



HOUSE OF LORDS

Science and Technology Select Committee

Corrected oral evidence: forensic science

Tuesday 6 November 2018

4.30 pm

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Members present: Lord Patel (The Chairman); Lord Borwick; Lord Fox; Lord Hunt of Chesterton; Lord Kakkar; Lord Mair; Baroness Manningham-Buller; Baroness Morgan of Huyton; Lord Renfrew of Kaimsthorn; Lord Thomas of Cwmgiedd; Lord Vallance of Tummel; Baroness Young of Old Scone.

Evidence Session No. 7

Heard in Public

Questions 68 - 80

Witnesses

Paul Hackett, Group Managing Director, Key Forensic Holdings Ltd; David Hartshorne, Managing Director, Cellmark Forensic Services; Dr Mark Pearse, Commercial Director, Eurofins Forensic Services.

USE OF THE TRANSCRIPT

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

Examination of witnesses

Paul Hackett, David Hartshorne and Dr Mark Pearse.

Q68 **The Chairman:** Good afternoon, gentlemen. Thank you for coming this afternoon to help us with this inquiry. You are key witnesses in exploring some of the issues in forensic science provision. Before we start, perhaps I may ask you to introduce yourselves for the record, and if you want to add anything else, please feel free to do so. We have lots of questions for you.

Dr Mark Pearse: I have been in the forensic science sector for 26 years as a practitioner, a manager and a leader. I am currently the Commercial Director in the forensics division of Eurofins. Eurofins is a €4 billion turnover international scientific services company providing forensic services in France, Belgium and Germany. A year ago, Eurofins acquired LGC's forensics division, creating Eurofins Forensic Services in the UK, which I work for.

David Hartshorne: I am the Managing Director of Cellmark Forensic Services. Cellmark is one of the three major providers of forensic services to the police. We have been in operation for about 30 years and I have worked for Cellmark throughout that time across a range of disciplines. My original specialism was in DNA analysis but I have been in the commercial sector of the organisation in more recent years.

Paul Hackett: I am the former Managing Director of Key Forensic Services. I have been in the forensic science sector for 25 or 26 years. I started off in the Forensic Science Service. Key Forensic Services was formed in 2005 at the point where one would argue that the forensic science sector began its journey of commercialisation. It was on the basis of that that Key Forensic Services was formed. I joined in 2008 and we effectively built the business from scratch with a handful of forensic scientists until, earlier this year, it went into administration. Since then, we have been bought out of administration by a company called CorpAcq. We are now continuing to trade as Key Forensic Services.

Q69 **The Chairman:** Thank you very much. My question follows on from your introduction. How sustainable is the Forensic Science Service in England and Wales?

Dr Mark Pearse: From my perspective, although we will probably all say the same thing, the market is sustainable given the right level of funding. The market in its current form has been in existence for only six or seven years post the closure of the FSS. In that time, because of austerity measures and other factors, we have seen a halving of the size of the market that is available for the private sector to serve. A combination of factors has led to that. The creation of more professional submissions units within police forces has allowed the screening and paring back of submissions to the minimum, reducing the amount of work submitted to us. There has been a little bit of in-sourcing, with the police doing the work for themselves, although let us not get too carried away with the scale of that. Most of the work is still done by the private sector in

England and Wales. Probably the biggest single factor that has created such an erosion of the market size has been multiple and repeated tender events on an organised scale, creating a very dominant customer who dictates very severe terms and conditions and contracts, with a particular weighting on pricing and tenders, such that we have seen a 30% or 40% erosion in pricing over six to seven years.

The Chairman: Do either of you want to add anything different from that?

David Hartshorne: I would concur with that. Fundamentally the market is sustainable with the appropriate levels of funding, but at the moment we are not seeing those levels of funding and that is putting everything at risk. I think it is sustainable because we have an established framework that delivers very high-quality forensic services to police forces across the country. Within our organisations, we have a huge body of experience of forensic scientists, some of whom have previously worked in the Forensic Science Service and some of whom have been trained in more recent times, working alongside colleagues with considerable expertise. Collectively, we have a history of innovation and efficiency and of delivering high-quality forensic services within a quality framework. That is the established situation that we find at the moment.

Paul Hackett: I would argue that without intervention it is not sustainable, as Key Forensic Services has demonstrated. We were not able to survive as a business with the income that we were getting from police contracts. Without some speedy financial intervention, the market in its current form is, in my opinion, not sustainable.

The Chairman: Am I right in thinking that you are the three key players in the market, or the only three players in the market?

Dr Mark Pearse: We are the three largest multidiscipline providers.

Paul Hackett: Collectively, we have in excess of 90% of the market share.

The Chairman: But you are competitors.

Dr Mark Pearse: Yes, that is true.

The Chairman: Therefore, you bid for the market, which means the cheapest quality.

Dr Mark Pearse: I think we would all get quite passionate about that. At the moment, although price has a disproportionate and increasing weighting in tenders, depending on the work area, we have a fundamental principle and set of values, which means that we will not let quality suffer. That is a fundamental principle, and our adherence to the regulator's codes of practice and conduct and participation in what I think is a European (and possibly globally) leading quality culture in forensic science in this country reflects the the minimum standard to work in this area.

David Hartshorne: Our organisations have a history of accreditation. Most of us go back probably 18 years holding 17025 accreditation, which

is the standard currently used to assess how forensic work is done. Yes, we are all suffering because of the current lack of funding, but the key issue for us is not to let the quality of the work that we provide fall. Not only would we not want that to happen but none of our scientists would want that either.

The Chairman: So all three of you make the same point: the market is sustainable as long as the funding is at an adequate level.

Dr Mark Pearse: The funding has slipped to levels that are not sustainable.

The Chairman: All of you are saying the same thing: that currently the funding is not what you would consider to be adequate.

Paul Hackett: Exactly.

The Chairman: So you do not make much profit out of it.

Paul Hackett: No, we are currently losing money. On the point about quality, it is important to note that to participate in the marketplace you have to adhere to a mandatory quality standard. Therefore, in order to bid for police contracts, we have to meet that standard, demonstrably. It is a prerequisite to winning the contract in the first place.

The Chairman: There is a lot of interest in not only this question but a lot of other questions, so the questions and answers will have to be targeted.

Lord Fox: Without causing undue pain to Mr Hackett, perhaps there is something that we could put on the record, because we can only report what we have evidence for. As I understand the rescue process, had you gone completely off the market, there would have been a huge capacity problem within the service. Is that correct? What did the market do to prevent that capacity leaving the market?

Paul Hackett: That requires a big response but I will keep it very brief. Essentially, when I made the decision that the company could no longer continue trading and I put it into administration, we spoke to a series of stakeholders, including the Home Office. At that point, because of the timing, the organisation would not have been able to meet its payroll at the end of January. We had in excess of 1,000 active cases, so there was a requirement for both the police and the Home Office to act quickly to provide the funding in order for us to wind the business down in an organised fashion—that is, to finish the cases that were in progress, to complete the work, to archive the work, to deal with the exhibits and to manage the business to a controlled closure. That is what the funding was made available for. That took in the region of three months, and during that period we pursued every option possible to find a buyer. So the wind-down period created the opportunity to sell the business out of administration, which is what happened.

Lord Vallance of Tummel: What is the size of the market, of which you make up 90%?

Dr Mark Pearse: I think about £50 million or £55 million.

Lord Vallance of Tummel: Do you have any business apart from state business?

Dr Mark Pearse: Yes we do.

Lord Vallance of Tummel: Is that significant?

Dr Mark Pearse: It is not; it is a small percentage, probably 5%.

Lord Vallance of Tummel: So, in effect, you have the state as a monopsonist buyer in a £50 million-odd market?

Dr Mark Pearse: Yes.

Q70 **Lord Kakkar:** First, does part of your ability to participate in the market require you to provide ongoing professional development for your experts, and what form does that take? Secondly, does it require you to participate in some form of research to develop this field of expertise?

David Hartshorne: In answer to the first part of your question, that is largely dictated by our quality accreditation, which requires us to be able to demonstrate the competencies of all our staff, which in turn requires ongoing training and ongoing demonstration of their abilities throughout their time with us.

In answer to the second part, we all carry out a good degree of internal development work as a requirement for us to remain competitive, but also to hold on to our accreditation and adapt to take on new technologies as they become available. This is not blue-sky R&D but the sort of development activity that is required to be able to validate whether it is a new DNA process or a new software that we need to be able to use to interpret our results. We have a number of different development activities ongoing, to make sure the science continues to move forward.

Baroness Manningham-Buller: Can I pick up on your answer to Lord Kakkar's question? You talk about development activities but you say this is not really blue-sky research. If you are scanning the horizon for scientific research that will be useful to your business and by extension the courts—or to the courts and by extension to your business—where would you look to see that being done, if you are not doing it?

David Hartshorne: I would argue that we are doing a fair amount of that. When you look at research and development that will assist in the presentation of our results in court, a lot of that is about interpretation and understanding how these techniques work in forensic situations.

You will hear reference to transfer and persistence studies so that we can understand and interpret the evidence and give the courts good direction as to the value of the analysis that has been undertaken. We do some of that work as individual organisations. We are all part of a grouping called the Association of Forensic Science Providers, which collectively funds some of this research as well. It makes sense for us to share our resources since we face the same situations.

We are also cognisant of our European partners, and we look at the literature of other areas of development, but we do quite a lot of work

ourselves. When you come to some of the more blue-sky R&D activities, historically a lot has been done outside the forensic sector. Our expertise in particular is taking existing technologies and applying them to a forensic situation. That is largely what we have done and will continue to do.

Baroness Young of Old Scone: Going back to the business of the operation of the market, there is price, there is quality and there is the viability of your organisations. He has gone over the edge; how close to the edge are you? How close are you to the point of saying that the next ratchet down in price will prevent you from providing the right quality?

Dr Mark Pearce: For our organisation, it very much depends on the work area. Some work areas are losing money, others are making single-digit profit numbers. We regard no area as being at the right level of profitability to sustain reinvestment in innovation and continuous professional development, recruitment and so on.

The funding is falling short of where we need to be in every area. Some forensic activities are in a position where, if things go on, we will ask questions about continuing that particular type of activity.

Q71 **Lord Hunt of Chesterton:** I want to ask about accreditation. You are saying that to maintain your accreditation you have to demonstrate that you are doing research. It is quite unusual in the accreditation process to have an obligation to do research, is it not? Would you like to comment on that?

David Hartshorne: That is probably why I tried to distinguish between blue-sky R&D and development activities, which are still ongoing development. The validation of any technique involves an awful lot of development activity, which is the sort of thing that we are talking about, as well as being able to introduce new technologies into our organisations. That is also required.

Dr Mark Pearce: The sector has done a lot—and the regulator has played a part in this—to define what is required to launch a technique in the criminal justice system in terms of minimum validation studies. As David said, we are effectively a magpie company when it comes to research; we take technology from other sectors and apply it to forensics. Most of our blue-sky research will be done in partnership with academia, and that recognises the contribution and position of each organisation in the technology readiness or capability scale.

Lord Hunt of Chesterton: I think we have discussed this with other witnesses. I understand that most of your funding is from prosecutions and not from defence, but there are other examples where there is almost no opposition and so lawyers help provide legal or information advice to the defence. What is your role in, for example, having some discussion chaired by the judge so that there is understanding by both teams of the knowledge used? Is this something you do within your own budgetary limits?

Dr Mark Pearse: We play a full part, as we discussed earlier, around criminal procedure rules and so on, and disclosure is a big part of case management for us. We play our full part in disclosing all the methods and techniques that have led up to the evidence that we are providing. That is as far as our obligations go. To get the most out of forensics and to understand what the evidence means in the context of the case, it is good practice to hold a case conference with prosecuting barristers and even to bring defence scientists into the pre-trial conference. This does not happen a lot, but that is because we do not go to court in that many cases.

The Chairman: Do you think for the benefit of the justice system it should happen more often?

Dr Mark Pearse: Yes it should; it certainly should. It would avoid misunderstandings and potentially improve the efficiency of trials, so evidence is not debated that does not need to be debated and points of agreement can be found. Communication is all. The pre-trial case conference involving forensic scientists, prosecutors and defence is essential.

Lord Hunt of Chesterton: So things could be greatly improved.

David Hartshorne: Yes and it is also worth pointing out that, within probably all our organisations, we work in some instances for the defence as well as for the prosecution. In fact, at Cellmark we have a separate grouping called Keith Borer Consultants, who are coming to talk to you later who specifically focus on defence work. We understand the requirements of transparency, which is fundamental to the delivery of forensic science to the criminal justice system.

Dr Mark Pearse: Our scientists are working for the courts; they are paid by the police. You could say it is semantics, but they are using their independent scientific rigour and ability to do deductive inferencing, to give evidence to the court and help the court make a decision. They do not really consider themselves prosecution people.

Paul Hackett: The frame of mind is one of unbiased independence; that is the purpose of the forensic scientist.

The Chairman: You mentioned that you get involved in R&D. Do you publish this and how widely is it available?

Dr Mark Pearse: Yes, it is available across the scientific literature and we attend conferences to present our work. We actually have a dedicated role, to which we have just appointed somebody, to look at knowledge sharing across our companies within Eurofins.

Lord Kakkar: Do you have a list of peer-reviewed publications from the last two or three years?

Dr Mark Pearse: Yes we do.

Lord Kakkar: It would be very helpful to receive that, to see the volume you are providing.

Q72 Lord Mair: I would like to ask more on the question of competing heavily on price, which is clearly a major issue. When you are bidding for work, what form does it take? Do the police ask you for a lump sum to do a particular investigation, or do you provide a schedule of rates for your scientific staff? How does it work?

David Hartshorne: Shall we talk a little through the history of procurement? It was mentioned earlier when the Forensic Science Service was privatised. Associated with that was the development of some product codes for identifying the different bits of work that needed to be done in a forensic investigation and the different product codes relate to different disciplines. Over time, through the various procurement exercises that we have been through, the number of product codes has exploded in number, which means that there is a very defined requirement for us to put a price to for doing particular parts of the forensic process across all disciplines. When it comes to tendering exercises, we are assessed on the pricing that we put forward for those product codes, and that assessment of the price is considered against other elements regarding quality and service provision.

One concern that we have seen over time is that the balance of price within the evaluation has risen. If you go back a few years, it was considered to be about 40% of the evaluation of a tender, now it is 60% and, in some areas, even higher than that. This means that it is very difficult to differentiate a tender submission on anything other than price; it becomes the primary differentiator. To complete the picture, we have seen some different tendering approaches very recently where what you can refer to as more of a fixed-price contract for an amount of work is starting to be seen. But even there we have seen downward pressure on pricing for that type of contract.

Dr Mark Pearce: I can personally understand—as we all can—the pressure on police budgets, so we can see the need to realise best value. The issue is the balance between the effectiveness of the science and the case strategies that you put together and the demonstration of quality and R&D activity versus price. We have had one or two tenders—certainly one springs to mind relatively recently—where we have a 60% weighting on price and three sides of A4 to describe our scientific approach and technical response to a homicide investigation, for example, when we have all sorts of techniques to describe which would bring added value to that potential investigation. It just feels slightly wrong that that is the emphasis is so much on price.

Lord Mair: So when there is a specific call for tenders, what form does that take? Is it the various products that you have described, with you putting a price against each product, or is it asking for your proposals as to how you would do the investigation?

David Hartshorne: Generally speaking, the police forces that are procuring the work will say how much work they think there is likely to be over a period of time and they will allow suppliers to bid on different disciplines. So we will have a piece of work that might be particular violent crime investigations; they sometimes separate out DNA work; or

separate out other areas. But, essentially, they put forward a proposal to say "This is the work that we are tendering and this is for how long. These are the product codes associated with that; can you put some prices to that along with how you would deliver them?"

Dr Mark Pearse: The state of the nation at the moment is that about half the country has gone for this very commoditised approach with the long list of product codes that David described. The other half of the country has done something slightly different. Each region or force has taken, again with slight variations, a different approach and tried to get more out of innovation and partnership working—I use the term advisedly. By partnership working I mean that they are making a nod towards forensic strategy and so on, but even the partnership contracts are still underpinned by quite toxic terms and conditions and still have an approach to pricing that has led us to the position that we are in now. But there are different approaches, so you cannot say that everyone has one particular style of procurement.

David Hartshorne: There are different approaches but I think it is fair to say that the price erosion that we have seen over a number of years has largely been driven by product code-based procurement. We are seeing some slightly different approaches now, but the pricing has been sliding for a number of years.

Q73 **Lord Oxburgh:** The conversation has moved on slightly from before, but you have all mentioned the importance of European work for your businesses. Can we get a feeling for what fraction of your business comes from Europe or indeed overseas in general? Would you be viable without it?

Dr Mark Pearse: We are now owned, as I mentioned before, by Eurofins, which took over—or acquired—LGC's forensics business, which was a UK private sector company, about a year ago, in order to create a larger division of forensics that serves France, Germany and Belgium primarily, though we do work for the Dutch state as well. There is a slightly different model in those countries, as almost every other country in the developed world, including in Europe of course, has a state provision of forensics as its core. So most of the private sector services that we provide there are looking at overspill work from state labs where there are backlogs and that kind of thing—we are talking police and law enforcement work where they are seeking additional capability or capacity.

The Chairman: Just to clarify: most other countries have a state-operated forensic service, and the private sectors in these countries get their business from those state-operated services?

Dr Mark Pearse: Yes. What we have established to varying degrees in countries throughout Europe is the concept of a delivery partner model, where you get the best of private sector efficiencies, turn-around times and service levels, complimenting state infrastructure.

The Chairman: So you are saying that the model of a state service with private sector involvement is a good model?

Dr Mark Pearce: It is a model that works in some countries, certainly. We would argue that the state labs across Europe could recognise their limitations, if you like, or their business position more, and work together in partnership better.

Paul Hackett: Both models have pros and cons, but I will not go into that. To answer the question regarding how much of our business is from Europe, for Key Forensic Services it is probably less than 1%. We are largely UK-focused, working exclusively with UK law enforcement.

David Hartshorne: For us it is very similar: about 1% of our revenue is from overseas. About 80% is prosecution-based in the UK. We do defence work and have some other areas of testing as well.

Q74 **Lord Fox:** On the toxic conditions mentioned by Dr Pearce, you mentioned that half your contracts are the “price list” variety. Is that half by value, by number of police authorities, or something else? How regularly are these rebid, and are they rebid on the basis of “winner takes all” per police authority? Because that would clearly put pressure on you to drive the price down regularly, if the loser loses everything in that situation. Is the nature of the tendering also putting pressure on you price-wise?

Dr Mark Pearce: The commodity list approach that we talked about is about half in terms of numbers, which equates to about half in terms of revenue as well, I would guess, very approximately. In terms of “winner takes all”, yes, there have some “winner takes all” situations. The half of the country that operates the commodity approach splits the work and operates a lots system, where a supplier gets a percentage of the work based on its bid. Some others regions have taken the “winner takes all” approach and others have taken the approach of having a majority winner, but the obligation on that winner is to outsource.

Lord Fox: The consolation prize.

Dr Mark Pearce: Yes, exactly—they outsource to tier 2 suppliers.

Lord Fox: How often are these being rebid?

Dr Mark Pearce: Again, it varies. The commodity-type focus is typically three to four years, then for some of the “partnerships”, as I described—with the interesting associated terms and conditions—it is typically longer, at about five or seven years.

David Hartshorne: Most of the tenders are three to five years—three with a couple of years’ extension possible.

Lord Fox: And they are staggered or do they all come up at the same time?

David Hartshorne: Therein lies some of the difficulty. One reason that we all find ourselves with some problems at the moment is that, towards the back end of 2016, about 75% of all the police work in the country went out to tender at the same time. It meant that 2017 was particularly difficult.

Paul Hackett: So if you have two-thirds or 80% of your revenue at risk, naturally that will drive certain behaviours in a commodity market, which is based on price.

David Hartshorne: We all have fixed overheads.

Paul Hackett: The alternative to losing the tenders for us was to go into administration 12 months earlier, because we would have gone bust. So it drives the procurement methodology, and the structure of the market has driven certain behaviours, such as the frequency of tendering, the large volume of tendering and the potential swings between businesses. It is perfect storm and it has led us to this crisis. We need the pendulum to swing back a little more in the previous direction.

Dr Mark Pearse: Somebody mentioned monopsony earlier. That is certainly the word that I would use. To be clear on these toxic terms and conditions, I guess it is typical of public sector tendering that we are talking by and large of zero indexation (with our wage costs going up and the cost of accreditation having gone up as standards are rightly raised by the regulator), and service credits, which are penalties on delivery times and vary according to contracts. When you add up service credits and indexation on top of falling prices you end up with what I call an unsustainable toxic set of conditions.

Lord Fox: A downward ratchet.

Dr Mark Pearse: Yes.

Q75 **Lord Vallance of Tummel:** If I may come back to monopsony, this is a classic distorted, lopsided market where you have a hugely powerful buyer and, in this case, anything but powerful suppliers. It is usually the other way round. This sort of thing should be something for an economic regulator. If it had been a monopoly it would have gone straight to an economic regulator. There are classic ways to try to mitigate the distortion between the two. Would it be helpful if you had longer-term contracts than you have at the moment? Would it be helpful if you had, for example, tariffs based on an expected return rather than those that are just competitive between three minnows with a great big shark?

David Hartshorne: We are very keen to see some level of rate card setting for the services we provide, which includes an element of profitability. At the moment these are extremely difficult economic times. There is a lack of profit to be able to further invest into the organisation.

Dr Mark Pearse: The longer-term contracts are good for one particular reason: joint innovation, innovating and developing products that allow us to pilot them with those forces. The problem is the "winner takes all" scenario that Lord Fox mentioned, so we have to come up with a procurement structure that mitigates against that. The tier 1 and tier 2 suppliers, the minimal level of subcontracting and those kinds of thing are tools that could help with that.

David Hartshorne: Where we have seen multi-supplier contracts they have removed some of the stress from the tendering process, because it

is all very well that they are longer if you win as a single supplier, but if you do not then you are out that market for a long period.

Lord Vallance of Tummel: So we have an issue with state procurement.

The Chairman: Baroness Young, do you have quick question?

Baroness Young of Old Scone: It is very quick. Mr Hackett mentioned that state-operated services internationally had benefits and disbenefits. Could all three witnesses write to us with their perceptions of which services elsewhere work better?

The Chairman: That would be good evidence.

Lord Fox: In other countries.

Dr Mark Pearce: On behalf of England and Wales, countries in Europe look to us for standards. The position of the regulator is one of envy. I sit on, as Paul does—

The Chairman: Perhaps you could write to us, otherwise it will be a long answer.

Q76 **Lord Renfrew of Kaimsthorn:** There has been a Forensic Science Regulator for 10 years now. What role do you feel she should ideally have? Two years ago the Government announced the intention that she should have a statutory position. If those powers were to be introduced by law, what do you feel they should be?

David Hartshorne: We are probably all in agreement in that we support the regulator having statutory powers to set standards and then to enforce them. That does not represent any concern for the major providers because we have been accredited for a good number of years and will continue to be. We have an interest in seeing a level playing field for quality standards across forensic provision in the UK, which will be of assistance. If the regulator had powers to ensure that that would be the case that would be a good thing.

Lord Renfrew of Kaimsthorn: Thank you. Do you feel that she is fulfilling her role? In evidence last week one of our witnesses said that they did not really see why she needed statutory powers.

Paul Hackett: From my perspective, if you look at what the regulator has been doing, given the resources, it has done a fantastic job. It is a role that our European colleagues look to. We were the first in the world to introduce standards, such as ISO 17025, into forensic science. We are the first in the world to develop the role of the regulator. All the benefits of that would be agreed and recognised. We are seeing that those participating in the wider marketplace, whether it be the police or smaller private providers, are not adhering to voluntary deadlines. The cajoling, the soft words and the carrot are not working so the regulator needs some teeth to ensure that it is a level playing field and that quality standards are maintained by everybody participating in the criminal justice system. That is not the case any longer. We have seen deadlines

missed by lots of different entities practising in the criminal justice system.

Q77 Lord Thomas of Cwmgiedd: You have told us a lot about your research and development role. I will ask you one or two supplementary questions about it. First, all of you collect huge databanks. The FSS had its own. To what extent do you pool your databanks?

David Hartshorne: Y-STR is perhaps a good example.

Dr Mark Pearse: Yes, exactly. There is a subset of DNA database that we are working on together and that we commissioned together as the Association of Forensic Science Providers that David mentioned. That association serves as a non-commercial organisation that pulls together members from Northern Ireland, Scotland and Ireland, as well as the private sector from England and Wales, to talk about best practice, proficiency trials and common use of data where appropriate.

Lord Thomas of Cwmgiedd: But what about the data that you actually have? This obviously goes to the funding of it. Do you pool data that is your intellectual property?

Paul Hackett: It depends very much on the data. There are quite a lot of constraints on us for certain types of data.

Lord Thomas of Cwmgiedd: For example, if you take footwear or mixtures on DNA, do you pool the information that you have from the tests you have done so that one can test the reliability using your collective knowledge, as the FSS used to do?

David Hartshorne: Yes. In fact, with footwear in particular we are sharing data or have access to data from police forces as well.

Lord Thomas of Cwmgiedd: And does the fact that you cannot earn any intellectual property money go to part of the model one has to look at in financing this?

Dr Mark Pearse: I suppose it does. However, we are not saying that the intellectual property position is causing issues or our lack of ability to own data. That is not the way that the scientific community and forensic science has worked in the past.

Lord Thomas of Cwmgiedd: Therefore, in research the same approach is that you pool your knowledge of new techniques so that, in distinction to other areas, there is no intellectual property that you earn from your activities?

Dr Mark Pearse: We work no differently from any other area of science in that respect: we publish peer-review papers and declare our research at conferences et cetera.

David Hartshorne: The criminal justice process demands that of us anyway for disclosure to the defence.

Lord Thomas of Cwmgiedd: So everything is disclosed, unlike in the US in certain instances where things are not disclosed and are kept private. On research, what do you see as the best method of carrying out

much more detailed research? Footwear is an example—I do not know whether you call it a science—and you go then to DNA, which is a science. Bearing in mind the extraordinary width of forensic work—I have taken out the word science—how do you think research in these different areas, which differ vastly, ought to be done?

Dr Mark Pearse: For me, there are three levels. There is primary blue-sky research that will develop the next technique to replace something new that is fundamentally different. We then have method development and technique modification to make something more sensitive or more effective that leads to more prosecutions. Then you have process efficiency developments that mean that throughputs are quicker et cetera. The three work together.

As David and Paul mentioned earlier, we are very much an applied science. We do not do blue-sky research. That is not how we see ourselves. We would like to work in partnership with people who want better positions from which to do blue-sky research, such as academia. We then take techniques and commercialise them. What is broken at the moment is that there is no definition of everybody's role in that chain and how those parties will apply for funding. When you apply for funding, how do you demonstrate the benefits to a sector that is actually not as good as the medical or pharmaceutical industries in being able to demonstrate value, which can say very specifically, "This drug will save 10,000 lives and save X hours in hospital", and it is very easy to quantify the benefits of the system. That is not the way we have worked in the past. I would not say that it is a failing, but it is a limitation on applying for funding for a particular technique. That is something that we can all do better.

David Hartshorne: I would add only that there is a particular expertise, among all the scientists working within our organisation, for the application of the science that we are dealing with. That is why there is a requirement—and I think it works best—that some of the R&D is done very close to the coalface. Critically, our scientists are undertaking vast amounts of forensic science every day. Collectively, we are doing tens of thousands of investigations a year across the organisations. Our scientists are very close to understanding some of the interpretational issues that we face and some of the limitations of the technologies we have. They are particularly well positioned to be able to lead on some of that work testing the analysis we have and testing our understanding of how they perform in particular ways.

Paul Hackett: I do not think that one body, group or entity has a helicopter view. There are so many different stakeholders, with so many different drivers. The emphasis on who should drive and lead R&D, both blue-sky research and the developmental activity, will change depending on what the R&D is and on whether there is push or pull from the market, whether it is technology-driven or development work from within the laboratory. It is a hodge-podge at the moment.

Q78 **Lord Borwick:** I turn to digital forensics. We have heard so much evidence of vast terabytes of information and that we are all going to be under two feet of data, but surely the speed of processors is going up so

much faster than the quantity of data. As computers get faster, this is a field that should get easier rather than harder. With the introduction of artificial intelligence, are not the automated ways of dealing with the quantities inside mobile phones—

Paul Hackett: I agree with you. Let us pare it back, sticking to forensics rather than any other sector, and look at how this market has developed since the early 1990s and the introduction of different technologies. Let us take DNA profiling. We in this country brought DNA profiling to the world. We were the first to have a national DNA database, which was hugely successful. Demand outstripped capacity. As a result, there was investment in robotics. We invented the first robots in the world for this process. We invented software. We led the world, because there was an incentive, a drive and funding to do it. I do not see the same drivers. Who is pushing the technology drive in artificial intelligence in digital forensics in the UK? Who? Nobody.

Dr Mark Pearce: We recognise our limited part in this. In a previous session, somebody commented on the relative amount done by the police versus the private sector. To answer that question from our perspective, the vast majority is done by the police. High-tech crime units and departments within the police have sometimes historically sat outside forensics and have made it a technical exercise to interrogate phones and computers from a forensic point of view, to find out what is stored on them and what has happened.

As you say, the amount of material has grown exponentially and the appetite for those kind of examinations has grown to the point where the police have backlogs and cannot cope. Transforming Forensics, the NPCC initiative to try to pull together a co-ordinated approach to forensics in this country, has an arm of activity looking at the forensic digital strategy. That will be very good.

Our role, in the private sector, is an emerging one. We as an organisation have 17025 accreditation for phones and computers and are sitting and waiting for demand that does not arrive from unaccredited police labs. Why that is the case I am not sure. Certainly, I think the market and the community, perhaps through Transforming Forensics, could take a much more joined-up approach in which the private sector could act as a delivery partner for the public sector in the same way that we talked earlier about the European examples for core and traditional forensics. That is not there yet, so we have a very small, emerging business that we are not sure whether to invest in. There is no incentive. We are not seeing the promised demand.

Lord Borwick: So all we can see now is the problem.

David Hartshorne: I think the private sector could assist, but at the moment there is no outsourcing strategy for digital work. Therefore, as Mark says, at the moment there is no great incentive to invest.

Lord Borwick: What about in other countries—in America and elsewhere in Europe? Is any more growth and development happening there?

Paul Hackett: I cannot comment specifically on digital, but certainly we, as a member of the European Network of Forensic Science Institutes, which covers all EU countries, are ahead of the game in delivering forensic services. Whether it be in not having any backlogs, in the speed of delivery or in quality standards, people turn to us for advice and guidance: "How do you achieve these miraculous, high-quality standards and phenomenal turnaround times?" They have months of backlogs and we do things in days that they could not dream of. That is general forensic science. I have not seen or heard anything that we can learn from them specifically in digital.

The Chairman: We might guess the answer to the next question. It is an important question.

Q79 **Baroness Manningham-Buller:** I think I can guess the answer, as can most of the Committee. We can give you a few minutes to think about it if you need it, but which short recommendation would each of you like to see as one of our recommendations in our report? If one of you says one thing and another agrees with it, that is fine. But we would like a single recommendation from each of you. You may have 20, but can you confine it to one?

Paul Hackett: We have thought about this. We have one between us.

Baroness Manningham-Buller: Is this a co-ordinated response?

Paul Hackett: It is indeed.

Dr Mark Pearse: We have one word, which is funding—loud and clear.

David Hartshorne: It is important to mention that it is funding not only for prosecution forensic work but for forensic work done by the defence. That is a good fail-safe check within the criminal justice system. Legal aid authority funding, as we know, has been cut to unsustainable levels as well, so funding across the board is what is required to support the expertise we have in this country, which has just been described as excellent, but our problem is sustainability.

Baroness Manningham-Buller: I am going to ask you to say a little more. We cannot put down, "Recommendation 3: Funding". What do you want us to say? Okay, increase legal aid, but from which area particularly?

Dr Mark Pearse: From my point of view, there is a timing issue because we need funding very quickly. But what is required over the medium term is for the whole criminal justice system and the agency within that system to recognise forensic science as a vehicle to realise efficiencies in the investigation process and in the courts—guilty pleas, early detection of individuals et cetera—rather than a burden on police departmental budgets. That is the wrong approach; a pound spent on forensics can save tens of thousands down the line in guilty pleas, so averting the need for a trial. We need that understanding across the agencies and the analysis of that in a recognised, published way that people could use to justify investment.

Baroness Manningham-Buller: Thank you. Mr Hackett, you are nodding. Do you want to say any more?

Paul Hackett: I am concurring violently with Mark. I think Mark is spot-on, but just because I like the sound of my own voice and want to embellish on that, in the short term it is about price increases. We have contracts now with all of the police forces and they are a vehicle in the very short term to increase the charges for the services that we deliver. That would solve the immediate crisis. Then I think we need to look at alternative methods of procuring forensic science.

Mark is absolutely right: the budget is held by the police force carrying out the investigation. The benefits are often recognised further down the supply chain in the courts and by the CPS. Until someone takes a holistic view and recognises that money spent over here can save tenfold the money spent over there, no one will see the bigger picture. Sadly, that is what we are missing. The holistic picture has gone—the umbrella or helicopter view, call it whatever you like. Nobody seems to know what is going on any more with the left hand and right hand. We are all competing in silos. Every chief constable is doing whatever they can to save money—quite rightly—because that is their target. But that impact does not take a collective view. That is the big problem that we have right now.

David Hartshorne: Could I just come back to nuance the funding issue a bit? The issue of increased pricing is right because we have reached a critical point and we have to protect the integrity of the forensic service provision that we have. At the moment, we have staff across our organisation who are leaving the industry because they are better paid in teaching than in forensic science. That is one example: there are serious concerns about maintaining our scientific base. But just increasing the prices for the individual product codes and the services that we provide is one thing.

Fundamentally, part of our problem is about volume as well. Because of austerity cuts in police budgets we are seeing restrictions on the amount of work that is being submitted, so we are seeing crimes that are not being investigated or forensic work that is not being done to the extent that it could be or should be. With the fixed overheads that these organisations have to be able to provide good-quality forensic science, we need to make sure that we have some of the volume going through them as well so it is not just about increasing the pricing of units but using forensics better to make savings elsewhere in the criminal justice system.

The Chairman: In some cases, would you be aware that the police have not requested you to do certain forensics and to pay for that, and are you then aware that if the police had only asked you to do certain other forensics, the case might be handled better?

David Hartshorne: Yes, they have budgetary restraints. They are struggling to work with a reduced budget.

Dr Mark Pearse: Yes.

The Chairman: That is not the question. The question is: are you then

aware that if only they had asked you to do different forensics, the case would have been settled better?

Paul Hackett: Sometimes. Forensic science is one giant funnel that starts with the event—the crime—and a recognition that a crime has occurred. You then have attrition at every single step. Do we send a scene of crime officer—yes or no? Do we investigate the crime? Is the force policy to follow up on car crime or burglary? We see massive attrition at the crime-recording level. You then have a decision internally. If we send somebody, do they collect the evidence? If they collect the evidence, do they submit the evidence? Which evidence do they submit? We would not be sighted on all the evidence that was collected or not even collected, so we get a tunnel-vision view of what has gone on in that event. We do not know whether evidence is available or not unless it is written on the submission form, which is not always the case.

David Hartshorne: We can see that some forces aren't investigating some crimes and are using some techniques as opposed to others because we work with multiple police forces and we see the differences.

The Chairman: Lord Vallance has a 10-second question that requires a 10-second answer.

Q80 **Lord Vallance of Tummel:** Would it be better to have longer-term contracts with some fixed element as a contribution to your fixed costs, with a variable element according to the amount of business that you do?

Paul Hackett: Yes.

Dr Mark Pearse: Yes.

David Hartshorne: Yes.

The Chairman: So you think that there should be a better business model.

David Hartshorne: Yes.

The Chairman: Thank you all for coming to help this afternoon with our inquiry. It has been a most helpful evidence session.