and almost ignore everything else, because no matter how good it is, it will not be the total answer, and we need to make sure that we do not just take the next new shiny toy and throw everything else out. We need to get the best out of all the tools we have in order to progress crime investigation and its evaluation in courts.

The Chairman: In your initial comments you said that in the United States the level of forensic science provision varies. I presume by that you mean it varies from one state to another.

Dr Sheila Willis: It varies even within states. There are state and local laboratories and federal laboratories.

The Chairman: So what does it look like in a state where it is good?

Dr Sheila Willis: I am not in a position to say. I suppose I am making the assumption that because you get variation you have good and bad, but I do not know of a model where I can say that it is excellent there, because I have not been around enough of the laboratories.

The Chairman: You said that in the US there is now an attempt to provide forensic science expertise to the courts. Is that right? Did you say that forensic scientists are embedded in the justice system?

Dr Sheila Willis: No. In fact, it is quite the opposite. My experience in the United States is that forensic scientists tend to work in quite an isolated manner.

The Chairman: So who provides the necessary education to the justice system and the judiciary?

Dr Sheila Willis: There are various training courses, but again they are rather varied. There are professional organisations and judicial training systems, but there is no uniform, fixed approach in such a way that you could say with certainty that all judges would have the right training that is necessary in these areas.

Q193 **Baroness Young of Old Scone:** Can we pursue a bit further this business of science being embedded in the investigation system or science and forensic science being more distant? One or two of our witnesses from Scotland and Northern Ireland seemed to think that there was value in having what they called a "sterile corridor" between the investigators and the forensic science specialists, which would mean that it would be much more impartial. What I am hearing from you is that you do not really favour that degree of separation; you are keener on a much stronger handshake, as it were, between the two sides.

Dr Sheila Willis: I think it is more an impression of impartiality than it is impartiality. Once the police procure the services, they are in total control of the service provided by forensic science, and that is much more controlling than if there were an advice system. Maybe your witnesses had in mind an advice system, but I was proposing another alternative. I have thought a lot about this. I think that providing good-quality forensic science is quite tricky, because responsiveness is needed at the investigation stage, where you want to narrow the number of options and get to the right people, but when it comes to the court case you need an independent approach whereby people ask, "Is this evidence stand-alone? How does it fit into the context of this case?"

I suggest that there are at least two purposes for forensic science. One is to help in the investigation stage, where quick turnaround times are needed. If the case is going to be contested, you need to think about evaluation, and I suggest that the providers should be requested to ensure that there is a separate report. At the moment in this country, streamline reporting is at least partially the norm, but that could be institutionalised to be part and parcel of the investigation so that streamline reports were the norm for investigations.

However, when a case was contested, a separate scientist in the organisation, or even in a different organisation, would be asked to assess the case. They would be asked what they would expect without knowing the findings and would then write an evaluative report that would be used in court. That would give the balance that was promoted by the Forensic Science Service back in the late 1990s as a way of ensuring a balanced output. It would not interrupt the flow of work to the police and the people who had to evaluate would gain a growing expertise. They would then have knowledge about the gaps. In relation to a particular case they might say, "Well, if only such a thing had been here, we could have given a better answer".

This group of people who I envisage would be overseen by a national group. It would be a small body of people who would be either stand-alone or placed with the regulator, the CPS or the Criminal Cases Review

Commission. So ideally it would be a different body with a better overview of the needs of the system.

Baroness Young of Old Scone: Where do you think a service for the defence should come from and how should its impartiality be safeguarded?

Dr Sheila Willis: I suppose I have not spent enough time thinking about that, although it is a very important aspect. At the moment, as you know, that service is carried out by private companies.

Baroness Young of Old Scone: If there were an independent impartial service, would it be capable of being accessed by the defence as well?

Dr Sheila Willis: There is no reason why it could not be, although my experience is that the defence prefer to have a totally independent resource.

Baroness Young of Old Scone: In the hope that they will get a different outcome?

Dr Sheila Willis: Of course. That is their function.

Lord Griffiths of Fforestfach: The people you described as evaluators play a key role. I take it that on the one hand they need an understanding of science but that, on the other, they also need a familiarity with the investigation and the whole process so that they can relate the two. Where would you get these people from, and how would you train them or have the equivalent of management development training for that sort of function?

Dr Sheila Willis: In the past, those skills were acquired by forensic scientists working in ordinary forensic science organisations and going to scenes or assisting in investigations. I do see no reason why that could not happen again. I would see it as overcoming the difficulty that I identified in the beginning of the race to the bottom, where we are not building enough new expertise in scientists.

We have promoted almost a technical role for the production of test results, as opposed to an advisory scientific role either to the police or to the courts. There is a gap there. Earlier, we talked about gaps in innovation and research. This is a gap that we need to be conscious of, and we need to think about how to fill it. That group could also liaise with academic institutions, which, it is fair to say, are keen to help, although they are coming from a completely different perspective and do not have practical experience of the gaps and issues.

Q194 **Lord Borwick:** Dr Willis, is enough being done to prepare for the increasing role of digital forensics in the future?

Dr Sheila Willis: I doubt it.

Lord Borwick: Is any other country doing it properly now?

Dr Sheila Willis: To go back to Switzerland, I know that a lot of digital work is being done at the University of Lausanne. I know that NIST in the US is also working on it. Whether it is enough, I do not know, and I do

not know how it will be set out to the organisations that will need to use it. I think that digital is particularly difficult in the forensic context, because there are so many other vested interests in it, including the intelligence community. It has many more commercial sensitivities than any of the other materials that we have traditionally used in forensic science. I am not sure that we have the structures in place to maximise its value in the investigation of crime. Therefore, my instinct is to say that we are not doing enough.

The obvious next question is: what should be done? However, I am less clear about that. As I said earlier, I would prefer an integrated system rather than stand-alone services. I have been thinking for the past 20 years that this is going to be really big, but only now are whole trials beginning to be based on digital information. The same problems are faced as in a lot of other areas where there is a phenomenal amount of data. The question is how to extract the relevant data without folding under and how to separate the signal from the noise. How do we get the bits that are useful for a particular case? That is an area for research, with close co-operation with both commercial providers of products and universities.

Lord Borwick: But the whole world has the same problem, and so far nobody has clearly established the proper way forward.

Dr Sheila Willis: I think that is fair comment.

Q195 **The Chairman:** With your knowledge about different countries and the provision of forensic science for the judicial system, and with your knowledge of England and Wales, what do you think are the strengths and weaknesses of forensic science provision for the criminal justice system in England and Wales?

Dr Sheila Willis: Its strength is that it is responsive, and the regulation and provision of standards are positives. To some extent, the system still partially relies on the remnants of the Forensic Science Service. In the end, everything comes down to people and some of the key people who were in those positions are still providing support to the service from different aspects. I am not sure that that has answered your question.

The Chairman: We have heard that a national statutory regulator might be of benefit. You had a kind of statutory regulator in Ireland in yourself.

Dr Sheila Willis: Yes, but I would not hold the two as equivalent. In Ireland, we were a small national unit. I said that I was responsible for the standard because there was nobody telling me what it should be. We then went for accreditation, and of course for accreditation you have to show that you are in line with other countries and so on. That is not at all equivalent to the regulator here. The regulator here is doing a very challenging job on very slim resources. I think lots of things work on a wing and a prayer.

Baroness Neville-Jones: You seem to hanker after—if I can put it that way—something that gets the system beyond test: that is to say, that it takes a bigger, wider view and has an advisory role. I can see the

argument. You have enough knowledge of the British system as things stand, so if you were trying to put it into the British system somewhere, where would you locate such a group? Would you locate it in the regulator's office or in something that UKRI set up?

Dr Sheila Willis: I think I would probably put it in the regulator's office rather than have yet another body, but I would encourage some kind of spending or budgeting system that would facilitate commercial providers to increase over and above the testing paradigm.

Forensic science is really trying to put some kind of sense on a past event. It starts at the scene. It sounds so simple. We pay very little attention to the scene. We have scene advisers and scene collectors, but it is presumed that everything that comes from there is fine, but the uncertainty of that is much greater than the level of uncertainty related to the test.

Baroness Neville-Jones: You are harking back to what you observed in the New Zealand system.

Dr Sheila Willis: I have not seen it, but yes, and Australia. I do not remember whether I mentioned that when I started out I worked for a short while in the Metropolitan Police laboratory, as it was then. It was housed in a police organisation, yet it was a very strong science culture. I probably got more advice and concern about ensuring that there was no skulduggery or bad samples coming in than I ever did, yet there was close co-operation with the investigations. Scientists went out to scenes and had a very strong sense of pride in their integrity and their ability to move the situation on. It was a long, long time ago, but it was close enough to a good model in my opinion.

Q196 **Lord Oxburgh:** Of its nature, forensic science is going to be a minority activity. This means that you are almost certainly going to have to borrow techniques and approaches from other disciplines. In your view, which are the disciplines and what are the techniques?

Dr Sheila Willis: I agree with you in part and disagree with you in part. Undoubtedly the testing methods are borrowed from other areas. Biology and chemistry, and to a lesser extent physics and geology, are all relevant, but forensic science in its own way is about trying to get information from some trace or clue or signal and how that helps to shed some light. I do not think that we as a community have put enough effort into that forensic science aspect. That is a kind of unifying approach and is what prompted me to say that I would prefer to see things more integrated rather than separated into different tests.

It is also one of the weaknesses of the academic approach, because the work that tends to be based in an academic department of biology, for example, will be interested in the biology and will be much less interested in how it works in forensic science. It will be a bit of an add-on as opposed to a fundamental research aim.³ I was at a summer school in

³ The witness sent this extra information following the session: The relatively new center The Leverhulme Research Center for Forensic Science based at Dundee University is

Lausanne this summer and I was really impressed by the fact that the questions that arose were police questions: "How does this affect a crime?", rather than, "How does this test fit this solution?" They were looking at the problems first and how we would get to them.

Q197 **Baroness Neville-Jones:** If you were asked to make a single important recommendation that could have a real impact on improving the quality of forensic science and its ability to underpin and contribute to the delivery of justice, where would you go? What would you pick out of all these things in a perfect world that you think would help most?

Dr Sheila Willis: I would separate the investigation from evaluation and have streamline reporting almost as it is at the moment in terms of the outputs from the providers, but I would put in a requirement that evaluation is needed for case-specific instances, because if that were done properly it would drive a lot of other aspects. There would be the need to recognise the context and to grow expertise, and there would be a balanced product for the assistance of the court in reducing its uncertainty.

Baroness Neville-Jones: Is that for all cases?

Dr Sheila Willis: For all contested cases.

Baroness Neville-Jones: I see.

Dr Sheila Willis: There are drawbacks, obviously. At the moment we are looking for one product to do a number of things, and I do not think that works.

Baroness Neville-Jones: And the evaluation would come from—

Dr Sheila Willis: It would come from addressing what questions arise in this case.

Baroness Neville-Jones: You are separating it from the testing. You have lots of people, so who are these people?

Dr Sheila Willis: I do not see why they would not be in the providers, but a separate group of people. It could be something that you would move on to after a period of testing, it could be something that you would rotate, or somebody could even decide that they do not want that provider to do this so they get it from another provider.

Going back to the point about borrowing from other areas, because that would be a specific forensic science approach, there is a need to have some overarching body to assess its progress. I would see that body being a very small number of people in the regulator's office. Accreditation as it stands is very valuable, but it tends to focus on the test, whereas I would see this as focusing on wider issues.

Baroness Neville-Jones: The regulator in our system has no statutory powers. It is all advisory. What do you think about that?

funded completely to carry out forensic science research. It is identifying, among many other initiatives, some of the gaps in transfer and persistence studies that I believe to be so necessary.

Dr Sheila Willis: I think it is a shame. It is an almost impossible ask to expect to regulate a growing area without having the powers to do it. I think it is amazing that—

Baroness Neville-Jones: You think some teeth would be good.

Dr Sheila Willis: I think it would.

The Chairman: Thank you very much Dr Willis for coming along today to help us with this evidence. It has been most useful. We appreciate it very much.

Dr Sheila Willis: Thank you very much.