

<p>1 Thursday, 12 May 2011</p> <p>2 (9.30 am)</p> <p>3 THE CHAIRMAN: Good morning. Yes, Ms Dunlop.</p> <p>4 MS DUNLOP: We have Dr Frank Boulton.</p> <p>5 THE CHAIRMAN: Good morning, Dr Boulton.</p> <p>6 DR FRANK BOULTON (affirmed)</p> <p>7 Questions by MS DUNLOP</p> <p>8 MS DUNLOP: Good morning, Dr Boulton. We are going to</p> <p>9 begin, as we usually do, by looking at your curriculum</p> <p>10 vitae. You have actually submitted two documents. I</p> <p>11 think one is entitled a "biography" and one is entitled</p> <p>12 a "curriculum vitae". They are both very short. Could</p> <p>13 we have the first one, which is [WIT0030293].</p> <p>14 This tells us a bit about you, that you studied</p> <p>15 medicine in London. You did an MD on haemoglobin</p> <p>16 variants and you became a fellow of the</p> <p>17 Royal College of Physicians of Edinburgh in 1986. And</p> <p>18 then the positions you have held. I see you were at The</p> <p>19 London hospital. Were you there at the same time as</p> <p>20 Dr Colvin?</p> <p>21 A. Yes, Brian Colvin followed me.</p> <p>22 Q. I thought you must be. You then became a senior</p> <p>23 lecturer in haematology at the Royal Liverpool Hospital</p> <p>24 and Liverpool University and also the director of the</p> <p>25 Liverpool Haemophilia Centre between 1975 and 1980, and</p> <p style="text-align: center;">Page 1</p>	<p>1 A. Yes.</p> <p>2 Q. We can see that there is some extra information with an</p> <p>3 asterisk in about the middle of the page.</p> <p>4 Just to let everybody take a moment to read that.</p> <p>5 (Pause)</p> <p>6 Dr Boulton, a number of witnesses wear more than one</p> <p>7 hat and you are obviously here today having been</p> <p>8 a haemophilia centre director and also having worked in</p> <p>9 a Blood Transfusion Service, which is more unusual.</p> <p>10 I just wondered, you obviously moved across from</p> <p>11 haemophilia care into blood transfusion; why did that</p> <p>12 happen?</p> <p>13 A. The situation in blood transfusion at that time, and to</p> <p>14 some extent still, differed very considerably from that</p> <p>15 in England. I think it would be fair to say that the</p> <p>16 history of the development of the Blood Transfusion</p> <p>17 Service in England was around a model whereby there was,</p> <p>18 originally, from the military regions in the</p> <p>19 Second World War, a regional basis of blood transfusion,</p> <p>20 blood donations, blood supply systems set up in a way</p> <p>21 that there was an organised system of collecting and</p> <p>22 testing the donations to be supplied to hospitals. For</p> <p>23 example, the 12 or 10 teaching hospitals in London were</p> <p>24 each supplied with blood from a region that would supply</p> <p>25 three or four of them. The model was that a regional</p> <p style="text-align: center;">Page 3</p>
<p>1 then you came an Edinburgh. Consultant and honorary</p> <p>2 senior lecturer in haematology and blood transfusion in</p> <p>3 Edinburgh between 1980 and 1990, and you were also the</p> <p>4 deputy director of the Edinburgh and Southeast Scotland</p> <p>5 Blood Transfusion Service, I think, from 1982?</p> <p>6 A. Correct.</p> <p>7 Q. Then you went to Southampton and you retired from the</p> <p>8 NHS and blood service in 2006, but you remain a visiting</p> <p>9 lecturer in the faculty of medicine in Southampton.</p> <p>10 Then we can see other positions you have occupied;</p> <p>11 including being the chair of the UK National Advisory</p> <p>12 Committee on the Care and Selection of Blood Donors for</p> <p>13 six years to 2006. And the chair of transfusion</p> <p>14 taskforce of the British Committee for Standards in</p> <p>15 Haematology, also in the early 2000s. You have some</p> <p>16 overseas' experience and I think, like many of our</p> <p>17 witnesses, a list of publications dealing with various</p> <p>18 topics, but you haven't given us a list of those and</p> <p>19 there is no problem with that.</p> <p>20 A. It would be too boring to do so.</p> <p>21 Q. Thank you.</p> <p>22 Your other document is [PEN0150506]. Much the same</p> <p>23 information, although you have told us on this document</p> <p>24 a little bit more about your past as a haemophilia</p> <p>25 director.</p> <p style="text-align: center;">Page 2</p>	<p>1 centre, with its specialist staff of collecting and</p> <p>2 testing and a few doctors to take the organisation,</p> <p>3 would be supplying the blood but the blood and its</p> <p>4 products would be used in a hospital by a team,</p> <p>5 initially of pathologists in the blood bank, supplying</p> <p>6 it to the clinicians, the surgeons and the doctors.</p> <p>7 So there was a pretty clear split that developed</p> <p>8 throughout England of the regional model, whereby</p> <p>9 a centre, for example in Southampton, would be supplying</p> <p>10 a series of hospitals in the region, of perhaps 3 or</p> <p>11 4 million people around it, where there would be between</p> <p>12 a dozen or two or three dozen hospitals. The hospitals</p> <p>13 having their clinicians using the blood but the blood</p> <p>14 actually coming from a centre in usually a university</p> <p>15 town somewhere in the middle of that supply chain.</p> <p>16 In Scotland, and in particularly on the East side of</p> <p>17 Scotland, in Edinburgh, less so than on the West side in</p> <p>18 Glasgow, but on the east side of Scotland, Edinburgh,</p> <p>19 Dundee, Inverness, Aberdeen, the models was more that</p> <p>20 the transfusion service was developed within the</p> <p>21 settings of an active working teaching hospital, in</p> <p>22 Edinburgh's case in the Royal Infirmary. So that within</p> <p>23 the Royal Infirmary we had a transfusion centre that</p> <p>24 also had an very active clinical base. Whereas in</p> <p>25 England the blood bank -- that is the laboratory which</p> <p style="text-align: center;">Page 4</p>

<p>1 tested the donations, selecting them for specific 2 patients -- was part of that hospital's responsibility, 3 usually within a haematology department; in Edinburgh 4 the testing of blood to be supplied to patients 5 specifically was actually done within the remit of the 6 transfusion centre, which is a contrast.</p> <p>7 Obviously there were and are haematologists in the 8 hospital and other clinician in the hospital who would 9 be using the blood, but the actual supply of blood and 10 its products to patients was under the control, or at 11 least under the responsibility of the 12 regional transfusion centre, in those days, in the 13 1980s, in the Royal Infirmary at Lauriston Place.</p> <p>14 Q. Thank you.</p> <p>15 A. Therefore, what I should add is that the attraction to 16 me of moving to Edinburgh from Liverpool was different 17 from say, when I moved from Liverpool Hospital to 18 Liverpool transfusion centre. I would have been less 19 likely to have done that in those days because the 20 nature of the work at the Liverpool transfusion centre 21 was very different from the nature of the work at the 22 Edinburgh transfusion centre. The Edinburgh transfusion 23 centre was much closer to patients than the Liverpool --</p> <p>24 Q. I was going to say, much more of a clinical content in 25 the position in Edinburgh.</p> <p style="text-align: center;">Page 5</p>	<p>1 A. Yes.</p> <p>2 Q. About its having been built where it was so that it 3 would be a safe distance from Glasgow, again for reasons 4 connected with the threat of bombing.</p> <p>5 A. That's right.</p> <p>6 Q. That was the second point that struck me when you were 7 speaking, that it has seemed as though the transfusion 8 set-up in the West of Scotland was really slightly 9 different --</p> <p>10 A. The model in the West of Scotland was more like -- not 11 totally like but more like the English.</p> <p>12 Q. Yes. In the sense of having this geographically distant 13 centre --</p> <p>14 A. Geographically distant centre, the medical staff of 15 which were less involved in direct patient care than the 16 medical staff of the Edinburgh centre were with the care 17 of patients in Edinburgh; both the Royal Infirmary and 18 related hospitals and other hospitals in Southeast 19 Scotland.</p> <p>20 Q. Yes. Thank you.</p> <p>21 Because of your involvement as a haemophilia 22 director in the 1970s, it did occur to me to ask you if, 23 for example, you remember the World in Action programme. 24 You may know that we watched it. It was two programmes 25 from December 1975 about the preparation of plasma</p> <p style="text-align: center;">Page 7</p>
<p>1 There were two things that were striking me as you 2 were speaking, Dr Boulton, and the fist was about 3 London. So if you had drawn London as a very big circle 4 or a very big oval, probably right to do, and then 5 perhaps quartered it, is that an accurate mental 6 picture --</p> <p>7 A. Pretty well. The south is a bit blurred because 8 Lewisham in the southeast was always fighting for its 9 independence from Tooting in the south-west, but in the 10 north you had a clear northeast that was interestingly 11 centred in Brentford in 1950, and the story was, and 12 I think it was true, that it was put out there in case 13 an atom bomb fell on London and that there would be 14 a surviving centre outside London that could supply 15 blood. Whereas in the northwest, it was set at 16 Colindale which was a little bit more central.</p> <p>17 But, yes, the mental picture is right: that London 18 was divided into four quarters and in each of the 19 quarters there would be three or four teaching hospitals 20 and a whole host of non-teaching hospitals who would be 21 dependent on blood collected in that region.</p> <p>22 Q. Right. It is interesting how often still one can trace 23 developments back to the war.</p> <p>24 A. Yes.</p> <p>25 Q. We spoke earlier this week about Law Hospital.</p> <p style="text-align: center;">Page 6</p>	<p>1 products in the United States. I just wondered if you 2 remembered having seen that?</p> <p>3 A. I certainly do remember, yes.</p> <p>4 Q. Did you watch it when it was on or did you watch it 5 afterwards?</p> <p>6 A. I didn't see the programmes live but I was very shortly 7 made aware of those programmes.</p> <p>8 Actually there is a slight -- it is not a conflict 9 of interest but I have a brother who was working with 10 Granada on the World in Action team at that time and 11 I can certainly remember me being actually slightly 12 cross with him because at that time -- and in fact on 13 reflection, I think my brother was right -- I felt that 14 the World in Action programme had exaggerated the 15 problems. But I was then quite a young and not very 16 experienced doctor and not quite so aware of how things 17 would work out.</p> <p>18 So I suspect that that World in Action programme -- 19 I certainly remember it very well and I remember 20 conversations after it, and having read the transcript 21 of it again very recently, it brings it back.</p> <p>22 Q. We have all imagined it being the talk of the hospital, 23 as it were. Is that how it was in your hospital?</p> <p>24 A. Well, I think actually at the time the programme came 25 out, I was not yet in Liverpool because I came to</p> <p style="text-align: center;">Page 8</p>

<p>1 Liverpool in October 1975, or if it was around then, 2 I was right in the middle of moving. 3 Q. Yes, December. 4 A. It was December? That's right. This was December and 5 my attention was quite honestly on other things like 6 organising a family move up from London to Liverpool and 7 I became aware of it, as I say, through my family 8 connection with the production of the programme and also 9 it clearly was discussed at the Liverpool centre. But 10 by the time I really settled into my job in Liverpool in 11 early 1976, it was already in the past. 12 Q. Right. But do you remember it having a continuing 13 effect in relation to your attitude to products from the 14 United States of America? 15 A. I might comment that back in London in 1973 or 1974, 16 I had a haemophilic patient who needed Factor VIII over 17 Christmas for a fairly major dental problem. He 18 developed an abscess and it needed surgery. And 19 although he was a mild haemophilic, we did not have 20 enough Factor VIII cryoprecipitate or NHS Factor VIII in 21 stock to safely cover his surgery in my opinion. This 22 would be literally Christmas Eve in 1973. 23 So I ordered in a small amount of commercial 24 Factor VIII, which was just becoming available at that 25 time, and this mild haemophilic man in his 50s did</p> <p style="text-align: center;">Page 9</p>	<p>1 and it is indeed quite possible that some of the plasma 2 they procured and fractionated came from America. 3 I would not know that but at the time I was clearly 4 under the impression, and had been told by their own 5 director, Norman Berry, that the material was Austrian 6 in origin. 7 Q. Thank you. 8 A. But clearly from paid donors. 9 Q. I noticed that you had attended a meeting in 1977. 10 Obviously because, having realised you had been 11 a haemophilia centre director, I was looking for you and 12 you are recorded as having been at the meeting of 13 24 January 1977. Could we just have a quick look that? 14 It's [SNB0017245]. 15 A. Yes. 16 Q. There you are. Liverpool Royal Infirmary. 17 A. Yes. 18 Q. That was a meeting in Oxford? 19 A. Yes. 20 Q. I think, for our purposes, the most interesting part is 21 page 6, if we could go to that, please. 22 Sorry, this is one of these documents where every 23 second page is blank from the way it has been scanned or 24 something. So when I say page 6, I'm meaning numbered 25 page 6 but we may have to Scotland through a few more to</p> <p style="text-align: center;">Page 11</p>
<p>1 receive some commercial Factor VIII, as a result of 2 which he got both Hepatitis B and non-A non-B. So that 3 struck home to me very vividly. So I had a rather rude 4 awakening into the dangers of hepatitis from 5 commercial -- in this case it was American -- 6 Factor VIII. 7 So one of the naive reactions that I had in 8 Liverpool was when we bought commercial Factor VIII it 9 was not American, it was European. It came from 10 Austria. So clearly there had been a concern that 11 American products were to be avoided. I think that was 12 a legitimate, or at least an understandable reaction to 13 my experience of treating and giving a patient -- and we 14 didn't know at that time exactly the consequences of 15 non-A non-B. It is very likely, if that man is still 16 alive, and I remember him well, he would be in his mid 17 80s now. It is quite likely that he would have had 18 quite a significant dose of hepatitis and liver disease. 19 Q. Where did Immuno get their plasma? 20 A. Austria. 21 Q. So it was Austrian plasma? 22 A. Yes. 23 Q. They didn't import -- 24 A. Quite honestly, I did not at that time conduct 25 a detailed enquiry into where all the donors came from,</p> <p style="text-align: center;">Page 10</p>	<p>1 find it. It's probably about page 11 or something. It 2 is page 11. 3 It is just I notice that this is a meeting at which 4 there had been a general discussion of the supply of 5 Factor VIII in the United Kingdom. 6 A. Yes. 7 Q. Dr Boulton, it would be pretty amazing if you remembered 8 this but I did just want to ask you: do you remember 9 this meeting? Do you remember anything about these 10 discussions? 11 A. Only very, very vaguely. I have no precise memory. 12 Q. Do you remember anything about this debate that we can 13 see cropping up here, about whether English plasma could 14 or should be sent to Scotland for fractionation? 15 A. No. 16 Q. We can see that Dr Prentice, whom we know to have been 17 a haemophilia centre co-director in Glasgow, is saying 18 that he thought there was still a shortage of 19 Factor VIII in Scotland and he had to buy commercial 20 Factor VIII to treat his patients. 21 A. I don't think I would have been particularly concerned 22 about the Scottish situation at that stage in my life. 23 Q. Can we move then to your arrival in Edinburgh. I think 24 it must have been at the beginning of 1980. Is that 25 right?</p> <p style="text-align: center;">Page 12</p>

<p>1 A. Yes, January 1980 I think it was, the middle of January.</p> <p>2 Q. We can see you in action in February 1980. Can we look</p> <p>3 at a letter, please, [SNB0072566]?</p> <p>4 It looks, Dr Boulton, as though from very shortly</p> <p>5 after your arrival, you were in discussions with</p> <p>6 Dr Ludlam, who must have been a new arrival around that</p> <p>7 time too, about the question of home therapy. I'll just</p> <p>8 give you a minute to look at the letter. (Pause)</p> <p>9 A. I have no specific memory of writing the letter, but</p> <p>10 I would think -- well, it clearly is authentic.</p> <p>11 Q. Yes.</p> <p>12 A. Actually it would fit the pattern in my mind, yes.</p> <p>13 Q. Yes. I was going to ask you about that. Firstly, when</p> <p>14 you arrived in Edinburgh, did you become aware of what</p> <p>15 the then prevailing position was regarding haemophilia</p> <p>16 therapy?</p> <p>17 A. Yes, I mean, this letter would indicate that I had had</p> <p>18 already, within the first couple of weeks of my arrival</p> <p>19 in Edinburgh, met and spoken to Christopher, who</p> <p>20 I remember from before, and he had made his position</p> <p>21 pretty clear and I felt at that time, and I think the</p> <p>22 feeling was right, that this was the right way ahead.</p> <p>23 Q. Right. Had you known Dr Davies, who was Dr Ludlam's</p> <p>24 predecessor?</p> <p>25 A. Only very slightly. I can't remember if I had met him</p> <p style="text-align: center;">Page 13</p>	<p>1 was like gold dust to me, and I kept it going for a week</p> <p>2 and it had regular infusions of cryoprecipitate into it.</p> <p>3 Dr O'Brien was not pleased with me for using one vein</p> <p>4 for a week because he felt it was likely to cause</p> <p>5 thrombosis, interestingly, and I should have</p> <p>6 catheterised a new vein every day. I politely told him</p> <p>7 I thought he was wrong but that goes to show that my</p> <p>8 introduction to cryoprecipitate was early.</p> <p>9 It is messy to deal with. In order to maximise its</p> <p>10 potency, one should wash out each bag with a bit of</p> <p>11 citrate, and it had this nasty property of gunking up</p> <p>12 and so it was not easy. So I had every sympathy with</p> <p>13 doctors whose job became a daily infusion of</p> <p>14 cryoprecipitate. Nevertheless, when I was in Liverpool</p> <p>15 as a consultant, I regularly did such stuff myself,</p> <p>16 partly to support the junior staff and partly to show</p> <p>17 them that it was actually a part of their duties.</p> <p>18 Q. Would you sign up to a view that has been expressed by</p> <p>19 others that it really was not suitable for home therapy?</p> <p>20 A. Very difficult for home therapy. It was not totally</p> <p>21 unsuitable. It could be used. But the patients, and if</p> <p>22 they were a young boy, the patient's family, the</p> <p>23 parents, would need quite careful and specific training</p> <p>24 and monitoring so to do. And so it was only really</p> <p>25 practical in families (a), who were relatively well</p> <p style="text-align: center;">Page 15</p>
<p>1 at one of the other HDO meetings but I did meet him</p> <p>2 afterwards. I did come to meet him and his wife was</p> <p>3 a practising consultant at the hospital at the same</p> <p>4 time. So there were occasions when I did meet Howard.</p> <p>5 Q. Did you know anything about his views on concentrates?</p> <p>6 A. Yes, he was a wise man and wiser in retrospect, perhaps,</p> <p>7 than seemed at the time.</p> <p>8 Cryoprecipitate is very messy to deal with. My</p> <p>9 initial experience of dealing with cryoprecipitate was,</p> <p>10 believe it or not, as a houseman in Portsmouth in 1967,</p> <p>11 when the local haematologist was a man called</p> <p>12 Dr John O'Brien, who had been among the Oxford team that</p> <p>13 discovered Christmas Disease in 1952. And Dr O'Brien</p> <p>14 had at his beck and call The Royal Navy. And a severely</p> <p>15 haemophilic man developed bladder cancer, the first sign</p> <p>16 of which was heavy bleeding. Cryoprecipitate had being</p> <p>17 described only two years before and John O'Brien was</p> <p>18 able to procure fresh donations from the ships and the</p> <p>19 naval bases in Scotland, and make them into</p> <p>20 cryoprecipitate and I was the young man who had to</p> <p>21 deliver the cryoprecipitate into the haemophilic</p> <p>22 circulation as the houseman. I wasn't even aware that</p> <p>23 I was going to become interested in haemophilia later.</p> <p>24 This man had very poor veins and I managed to</p> <p>25 catheterise a narrow vein on the back of his hand, which</p> <p style="text-align: center;">Page 14</p>	<p>1 trained and (b), probably in fairly close proximity to</p> <p>2 the hospital in case things went wrong.</p> <p>3 Q. Right. So just to go back to Dr Davies, what was your</p> <p>4 understanding of his views about different forms of</p> <p>5 therapy when you arrived?</p> <p>6 A. I can't say that I was aware of those views within the</p> <p>7 timeframe of writing this letter, but as time went by,</p> <p>8 I did become aware of views that there were problems</p> <p>9 with fractionated product, even from NHS volunteer</p> <p>10 donors. But I think it was not unreasonable for the</p> <p>11 newer generation to advocate an increase in usage of</p> <p>12 Factor VIII.</p> <p>13 The problem was that if one were to restrict the use</p> <p>14 to what, at that time, was felt on good grounds but not</p> <p>15 on established grounds, to be a safer product, ie</p> <p>16 a cryoprecipitate that was more difficult to use, less</p> <p>17 potent, the patients would not have so much protection</p> <p>18 from joint damage, whereas one would be able, with</p> <p>19 higher doses of smaller volume infusion lyophilised from</p> <p>20 the freeze-dried fractionated product, be able to embark</p> <p>21 on a programme of prophylactics for preventing the</p> <p>22 damage to joints, particularly in boys as they were</p> <p>23 approaching their teens.</p> <p>24 Q. If that's the distinction between cryoprecipitate and</p> <p>25 concentrates, what did you discover to be the prevailing</p> <p style="text-align: center;">Page 16</p>

<p>1 view in Edinburgh about the difference between American 2 concentrates and NHS concentrates; can you remember 3 that?</p> <p>4 A. We go back to the wonderful book, The Gift Relationship, 5 by Richard Titmuss, which came out in 1970, which 6 I still think -- I'm sure that many in this room will 7 now have read that book and indeed its sequence, and 8 indeed Richard's daughter, Ann Oakley, has also written 9 on the same subject.</p> <p>10 Although it is a rather ponderous social study type 11 book, The Gift Relationship, it very clearly describes 12 the risk of using blood from donors who are paid, that 13 is the profit-making donor centres, and the blood from 14 the non-profit-making donor centres, who used volunteer 15 donors in America.</p> <p>16 And indeed, there was a long drawn-out legal battle 17 in America in which the for-profit companies were taking 18 the not-for-profit companies to court for unfair 19 practices; in other words, undercutting their commercial 20 development by using donations that were not paid for.</p> <p>21 The book very clearly established the greater risk 22 from using blood -- this is not fractionated products 23 but just straight blood -- from donors who are paid 24 compared with donors who are not paid, and although 25 there has been more than one magnitude of difference</p> <p style="text-align: center;">Page 17</p>	<p>1 Q. He makes a point in his letter about: 2 "... a bias in favour of Inverness where the 3 geography of the region makes a more widespread 4 utilisation of home therapy a rather necessary fact of 5 life." 6 I haven't really come across very many references of 7 that nature, Dr Boulton, but it is interesting to see it 8 because in about 1973, when the commercial concentrates 9 were coming in, at least some people seemed to think 10 that perhaps they would be for people who lived a long 11 way away from the haemophilia centre, but I think we 12 understand that that wasn't really translated into 13 practice.</p> <p>14 A. There is a good reason why it wasn't necessarily 15 translated into practice and I probably didn't make it 16 clear enough to John Watt at the time. There is the 17 magnetic effect of having a haemophilia centre, and this 18 was particularly characterised historically in Oxford, 19 where the centre there was developed under the great 20 Dr MacFarlane, and Oxford became a magnet so that many 21 haemophiliacs' families moved into the Oxford region so 22 that their children could be treated.</p> <p>23 It is quite possible, indeed probable, that some 24 haemophiliacs' families in Scotland gravitated to 25 Edinburgh and Glasgow, where they would be more likely</p> <p style="text-align: center;">Page 19</p>
<p>1 drop in the risk of paid and non-paid blood donors, that 2 debate is still going on to this day, as far as I know.</p> <p>3 So by 1980 one would be very aware of the problems 4 of using blood from donors who were paid and therefore, 5 fractionating plasma from donors who were paid, and 6 going back to the World in Action programme, that was 7 certainly highlighted, and I think that one was 8 certainly aware that there were risks associated with 9 using commercially obtained plasma from companies who 10 were bleeding their donors and paying them in America or 11 indeed, on reflection, in Austria.</p> <p>12 Q. So much so that Dr Davies, we have heard, didn't want to 13 use the commercial products at all.</p> <p>14 A. That, I think, would be fair comment.</p> <p>15 Q. Yes. We also understand that Dr Ludlam continued that 16 policy when he arrived in Edinburgh in 1980.</p> <p>17 A. But the letter does indicate that Christopher was quite 18 rightly anxious to increase the use of Factor VIII for 19 the haemophilic patients, particularly the young ones, 20 and that his preferred option was to use PFC-derived 21 Factor VIII concentrate.</p> <p>22 Q. Just so look at the response to the letter, can we look 23 at [SNB0072568]. This is actually from Mr Watt back to 24 you.</p> <p>25 A. Yes.</p> <p style="text-align: center;">Page 18</p>	<p>1 to get treatment more promptly. So although Inverness 2 has the relative problem of geographic remoteness and 3 the haemophilic living in the Western Isles actually was 4 probably supplied by Aberdeen -- but nevertheless -- I 5 think Aberdeen supplied the Orkneys and the Western 6 Isles were supplied by Inverness. Although there was 7 that very real geographical problem, it may have been 8 more than countered -- although I wouldn't know this for 9 certain by any means -- by, as I say, the magnetic 10 effect of having a dedicated centre in a city like 11 Edinburgh or Glasgow.</p> <p>12 Q. Can we just look at the second page of the letter, 13 please.</p> <p>14 I think, in short, we can see that this letter was 15 Mr Watt. We have to go on to page 3. We have another 16 blank page here.</p> <p>17 A. Yes.</p> <p>18 Q. Mr Watt had come up with a sort of plan. I don't think 19 we need to go into the details of it because it doesn't 20 look as though it actually was implemented, if we look 21 at another letter, which is one that Dr Cash wrote. We 22 can see this letter was copied to him, and then 23 [SNB0072571], Dr Cash didn't seem to like the proposal.</p> <p>24 Well, Dr Boulton, we know that one way or another, 25 and perhaps with a few initial hiccups, more of a home</p> <p style="text-align: center;">Page 20</p>

5 (Pages 17 to 20)

<p>1 therapy programme did become established in Edinburgh 2 using product from PFC, and you were obviously assisting 3 Dr Ludlam in getting that up and running from 1980 4 onwards.</p> <p>5 A. I think this correspondence, which I have seen recently, 6 there is a slightly unfortunate assumption in there that 7 John Watt felt that I could personally increase the 8 amount of plasma that would go to PFC. Maybe that's 9 unfair on John, and when he uses the word "you" in his 10 letter to me, he wasn't referring to me personally but 11 the Edinburgh centre.</p> <p>12 What I can say is that at that time and shortly 13 after, the amount of blood donated in the Edinburgh 14 region was much higher, the number of donors that 15 donated per year, the number of donations collected per 16 year, was much higher than the national average, 17 certainly in England, and it was actually accompanied by 18 an almost conscious excess discard rate of red cells.</p> <p>19 In other words, the blood donation emphasis became 20 driven by the need for plasma so that a very significant 21 proportion -- I'm not talking about 5 per cent but 22 15/20/25 per cent -- of the donations were collected and 23 the red cells not used. So we were never short of red 24 cells. But what we did do was to take off 200 mls of 25 plasma from each donation to maximise the supply of</p> <p style="text-align: center;">Page 21</p>	<p>1 cryoprecipitate would have contained about 50 per cent 2 of the original Factor VIII in the donation. That would 3 be in 30 mls. The remaining 180/200 mls of 4 cryosupernatant plasma still had Factor VIII in it. And 5 although this would need to be confirmed from Dr Foster, 6 I seem to remember that cryosupernatant was also put 7 into the pot to make fractionated Factor VIII.</p> <p>8 Q. I think that may have been an initiative that Dr Foster 9 said in his paper was less successful because some of 10 the batches were too "weak".</p> <p>11 A. But it reflects the conscious need to maximise 12 Factor VIII yields.</p> <p>13 THE CHAIRMAN: I think there is a considerable history of 14 development of supernatant Factor VIII but also 15 considerable resistance from some directors to its use.</p> <p>16 A. Yes.</p> <p>17 THE CHAIRMAN: Especially from the West of Scotland. Or 18 does that not square with your recollection?</p> <p>19 A. I was not directly involved in discussions in the West 20 of Scotland.</p> <p>21 THE CHAIRMAN: We might hear a little from you about the 22 insularity, otherwise called the autonomy, of different 23 regions.</p> <p>24 A. Yes.</p> <p>25 MS DUNLOP: Just sticking, Dr Boulton, with a sort of</p> <p style="text-align: center;">Page 23</p>
<p>1 plasma within the bounds of the donor supply, the amount 2 of plasma. And of course, when optimal additive became 3 available in the early 1980s, that increased our yield. 4 So steps were actually taken to increase the volume, the 5 kilogrammes of plasma that were sent to PFC.</p> <p>6 So although the specific proposals in this letter 7 and its reply and John Cash's reaction to it were not 8 specifically developed in the way that Christopher and 9 I would have liked, there was still a marked increase in 10 the amount of plasma that I think was sent to PFC and 11 I guess that was also reflected from the other regions 12 as well.</p> <p>13 So we in Scotland were doing our very best to 14 maximise the kilogrammes of plasma sent to PFC, and 15 I think at that time I have no doubt we were way ahead 16 of the situation in England.</p> <p>17 Q. We have also had a impression from very detailed paper 18 that Dr Foster has given us of efforts at PFC really to 19 use every scrap.</p> <p>20 A. Absolutely.</p> <p>21 Q. Yes. To recover every scrap and to use every scrap.</p> <p>22 A. I think I'm right in saying that they even used -- the 23 plasma that the centres made into cryoprecipitate would 24 result in a cryosupernatant, and I think that PFC even 25 used cryosupernatant to get Factor VIII, because the</p> <p style="text-align: center;">Page 22</p>	<p>1 chronological progress at the moment and moving into 2 1981, I wanted to go back to another meeting, which is 3 [SNB0017354]. The interest of this is really to note 4 and come back to it later, about arrangements for 5 obtaining, holding and distributing blood products. 6 This is the minutes of a meeting of UKHCDO at the Royal 7 Free on 9 October 1981. You were at that, by this time 8 from the SNBTS in Edinburgh. If we go to page 9 of this 9 document, please, I think this is going to be page 9.</p> <p>10 We can see that this is a discussion of the question 11 of purchasing, holding and distribution by blood 12 transfusion centres of blood products; stocks of all 13 types, including Factor VIII and Factor IX concentrate.</p> <p>14 As I read this, Dr Boulton, it is really discussing 15 a problem in England, I think. I'll let you take 16 a minute to look at it. (Pause)</p> <p>17 Perhaps we can scroll down to the bottom of the 18 page, thank you. (Pause)</p> <p>19 Perhaps we should look at the next page as well, 20 please. (Pause)</p> <p>21 It rather looks, putting it very crudely, 22 Dr Boulton, as though the quid pro quo for retaining 23 control over purchasing, holding and distribution of 24 products was better furnishing of data about what was 25 going on, to enable health authorities and transfusion</p> <p style="text-align: center;">Page 24</p>

6 (Pages 21 to 24)

<p>1 centres to carry out long-term planning. Do you 2 remember this being a tussle in England about who had 3 control over the purchase, holding and distribution of 4 products?</p> <p>5 A. I do have memories. They are rather vague. I think it 6 should be realised -- and this is no aspersion to the 7 English, who are ten times bigger than the Scots -- that 8 the dozen or so regions and the relationship between the 9 regional transfusion centre and the local clinicians, 10 particularly the haemophilia doctors, was highly 11 variable. In some there was a close relationship 12 between the haemophilia director and the region, 13 possibly helped by geography, and that was certainly the 14 case at Liverpool and in others there would be a more 15 remote relationship.</p> <p>16 I remember in Liverpool I was given a budget of 17 £40,000 to buy commercial Factor VIII and I was praised, 18 amazingly, by the finance doctor, for keeping more or 19 less within budget. But I also kept the transfusion 20 centre, under Dermot Lehane in Liverpool at that time, 21 aware of what was going on. So there was a sharing of 22 information. We used whatever we could from Elstree. 23 We used whatever we could from the transfusion centre in 24 the way of cryoprecipitate, but we had to buy extra, and 25 I'm pretty sure that we kept all parties informed. I'm</p> <p style="text-align: center;">Page 25</p>	<p>1 "Acquired Immunodeficiency Syndrome." 2 A. Yes, I see the note. 3 Q. You perhaps know what I'm going to ask you, which is 4 your record of the fact that three cases had occurred in 5 haemophiliacs in the USA, possibly associated with 6 parenteral drug abuse. You have also written there is 7 a remote, underlined, possibility of transmission via 8 commercial Factor VIII. 9 The reference to there being a remote possibility of 10 a connection with blood products does feature in the 11 main minutes of the meeting but not the idea that the 12 cases in people with haemophilia in America might be 13 associated with parenteral drug abuse. Just before 14 I ask the question, can we compare what was said in the 15 MMWR, which is [LIT0010559]. Look at this report. 16 A. Can we see the date of that? 17 Q. Yes, this is 16 July 1982. It is actually stated in the 18 first paragraph that: 19 "All three were heterosexual males. None had 20 a history of intravenous drug abuse." 21 If we look on to the second page, if we could, 22 please, and I think we need to go down to the editorial 23 note at the end of the second paragraph. It says: 24 "The occurrence among the three haemophiliac cases 25 suggests the possible transmission of an agent through</p> <p style="text-align: center;">Page 27</p>
<p>1 not sure that that pattern was duplicated across all the 2 other centres in England.</p> <p>3 Q. Right. I want to come back to that, having noted that 4 that seems to have been the set-up in England. But now 5 can we move to a slightly different theme by looking at 6 a meeting of UKHCDO in September 1982. The meeting took 7 place on 13 September and we have a number of different 8 notes of that meeting, including one written by you.</p> <p>9 A. Yes.</p> <p>10 Q. Which is [SNB0017494]. I don't think this one is signed 11 but --</p> <p>12 A. This is me.</p> <p>13 Q. It is you, yes?</p> <p>14 A. Yes.</p> <p>15 Q. There may be a signature on the last page but anyway, 16 you are content that you wrote this?</p> <p>17 A. Yes.</p> <p>18 Q. We can see a number of points mentioned with which we 19 are already familiar, but the particular matter to which 20 I wanted to direct your attention is the reference to 21 what was said about Acquired Immunodeficiency Syndrome 22 in the United States. 23 Can we just move through, please, towards the end of 24 Dr Boulton's note? 25 You see that note there, Dr Boulton:</p> <p style="text-align: center;">Page 26</p>	<p>1 blood products." 2 Dr Boulton? 3 A. Yes, yes. 4 Q. It is turning into a big question, but firstly you made 5 a reference in your note to a possible connection with 6 parenteral drug abuse and you also recorded that the 7 possibility of a connection with blood products was only 8 remote. I don't imagine that you made that up yourself. 9 Do you remember what the source of that information in 10 your notebook was? 11 A. It was the proceedings of a meeting. This was not 12 a personal opinion about being remote. This was my 13 record, taken by myself, with notes then transcribed 14 a few days later, of the discussions at the meeting; and 15 I think it is in the context of the hepatitis risk, 16 which is the item immediately above there. So it was 17 not a personal opinion; it was just what was said at the 18 meeting. 19 Q. Yes. Indeed, but you don't remember who said it? 20 A. No, I didn't note that but, as I say, this comes in the 21 context of the notes, immediately after the hepatitis 22 risk. 23 Q. Yes. 24 A. So it would have been, in my recollection -- and if 25 Christopher was there, he may remember better than me --</p> <p style="text-align: center;">Page 28</p>

7 (Pages 25 to 28)

<p>1 but my recollection is that this was not quite 2 a throwaway but as a bit of an extra about the 3 infectious risk, and the emphasise was on hepatitis. 4 And I might comment that -- and I'm sure you will have 5 observed as well -- there are two other reports in your 6 files of the same meeting. 7 Q. Yes. 8 A. One of which I think came from PFC. 9 Q. One is Dr Perry and the other is from the Haemophilia 10 Society. 11 A. That's right. And in neither case is a reference made 12 to that particular item about AIDS, and so the only 13 report in your files of the meeting that mentions the 14 fact that AIDS was discussed at all was in my notes. 15 So I haven't actually seen recently the actual 16 official minutes of that meeting. It would be 17 interesting if they had a reference to it. 18 Q. Yes. The official minutes don't say that there might 19 have been a connection with intravenous drug abuse. 20 They do say that there was a remote possibility that 21 blood products might be involved. 22 A. That's right. 23 Q. I think the only significance of it, Dr Boulton -- and 24 at the end of the day it's only nuance. 25 A. Absolutely.</p> <p style="text-align: center;">Page 29</p>	<p>1 So what I'm saying is that there was an awareness 2 that blood transfusion could be dangerous in a special 3 way in that setting, and on the other hand for entirely 4 understandable reasons -- and this is most important to 5 get this balance right -- families of boys who were 6 being crippled by haemophilia, who had this 7 cripple-saving and actually life-saving infusion 8 available to them, were understandably anxious that 9 their boys could grow up with healthy joints, pain-free, 10 and were therefore in a dilemma between how dangerous 11 was this stuff and how effective it was. And it's an 12 entirely understandable, human reaction. When you see 13 the immediate benefits -- a little child crying and then 14 not crying within minutes of receiving an injection and 15 the remote possibility of it going a bit yellow in a few 16 weeks' time and HIV wasn't even thought of -- you can 17 see that there was a lot of pressure dealing with the 18 acute and not worrying so much about the remote 19 possibilities. 20 Q. Yes. I quite appreciate that, Dr Boulton. In what you 21 have said, you have mentioned the chance of having 22 undamaged joints, and actually something did strike me, 23 which I haven't asked any of the other doctors, so I'll 24 just ask you: whether the availability of joint 25 replacement made a difference in haemophilia care?</p> <p style="text-align: center;">Page 31</p>
<p>1 Q. But perhaps it could be thought there is a hint of, even 2 at this stage, the risk being downplayed. 3 A. Sadly, I think that's true. I think there was 4 a difference, certainly within Scotland, and the English 5 haemophilia directors -- I wouldn't say this was the 6 Scottish haemophilia directors -- but I think there 7 was -- and I think they are coming to the Bloom letter 8 soon. There was a distinct unease among the Scottish 9 transfusion directors and consultants about the onset of 10 this horrible disease, which by 1983 was becoming more 11 and more apparent as indicated by that MMWR of June and 12 of one that follows two weeks after this meeting 13 in September. 14 So although it is only a recollection, and I don't 15 think too much emphasis should be placed on it, there 16 was unease among the Scottish. And I might comment that 17 one of the reasons for the unease, particularly in 18 Edinburgh, is that a year or so before I arrived in 19 Edinburgh there had been a horrible outbreak of 20 Hepatitis B in the renal unit among the patients and one 21 of the fatal victims of that incident was a technician 22 in the Blood Transfusion Service of Edinburgh, whose 23 memory was, even though she had died a year or two 24 before I arrived, still very strong among the scientific 25 and technical staff of the centre.</p> <p style="text-align: center;">Page 30</p>	<p>1 Presumably joint replacement began to be possible? 2 A. Well, total hip replacement was the first one that 3 became available and slightly ironically it was realised 4 that total hip replacement was frequently followed by 5 thrombosis and so anticoagulants would be given to 6 prevent the surgery causing thrombosis and pulmonary 7 embolism. But it was confined to the middle aged and 8 elderly. 9 Even to this day I don't think an orthopaedic 10 surgeon would consider replacing the knee joint. Knees 11 were often particularly badly affected in a young man 12 of, say, 25, who had severe arthritis due to 13 haemophilia. Joints have a habit of wearing out after 14 20 years or so and further surgery being required. You 15 would have to ask an orthopaedic surgeon but I would 16 very much doubt if joint replacement surgery would be 17 certainly featuring in the 1980s. 18 Q. Thank you. 19 THE CHAIRMAN: Dr Boulton, why were you at the meeting 20 in September 1982? 21 A. John Cash asked me to go. 22 THE CHAIRMAN: You were no longer a haemophilia director by 23 then. 24 A. That's right. Harking back to my appointment at the 25 Edinburgh centre and the reason why I went there: I have</p> <p style="text-align: center;">Page 32</p>

<p>1 explained that it had its great attractions because in 2 contrast with English centres it had a real clinical 3 link to the surgeons, the heart surgeons et cetera, 4 et cetera.</p> <p>5 I loved my haemophilic job in Liverpool. It was not 6 one which I was wanting to run away from and I missed 7 the patients when I left there. But I was encouraged to 8 believe that I would still have contact with the 9 haemophilia community, which I did, in Edinburgh.</p> <p>10 Christopher had no problems about them getting to 11 know me and I think I even addressed a meeting of the 12 Haemophilia Society fairly shortly after I arrived. So 13 the reason I went to Edinburgh was so that I could 14 continue -- and particularly there were possibilities of 15 research in the transfusion area, which was of interest 16 to me.</p> <p>17 But I was known to the haemophilia community in 18 England. I knew Arthur Bloom personally, and it was 19 thought not unreasonable that a representative from the 20 SNBTS be present at those haemophilia directors' 21 meetings in the early 1980s and I was very welcomed 22 among them.</p> <p>23 THE CHAIRMAN: Thank you very much.</p> <p>24 MS DUNLOP: Another meeting you attended was the meeting at 25 Heathrow Airport in January 1983 and you also prepared</p> <p style="text-align: center;">Page 33</p>	<p>1 epidemiology was pretty close to that of Hepatitis B, 2 which was well-known.</p> <p>3 I think at this time, 1982/1983, there was still 4 a reluctance by some haemophilia directors to -- and 5 I think this is typified by my dear friend Peter Jones 6 of Newcastle, who was really anxious to get the balance 7 right, as I said earlier, between relieving the 8 immediate problems of haemophilia bleeding against the 9 remote -- I put that in inverted commas -- risk of some 10 infectious disease later so. So I suspect at this time 11 there was a spectrum of opinion among haemophilia 12 directors about where the balance lay.</p> <p>13 Q. You have underlined, I suppose -- I don't know if it's 14 your underline. Someone has underlined that there was 15 a 45 per cent mortality?</p> <p>16 A. I don't think that's my underlining. I suspect it's 17 Brian McClelland.</p> <p>18 Q. Actually, on the first page, there are various 19 hieroglyphics. It does look as though you were 20 preparing in note as a form of reporting?</p> <p>21 A. Yes.</p> <p>22 Q. I suppose you will certainly have wanted to show it to 23 him?</p> <p>24 A. Yes.</p> <p>25 Q. Can we look on to the last page, please? There is</p> <p style="text-align: center;">Page 35</p>
<p>1 a note of that, which we have. Can we look at that, 2 please? That's [SNB0014033]. Do you remember this 3 meeting?</p> <p>4 A. Yes. Well, very vaguely, I'm sorry to say. Yes.</p> <p>5 Q. It looks as though it might have been primarily, at 6 least from Immuno's point of view, a promotional 7 meeting. Would that be right?</p> <p>8 A. I suspect so, yes.</p> <p>9 Q. What Immuno was interested in talking about was their 10 hepatitis-reduced Factor VIII and Factor IX 11 concentrates. And it's interesting that in Immuno's 12 notes of the meeting that is overwhelming the subject 13 matter that's recorded, but in your note you have 14 recorded that too but you have gone on to talk about 15 a discussion which I think took place in the afternoon 16 in relation to AIDS. That's page 3. So if we could go 17 to that, please.</p> <p>18 Dr Boulton, you were there. At that time, early 19 1983, was this going to be something that any gathering 20 of haemophilia clinicians would want to talk about?</p> <p>21 A. It is very difficult for me, 27 years on, to recall the 22 chronology. Certainly at some stage around this time 23 there was a heightened awareness of the distinct 24 possibility that this awful disease would be transmitted 25 in blood and there was an awareness that its</p> <p style="text-align: center;">Page 34</p>	<p>1 a paragraph there about the possible nature of the 2 transmissible agents. It certainly looks as though the 3 writer of this note -- that is you -- belonged to the 4 school of thought that there was a transmissible agent. 5 Is that right?</p> <p>6 A. I think that's a fair assumption.</p> <p>7 Q. Dr Boulton, you have mentioned --</p> <p>8 THE CHAIRMAN: Are you leaving the note?</p> <p>9 MS DUNLOP: Yes, I was going to.</p> <p>10 THE CHAIRMAN: Can we go back to an answer which I think may 11 need a little bit of unpacking.</p> <p>12 You were asked whether you could recall this meeting 13 terribly well and you started by saying it was very 14 difficult to recall it with clarity. At some stage 15 around now, there was heightened awareness of the risk 16 and of the common epidemiology between AIDS and 17 hepatitis. Then you went on to say there was still 18 a reluctance by some haemophilia directors, for example, 19 your good friend Peter Jones, who were anxious to get 20 the balance right. I think that you perhaps didn't 21 explain to me clearly enough what the reluctance was 22 about. I can see the point about getting the balance 23 right but what was the underlying factor that explained 24 the reluctance?</p> <p>25 A. I would like to put this in the context of my</p> <p style="text-align: center;">Page 36</p>

<p>1 correspondence and telephone calls with Peter Jones, who 2 I regarded as a leading haemophilia director in England 3 and who I knew really quite well personally. Obviously 4 it's important to get his own views on this, if 5 possible. But at that time, 1982/1983, Peter, who was 6 a paediatrician by training and largely dealing with 7 boys with haemophilia in the Newcastle area, really 8 wanted to test the thinking about the nature of this 9 epidemic, or looming epidemic, that seemed to be focused 10 in America, particularly the west coast, and how 11 relevant that was to England. I think he was reluctant 12 in drawing too much of a conclusion that would reduce 13 significantly the amount of therapy he could give to his 14 patients. 15 I think it's possibly, particularly because a large 16 number of his patients were boys, growing up, for whom 17 he felt a personal responsibility to give them a healthy 18 adult life, which was dependent upon ever-increasing 19 supplies of clotting factors. The British, particularly 20 the English, could not meet the demands and so there was 21 a need to go overseas, particularly to America, where 22 there were products available, and although there were 23 legitimate concerns about the safety of those products, 24 Peter and many like him were reluctant to abandon the 25 treatment; in other words, go back ten years or so to</p> <p style="text-align: center;">Page 37</p>	<p>1 patients I ever met was a young man in those days, 2 called John Prothero, who died of HIV/AIDS. He became 3 a leading light in the Haemophilia Society. I remember 4 him as a boy of 15. So what I say about the Haemophilia 5 Society now has to be taken in the light that I knew 6 them well at that time. And Reverend Tanner, I knew 7 very well. 8 So we are going into Haemophilia Society history. 9 Lovely people, very caring, very driving. 10 Reverend Tanner was a lovely man but very focused on the 11 care for haemophiliacs, of course, because of his son, 12 and at that time, the early 1980s, I think it would be 13 fair to say that the Haemophilia Society was very 14 reluctant to accept the validity -- they wanted the risk 15 of nasty things from their blood products to be really 16 proved before they would agree to reducing the 17 availability of material for their patients. 18 So there was a drive from the haemophilics 19 themselves, including the Haemophilia Society, to 20 maintain the amounts of therapeutic material available. 21 So there was, in other words, a feeling that the 22 risk was probably acceptable. 23 THE CHAIRMAN: Of course, proof is a difficult concept 24 unless one knows the standard against which the evidence 25 has to be measured. What do you understand by proof at</p> <p style="text-align: center;">Page 39</p>
<p>1 the style of treatments usually only cryoprecipitate or 2 small pooled products which would reduce the dosage that 3 children could get and return them to a risk of getting 4 permanent joint damage from their early years. 5 THE CHAIRMAN: Let me make my interest more clear: I can 6 understand that a person concerned with the care of 7 haemophilia patients would be very reluctant to give up 8 a therapeutic product that had established itself as 9 effective and indeed transformative in caring for the 10 patient. That's one thing. But the basis on which the 11 reluctance is maintained can be one or other of two 12 things. It can either be a failure or refusal to accept 13 the growing evidence of a competing risk, or it can 14 involve the acceptance of that risk but preferring still 15 to get the acute benefits and accept the long-term risk. 16 I'm anxious to know whether the haemophilia 17 population, and the directors in particular, maintained 18 a resistance to the growing evidence of a link, the 19 transmissible agent theory, beyond the point at which 20 that was reasonable and sensible as scientists. That's 21 the focus. 22 A. I remember the Haemophilia Society at that time really 23 quite well. I had very close links with the Haemophilia 24 Society in my time in Liverpool. I helped found the 25 local branch. One of the very first haemophilic</p> <p style="text-align: center;">Page 38</p>	<p>1 this time? 2 A. The proof would have to be epidemiological. I mean, the 3 ultimate proof would be the final demonstration of 4 Koch's Postulates about infections, and that's why the 5 chimpanzees in the Immuno report were so interesting. 6 One of the problems that Immuno had was that there was 7 a developing shortage of chimpanzees. In other words, 8 could we get an infectious agent from person and put it 9 into another person or animal and demonstrate the same 10 disease? So that would be the proof. 11 So that's not epidemiological, that's just 12 biological but you can then get an epidemiological 13 indication that there was a proof. So there is 14 a reasonable proof that Hepatitis B was transmittable by 15 blood products. That risk was first identified in the 16 Second World War and became more and more evident, 17 particularly when the so-called Australia antigen was 18 discovered. So when you find the organism, you can 19 prove. Until you find the organism, proof has to be 20 based on epidemiological grounds, which are always 21 subject to some degree of contention. 22 THE CHAIRMAN: Yes. I think I heard on the radio this 23 morning that American scientists think that they may at 24 last have identified the HIV virus, but until that 25 point --</p> <p style="text-align: center;">Page 40</p>

<p>1 A. The ancestral virus? 2 THE CHAIRMAN: Yes. But until that point, on this 3 hypothesis Koch's postulate wouldn't be satisfied in the 4 case of the connection between HIV and AIDS, would it? 5 A. I would have to be made familiar with the details. My 6 understanding is that HIV or proto HIV was a virus that 7 was transmitted among the higher primate world, was 8 taken up by people who were in close contact, 9 particularly hunters and eaters of the meat of the 10 monkeys, and so particularly for HIV-2, I think, this is 11 fairly likely but how it got into humankind... The 12 other thing about HIV is of course its extraordinary 13 propensity to evolve rapidly. So the viruses we have in 14 the HIV group now may be really quite substantially 15 different from the virus that was lurking in the 1950s. 16 THE CHAIRMAN: Thank you very much. 17 MS DUNLOP: Dr Boulton, I wanted to take you to one or two 18 other events in 1983. We were looking at the discussion 19 that was held at the meeting at Heathrow Airport on 20 24 January. You yourself mentioned a moment or two ago 21 the Bloom letter, and actually there are two Bloom 22 letters, I suppose, one we have and one we don't. The 23 one I was going to ask you about is the one that we 24 don't have, which is your letter to Professor Bloom. Is 25 that what you were expecting when you referred to it?</p> <p style="text-align: center;">Page 41</p>	<p>1 Edinburgh -- and by that time you were working in 2 Edinburgh -- you think the focus of your concerns may 3 have been more to do with the treatment in England and 4 Wales. Is that right? 5 A. Yes. 6 Q. Do you want to explain a little bit? I know you have 7 set it out in your statement. 8 A. Also, at the same time, there is another document from 9 this era, that you may have, which is my memo to 10 Brian McClelland about a telephone conversation I had 11 with Peter Jones on 24 May. 12 Q. I was going to go to that after we talked about the 13 letter, if that's all right with you? 14 A. Yes, fine. 15 Q. Right. 16 A. It's impossible for me at this stage to say precisely 17 what was in my mind and what made me write those 18 letters. So anything that follows from me in this 19 regard must be taken with a degree of, if not 20 scepticism, at least realising the limitations of the 21 value of my recollection. 22 And I find it very frustrating, just as you do, that 23 I have no idea really what my wording was for my 24 recommendations one and two. There were these two 25 recommendations that I made to Arthur Bloom in my</p> <p style="text-align: center;">Page 43</p>
<p>1 A. I understood that this was likely to crop up. 2 Q. Yes. We should look, just to explain this issue, at the 3 reply to your letter, which is [SNF0013711]. This is 4 a letter to you from Professor Bloom, dated 23 May 1983. 5 We can see that you have obviously written, he doesn't 6 say when, but no doubt not that long before 23 May and 7 you have made some suggestions. He is recording what he 8 perceives as a consensus that it would be 9 counter-productive to ban the importation of blood 10 products at this moment. You must also, I think, have 11 made some mention of deferral of home treatment. 12 Perhaps we could keep that letter and juxtapose 13 Dr Boulton's supplementary statement, which deals with 14 this issue. It is [PEN0150226]. 15 It's the second, third and fourth paragraphs of this 16 supplementary statement that deal with this topic, 17 Dr Boulton. 18 I think it would be fair to say, sir, that a lot of 19 people have looked for Dr Boulton's letter. 20 A. Including myself. 21 Q. Including you. But we haven't found it. So all you 22 have been able to do really is to speculate as to what 23 you might have said. 24 In a nutshell, Dr Boulton, I think what you are 25 saying is that although you were writing from</p> <p style="text-align: center;">Page 42</p>	<p>1 letter, which was probably around about 20 May. As 2 I say, it must be limited. But also his letter to me is 3 marked "Strictly confidential", as I commented. And I'm 4 not even sure that the letter I wrote to him, I would 5 have copied to Brian McClelland. So consequently, 6 although I would have kept Brian in touch with the gist 7 of this conversation afterwards, it may not exist in the 8 SNBTS files at all. If it exists anywhere, it will be 9 in whatever remains of my personal files, which I left 10 behind when I left Edinburgh in 1990. 11 But it may turn up one day, and the one thing 12 I don't want to do is to say something now that is shown 13 to be completely wrong if it turns up again. And 14 anyway, I want to be totally honest, as I have got to 15 be. I have affirmed so. 16 I think it is likely that my concern was directed 17 towards the English more than in a way to the Scots. 18 Arthur Bloom, the then director -- lovely man, very 19 caring physician, really anxious to get things right, 20 I would say actually little short of brilliance in terms 21 of his intellect and his ability to see many sides of an 22 issue -- was right in the middle of this dilemma about 23 safety from the point of view of unintended horrible 24 side effects and efficacy, the intended good effect. 25 All I can say is that in this increasing</p> <p style="text-align: center;">Page 44</p>

<p>1 awareness that fractionated blood products, particularly</p> <p>2 but not solely commercial fractionated products, were</p> <p>3 associated with a risk. Long-term -- remote therefore</p> <p>4 in the sense of long-term -- but not remote in terms of</p> <p>5 the actual risk to the patient, unintended, nasty side</p> <p>6 effects of producing a debilitating and potentially</p> <p>7 fatal disease.</p> <p>8 So I honestly can't say more than that. It looks as</p> <p>9 if it was directed towards the English and I would agree</p> <p>10 that, but it was not irrelevant for the Scots, which is</p> <p>11 why I let Brian have a copy of Arthur's confidential</p> <p>12 letter to me.</p> <p>13 Q. Yes. You have mentioned certain characteristics of</p> <p>14 Professor Bloom. It has been suggested to us that he</p> <p>15 didn't have a lot of clinical involvement directly in</p> <p>16 looking after patients. Is that your recollection or</p> <p>17 will you not have known about that?</p> <p>18 A. I never worked in Cardiff, so I wouldn't be in</p> <p>19 a position to make that comment. But however directly</p> <p>20 concerned with patient care he was, he was an extremely</p> <p>21 caring man. There is no doubt that he was acutely</p> <p>22 conscious of his responsibility for the quality of life</p> <p>23 of the patients, the care of whom he was ultimately</p> <p>24 responsible for.</p> <p>25 Q. The memo to which you have alluded, about your</p> <p style="text-align: center;">Page 45</p>	<p>1 to travel and go to exciting things like festivals and</p> <p>2 be so minded to donate while they were on site.</p> <p>3 What could we legitimately do about minimising the</p> <p>4 risk that such people might be carrying a virus, which</p> <p>5 at that stage was totally unidentified? So admittedly</p> <p>6 it was hypothetical and I don't know that it ever had</p> <p>7 any tangible results, but what I'm saying is that in the</p> <p>8 summer of 1982, we were sufficiently concerned about the</p> <p>9 possibility of there being a causative virus or</p> <p>10 causative agent for this disease that might embarrass</p> <p>11 the quality of our donated blood. So that's just</p> <p>12 putting that in context.</p> <p>13 So we were already facing up to -- and I know that</p> <p>14 Brian had good conversations, very productive</p> <p>15 conversations, with the gay community in Edinburgh,</p> <p>16 about how to get over the message to gay men that if</p> <p>17 they were minded to give blood, they should be aware</p> <p>18 that there was a potential problem.</p> <p>19 Brian would be -- and probably has given you better</p> <p>20 testimony about that period, but what I'm really saying</p> <p>21 is that there was a real concern among the doctors in</p> <p>22 the transfusion centre in Edinburgh that this could be</p> <p>23 a problem.</p> <p>24 So consequently, when it comes to being reluctant to</p> <p>25 talk about the sexuality of the potential donor in front</p> <p style="text-align: center;">Page 47</p>
<p>1 conversation with Dr Jones, is in fact immediately</p> <p>2 preceding document in our database. It's [SNF0013710].</p> <p>3 This is 30 May. We can see that, at least in part, the</p> <p>4 focus of the conversation that you had had with Dr Jones</p> <p>5 is to do with selection of donors, the possible deferral</p> <p>6 of donors, but you seem to have had a more wide-ranging</p> <p>7 discussion about the state of play as at May 1983.</p> <p>8 A. Yes. And in fact, the third paragraph, the one that</p> <p>9 starts, "He went on ..." I think does throw a little bit</p> <p>10 of light on the letter to Arthur Bloom that I wrote, and</p> <p>11 his reply to me. Although I spoke to Peter on 24 May,</p> <p>12 I wrote this on 30 May, after which I had obviously</p> <p>13 received Arthur's letter.</p> <p>14 It does rather look as if one of my points in the</p> <p>15 letter to Arthur indeed was about donor selection,</p> <p>16 a subject on which I became more and more expert as time</p> <p>17 went on. I do remember very clearly around this time in</p> <p>18 Edinburgh -- and I suspect it was around the time of the</p> <p>19 Edinburgh Festival in 1982 -- when we, that's the</p> <p>20 doctors in the transfusion centre in Edinburgh, were</p> <p>21 discussing how to cope with the influx of visitors,</p> <p>22 including Americans, who might want to give blood.</p> <p>23 We were, in other words, sufficiently concerned at</p> <p>24 that stage that there was in America a virus that may be</p> <p>25 associated with a socio-economic group that was likely</p> <p style="text-align: center;">Page 46</p>	<p>1 of you, I think we were somewhat ahead of the game than</p> <p>2 Peter Jones in May 1983.</p> <p>3 Q. You are dating concern in the transfusion world in</p> <p>4 Edinburgh to the summer of 1982?</p> <p>5 A. Yes.</p> <p>6 Q. So you are sure about that? That's a year before</p> <p>7 really?</p> <p>8 A. Yes.</p> <p>9 Q. Before all this material?</p> <p>10 A. Yes.</p> <p>11 Q. Again, I said to another witness, there is not much</p> <p>12 point in asking you to say the same thing as you said in</p> <p>13 this memo in different words, but the comment at the end</p> <p>14 of the fifth paragraph, that you felt that Dr Jones was</p> <p>15 being somewhat less than cautious in his attitude:</p> <p>16 "This is not unexpected given his interests ..."</p> <p>17 Et cetera, and then the comments in the next</p> <p>18 paragraph as well:</p> <p>19 "His ears being attuned to only part of the message</p> <p>20 which Anne Collins would have given him."</p> <p>21 Just in passing, who was Anne Collins?</p> <p>22 A. She was the transfusion director of Newcastle region.</p> <p>23 Q. You can see there what you said, Dr Boulton. Is there</p> <p>24 anything that you want to amend or explain or should we</p> <p>25 just let the memo speak for itself?</p> <p style="text-align: center;">Page 48</p>

<p>1 A. I would rather the memo spoke for itself.</p> <p>2 Q. Thank you. We should, I think, go back to your</p> <p>3 supplementary statement, just to say that you have also</p> <p>4 given us some input in it on this topic. That was</p> <p>5 [PEN0150226]. You cover this in the first paragraph and</p> <p>6 you return in the paragraph at the bottom of the page to</p> <p>7 the topic of the memo of 30 May, and we can read on to</p> <p>8 the next page as well, please.</p> <p>9 You mention in your supplementary statement the</p> <p>10 meeting of October 1983 and I did want to have a brief</p> <p>11 look at that as well, more particularly your note of it,</p> <p>12 which is [SNB0017535]. This one is signed, Dr Boulton,</p> <p>13 so there was never any doubt that this was your note.</p> <p>14 From page 2 on to page 3, there is a discussion of</p> <p>15 heat treatment and in fact on page 3 we can see</p> <p>16 a comment from Dr Jones:</p> <p>17 "Any chance of reducing the risk of product should</p> <p>18 be taken."</p> <p>19 Then a section, section 4:</p> <p>20 "The current situation regarding AIDS."</p> <p>21 When you said there was no evidence of AIDS entering</p> <p>22 the general population, do you think you will have been</p> <p>23 quoting from Dr Craske?</p> <p>24 A. Yes.</p> <p>25 Q. Right. In one sense, everyone is the general</p> <p style="text-align: center;">Page 49</p>	<p>1 mind this is 27 years ago, I added too many "nots" in</p> <p>2 there, but it would have been more clearly expressed --</p> <p>3 and I think this would be a reasonable interpretation of</p> <p>4 what I was trying to say -- that, in spite of all the</p> <p>5 evidence that was accumulating -- and clearly there is</p> <p>6 a big difference in that one year -- my very brief</p> <p>7 comment in 1982, considerably expanded in 1983 -- there</p> <p>8 was still a reluctance by some haemophilia treaters to</p> <p>9 reduce or to stop -- or even just reduce the amount of</p> <p>10 Factor VIII of commercial origin for their patients.</p> <p>11 That's really what it means, that although</p> <p>12 Geoff Scott -- I'm sorry, I also apologise for my bad</p> <p>13 spelling of "acumen". Geoff Scott was another man whom</p> <p>14 I knew very well and I actually can recall the</p> <p>15 conversation I had with Geoff about his great concern</p> <p>16 for his case and that the local haemophiliacs had become</p> <p>17 very, very wary indeed of the use of commercial</p> <p>18 Factor VIII. So this is the haemophilic population</p> <p>19 around Bristol in 1983.</p> <p>20 And nevertheless there were still, in other parts of</p> <p>21 the country, an anxiety to keep up the use of</p> <p>22 Factor VIII until the situation of the epidemiology, or</p> <p>23 even better, Koch's Postulates, could be clarified.</p> <p>24 Q. In the official minutes of the meeting there is also</p> <p>25 reference to a point that was made by Dr Chisholm, who</p> <p style="text-align: center;">Page 51</p>
<p>1 population. It really depends on how you classify</p> <p>2 different groups of people.</p> <p>3 A. Yes. How you select your population.</p> <p>4 Q. Yes. Then can we look on to the next page, please? You</p> <p>5 have recorded that there was a previous discussion on</p> <p>6 the use of imported Factor VIII. You have commented in</p> <p>7 your supplementary statement that the passage saying</p> <p>8 that there was no logic in not using imported</p> <p>9 Factor VIII and also --</p> <p>10 A. I apologise for the double negative.</p> <p>11 Q. Yes, it is:</p> <p>12 "The patients should be encouraged not to refuse</p> <p>13 imported Factor VIII."</p> <p>14 You said you felt that was slightly tortuous</p> <p>15 phraseology but no doubt you didn't imagine it would be</p> <p>16 scrutinised all these years later.</p> <p>17 THE CHAIRMAN: I think the next sentence worries me even</p> <p>18 more:</p> <p>19 "In view of the AIDS incidence in haemophiliacs in</p> <p>20 the USA, it was felt that there was no logic in not</p> <p>21 using imported Factor VIII."</p> <p>22 MS DUNLOP: I do have a question mark beside that as well,</p> <p>23 Dr Boulton. What do you think is the logical point</p> <p>24 that's being made?</p> <p>25 A. Well, I wouldn't be surprised if actually, bearing in</p> <p style="text-align: center;">Page 50</p>	<p>1 was actually the director in Southampton, I think, at</p> <p>2 about that time. Was she your predecessor?</p> <p>3 A. No. Dr Chisholm was one of the four clinical</p> <p>4 haematologists in Southampton General Hospital, and in</p> <p>5 fact she was on the panel that interviewed me for the</p> <p>6 appointment of director of the Southampton transfusion</p> <p>7 centre. So we were in the same town but employed by</p> <p>8 different bits of the NHS.</p> <p>9 Q. She is minuted as having raised the question of patients</p> <p>10 reverting to cryoprecipitate, and in fact Dr Winter has</p> <p>11 explained to us since that that was more of an option</p> <p>12 for her because she had a lot of access to</p> <p>13 cryoprecipitate or access to a lot of cryoprecipitate.</p> <p>14 A. The transfusion centre was right on her doorstep.</p> <p>15 Q. Yes. But it doesn't seem that her suggestion was really</p> <p>16 enthusiastically accepted at the meeting.</p> <p>17 THE CHAIRMAN: Dr Boulton, it's quite difficult to make</p> <p>18 sense of your own sentence, I think.</p> <p>19 A. I agree.</p> <p>20 THE CHAIRMAN: But one possibility that occurred to me was</p> <p>21 that it might be that there was no logic in</p> <p>22 discontinuing the use of imported Factor VIII because</p> <p>23 there was already a well established incidence of AIDS</p> <p>24 among haemophiliacs in the United States of America,</p> <p>25 which would suggest that it might have been too late.</p> <p style="text-align: center;">Page 52</p>

13 (Pages 49 to 52)

<p>1 Did that ever occur as a topic of conversation?</p> <p>2 A. Yes, I would agree that that is a distinct possibility.</p> <p>3 MS DUNLOP: Yes.</p> <p>4 A. Could I just add that there was a feeling that the</p> <p>5 epidemic of this horrible condition in America was very</p> <p>6 likely to come to Europe but it might take a year or</p> <p>7 two.</p> <p>8 MS DUNLOP: I suppose at that time too, Dr Boulton, the</p> <p>9 absolute numbers being described would be seen as very</p> <p>10 small in a country as large as the United States.</p> <p>11 A. Yes.</p> <p>12 Q. One more matter I wanted to look at. I don't know if we</p> <p>13 can carry on. It is coming up for ten past 11.</p> <p>14 I just thought I should cover this with you,</p> <p>15 Dr Boulton, because you referred in your supplementary</p> <p>16 statement to 1983 being a peak year for commercial</p> <p>17 Factor VIII use in Scotland. I wonder if we could just</p> <p>18 have a look at the figures we have in the appendix to</p> <p>19 our preliminary report. [PEN0131433]. Was it these</p> <p>20 figures you were looking at when you made that comment?</p> <p>21 Could we go on to 1438, please?</p> <p>22 Just having a very quick look at 1983. There is</p> <p>23 Aberdeen. An amount of Fiba, and then 1441, 1983 in</p> <p>24 Dundee is shown. It looks to be entirely NHS product.</p> <p>25 And Edinburgh is on 1444. We can certainly see some</p> <p style="text-align: center;">Page 53</p>	<p>1 DEFIX from the PFC, but Fiba seemed to have -- and</p> <p>2 I think we now know the reason why, but it seemed to</p> <p>3 have a particular property of bypassing the inhibitor</p> <p>4 block that had developed in these tragically affected</p> <p>5 haemophiliacs. So you can't really compare Fiba with</p> <p>6 straightforward PFC or indeed commercial straightforward</p> <p>7 Factor VIII usage.</p> <p>8 Q. I understand. So for a patient with Haemophilia A, who</p> <p>9 had inhibitors, who needed treatment, there really was</p> <p>10 very little choice?</p> <p>11 A. There was also a very significant demand of PFC</p> <p>12 Factor VIII because some responded to very high doses of</p> <p>13 straightforward Factor VIII and those sort of patients</p> <p>14 distorted, if you like, the general pattern of</p> <p>15 haemophilic usage. And I think there was one occasion</p> <p>16 when Christopher had two patients with inhibitors at the</p> <p>17 same time. I think it might have been 1984 or so.</p> <p>18 Which was a very considerable worry to himself and to us</p> <p>19 about how much we could sustain the supply, and I think</p> <p>20 that what has to be borne in mind is the specific</p> <p>21 problem of the Factor VIII deficient patient with strong</p> <p>22 inhibitors, and about 5 to 10 per cent of patients</p> <p>23 develop that complication.</p> <p>24 Q. I see. Thank you, sir. That would be a good moment at</p> <p>25 which to break.</p> <p style="text-align: center;">Page 55</p>
<p>1 commercial product mentioned for Edinburgh but</p> <p>2 1.75 million units of PFC product; far and away the</p> <p>3 largest there. 1446 is Yorkhill in Glasgow. By 1983</p> <p>4 even Yorkhill, which we know had been a big user of</p> <p>5 commercial product earlier, it's 1.1 million units and</p> <p>6 then Glasgow Royal Infirmary, which is 1449, again some</p> <p>7 mention of commercial product, Armour Factorate Fiba,</p> <p>8 but 1.95 million units of PFC product. Then we should</p> <p>9 also look at Inverness, which is 1452. We can see there</p> <p>10 statistics for 1983. At least from these tables, it</p> <p>11 doesn't look to have been a particularly heavy usage in</p> <p>12 1983. I just wondered if you had had those tables in</p> <p>13 front of you at the time?</p> <p>14 A. I don't think I did and the tables are clearly much more</p> <p>15 likely to be reliable than my recollection. Could</p> <p>16 I just add, of course, that Fiba, which was of</p> <p>17 commercial origin, would have been used specifically for</p> <p>18 haemophiliacs with inhibitors and would not have been</p> <p>19 given to the general haemophilic population, and would</p> <p>20 only have been given to haemophiliacs with inhibitors</p> <p>21 under rather dire circumstances, which I'm sure</p> <p>22 Christopher would explain in more detail than myself.</p> <p>23 In other words, you can't really compare the use of</p> <p>24 Fiba -- there was a sort of Scottish equivalent. I see</p> <p>25 it's used up there occasionally, of DEFIX or activated</p> <p style="text-align: center;">Page 54</p>	<p>1 THE CHAIRMAN: I don't know how you want to use Dr Foster's</p> <p>2 data but his table 19, of course, gives information on</p> <p>3 the pattern of usage of commercial and if it is</p> <p>4 accepted, it might make a very acute picture but we will</p> <p>5 leave it until after the break.</p> <p>6 MS DUNLOP: Thank you.</p> <p>7 (11.13 am)</p> <p>8 (Short break)</p> <p>9 (11.37 am)</p> <p>10 THE CHAIRMAN: Yes, Ms Dunlop?</p> <p>11 MS DUNLOP: Thank you.</p> <p>12 Dr Boulton, I wanted to ask you some questions about</p> <p>13 your involvement in supply of products for the treatment</p> <p>14 of patients with haemophilia in Edinburgh. First of</p> <p>15 all, I wanted to ask about the arrangements that there</p> <p>16 were for obtaining commercial product, if that was</p> <p>17 required. Can we look first at a document [PEN0150478]?</p> <p>18 This is a meeting at Lothian Health Board, I think, on</p> <p>19 14 January 1981 and you were at that. As was Dr Ludlam</p> <p>20 and also Dr McClelland, and Dr Parker. He was another</p> <p>21 haematologist, as I understand it, from the Royal</p> <p>22 Infirmary.</p> <p>23 THE CHAIRMAN: There are two Parkers.</p> <p>24 MS DUNLOP: Sorry, Dr A C Parker, the "he". I can't</p> <p>25 remember his first name. Was it Anthony?</p> <p style="text-align: center;">Page 56</p>

<p>1 THE CHAIRMAN: Alistair. 2 MS DUNLOP: Thank you. Alistair Parker. We can see 3 Dr Ludlam saying that: 4 "PFC were providing intermediate Factor VIII. The 5 cost of this was met by the Blood Transfusion Service of 6 the Common Services Agency." 7 So the health board wasn't having to fund the 8 haemophiliac service, but that there would be cases 9 where commercial Factor VIII had to be bought. There 10 had been three cases in 1980. There is a discussion 11 about supply of PFC products. That's paragraph 2. 12 Dr Ludlam in paragraph 3 has provided an estimate of his 13 requirement for the coming year. Then paragraph 4, 14 please. We see that: 15 "With commercial Factor VIII, Dr Ludlam has pointed 16 out the danger of liver disease, the cause of which 17 [was] at present being investigated." 18 Then paragraph 5. Dr Cash and Mr Myers, presumably 19 from the health board, had discussed the purchasing of 20 commercial blood products in the past, and all 21 commercial products were ordered through the regional 22 transfusion service. Then can we go on to the next 23 page, please. 24 So from this it would be correct, would it, to have 25 an understanding that where a haemophilia clinician in Page 57</p>	<p>1 I'm sure quite justifiably, 28 years ago, I plead lack 2 of recollection. 3 Q. Yes. Actually we have seen this before but we can note 4 that Dr Ludlam was saying that the new arrangement would 5 bring Edinburgh into line with arrangements that prevail 6 in the rest of the United Kingdom. So that looks to be 7 the position as far as commercial product was concerned. 8 As far as NHS product goes -- 9 A. Can I just comment that whatever the details of who was 10 ordering what, my recollection is that the Lothian 11 Health Board actually carried the tab and not the SNBTS, 12 but that may not be fully correct. 13 Q. Yes. Dr Ludlam is saying: 14 "As before, I shall still be accountable for the 15 financial cost." 16 A. Which I think is consistent with what little bit I do 17 recollect, but I have no recollection of the details of 18 the meetings behind this correspondence. 19 Q. So in other words it would come from his budget, 20 whatever his budget was, or his department's budget? 21 A. I think so, yes. 22 Q. Which would be health board money? 23 A. Yes. 24 Q. Yes. Can we look at some correspondence in relation to 25 NHS product. The first letter is [SNB0015199]. Page 59</p>
<p>1 Edinburgh needed commercial product for a particular 2 reason, it would have to be ordered by you, the 3 regional transfusion centre. That seems to be the 4 arrangement that obtained, indeed before this meeting, 5 and that was to continue? Is that your recollection? 6 A. I regret to say I have no recollection of this 7 whatsoever. 8 Q. Right. I suppose, if commercial material was needed for 9 a particular patient and was then ordered in accordance 10 with this procedure, it wouldn't really be much of 11 a question of storage because it would be needed more or 12 less immediately, but when it arrived, where would it 13 go? 14 A. I have no recollection. 15 Q. Right. It looks as though -- and this is material that 16 Professor Ludlam has provided us -- that arrangement 17 then changed. Can we see [PEN0150480]. 18 Part of the reason for looking at the minutes of the 19 UKHCDO meeting earlier this morning, Dr Boulton, was to 20 apprise ourselves of what the arrangements were in 21 England, and we can see from this letter, which is 22 Dr Ludlam to Dr Brough on 19 April 1983, that there was 23 a change at that time. Do you remember any of this 24 either, the change? 25 A. Although I'm quoted by Christopher in that letter, and Page 58</p>	<p>1 This is a letter from you to Dr Ludlam of 2 10 May 1982 and you had in the transfusion centre 3 a table of haemophilia home therapy patients and the 4 amount of Factor VIII that had been issued in the first 5 quarter of 1982. You are recording concern at the 6 amount. 7 I think you are really recording that there is a gap 8 between issue and usage. So you are saying that you are 9 officially issued, in the first quarter of 1982, with 10 261,530 units, and the total for the first quarter that 11 had been used on the home therapy programme was 206,800. 12 And it has been necessary in fact to get some more from 13 Inverness. 14 Then you go on to say that: 15 "The allocation is actually based on the amount of 16 plasma we supply to PFC." 17 A calculation of that, you have said, would produce 18 about 300,000 units, which is the amount you received 19 back, plus some retained for stocks. Then you seem, on 20 the second page, to be putting down, I suppose, some 21 markers about what you thought needed to happen. 22 The first thing, Dr Boulton, is: do you remember 23 there being a calculation of how much each region in 24 Scotland was to receive by way of issue from PFC; that 25 PFC would say, "You will be issued with ..." and there Page 60</p>

15 (Pages 57 to 60)

<p>1 would be a figure?</p> <p>2 A. Quite honestly, I have no recollection really of writing</p> <p>3 this letter. I do recall the, I think very fruitful</p> <p>4 discussions I had with Christopher about the general</p> <p>5 problem of supply.</p> <p>6 In answer to your specific question, I think I was</p> <p>7 too remote from the national scene in Scotland to be</p> <p>8 able to comment about the other centres in detail.</p> <p>9 Clearly, we clawed back some from Inverness, and</p> <p>10 presumably Inverness may have been reluctant to let us</p> <p>11 have it but were content to let us have that amount.</p> <p>12 That's as much as I can say about the regional</p> <p>13 distribution and reallocations. I can say no more</p> <p>14 detail than that.</p> <p>15 Q. Do you remember the problems starting to emerge? Do you</p> <p>16 remember being anxious about meeting the demand?</p> <p>17 A. Oh, yes. Yes, as a concern arising. And until I had</p> <p>18 seen these letters, I would not have been able to put</p> <p>19 a precise chronology to that but I think, whereas</p> <p>20 perhaps in the first year or so -- in other words,</p> <p>21 1980 -- I was relatively reassured that the expanding</p> <p>22 programme for caring for haemophiliacs in Edinburgh</p> <p>23 could be met by the SNBTS, perhaps by this time we were</p> <p>24 getting anxious about the specific problem in Edinburgh.</p> <p>25 But I think then I was conscious of the thing I referred</p> <p style="text-align: center;">Page 61</p>	<p>1 depending upon their clinical status, it was better to</p> <p>2 do it -- and by this time we were getting quite a good</p> <p>3 idea of the total amount of at least severe</p> <p>4 haemophiliacs in the UK. So I always had been uneasy</p> <p>5 about it going on per total head of population. That's</p> <p>6 just a general comment. I can't at this stage recall</p> <p>7 detailed concerns.</p> <p>8 THE CHAIRMAN: If we look at the regime you mention here,</p> <p>9 proportionate to the contributions of plasma, of course,</p> <p>10 many different factors could influence what a region was</p> <p>11 prepared to send.</p> <p>12 A. Absolutely, yes.</p> <p>13 THE CHAIRMAN: Such as?</p> <p>14 A. Well, such as the nature of the other demand from the</p> <p>15 clinicians in the surgical units, in the heart units, in</p> <p>16 the emerging -- and interestingly, within the</p> <p>17 haematology camp -- the emerging far greater efficacy of</p> <p>18 leukaemia therapies, which required blood products.</p> <p>19 So we had an increasing competition from platelet</p> <p>20 production from our donations, the same raw materials.</p> <p>21 So there are all sorts of other directions that blood</p> <p>22 was being used for. So if you had two or three big</p> <p>23 hospitals in a region like the West of Scotland, you</p> <p>24 could see that they had other patients than haemophilia</p> <p>25 to be concerned about, and that was also true, of</p> <p style="text-align: center;">Page 63</p>
<p>1 to earlier today about the magnetic effect of having an</p> <p>2 effective haemophilia centre in one town drawing the</p> <p>3 customer.</p> <p>4 Q. Right.</p> <p>5 THE CHAIRMAN: No doubt there are lots of special factors</p> <p>6 that come into it.</p> <p>7 A. Yes.</p> <p>8 THE CHAIRMAN: I know, for example, that Inverness, for</p> <p>9 a considerable period had two very heavy users.</p> <p>10 A. Yes.</p> <p>11 THE CHAIRMAN: And if one of them happened to be attracted</p> <p>12 to Edinburgh for some reason or other, treatment or</p> <p>13 education, then, of course, there would be the point you</p> <p>14 make in paragraph 4, that perhaps they should come with</p> <p>15 their allocation in effect.</p> <p>16 But leaving that aside, do you remember this regime</p> <p>17 in operation and do you remember it changing from time</p> <p>18 to time? For example, I know that at one stage</p> <p>19 allocation was on the basis of population. Do you</p> <p>20 remember --</p> <p>21 A. I always struggled with the total heads of population</p> <p>22 because it already seemed to me to be much more sensible</p> <p>23 to do it per haemophilic, and I felt that all my life.</p> <p>24 All my life in haemophilia, I felt, even though there</p> <p>25 are considerably different demands of each haemophilic</p> <p style="text-align: center;">Page 62</p>	<p>1 course, in east Scotland.</p> <p>2 THE CHAIRMAN: I shouldn't look for a simple solution then,</p> <p>3 Dr Boulton?</p> <p>4 A. Yes.</p> <p>5 MS DUNLOP: Dr Boulton, I appreciate it's a very long time</p> <p>6 ago and I quite understand it is very difficult to</p> <p>7 recall the detail of any of this, but perhaps just for</p> <p>8 the record, to look at the next letter, which is</p> <p>9 [SNB0015205]. This is, I think, 10 August 1982, rather</p> <p>10 faint but we have other copies. You are apologising for</p> <p>11 repeating yourself but it looks as though you are really</p> <p>12 making the same points. In July -- I'm not sure,</p> <p>13 I think that's perhaps 350 bottles were used:</p> <p>14 "Which is approximately 160 per cent of our monthly</p> <p>15 allocation."</p> <p>16 It looks as though, as far as where the stock was,</p> <p>17 some of it will have been in or around the ward, and the</p> <p>18 Speywood material was in your deep freeze. But you were</p> <p>19 feeling a need to meet, which you did on 23 August -- we</p> <p>20 have a note of the meeting. That's [SNB0015207]. You</p> <p>21 began by noting the stock situation and, as recorded in</p> <p>22 the note, you were already in August eating into</p> <p>23 the September stock.</p> <p>24 I wondered from paragraph 4 what was meant by the</p> <p>25 deduction at source effect. Do you remember?</p> <p style="text-align: center;">Page 64</p>

16 (Pages 61 to 64)

<p>1 A. 4(c)? 2 Q. Yes. 3 A. I can't recollect the details of this concept, and I'm 4 having some difficulty in recollecting it right now, but 5 I think that one of the problems that would be in 6 people's mind -- depending upon whether they were 7 a blood transfusion scientist, blood transfusion doctor, 8 a haemophilia carer doctor -- is how much you could 9 expect a kilogramme or 1,000 kilogrammes of plasma to 10 yield. The deduction at source would have been the 11 amount of Factor VIII that came out of a kilogramme of 12 plasma. That was not used for direct treatment but was 13 used for other purposes, such as quality assurance, to 14 see how much Factor VIII there was in that particular 15 batch, and nother tests that might have been conducted 16 which meant that there was an inevitable reduction of 17 the final yield that reached the patient bank. 18 Q. Right. 19 A. I'm not certain but I suspect that that's what that 20 means. So in other words, not every unit that was taken 21 out of a gramme or kilogramme of plasma would have ended 22 up in a patient. You wouldn't have expected it to 23 because there were legitimate other uses on the way. 24 Q. Right. Then Dr Ludlam is setting out his position in 25 section 5. On to the next page, please. It's obvious,</p> <p style="text-align: center;">Page 65</p>	<p>1 patients that suffer but the families, it's their 2 friends, and society has a big responsibility for the 3 care of such people. 4 I'm very much on the side of maximising the 5 opportunities for those people in whatever way you can. 6 For that reason, it was therefore not unreasonable for 7 the Blood Transfusion Service to maximise its own 8 efforts. 9 So in a way I was the middleman and indeed I guess 10 I was appointed to be so because I was the first actual 11 haematologist, let alone a haemophilia doctor, to be 12 appointed to the Edinburgh BTS consultant grade. 13 I guess, for their sins, that was the attraction for 14 me to be appointed there. Furthermore, I was 15 specifically put on the blood issue side. That was my 16 job within the centre. To be the consultant in charge 17 of the blood bank and all the things that were issued 18 from it, which included, plasma, platelets and PFC 19 Factor VIII. 20 So clearly I was involved deeply with Christopher in 21 his work but at the same time I had a responsibility for 22 maximising the use of donor materials as much as 23 possible as well. 24 So yes, I was the middleman but I certainly 25 recognised that there were limitations and Christopher</p> <p style="text-align: center;">Page 67</p>
<p>1 Dr Boulton, that from the time of you and Dr Ludlam 2 arriving in 1980, usage, particularly for home therapy, 3 has increased very considerably. Is that right? 4 A. It looks like it. I'm sure that's right, yes. 5 Q. Yes. Then [SNB0015213]. You obviously sent the minutes 6 of the meeting to Dr Ludlam. I don't think we have had 7 a letter but he wrote back. 8 A. Yes. 9 Q. 1 September. Then you replied on 3 September 10 [SNB015215]. I suppose you are really the middleman in 11 both directions, Dr Boulton, aren't you? Because you 12 are involved in how much plasma is going from collection 13 in Edinburgh and the southeast to PFC, and then you are 14 involved in trying to assist Dr Ludlam in getting the 15 amount he needs with which to treat his patients. Is 16 that right? Was that your role? 17 A. I think I felt at the time that the prior case was for 18 the treatment of the patients, to give them as adequate 19 an amount as we could. Therefore responding to 20 Christopher's needs. 21 I fully understood Christopher's desire to maximise 22 the treatment for his patients and I had a great deal of 23 sympathy with that because, after all, we are in this 24 world to make patients' lives as best as possible and 25 haemophilia is a horrible disease, and it's not just the</p> <p style="text-align: center;">Page 66</p>	<p>1 was very legitimately pushing us on that because that 2 was his job, and it was my job to help him as much as 3 possible but within the constraints that I was put under 4 from the supply side. 5 Q. Just to follow the chain of events into December, can we 6 have [SNB0015219]. 7 You are reporting to Mr Watt. We can see that two 8 other centres in Scotland have chipped in with offers. 9 Do you have any memory, Dr Boulton, of what amount of 10 stock you would have wanted to have at any given time? 11 By that I'm thinking of a length of time. Would you 12 have wanted to have a month's stock, six months' stock, 13 a year's stock? What would have made you feel 14 comfortable? 15 A. My recollection is it would be somewhere between one 16 month and three months in stock. And it is only 17 a recollection. I think it was nearer three months than 18 one month, but that I think was likely, and maybe you 19 are going to ask me this in a minute: I think there was 20 a specific circumstance behind this, which is that 21 Christopher had at least one if not two patients with 22 inhibitors that were demanding a lot of material at that 23 particular time, but they are not referred to in these 24 particular letters by name. 25 Q. We can see that cryoprecipitate may be being used a bit</p> <p style="text-align: center;">Page 68</p>

<p>1 more. It's recorded in the second paragraph, 2 notwithstanding its drawbacks, and we have heard quite 3 a lot about that. 4 A. Yes. 5 Q. You wrote again on 29 December. That's [SNB0015221]. 6 I think this may be the two patients to whom you were 7 referring. 8 A. I think that's right, yes. 9 Q. There does come through from this correspondence, 10 Dr Boulton, an underlying reluctance to have to resort 11 to commercial material. Is that a sentiment -- 12 A. Yes. 13 Q. -- both parties shared? 14 A. Yes, I think so. 15 Q. I don't think it's necessary to go to the minutes of 16 this meeting but I think we know that there was a joint 17 meeting on 21 January 1983 between the haemophilia 18 directors and the SNBTS directors with government 19 officials in attendance, and that this topic cropped up. 20 That is purchase of commercial material in Edinburgh 21 cropped up. We know from Dr McClelland's handwritten 22 notes that he was thinking at the meeting it was 23 something he was going to have to speak to you about. 24 Do you remember all of that in the early part of 1983 or 25 is that a bit of a blur?</p> <p style="text-align: center;">Page 69</p>	<p>1 Q. Dr Boulton, can you just explain to us, around about 2 this time, 1982 and into 1983, what was your daily job? 3 What were your tasks you had to do to make sure that 4 everybody who needed material, whether blood or blood 5 products, was supplied? 6 A. I was one of three, then four, consultants in the 7 centre. My main work was to be the consultant in charge 8 of -- and this is an interesting term -- of the blood 9 bank. In other words, the blood bank, which distributed 10 to -- not just the Royal Infirmary but other hospitals 11 that were served by the labs of the Royal Infirmary; to 12 supply them with all the blood products that came our 13 way from the donors. 14 So it would be whole blood, it would be red cells, 15 it would be platelets, it would be plasma and it would 16 be cryoprecipitate, and sometimes even cryosupernatant, 17 for the patients in the Royal Infirmary. There were 18 four other hospitals in the southeast region, which 19 included the Western General Hospital and Peel, Melrose, 20 that had their own blood bank, to whom we just supplied 21 the raw materials and they selected the patients. 22 But for about two thirds or 70 per cent of the 23 southeast region's patients, the blood transfusion 24 centres own laboratory selected the patients who were to 25 receive that. That included, for example, the very</p> <p style="text-align: center;">Page 71</p>
<p>1 A. I actually do remember that there were these concerns 2 and when I saw this correspondence, the bell that went 3 in my mind was fairly loud. Because I do recollect that 4 Christopher and I were discussing in some detail the 5 specific needs of the patients and how best we could 6 meet them. So to be faced with this again was 7 actually -- even though so long ago, I do remember. But 8 that doesn't mean to say I can recollect the details. 9 Q. No. And it looks as though, after that meeting 10 in January 1983, there was some sort of expectation that 11 everyone was going to sit down and resolve matters 12 around a table, but that probably didn't happen, if we 13 read [SNB0015194]. This is Dr McClelland writing to 14 Dr Cash. 15 In short, Dr Boulton, I think what comes across is 16 that the home therapy programme has been expanding and 17 that the haemophilia centre at the Royal Infirmary was 18 a heavy user of NHS concentrate by this point. I don't 19 think that can really be disputed and that obviously led 20 to a bit of tension for you and -- 21 A. It was not a problem for me. 22 Q. No. 23 A. But it was within one's professional duty to do one's 24 best to meet the demand that was legitimate, but clearly 25 there were wider implications for that demand.</p> <p style="text-align: center;">Page 70</p>	<p>1 exciting development in the cardiac surgical unit about 2 blood supply for heart surgery, which was at that time 3 quite intensive. So I would go along to audit meetings 4 in the cardiac departments, I would be very familiar 5 with the use of blood for surgical purposes. I would be 6 pretty familiar also with the use of blood for the 7 leukaemics. 8 At the same time there was a small laboratory in the 9 Edinburgh centre that conducted tests of coagulation on 10 patients, not haemophiliacs. That was clearly 11 Christopher's section. But in patients in intensive 12 care unit, in the cardiac unit and elsewhere, who were 13 in need of specialist advice concerning transfusion of 14 appropriate products. 15 So we had a laboratory that did a clinical service 16 and the same laboratory was also responsible for 17 conducting quality control exercises on plasma and on 18 other materials derived from PFC. 19 So it was actually quite a complicated set of 20 responsibilities that I had. I did not have primary 21 responsibility for donor selection and I did not have 22 primary responsibility for the transplant immunology 23 work that was going on in the centre at the same time. 24 Although I was again familiar with those sort of 25 problems.</p> <p style="text-align: center;">Page 72</p>

<p>1 Q. So much of what you are describing as the distribution 2 part of your job? 3 A. Yes. 4 Q. What about the input into the centre in Edinburgh? Were 5 you projecting on a daily or a weekly or a monthly basis 6 what you were going to need and sourcing that, as far as 7 blood products were concerned, from PFC? You would be 8 reporting to PFC, "We need for June the following 9 amounts"? 10 A. It wasn't as precise as that, and to some extent I think 11 Brian was slightly more in that particular field because 12 he would be part of the SNBTS directorate meetings at 13 which John Watt would also be present. So I might get 14 from Brian, the trend from PFC. Also I would be given 15 notice of the periods when PFC had to be shut down, 16 sometimes for two or three months, for refurbishment or 17 upgrading or that sort of thing, and there would be 18 a period in advance whereby there would be a stock 19 piling process going on. So I would be involved but not 20 necessarily at that close liaison level with PFC. 21 Q. Professor Ludlam described the van coming from PFC on 22 a monthly basis. Does that ring a bell for you? 23 A. Yes, but not -- yes, yes. 24 Q. But sometimes not very regular or sometimes more than 25 once a month?</p> <p style="text-align: center;">Page 73</p>	<p>1 Factor IX concentrates that might have been made 2 available. And clearly from this letter, I was aware of 3 materials like Speywood, Fiba, et cetera. Speywood, as 4 far as I recollect, was porcine Factor VIII. So those 5 materials I would have been aware of but quite honestly 6 I don't have any recollection of being involved 7 specifically in the ordering pattern of those. 8 Q. Was there somebody who was your opposite number in the 9 West of Scotland, who did the same job as you are 10 describing for us but for the West of Scotland? 11 A. I think that was Bob Crawford, the late Bob Crawford. 12 Q. And he was based at Law, was he? 13 A. Yes. 14 THE CHAIRMAN: Was the structure exactly the same? 15 A. No, I don't think one can really compare the structure 16 at Law very closely with that of Edinburgh because the 17 only crossmatching activities that they would do would 18 be for non-haemophilic patients, but for patients 19 requiring blood cells that had funny antibodies. So 20 they would be a sort of specialist laboratory for 21 patient distribution. 22 MS DUNLOP: There has been reference to a daily order in 23 fact, going to the centre at Law. And I think at one 24 time also Dr Davidson may have been involved. He may 25 have been --</p> <p style="text-align: center;">Page 75</p>
<p>1 A. To carry on that figurative analogy, it didn't ring very 2 loudly outside my door. 3 Q. Right. When it came, did it just, as far as blood 4 products are concerned, contain your allocation? 5 A. Of PFC-derived materials like Factor VIII and Factor IX, 6 et cetera? 7 Q. Yes. 8 A. Yes, I think it probably would have done. 9 Q. Right. We have spoken about commercial products. So 10 I suppose, if the allocation was running very low, if 11 you were looking at your own stocks and you could see 12 the allocation was running low or if there was 13 a particular patient with a particular problem and you 14 had to source some commercial material, would it be you 15 or somebody in your department who would then actively 16 take the steps to do that? 17 A. I don't recall being directly involved in the ordering 18 of any commercial materials. So, although I would be 19 aware, as indicated in some of these letters, of a surge 20 in demand, and also to some extent aware of the reason 21 for that surge in demand -- there would be one or two 22 special patients or surgery had been planned or 23 whatever -- I would be able to respond in terms of what 24 the SNBTS could provide in the way, firstly of 25 cryoprecipitate, second of PFC and thirdly perhaps the</p> <p style="text-align: center;">Page 74</p>	<p>1 A. I cannot answer for the practices that were going on in 2 the West of Scotland. 3 THE CHAIRMAN: Was there a separate haematology department? 4 A. I think I may have described the -- 5 Glasgow Royal Infirmary had two excellent haematologists 6 in John Davidson and Isobel Walker, who were responsible 7 for that part of my job analogous to the distribution of 8 red cells, platelets and liquid plasma, frozen plasma. 9 But they were Glasgow, West of Scotland Health Board 10 employees, so to speak. So they were in the hospital. 11 I was a bit of a hybrid. 12 THE CHAIRMAN: So your function was really rather more 13 distributed in the Glasgow area, with the Royal 14 haematology department carrying some of your 15 responsibilities and Law carrying others? 16 A. Yes. That situation is more like England. You can see 17 the attraction for me as a relatively young man coming 18 to a job with these diverse responsibilities. There 19 were similar situations as far as I recall in Dundee and 20 Aberdeen. They were more like Edinburgh than West of 21 Scotland. 22 THE CHAIRMAN: Just before I forget, there was a question 23 I wanted to ask you. Where was Dr Mitchell located? 24 A. West of Scotland, Law. 25 THE CHAIRMAN: At Law?</p> <p style="text-align: center;">Page 76</p>

<p>1 A. Yes. 2 THE CHAIRMAN: And Dr Wallace -- 3 A. Dr Wallace preceded him at Law, yes. 4 THE CHAIRMAN: Yes. 5 MS DUNLOP: Dr Boulton, we should look at the statement that 6 you provided as well, which is [PEN01500054]. I think 7 there are really only two points that you cover in this 8 statement that we haven't discussed this morning. Your 9 answers are shown on this copy of the schedule, which 10 was sent to you, and they are underlined. 11 A. Oh, I see, yes. Yes. 12 Q. I just wanted to ask you in the first place about your 13 reference to self-sufficiency. You say: 14 "Scotland had become largely self-sufficient by the 15 early 1980s but some commercial product was still being 16 used in Edinburgh and possibly more so in Glasgow." 17 At the end of your answer you refer to "absolute 18 self-sufficiency". I don't want to create the 19 impression that we are hung up on self-sufficiency. We 20 have asked a lot of people about it, but what do you 21 mean by "absolute self-sufficiency"? 22 A. Something in which a community would be able to supply 23 every single vestige of blood or blood products from 24 within that own community, with no dependence upon 25 outside agencies at all. Page 77</p>	<p>1 organisation for blood transfusion. It's a little bit 2 unrealistic in some ways but it tries very hard. 3 Because obviously the world has to be self-sufficient. 4 It has to come from humans somewhere -- or occasionally 5 from dogs and cows and pigs, if you are talking about 6 porcine Factor VIII -- but otherwise we have to be 7 self-sufficient within the world. 8 Clearly now, with the development of recombinant 9 technology, it is a lot different. I think the majority 10 of haemophiliacs in this country who require factor VIII 11 get it from recombinant sources, so they don't get any 12 human sort at all. But in those days before it became 13 available, they had to depend upon human-type material. 14 And of course we in Britain these days are dependent 15 upon plasma and things like anti-D from overseas because 16 of the ban as a result of the BSE tragedy. So 17 self-sufficiency is a lovely ideal. It is one to which 18 we should aspire at all times but we have to be balanced 19 about it. 20 Q. The other answer I just wanted to perhaps just note in 21 your statement on page 7, Dr Boulton. I'm not sure if my 22 pagination is different. It is answer (vii). So 23 I think we need to go back if he could. It is actually 24 2(vii). It's this mention you have made -- I wanted to 25 note it -- of what I understand to have been a system of Page 79</p>
<p>1 Q. We know that the Australians for example, in the early 2 1980s, banned the import of commercial blood products. 3 A. Yes. 4 Q. Would a country ever be able to achieve absolute 5 self-sufficiency, as far as blood products are 6 concerned, without a measure of that nature, without 7 there being an actual ban on importation of commercial 8 material? 9 A. Gosh. I think it would be cloud cuckoo land. What 10 I have described as "absolute", it would be cloud cuckoo 11 land. If we again go outside the world of haemophilia, 12 there will be patients who require red cells of an 13 extraordinarily special nature. There is a funny blood 14 group called O-Bombay who appear to be blood group O. 15 Who could therefore receive anything, but actually have 16 a powerful antibody against practically everybody else 17 in the world except for some people of their racial 18 origin, which is India. That's why it's called 19 O-Bombay. So if we in Scotland had a patient with 20 O-Bombay, it would be very difficult to find a Scot who 21 could give that blood. 22 So therefore, on those grounds alone, absolute 23 self-sufficiency is not achievable. 24 In the world of blood transfusion, there is a need 25 for communality. There is a pretty good WHO Page 78</p>	<p>1 dedicated patients to a batch, not a batch to a patient 2 but patients to a batch? 3 A. This is a good idea of Christopher's, that in order to 4 reduce the patient exposure to multiple donors, it would 5 be sensible to batch the PFC materials that came to us. 6 This tragically was after it became established that 7 PFC Factor VIII in the preheat treatment days could be 8 contaminated with HIV. So consequently, with that 9 established risk, in order to reduce it, if a patient 10 required a treatment from a batch of PFC Factor VIII, 11 until that batch ran out, that patient should only 12 receive material from that batch. At the same time 13 there may be another batch or two in stock and materials 14 from that would be reserved for other patients. 15 So instead of the one patient arbitrarily, when 16 treatment is required, getting a vials of Factor VIII 17 from two or three of the batches in stock, it was 18 a single batch that they were exposed to and that was 19 a good idea in an attempt it to reduce the amount of 20 donors to whom they were exposed. 21 Q. In conclusion, Dr Boulton, I want to ask you one final 22 point and it's more a reflective matter again. 23 Periodically in your testimony, you have spoken 24 about people, particularly in the 1982/1983 period, 25 haemophilia clinicians, who were anxious to maintain the Page 80</p>

<p>1 huge improvement in quality of life that had been 2 achieved for patients with haemophilia, and you have 3 also talked about how that sentiment persisted in the 4 face of some of the reports that were coming, initially 5 from America and then perhaps closer to Britain. 6 If you think of the people, the haemophilia 7 clinicians who were at the very forefront of these 8 developments, wanting to maximise home therapy and use 9 American concentrates to do so, and perhaps telling 10 their patients that boys with haemophilia would grow up 11 normally, it has been suggested to us that such 12 clinicians jumped the gun. Do you agree with that? 13 A. The onset of the AIDS tragedy, which really became 14 apparent -- the first glimmerings came home, I guess, in 15 early 1982 -- the danger is that one can sound terribly 16 wise in retrospect. I think it would be fair to say 17 that I referred earlier to Howard Davies being a wise 18 man. So his concern was probably directed against the 19 hepatitis risk but quite possibly he would have been 20 concerned about the possibility of other viruses being 21 present. 22 There is no doubt that the HIV tragedy, more than 23 the Hepatitis B work of the 1970s, alerted -- it was 24 a sea change in the community of blood transfusion 25 throughout the world. It is easy for people like me in Page 81</p>	<p>1 long-term effects of non-A non-B which eventually was 2 characterised as Hepatitis C in 1989/1990, and which the 3 transfusion service has been extraordinarily successful 4 in virtually eliminating from risk. 5 So I don't like the phrase "jumping the gun". 6 I think that it's a reflection of the period. Coming 7 back, there was also an accusation -- and it was an 8 accusation -- from one British transfusion director to 9 another that by introducing a test for Hepatitis C 10 before the rest of the country, that person was jumping 11 the gun. So it wasn't just an accusation to haemophilia 12 directors, the best way I can put it is: are we a team 13 coordinated with a strategy that when a new test becomes 14 available for a blood product -- as the HIV did 15 in March 1985 from America, September 1985 for 16 Great Britain -- are we a team in which we do all the 17 preliminary work in planning that test introduction? 18 Are we a team in which we are all coordinated throughout 19 Britain? Or is each regional centre allowed to do its 20 own thing? 21 Given human nature, among the 15 or so regional 22 transfusion directors throughout the UK, there were one 23 or two who broke rank, and there was some concerns. 24 On the other hand, why did they break rank? They 25 didn't break rank because they wanted to have Page 83</p>
<p>1 retrospect to say in 1981 we should have been much, much 2 more cautious and they were jumping the gun. It is easy 3 for us to say that now. My recollection, a slightly 4 guessed recollection, is that throughout this period of, 5 say, 1982 to 1984 there was an increasing awareness 6 among the haemophilia clinicians that actually the ice 7 was getting thinner and that our patients were being 8 more and more exposed to long-term risk. 9 I think actually it was not just the HIV possibility 10 but also this mysterious non-A non-B hepatitis. When it 11 became apparent that non-haemophiliacs who had been 12 transfused and had an episode of jaundice a decade or 13 two before now had severe liver disease. Their spleens 14 were big and they had disordered liver enzymes. Then 15 came the idea of looking at the livers of haemophiliacs. 16 One big problem: they would bleed so you had to give 17 them Factor VIII, rather ironically. 18 Nevertheless, people like Eric Preston in Sheffield 19 did a study, and I think it was 1983, 1984, which show 20 that haemophiliacs, in spite of not being jaundiced and 21 perhaps never having a history of an episode of 22 jaundice, had severe cirrhosis and were impending for 23 liver disease. 24 So it wasn't just HIV that stimulated this, although 25 it was a major point, it was also the awareness of the Page 82</p>	<p>1 a grandiose star for themselves. They did it for the 2 sake, the concern of the patients who were going to get 3 their production. 4 So breaking the ranks, jumping the gun is not done 5 out of a sense of irresponsibility. If it is done at 6 all, it is out of a sense of concern and, "Playing the 7 team is all very well, but I'm so concerned that my 8 patients are not going to benefit. And actually my 9 patients will be put in danger unless we do this." We 10 don't need to go into much more detail but we know that 11 in other countries doctors have been sent to prison 12 about the HIV status. 13 Many of us felt that there but for the grace of God, 14 go I. We, people like myself, people like Christopher, 15 have a real ache in our hearts, which is that 1,500 16 haemophiliacs have died; a very substantial proportion 17 of the haemophilic population in Britain have died as 18 a result of the material that we gave them. 19 So consequently you can see why jumping the gun was 20 a very tempting thing to do, and although I personally 21 don't think I did jump the gun, I can jolly well 22 understand the feelings of those who did want to jump 23 the gun. Because the greatest tragedy in my 24 professional lifetime was what has happened to 25 haemophiliacs. The variant CJD tragedy, which also Page 84</p>

<p>1 occurred during my lifetime, is awful in the same level 2 of how it has affected individuals, but on a scale of 3 numbers, where we have hundreds compared with thousands 4 of haemophiliacs, you know, one's heart -- going back, 5 John Prothero was a man I really liked and I still miss 6 him at an individual level. So jumping the gun -- okay, 7 but I think I have said enough.</p> <p>8 Q. Thank you.</p> <p>9 THE CHAIRMAN: I have heard the expression used that this 10 was the worst tragedy, and I wouldn't in any 11 circumstances want to understate it, but one does have 12 to remember that there was thalidomide.</p> <p>13 A. Absolutely.</p> <p>14 THE CHAIRMAN: One does have to remember that there are 15 other patient populations in the wider community who may 16 feel that perhaps they are deserving of as much sympathy 17 as the haemophiliac. For example, a very large group of 18 people with compromised brain functions resulting from 19 the circumstances in which they were born. Should one 20 be a little cautious perhaps in emphasising --</p> <p>21 A. I was quite careful to say that in my professional 22 lifetime it was the biggest tragedy. I remember the 23 thalidomide very well. In fact my mother-in-law took 24 thalidomide from the middle trimester of her third 25 pregnancy, fortunately too late to affect her younger</p> <p style="text-align: center;">Page 85</p>	<p>1 that, we are members of a wider healthcare professional 2 team and we should be listening to our colleagues who 3 are presenting different view points and modifying our 4 approach.</p> <p>5 So I think there have been huge advances but there 6 is still some way to go.</p> <p>7 THE CHAIRMAN: Thank you very much.</p> <p>8 Yes, Mr Di Rollo?</p> <p>9 MR DI ROLLO: Mr Dawson is going to ask the questions.</p> <p>10 Questions by MR DAWSON</p> <p>11 MR DAWSON: Thank you.</p> <p>12 Dr Boulton, if we just have up on the screen one of 13 the two admirably short CVs which you have provided to 14 the Inquiry, that is [PEN0150506]. I'm particularly 15 interested in asking you about the last paragraph in the 16 section, "Employed posts", where you say that:</p> <p>17 "At Liverpool and the London Hospital in pre-AIDS 18 days, I worked with haemophiliacs on their comprehensive 19 care and developed, especially for boys, prophylactic 20 use of plasma-derived clotting factors. At Liverpool 21 I helped to found the local branch of the Haemophilia 22 Society and had an annual budget of £40,000 from the RHA 23 for commercial blood products at about 10p per clotting 24 factor unit."</p> <p>25 Could you please explain what the reference to the</p> <p style="text-align: center;">Page 87</p>
<p>1 daughter.</p> <p>2 Thalidomide was wonderful. It stopped women being 3 sick, and it's horrible to be sick in the middle of your 4 pregnancy but it caused phocomelia and other horrible 5 things. Ironically it has come back into favour for 6 treating certain conditions related to myeloma. But 7 nevertheless it was a seminal experience in the 8 relationship between the pharmaceutical industry and the 9 clinicians and it considerably strengthened the 10 regulatory system that has been so finely developed in 11 the UK since. So I acknowledge the validity of your 12 comment about other tragedies, absolutely.</p> <p>13 I have seen other tragedies concerning organ 14 donation. I have been through quite a lot in my 15 lifetime that's observed directly. And we still see 16 tragedies of wrong blood being transfused. I can 17 guarantee that it still is happening in Britain. People 18 who are group O receive a pint of group A and their 19 lives are permanently affected thereafter.</p> <p>20 It is happening all the time. So it is a question 21 of developing the regulatory system and clinical 22 awareness, education. I think the one really good thing 23 that has happened in my lifetime in terms of the medical 24 career is that we doctors are much more aware -- at 25 least I like to think this -- of our role in society</p> <p style="text-align: center;">Page 86</p>	<p>1 annual budget of £40,000 from the RHA means?</p> <p>2 A. It means that after discussion with the treasurer of the 3 RHA, I was allocated £40,000 to buy commercial 4 Factor VIII.</p> <p>5 Q. At that stage, I think you are suggesting that you had 6 some involvement with the founding of the Haemophilia 7 Society locally. Is that correct?</p> <p>8 A. Yes, I did.</p> <p>9 Q. What was your involvement with the Haemophilia Society 10 at around that time?</p> <p>11 A. Well, I knew the Haemophilia Society in London well. As 12 I say, the Reverend Alan Tanner who was then the 13 chairman, and John Prothero who was on the council were 14 personal acquaintances and actually I would say friends 15 of mine.</p> <p>16 It was very simple. In the older Liverpool 17 Royal Infirmary, which is a red brick late Victorian 18 building, the labs were tucked away somewhat and people 19 would wait in the corridor to have their blood taken, 20 and on one occasion two women with their boys were 21 sitting next to each other and they found that both the 22 boys had haemophilia and blood was about to be taken for 23 my technicians to analyse, and they got chatting and 24 then they got chatting to me and I said, "Why don't we 25 found a local branch of the Haemophilia Society", and</p> <p style="text-align: center;">Page 88</p>

22 (Pages 85 to 88)

<p>1 they said, "What a good idea", and went ahead and did</p> <p>2 it. And I gave them the address of the London contacts</p> <p>3 and from there it developed.</p> <p>4 Q. Did you continue to have involvement with that local</p> <p>5 branch after the foundation?</p> <p>6 A. Yes.</p> <p>7 Q. What was your involvement?</p> <p>8 A. Well, I was, if you like, the sort of consultant adviser</p> <p>9 to them about the realistic expectations that their</p> <p>10 sons, their affected sons, could have and how that</p> <p>11 should be improved over the course of the next decades.</p> <p>12 Also, what was very striking to me is that the older</p> <p>13 haemophiliacs, those adults, who were lovely men, who</p> <p>14 had survived and were crippled, had a very different set</p> <p>15 of attitudes to the doctors who were caring for them.</p> <p>16 I mean, immense respect and rather almost embarrassing</p> <p>17 reverence, whereas these mothers and fathers of these</p> <p>18 haemophilics had much greater expectations from me, and</p> <p>19 I wanted to respond to that. And when they said to me</p> <p>20 things like, "Don't you think haemophilia is a bit like</p> <p>21 diabetes: we should get injections every day so that our</p> <p>22 boys can live normally lives?" I completely understood</p> <p>23 what those mums were talking about.</p> <p>24 Q. This was --</p> <p>25 A. 1976/1977.</p> <p style="text-align: center;">Page 89</p>	<p>1 A. Yes.</p> <p>2 Q. At that time in the late 1970s there were difficulties</p> <p>3 and misunderstanding in the medical community about the</p> <p>4 safety of the product. Would that be fair to say?</p> <p>5 A. In the 1970s --</p> <p>6 Q. I'm thinking about the period post the World in Action</p> <p>7 DVD, which seems to suggest that that might be the case.</p> <p>8 A. My recollection actually is that the vast majority of</p> <p>9 people felt Britain is not America, and it's an American</p> <p>10 problem and somehow or other the risk of</p> <p>11 American-derived Factor VIII would be attenuated by the</p> <p>12 time it got to Britain. And the only reason why that</p> <p>13 might have been understandable to the thinking was that</p> <p>14 the Americans were claiming greater and greater testing</p> <p>15 of their products, selection of their donors, to avoid</p> <p>16 the skid row component.</p> <p>17 So I think, to some extent there was almost wishful</p> <p>18 thinking that this was a problem that would stay in</p> <p>19 America but wouldn't come over to Britain.</p> <p>20 Q. How aware were you, as a haemophilia doctor at that</p> <p>21 time, as to how safe the American products actually</p> <p>22 were?</p> <p>23 A. I have already intimated that when the opportunity came</p> <p>24 to buy in Factor VIII, I didn't go for the American. So</p> <p>25 in other words, American products to my mind, as a young</p> <p style="text-align: center;">Page 91</p>
<p>1 Q. The late 1970s?</p> <p>2 A. Yes.</p> <p>3 Q. So that would be in the years after the World in Action</p> <p>4 DVD to give it a place in history?</p> <p>5 A. Yes.</p> <p>6 Q. Did the members of the local haemophilia branch seek</p> <p>7 your advice about the safety of products that were being</p> <p>8 used, blood products, at that time?</p> <p>9 A. Oh, yes and I was quite upfront with them about the</p> <p>10 hepatitis risk, as far as I recollect.</p> <p>11 Q. Would it be fair to say that members of the haemophilia</p> <p>12 community at that time and subsequently have generally</p> <p>13 a good understanding of haemophilia care and the</p> <p>14 products which are being used?</p> <p>15 A. Around about that time, Peter Jones came out with his</p> <p>16 book, Living With Haemophilia, his first edition which</p> <p>17 I think was 1978 or 1979, which went down, as you will</p> <p>18 know, in the haemophilia world as a whirlwind. It was</p> <p>19 super, it was clearly illustrated, it was wonderful for</p> <p>20 the advice for the mums and the dads and the boys</p> <p>21 themselves, and it was highly successful and it did</p> <p>22 a lot to feed the understanding within the haemophilia</p> <p>23 community of the prospects of a bleed-free life.</p> <p>24 Q. And the members of the Haemophilia Society with whom you</p> <p>25 were speaking, these were lay people?</p> <p style="text-align: center;">Page 90</p>	<p>1 haemophilia doctor in the late 1970s, were to be avoided</p> <p>2 if possible.</p> <p>3 Q. Presumably the members of the Haemophilia Society as lay</p> <p>4 people were reliant upon your advice about --</p> <p>5 A. I think they felt that my advice was good.</p> <p>6 Q. You made a distinction in your earlier evidence between</p> <p>7 weighing up the dangers of products against the</p> <p>8 effectiveness of products.</p> <p>9 A. Yes.</p> <p>10 Q. What I would like to ask you is: were the Haemophilia</p> <p>11 Society members reliant upon your advice about the</p> <p>12 dangers of the products?</p> <p>13 A. Yes.</p> <p>14 Q. I understand that you arrived in Edinburgh in 1980. Is</p> <p>15 that correct?</p> <p>16 A. January 1980.</p> <p>17 Q. And you became the deputy director in 1982?</p> <p>18 A. Yes.</p> <p>19 Q. So your arrival in Edinburgh coincided, I think, quite</p> <p>20 closely with the arrival of Dr Ludlam as the haemophilia</p> <p>21 director?</p> <p>22 A. I think he was a month or so before me.</p> <p>23 Q. So you were both around about the same time?</p> <p>24 A. Yes.</p> <p>25 Q. Could I just clarify something with you? In his</p> <p style="text-align: center;">Page 92</p>

23 (Pages 89 to 92)

<p>1 evidence about the way in which the BTS worked in 2 Edinburgh, Dr McClelland suggested that there are really 3 two parts to the operation and that one part was to do 4 with collection of blood, so focusing on the donors, and 5 the other part was to do with the storage and 6 distribution. So to do with what one might call the 7 blood bank. Is that an accurate representation of what 8 your activities were? 9 A. My activities were with the blood bank. Yes, that's 10 accurate. 11 Q. I meant in general, was that an accurate representation 12 of what the blood transfusion service in your region was 13 doing at that time? 14 A. There was a third component which was completely 15 separate from haemophilia care, which was the selection 16 for organ transplantation. 17 Q. I think Dr McClelland characterised the division of 18 responsibilities as you being mainly responsible for the 19 blood bank side whereas he was more responsible for the 20 donor side. Is that correct? 21 A. Yes. 22 Q. I just wanted to ask one question about the main 23 statement which you have given. Perhaps we could have 24 up page [PEN01500578], which is in the document that 25 commences on [PEN0150054]. You have given us some Page 93</p>	<p>1 BTS, administrative difficulties? 2 A. It simply meant that the staff day and night in the 3 blood bank had to be aware of the problem, and also the 4 doctors on-call in the haematology department for 5 haemophilia care had to be aware of the system. I think 6 there may have been occasions -- in fact I'm fairly sure 7 there were occasions when the system failed, either 8 because the lab staff member on-call at night was 9 unaware of the system or was busy doing something else 10 and breached the system or the registrar on-call for the 11 haemophilia unit may have not been fully familiar with 12 the system. 13 But that's the way it was designed and when I said 14 it worked fairly well, to my recollection, I do 15 acknowledge there may have been some breaches through 16 human error. 17 Q. So when you say "some breaches", you mean that certain 18 people, who should have been allocated to a particular 19 batch, were exposed to blood product -- 20 A. Yes, they got a vial in the middle of the night from 21 another batch. 22 Q. Okay, thank you. Could I just return to something 23 I asked you about a moment ago, which is to do with the 24 administration within the Blood Transfusion Service and 25 particularly the use of the blood bank. You have Page 95</p>
<p>1 comments about this already. I wanted to ask about the 2 section at the bottom and in particular what you say 3 about the batch dedication or batch allocation system. 4 Could I just read that out? You say that: 5 "I do remember at one stage in the Edinburgh centre, 6 we attempted to reduce donor exposure to haemophiliacs 7 by restricting batch numbers of PFC Factor VIII 8 concentrate to specified patients. In other words, once 9 a new batch of Factor VIII had been administered to one 10 patient, further treatments came from the same batch 11 until that batch was exhausted. This was Dr Ludlam's 12 suggestion and was administered, as far as I can recall, 13 reasonably well by the staff of the blood product 14 issuing department of Edinburgh and Southeast Scotland 15 BTS, based in the Royal Infirmary. I cannot date the 16 start of this policy. I cannot comment on how much 17 DDAVP was used ..." 18 Et cetera, et cetera. I'm just wondering whether, 19 with the obvious exposure you have had to historic 20 material prior to giving evidence today, you have any 21 recollection as to when this system was actually 22 introduced? 23 A. I'm sorry, I cannot be more precise. I suspect that 24 Dr Ludlam would be better informed than me. 25 Q. Did this batch allocation system cause you, within the Page 94</p>	<p>1 answered some questions to the best of your recollection 2 on this topic already but I have a few more I would like 3 to put to you. The first is: did you ever at any time 4 have a surplus of blood products within your region in 5 the early 1980s? 6 A. Can I ask what you mean by "blood products"? 7 Q. Well, particularly factor concentrates. 8 A. Of PFC and cryoprecipitate, I very much doubt. Of the 9 slightly specialised products, such as the Factor IX 10 from PFC that would be reserved for inhibitor patients, 11 there may have been batches that ran out. I'm not 12 saying, however, that every single vial of PFC 13 Factor VIII ended up in a patient. There may well have 14 been occasions when some did expire, but we tried to 15 minimise that. 16 Q. How long would a product be kept before expiry? 17 A. It would have had a date on it, which I think was 18 two years or 18 months. Sorry -- but that sort of 19 timescale. So, not unreasonably, the day after it 20 expired clinicians would be reluctant to use it. 21 Q. To look at it from the other side of the equation, 22 I think it's clear from the documentation we have looked 23 at that there were times there were shortages of 24 concentrates. 25 A. That's much more frequent, yes. Page 96</p>

24 (Pages 93 to 96)

<p>1 Q. In those circumstances what I'm interested to know about 2 is whether it was possible, as some of the 3 correspondence we have looked at seems to suggest, for 4 you to make up the shortfall by looking in the stores of 5 other regional blood transfusion services? 6 A. Well, that did happen, that's why we got some from 7 Inverness on that occasion. 8 Q. I think we looked at a letter -- for the record, I think 9 it was [SNB0015219], which was a letter of 10 7 December 1982, which suggested that you were able to 11 get some product from both Inverness and Glasgow. 12 A. Yes. 13 Q. Is that, to the best of your recollection, accurate -- 14 A. Yes. 15 Q. -- that you would have got some? How did that work 16 administratively between the regions? Would you be 17 responsible for that? 18 A. Not directly. 19 Q. Right. 20 A. There was a chief MLSO, a chief technician, in the blood 21 bank, who was responsible for all aspects of, if you 22 like, the mechanics of the delivery of blood and blood 23 products to the relevant clinical departments. There is 24 also, as we have heard earlier, an allusion to a van 25 that the SNBTS had, a vehicle that could transport Page 97</p>	<p>1 within the transfusion service, which is very rare. 2 I think you pointed out already that you were the 3 first person to be appointed in the region who had that 4 background. Is that accurate? 5 A. Yes, I think so, yes. 6 Q. I'm interested to know who was responsible within the 7 Edinburgh and Southeast region for determining what 8 products would be used in the treatment of 9 haemophiliacs. 10 A. The primary person responsible for that would be the 11 haemophilia director. 12 Q. And that at that time was Dr Ludlam? 13 You say the primary person responsible. Did you 14 have any involvement in that process, given your 15 background as a haemophilia doctor? 16 A. Christopher knew where I came from. We had a cordial 17 relationship and I think you can see the evidence of 18 particularly that 1982 period, where there were quite 19 intensive meetings between us, that we actually came to 20 a workable arrangement. 21 Q. Would you express your view as to the regimes for 22 treatment that he was using from a haemophilia doctor 23 point of view? 24 A. Well, I had the cheek to suggest that one patient might 25 benefit from having no therapy at all. So the answer to Page 99</p>
<p>1 safely and under proper conditions, ie refrigeration, 2 materials that could be transferred between the regional 3 centres, so that what was in store in Law or in 4 Inverness could be driven down under proper conditions 5 and placed in proper conditions in the Edinburgh blood 6 bank, and the day-to-day running of that would have been 7 through the chief MLSOs. 8 Q. Thank you. Was there a tendency for certain regions to 9 have a shortfall of factor concentrates and other 10 regions to have an abundance of this? 11 A. I can only answer for Edinburgh. Clearly, Edinburgh was 12 the whole was short. 13 Q. You have suggested on a couple of occasions going to 14 Inverness to make up the shortfall. I wonder whether 15 perhaps that was one which you thought would be likely 16 to have something, if you approached them. 17 A. I cannot recollect but I suspect that our wonderful 18 chief MLSO phoned round the other centres, said, "How 19 much have you got?" And they said either, "None," or, 20 "A little bit," or, "Yes, we can do a bit." But I was 21 not involved in those direct selection procedures. 22 Q. Thank you. I'm interested in exploring a little bit 23 further the precise nature of your job because, as 24 counsel to the Inquiry has pointed out, you are someone 25 who is experienced as both a haemophilia doctor but also Page 98</p>	<p>1 your question is yes. 2 Q. I'm aware of the reference that you are making and we 3 may come to that in a moment. I think the word that you 4 used was "impertinence" at the time. 5 A. Yes. 6 Q. What I'm interested in knowing is was that a regular 7 concern. Did you regularly have conversations with 8 Dr Ludlam about the way in which patients should be 9 treated, either generally or specifically? 10 A. That's putting it too strongly. Not the way the 11 patients should be treated, but we did have 12 conversations about the problems or the various 13 variations that might be available for patients. 14 I think, although I can't be certain of this, that we 15 were not always, but quite often, given notice of 16 planned surgery for haemophiliacs. So if a haemophilic 17 required a planned orthopaedic procedure which would be 18 likely to require a lot of blood, we would be given 19 advance notice. 20 Q. Could I ask you what the position was from a more 21 general point of view? You have answered there in 22 relation to specific patients undergoing operations, but 23 the position, as I understand it, in around 1980 was 24 that Dr Ludlam had expressed a desire to move away from 25 the previous regime, which relied heavily under Page 100</p>

25 (Pages 97 to 100)

<p>1 Dr Davies on cryoprecipitate, but move towards more 2 factor concentrate use, in particular with a view to 3 putting more patients on home treatment. Is that 4 accurate?</p> <p>5 A. I'm sure that Christopher would give a better answer 6 than me but that's what I recollect.</p> <p>7 Q. I think that that is probably reflected in your letter, 8 which we have looked at, to Mr Watt, dated 9 1 February 1980. Can we have that up, please? It's 10 [SNB0072566]. That is a letter, as I say, we have 11 looked at already but you are sending a letter to 12 Mr Watt at the PFC. The title is "Factor VIII stocks 13 for home therapy". You say in the second paragraph: 14 "Naturally, I'm anxious to support such a programme 15 as much as possible and feel you ought to know that 16 I see no reason to discourage Dr Ludlam from going ahead 17 with this programme. I feel that he is very likely to 18 expand his home therapy programme, certainly in the 19 course of the next year, and this may well result in 20 a significant difference in the pattern of our Factor 21 VIII usage, ie less cryo, more concentrate, and this, of 22 course, may mean that we should be prepared to ship you 23 more fresh-frozen plasma for fractionation. Please let 24 me know if you have any comments on these points. 25 It would be fair to say that this letter was written</p> <p style="text-align: center;">Page 101</p>	<p>1 purity", nevertheless that was as good a quality product 2 as could be obtained anywhere in the world and on a par 3 with commercial firms.</p> <p>4 In some other correspondence you will have seen 5 about how to package it and send it and the interesting 6 point is that the commercial firms developed a very good 7 marketing strategy. By that I mean the packaging, the 8 water with which it came, and the literature -- lovely 9 pictures of haemophilia boys riding bicycles -- which 10 was beyond the budget of the PFC. So John Watt very 11 naturally sometimes would say to me, "Frank, you are 12 getting too enthusiastic about trying to beat the 13 commercial boys at their own game, but we can supply you 14 good quality material; it may not look as nice." So, in 15 essence, that's the sort of thing that John Watt was 16 saying.</p> <p>17 So I supported Christopher's then desire to use more 18 PFC Factor VIII for his patients. It was the right 19 direction and to my mind was clearly so then and I think 20 is entirely justifiable as an attitude even now.</p> <p>21 Q. Did you have a view on his proposal that there should be 22 this move away from cryo towards factor concentrates 23 from the point of view of supply?</p> <p>24 A. Well --</p> <p>25 THE CHAIRMAN: I'm sorry, I don't think I quite understood.</p> <p style="text-align: center;">Page 103</p>
<p>1 as a result of a strategic planning conversation you had 2 had with Dr Ludlam about his intention to increase home 3 therapy?</p> <p>4 A. That sounds rather grandiose but I suspect you are 5 right. This was written two weeks after I had started 6 my job.</p> <p>7 Q. So by that time you had already had this conversation 8 with Dr Ludlam, it would appear.</p> <p>9 A. Yes.</p> <p>10 Q. Did you have a view on the general proposal that there 11 should be this move away from cryoprecipitate treatment 12 towards the use of more Factor VIII from a haemophilia 13 point of view?</p> <p>14 A. My view was that Christopher was right. At that time we 15 had no inkling of HIV/AIDS. We, of course, did know 16 about hepatitis. But perhaps -- no. I was going to say 17 "naively" but that would be unfair. We reckoned that 18 the process of blood donor selection and testing for, on 19 the whole, ever better hepatitis screenings would result 20 in a quality of plasma sent for fractionation that would 21 be as risk-free as possible and also a recognition that 22 the process of fractionation, although the product that 23 was infused into haemophiliacs had many more proteins in 24 it than just Factor VIII and in technical terms was 25 rather impure and was called actually "intermediate</p> <p style="text-align: center;">Page 102</p>	<p>1 A. I think what he is referring to is, Christopher's 2 demand, was it realistic?</p> <p>3 MR DAWSON: Indeed.</p> <p>4 THE CHAIRMAN: We can come back to that after lunch, 5 Mr Dawson. 6 (1.00 pm) 7 (The short adjournment) 8 (2.00 pm)</p> <p>9 THE CHAIRMAN: Yes, Mr Dawson.</p> <p>10 MR DAWSON: Thank you, sir. Dr Boulton, if could I ask you 11 the question: in 1980 what was your view about whether 12 it would be realistic to provide enough PFC Factor VIII 13 concentrate to meet Dr Ludlam's plans for increased home 14 therapy with PFC Factor VIII?</p> <p>15 A. In early 1980, within a few weeks of me joining the 16 service, I suppose that my feelings were that every 17 effort should be made to meet the demands that were 18 likely to occur over the next few years. I can't really 19 be much more precise than that.</p> <p>20 Q. Did you think it would be realistic to be able to meet 21 those demands?</p> <p>22 A. Well, I wouldn't have supported the proposal had 23 I thought they were unrealistic. How realistic 24 I thought they would be? I suppose I was still in 25 a process of learning.</p> <p style="text-align: center;">Page 104</p>

<p>1 Q. What was the point then of your letter to Mr Watt that 2 we looked at, dated 1 February 1980? 3 A. Could we refer back to that one? 4 Q. Absolutely. It's [SNB0072566]. You will recall that 5 I read out the second paragraph of that. My question 6 is: why did you consider it necessary to write that 7 letter to Mr Watt at that time? 8 A. Well, one reason is to give John Watt some indication of 9 the reason for a likely surgeon in demand: 10 "I feel that he [Dr Ludlam] is very likely to expand 11 his home therapy programme considerably in the course of 12 the next year." 13 So it was in a sense giving notice to the plasma 14 fractionators that this demand was coming their way and 15 therefore they should prepare accordingly or respond 16 accordingly. 17 Q. Does this letter embody a concern that there might be 18 difficulties of supply in the future if that home 19 therapy programme were ruled ought, as has been 20 suggested? 21 A. I can't say. It is too far away for me to remember 22 that. 23 Q. Can we roll on a bit in the timeline and can I ask you: 24 did you experience problems with supply in the first 25 half of the 1980s? Supply of Factor VIII concentrate</p> <p style="text-align: center;">Page 105</p>	<p>1 half of the 1980s. It might be helpful to be more 2 specific as to time. 3 MR DAWSON: Indeed. I apologise. I was actually just going 4 to take Dr Boulton to a document that would pin it down 5 to a particular timeframe, but before I do that, could 6 I simply ask: by 1982 -- and we have looked at some 7 documentation from that particular period -- was there 8 increased demand? 9 A. Yes. 10 Q. And what was the cause of that increased demand at that 11 time? 12 A. Principally, the desired switch from cryoprecipitate to 13 PFC materials and a developing home therapy programme, 14 as far as I'm aware. 15 Q. Could I just take you to that document, which we have 16 looked at before, from the middle of 1982. It's 17 [SNB0015199]. 18 As I say, I think this is a letter to which you have 19 been taken before. It's a letter which is dated 20 10 May 1982 from you to Dr Ludlam. You say in 21 paragraph 2 of that letter that: 22 "My concern is the amount of Factor VIII that has 23 been issued. The total for the first quarter was 24 206,800 units. This would be an annual consumption of 25 827,200 units. This means that for each of the 20</p> <p style="text-align: center;">Page 107</p>
<p>1 from PFC, I should say. 2 A. I think the records we have already looked at of the 3 meetings I had with Dr Ludlam in 1982 go a long way to 4 address that. But are you asking me if I thought in 5 1980 there would be problems in 1982? 6 Q. No, I'm just asking you whether in reality you did 7 experience problems in supply? 8 A. The records of those meetings in 1982 with Christopher 9 would indicate that there was an awareness of 10 a challenge that we needed to address as much as 11 possible. So there was a problem insofar as it required 12 Christopher and I to jointly try to sort it out. 13 Q. But there was a problem of supply. Are you agreeing 14 with that proposition? 15 A. There was a problem of trying to adjust the legitimate 16 demand of the patients with what could conceivably be 17 available. That's not quite the same as: was there 18 a problem of supply? The supply and demand, in general, 19 the equation has factors on both sides and both sides 20 can be adjusted, and the important thing in this sort of 21 situation is to devise a system whereby both sides can 22 be satisfied but with some degree of compromise. 23 Q. Was there an increase in demand -- 24 THE CHAIRMAN: Mr Dawson, can I remind you that you started 25 off the section by asking about a problem in the first</p> <p style="text-align: center;">Page 106</p>	<p>1 patient, the average annual consumption would be 41.360 2 units or 34,464 units, if you included all 24. These 3 figures are obviously pretty close to the UK national 4 average." 5 Then down to paragraph 4. You say: 6 "Hence, you will see that your home therapy 7 programme alone has accounted for about 80 per cent of 8 our allocation from PFC." 9 Would you like to make any comment about the reason 10 why you were bringing to Dr Ludlam's attention at that 11 time the statistics relating to the amount of PFC 12 Factor VIII that was being used for what you describe as 13 his home therapy programme? 14 A. I honestly don't think I can say any more. This is 15 27 years ago and I'm being asked to recall in detail the 16 motivations I had for making these points. I honestly 17 don't think I can satisfy you if that's the road you 18 want me to go down, any more than is actually written 19 down here. I don't refute any of these statements that 20 I made in these letters. I think I just have to ask you 21 to take them at the value you see them written. I can't 22 add anything more at this stage. 23 Q. I understand that difficulty, Dr Boulton. If I 24 could ask for the second page of this letter to be put 25 up. Perhaps a third page. I think the third page of</p> <p style="text-align: center;">Page 108</p>

<p>1 the document is actually the second page of the letter. 2 You say there: 3 "I think that the SNBTS as a whole can just about 4 hold your requirements so long as the following points 5 are borne in mind." 6 Then you have a list there of the kinds of things 7 that you think might be able to keep the position as it 8 is, which appears to be just about surviving. Is that 9 correct? 10 A. It looks like it, yes. 11 Q. One of those is that no more patients are put on home 12 therapy, number 2. 13 A. Yes. 14 Q. Can you tell me -- and of course you may have 15 difficulties with your recollection -- as to whether you 16 managed to adhere to these five propositions after that? 17 A. Well, it's not a question of me adhering. These are the 18 requirements that would be on the clinicians supporting 19 the haemophiliacs, and I was not a clinician supporting 20 the haemophiliacs directly. 21 Q. Was Dr Ludlam able to adhere to these -- 22 A. You would have to ask him. I don't know. 23 Q. Thank you. That's all I want to ask but that particular 24 document. 25 We heard some evidence -- I think you were aware -- Page 109</p>	<p>1 in the nature of humankind. We are different people but 2 we have a common outlook on many things, and whenever it 3 comes -- it is like in many situations between 4 colleagues or close friends, there are differences that 5 had to be sorted out, and so long as we can sort it out 6 in a civilised and positive manner, that's how progress 7 is made. 8 Q. I think that in the same email Dr McClelland was making 9 specific reference to the possibility of tension arising 10 out of the fact that you were both experts in treating 11 haemophilia patients. So was there any tension which 12 arose as regards the way in which one might best treat 13 haemophilia patients? 14 A. I did not want to be responsible for treating his 15 haemophilia patients. I recognise that I had no direct 16 role in patient care because that was his job and I had 17 a different job. I might have had an insight into the 18 nature of Christopher's job because of my previous work 19 but I was not in the position and would never have 20 wanted to be in the position of actually interfering 21 with his work. 22 Q. I would like to ask you a few questions about a topic 23 that we have touched on already, which is to do with 24 your awareness of the increasing possibility of there 25 being a risk of AIDS and the dangers for your patients Page 111</p>
<p>1 from your former colleague, Dr McClelland, last week and 2 he spoke about a number of these issues that we have 3 been discussing with you. He was asked what the 4 relationship between yourself and Professor Ludlam, the 5 working relationship, was like and he said that: 6 "It is also possible that there may have been some 7 sort of medical/professional tension between them 8 because they were both experts in treating haemophilia 9 patients and experts frequently don't agree about 10 things." 11 Is that an accurate representation of the 12 professional relationship or not? 13 A. If that impression is one that gives a negative picture, 14 that is not correct. Tension can be productive and my 15 recollection of those times, yes, there were tensions, 16 but there was no animosity, and although occasionally 17 frustrations may have been vented in the privacy of 18 one's room, et cetera, et cetera, I think we are all 19 adult enough to recognise that under these sort of 20 circumstances tension can be used creatively, and 21 I would like to think some years further on that the net 22 result was a positive one. 23 Q. What was the cause of the tension? 24 A. We had different personalities. We have different 25 training assumptions. Thank goodness there is diversity Page 110</p>	<p>1 arising out of that. 2 Can we have up, please, to document [SNF0013710], 3 which is again a document we have seen before. 4 Just to put it in context, Dr Boulton, this was the 5 memo that was sent from you to Dr McClelland on 6 30 May 1983, in which you had made reference to your 7 telephone conversation with Peter Jones on 24 May. Can 8 I ask you first of all why it was that you had made that 9 telephone call to Peter Jones? 10 A. The second sentence, I think, might give an indication. 11 I was basically following what he was claimed to have 12 said on a nationwide programme the previous week about 13 non-rejection of gay donors. I have no memory of why 14 I phoned Peter Jones other than what's in here, but it 15 does look as if what I was a little bit concerned about 16 was the issue of the appropriateness of men who have had 17 sex with other men giving blood. 18 Q. So was that an issue, as far as you can remember, within 19 your Blood Transfusion Service at that time? 20 A. Oh, yes. 21 Q. What was the issue? 22 A. By May 1983 we were well aware of the epidemiology of 23 this strange disease, coming from the States, that 24 heavily associated it with men who had had sex with 25 other men. Page 112</p>

28 (Pages 109 to 112)

<p>1 Q. So would it be accurate to say at this stage that there 2 were discussions going on between yourself and 3 Dr McClelland about whether you could and whether it 4 would be a good idea to try and screen donors who had 5 a history of homosexual contact with other men on the 6 basis that it might pose a risk?</p> <p>7 A. The question, I think, that is highlighted in this memo 8 is how appropriate would it be to ask men if they had 9 had sex with other men somewhere along the line between 10 them attending and giving blood.</p> <p>11 1983, very different times from now, when there is 12 much greater acceptance within society as a whole of the 13 validity of the homosexual lifestyle. Much less 14 judgmental these days than those days and we were 15 sensitive to social stigma that would be associated with 16 men who admitted that they had sex.</p> <p>17 So, given the fact that donor sessions, although 18 meant to be totally confidential, are nevertheless 19 conducted sometimes in a more open way, given the fact 20 that the general public was aware that some people did 21 not give blood or were not allowed or were not expected 22 to give blood because of their sexual history, given the 23 fact that donors sometimes turned up in bunches to 24 encourage each other to give blood, given the fact that 25 any one of those who was turned away was a cause of</p> <p style="text-align: center;">Page 113</p>	<p>1 concepts that I can't guarantee the total accuracy of. 2 But in reconstruction it does rather look as if we felt 3 that you needed to do more in donor selection than just 4 leave a document hoping that they would read it.</p> <p>5 Q. Thank you for that.</p> <p>6 I think that just to put it in a bit of context and 7 maybe just to refresh your memory, I can refer very 8 briefly to paragraph 8.33 of the preliminary report 9 which gives some background to what is going on at this 10 time, and it says there in the last couple of sentences: 11 "In June 1983, Edinburgh and Southeast Scotland 12 produced a leaflet, "AIDS and Blood Transfusion". The 13 leaflet asked those in certain high risk groups not to 14 give blood until there was a suitable screening test. 15 It appears to have commenced circulation around 16 15 June 1983."</p> <p>17 So that appears to suggest that the leaflet route 18 was what was decided upon after this. Do you recall 19 that leaflet coming out, Dr Boulton?</p> <p>20 A. Sorry, can we have --</p> <p>21 Q. I can put the document up if it's of assistance to you. 22 It's the original page 196 of the preliminary report. 23 Sorry to jump about between documents. Paragraph 8.33.</p> <p>24 A. Is it going to come up on the screen?</p> <p>25 Q. It's going to come up on the screen, yes.</p> <p style="text-align: center;">Page 115</p>
<p>1 suspicion, given all these social circumstances around 2 the blood donation procedure, there was great concern 3 about the right way of, as you say, screening, which 4 isn't quite the word I would have used, but of selecting 5 donors according to their sexual history, a very 6 delicate subject, particularly in those times.</p> <p>7 So whereas Peter Jones was of the opinion that we 8 should not ask them verbally at the session about their 9 lifestyle but leave literature around explaining it, 10 most of us on our side -- and I'm pretty sure that I was 11 on this side -- were of the opinion that that would not 12 be adequate, that in fact a person who had already 13 screwed up enough encourage to come and give blood was 14 unlikely to be deterred by a slightly strangely worded, 15 incomprehensible document when it needed to be explained 16 to them in words by a friendly, non-judgmental person, 17 who would be able to explain to them in some sort of way 18 at the interview session.</p> <p>19 So why -- where I go on later saying that -- is it 20 in this one, where I say Peter Jones was less than 21 cautious? Yes, I felt he was being somewhat less than 22 cautious in his attitude, et cetera, my feeling is -- 23 and I might say that until I saw this again a few months 24 ago, I didn't remember this whole thing. So you are 25 asking me to recreate from the back of my brain a set of</p> <p style="text-align: center;">Page 114</p>	<p>1 You see there under the heading "Summer 1983", this 2 is in a chapter of the preliminary report where we are 3 discussing HIV and AIDS. In this paragraph we are 4 talking about the particular time period, summer 1983, 5 action taken in the United Kingdom. What I have read is 6 four lines from the bottom of the first paragraph, 7 starting: 8 "In June 1983, Edinburgh and Southeast Scotland 9 produced a leaflet, "AIDS and Blood Transfusion". The 10 leaflet asked those in certain high risk groups not to 11 give blood until there was a suitable screening test. 12 It appears to have commenced circulation around 13 15 June 1983."</p> <p>14 I think you made reference earlier to a leaflet. 15 This is presumably the leaflet you were talking about 16 a moment ago?</p> <p>17 A. I certainly recollect a leaflet being prepared with this 18 theme. I could not possibly date it.</p> <p>19 Q. Right. There is a reference there to high risk groups. 20 Would that include the gay donors that are referred to 21 in the opening paragraph of your memo to --</p> <p>22 A. Yes, however, I think it fair to comment that probably 23 around about that time, or maybe a little before that 24 time, there was a lot of concern, as I'm sure you are 25 aware, in Edinburgh of injecting drug users being</p> <p style="text-align: center;">Page 116</p>

29 (Pages 113 to 116)

1 **a particular risk group category. So in some ways**
 2 **I think we were as concerned about the injecting drug**
 3 **users as we would have been about homosexual men.**
 4 Q. Would there not have been, at that time, some other
 5 method of excluding injecting drug users from giving
 6 blood?
 7 **A. Well, the lesson of the epidemiology of Hepatitis C is**
 8 **clearly no; we can say that now, no. Whether I was able**
 9 **to say that in 1983 is a bit more dubious, but may**
 10 **I remind you that when we found that there were people,**
 11 **after 1991, when we introduced the Hepatitis C test, who**
 12 **were Hepatitis C-positive and who admitted to, on**
 13 **reflection, one or two parenteral drug using episodes**
 14 **a decade or so before, we realised that even one**
 15 **parenteral injection of a drug under such circumstances**
 16 **could infect with Hepatitis C with all the dire**
 17 **consequences that could result. We were not aware of**
 18 **that in 1981. But nevertheless we were aware and the**
 19 **other thing is that Edinburgh seemed at that time to be**
 20 **a hotspot of parenteral drug use.**
 21 Q. Was there a concern at the time of these documents, in
 22 the middle really of 1983, that the HIV virus had
 23 entered the UK blood donor population then?
 24 **A. It's very difficult for me at this stage to identify the**
 25 **degree of that concern but I think it's likely that**
 Page 117

1 **there was a concern about the possibility, either**
 2 **already there or about to come.**
 3 Q. Right. The concern was great enough to give rise to
 4 these attempts to exclude groups -- gay donors or
 5 intravenous drug users -- that you think might be at
 6 a higher risk of HIV than other people. Is that
 7 correct?
 8 **A. Yes, I imagine so.**
 9 Q. Could we return to the document we were looking at
 10 before, [SNF0013710]. It will come up on your screen
 11 again, Dr Boulton.
 12 This is just us back to the memo between yourself
 13 and Dr McClelland relating to your conversation with
 14 Peter Jones and you referred already to the second last
 15 paragraph, could I just read that out. It says:
 16 "He [which is a reference to Dr Jones] also claimed
 17 there is a lot of doubt about the diagnosis of all the
 18 AIDS cases in the UK, and in particular the
 19 haemophilics."
 20 You then say:
 21 "I felt he was still being somewhat less than
 22 cautious in his attitude but this is not unexpected
 23 given his interests ..."
 24 Et cetera. Could you tell me first of all why it
 25 was that you thought Dr Jones was being somewhat less
 Page 118

1 than cautious in his attitude at that time?
 2 **A. I think this goes back, although I say repeatedly,**
 3 **I think that this goes back to a suggestion that we**
 4 **don't ask donors at the session but just leave leaflets,**
 5 **ask them to read a leaflet, and that, I think, could**
 6 **arguably be said to be less than cautious enough.**
 7 Q. Why did you think that the fact he was being somewhat
 8 less than cautious in his attitudes was not unexpected
 9 given his interests?
 10 **A. This may seem a little unfair but one possibility could**
 11 **be that he was anxious, particularly with the earlier**
 12 **paragraph about the diagnosis of -- sorry, I have lost**
 13 **it somewhere:**
 14 "He also claimed that there is lot of doubt about
 15 the diagnosis of all the AIDS cases in the UK."
 16 So one possible reason for his interests being
 17 implicated in this is that asking men if they had had
 18 sex with other men would not be a very effective way of
 19 screening out such donors because AIDS in the UK might
 20 have had different diagnostic and clinical
 21 characteristics than AIDS in the US, but I'm being
 22 speculative here.
 23 But Peter's interests were in maximising Factor VIII
 24 availability for his patients. He was aware that there
 25 is a problem or potential problem in supply in relation
 Page 119

1 to an infection but at that time there was still some
 2 doubt about the impact of the infection and I think
 3 one's views on those impacts could be, understandably,
 4 although possibly not legitimately, but understandably
 5 influenced by one's own practices. So that if you are
 6 responsible for stopping little boys from having
 7 a distressing bleed, that will head you in one
 8 direction. If you are cautious about giving little boys
 9 a disease that might haunt them in 20 years' time but
 10 only might and might not -- and the might not is more
 11 than the might -- then you have a slightly different
 12 emphasis.
 13 So if you like, it's a tension between the clinical
 14 insights of the one side or the other.
 15 Q. So it's a balancing exercise, if I understand you
 16 correctly, between his practice of giving treatment in
 17 a certain way, balanced against the risks?
 18 **A. At that time the risks were incredibly ill-defined in**
 19 **quantitative terms. There was an understanding about**
 20 **what the risks were qualitatively, but what was AIDS?**
 21 **How infectious was it? Was it likely to be a permanent**
 22 **illness? Could it have been transmitted by other means**
 23 **than blood? Those were questions that were still in the**
 24 **air. And until the actual virus was identified and its**
 25 **epidemiology addressed, clearly in the Koch's Postulates**
 Page 120

<p>1 way, there were all these sorts of questions beforehand.</p> <p>2 So there was an area of uncertainty. So the balance</p> <p>3 was very difficult to achieve because you didn't know</p> <p>4 how much the weight on that side of the seesaw was.</p> <p>5 Q. Were you aware of Dr Jones' attitude towards the use of</p> <p>6 commercial product?</p> <p>7 A. Well, I think Peter was very aware of the availability</p> <p>8 of commercial Factor VIII, not least because the</p> <p>9 commercial manufacturers were very active in marketing</p> <p>10 it in the UK.</p> <p>11 Q. Were you aware that he had a relationship with an</p> <p>12 American pharmaceutical company as a paid consultant?</p> <p>13 A. I was not aware specifically. There were certain</p> <p>14 statements to that effect.</p> <p>15 Q. Right. Could that relationship or those statements as</p> <p>16 regards that relationship be what you mean by his</p> <p>17 "interests"?</p> <p>18 A. Well, no. I don't think I meant in his interests that</p> <p>19 he had an interest in a commercial company. I think the</p> <p>20 interests he was referring to would be to his clinical</p> <p>21 concerns for the benefits of his patients. I don't</p> <p>22 think -- I'm pretty sure -- again, you are asking me to</p> <p>23 recollect, and it's a good question but I honestly don't</p> <p>24 think that I meant by his interests that he had some</p> <p>25 sort of commercial/financial/shareholding, or whatever</p> <p style="text-align: center;">Page 121</p>	<p>1 you a certain impression of what had gone on. But there</p> <p>2 might have been a different impression conveyed to</p> <p>3 Peter Jones. Is that right?</p> <p>4 A. I think that's right. It looks to me as if Brian was</p> <p>5 there, gave us a resume of his understanding of what had</p> <p>6 proceeded, and it didn't quite tally with the resume</p> <p>7 that Peter Jones had given of the same meeting.</p> <p>8 Q. Could I ask you just a couple of very general questions</p> <p>9 to finish off.</p> <p>10 Did you, in your time in Edinburgh, speak regularly</p> <p>11 with haemophilia centre directors about your views on</p> <p>12 matters of the day, including issues relating to the</p> <p>13 possible infectivity or infection which could be</p> <p>14 transmitted through blood products?</p> <p>15 A. I think my only contact with the UK haemophilia</p> <p>16 directors were at that three or four meetings of the UK</p> <p>17 centre directors in that period of time, and that one</p> <p>18 telephone call with Peter. There would have been</p> <p>19 meetings of the British Society for Haematology, at</p> <p>20 which I also may have met them, but it was not on</p> <p>21 anything like a regular basis.</p> <p>22 Q. What about with Dr Ludlam? Would you regularly discuss</p> <p>23 issues about risks of infection with him at this time?</p> <p>24 A. "Regularly" implies that there was a predictable date at</p> <p>25 which we would meet. I think our relationship was often</p> <p style="text-align: center;">Page 123</p>
<p>1 interest, in those commercial companies. I think it's</p> <p>2 a clinical interest.</p> <p>3 Q. Okay, thank you. Could I just ask you about the final</p> <p>4 paragraph there. I don't think we have actually read</p> <p>5 this bit out:</p> <p>6 "He also seems to have picked up a somewhat</p> <p>7 different picture of the Cambridge Travenol meeting than</p> <p>8 that which you gave to us. I think it is probably</p> <p>9 a question of his ears being attuned to only part of the</p> <p>10 message which Anne Collins would have given him.</p> <p>11 However, I think it has been useful that we, as</p> <p>12 transfusionists, do interact with the haemophilia</p> <p>13 treating doctors, and certainly I think Arthur's letter</p> <p>14 is not unreasonable."</p> <p>15 Could you just, to the best of your ability, tell me</p> <p>16 what you were talking about when you referred to the</p> <p>17 Cambridge Travenol?</p> <p>18 A. I am afraid I can't. I can't recollect now what that</p> <p>19 Cambridge Travenol meeting was, and anyway I wasn't</p> <p>20 there. I think it was Brian who was there and then</p> <p>21 Brian would have transmitted his impressions of that</p> <p>22 back to us, which apparently differed from the message</p> <p>23 I had from Peter.</p> <p>24 Q. It certainly suggests from the words "that which you</p> <p>25 gave to us", that Brian was there because he had given</p> <p style="text-align: center;">Page 122</p>	<p>1 less formal than that. So --</p> <p>2 Q. I didn't mean to suggest any formality. I was wanting</p> <p>3 to know how often --</p> <p>4 A. We saw each other perhaps three or four times a week but</p> <p>5 we probably didn't actually talk about the haemophilic</p> <p>6 problems as frequently as that. Christopher was in the</p> <p>7 department next door. We didn't often need to actually</p> <p>8 have a specific date but there were these occasions in</p> <p>9 1982 in particular when we were addressing the situation</p> <p>10 about the right balance of supply, which were</p> <p>11 specifically recorded. We had more meetings than that</p> <p>12 that probably were not often recorded, of which there is</p> <p>13 no extant record. It wasn't just those meetings. They</p> <p>14 were on a more frequent basis. How regular they were</p> <p>15 and how long they went on for, I can't remember.</p> <p>16 Q. I understand. What was your opinion about the risk of</p> <p>17 HIV transmission through blood and blood products in the</p> <p>18 spring of 1983?</p> <p>19 A. Spring of 1980 ...?</p> <p>20 Q. 3.</p> <p>21 A. 3.</p> <p>22 Q. Roughly about the time that you wrote the memorandum we</p> <p>23 were just looking at to Dr McClelland.</p> <p>24 A. My opinion was not mine, it was one that was as a result</p> <p>25 of discussion with other transfusion doctors and with</p> <p style="text-align: center;">Page 124</p>

31 (Pages 121 to 124)

<p>1 Brian and with whoever else, other clinicians around.</p> <p>2 My recollection is that I felt there was sufficient</p> <p>3 grounds to be concerned about the possibility of</p> <p>4 transmission of whatever causative agent was.</p> <p>5 Q. Can I just put one quotation from the evidence we had</p> <p>6 from Dr Mark Winter whom you will no doubt know.</p> <p>7 A. Thank you, yes.</p> <p>8 Q. Just to get your reaction as to whether you agree with</p> <p>9 this proposition or not. This is just for the record</p> <p>10 from his evidence on day 16 of the hearings.</p> <p>11 It's page 34 at line 8 under a reference to a document</p> <p>12 dated March 1983. He said:</p> <p>13 "I think by that stage, all haemophilia clinicians</p> <p>14 were signed up to the infectious theory because of the</p> <p>15 evidence of the San Francisco child. There was no other</p> <p>16 construction you could put on that evidence. So I think</p> <p>17 these minutes are just reflecting -- they are setting</p> <p>18 out the other theories and discounting them because of</p> <p>19 the new haemophilia data."</p> <p>20 A. Sorry, I did read Mark Winter's -- it is not on the</p> <p>21 screen.</p> <p>22 Q. His proposition, I think if I can summarise it, was that</p> <p>23 in March 1983, all haemophilia clinicians had signed up</p> <p>24 to the theory that HIV was a virus and that it was</p> <p>25 transmissible through blood. Would you agree with that</p> <p style="text-align: center;">Page 125</p>	<p>1 regions, yes.</p> <p>2 Q. But was there any failure to cooperate if cooperation</p> <p>3 was required?</p> <p>4 A. Well, thankfully I was not the director of the Southeast</p> <p>5 Scotland region. I was just one of the consultants. So</p> <p>6 to some extent I was protected from the negotiations or</p> <p>7 whatever or the relationships that were being exercised</p> <p>8 at a higher level.</p> <p>9 So I'm not really very competent at making any</p> <p>10 observations. But let's face it, we are all aware that</p> <p>11 in any greater society there will be pockets of local</p> <p>12 loyalty that result in occasional rivalries or even</p> <p>13 differences. So it would not be surprising that in each</p> <p>14 of the five regions, that were of very disparate sizes</p> <p>15 in Scotland, there would be a difference of emphasis, a</p> <p>16 difference much attitude.</p> <p>17 If I can come specifically to Glasgow. Glasgow did</p> <p>18 have a very interesting practice of freeze-drying their</p> <p>19 own cryoprecipitate, and I think this practice extended</p> <p>20 until the early 1980s, and when that plant was closed</p> <p>21 down on the grounds of the Medicines Inspectorate's</p> <p>22 opinion, I think that was a blow to the Glasgow pride.</p> <p>23 So I think in the context of what one region could do</p> <p>24 and what other regions could do, there was always</p> <p>25 a tension.</p> <p style="text-align: center;">Page 127</p>
<p>1 proposition? I know that at that time you might not be</p> <p>2 described as a haemophilia clinician but obviously you</p> <p>3 had been, and would you include yourself within that</p> <p>4 category at that time?</p> <p>5 A. The answer to that is yes. What I cannot say is how</p> <p>6 valid the word "all" is.</p> <p>7 Q. But you would have associated yourself --</p> <p>8 A. Yes, I would have been of that opinion, yes.</p> <p>9 Q. Thank you, sir.</p> <p>10 Thank you, Dr Boulton.</p> <p>11 THE CHAIRMAN: Mr Anderson?</p> <p>12 Questions by MR ANDERSON</p> <p>13 MR ANDERSON: Yes, thank you.</p> <p>14 Dr Boulton, good afternoon to you. You will be</p> <p>15 relieved to hear I only have one or two questions for</p> <p>16 you.</p> <p>17 A. Thank you.</p> <p>18 Q. Dr Boulton, the chairman used the phrase:</p> <p>19 "'insularity', otherwise called autonomy of</p> <p>20 different regions."</p> <p>21 If -- and it may be a very big if -- insularity</p> <p>22 suggests that one region didn't know what the other was</p> <p>23 doing or wasn't cooperating with another region, would</p> <p>24 that be an apt description, do you think?</p> <p>25 A. We didn't always know what was going on in other</p> <p style="text-align: center;">Page 126</p>	<p>1 Q. I was thinking more of the ability of one region perhaps</p> <p>2 to help another region out. We have seen an example</p> <p>3 this morning already of Inverness, for example, sending</p> <p>4 supplies to Edinburgh?</p> <p>5 A. I have no doubt that if one region approached another</p> <p>6 region for help and gave a sound reason for that</p> <p>7 request, the help would be forthcoming with very little</p> <p>8 difficulty.</p> <p>9 Q. Thank you, Dr Boulton.</p> <p>10 I think you have talked about one of your officers</p> <p>11 phoning round various regions. Do you know if that</p> <p>12 happened often or is that a relatively isolated</p> <p>13 incident?</p> <p>14 A. I don't think it happened very often but that phoning</p> <p>15 around story that I gave earlier is one that I can</p> <p>16 recollect in that it happened, but in terms of</p> <p>17 frequency, I can't say. Again, to a large extent</p> <p>18 I wouldn't necessarily have been involved in that.</p> <p>19 Q. On a separate matter, Dr Boulton, counsel to the Inquiry</p> <p>20 took you through some correspondence, not long after</p> <p>21 your arrival in Edinburgh. Can we look at one document</p> <p>22 that you weren't referred to, please? It's</p> <p>23 [SNB0073264]. You are not a party to this letter. It</p> <p>24 is a letter, I think, from Dr Cash to John Watt. Have</p> <p>25 you seen this letter before? Take time to read it.</p> <p style="text-align: center;">Page 128</p>

<p>1 (Pause)</p> <p>2 It appears, you will see in the second paragraph, to</p> <p>3 make reference to the pro rata meeting. Do you recall</p> <p>4 if you were at that meeting?</p> <p>5 A. No, I can't recall.</p> <p>6 Q. Can you help us with what "pro rata meeting" means with</p> <p>7 reference to the final paragraph on that page, the</p> <p>8 question of reintroducing pro rata.</p> <p>9 A. I would imagine that it means that if we gave</p> <p>10 4,000 litres to PFC, if the Edinburgh and Southeast</p> <p>11 regional centre gave 4,000 litres of plasma to PFC, the</p> <p>12 Edinburgh haemophilia centre would get 4,000 litres'</p> <p>13 worth of Factor VIII.</p> <p>14 Q. You will see in the final paragraph it says:</p> <p>15 "What I would like to explore with you is whether we</p> <p>16 should reconsider the matter of reintroducing pro rata</p> <p>17 as soon as possible, rather than sitting on a stock</p> <p>18 which could prevent certain patients in the SE being</p> <p>19 exposed to commercial concentrate."</p> <p>20 Again, one gets a flavour of the preference,</p> <p>21 I think, for NHS product. Is that right?</p> <p>22 A. I would imagine so. I was relatively remote from this</p> <p>23 particular level of discussion, I think.</p> <p>24 Q. All right. Pro rata has nothing to do, does it, with</p> <p>25 allocation being based on head of population? Or do you</p> <p style="text-align: center;">Page 129</p>	<p>1 to hopefully finish his evidence on this topic today.</p> <p>2 So could I ask for Dr Dow to come to the stand.</p> <p>3 DR BRIAN DOW (continued)</p> <p>4 Questions by MR MACKENZIE (continued)</p> <p>5 MR MACKENZIE: Dr Dow, welcome back. Sorry to keep you</p> <p>6 waiting. We are returning to your evidence on the topic</p> <p>7 C1, being the acceptance of blood from higher risk</p> <p>8 donors; in particular (a), prisoners and (b), those with</p> <p>9 a history of jaundice.</p> <p>10 We had largely completed your evidence on the</p> <p>11 question of prisoners. I would like to just deal with</p> <p>12 one or two things before we move on. Firstly, there</p> <p>13 were two matters you wished to clarify firstly, from</p> <p>14 your own evidence on 18 March this year. So if we could</p> <p>15 please have the transcript for your evidence on 18 March</p> <p>16 at page 118.</p> <p>17 We see in line 24 and 25, on page 118, we then went</p> <p>18 to a document [SGF0012836]. Go on to the next page of</p> <p>19 the transcript, please. There is a letter from</p> <p>20 Dr Wallace, dated 26 June 1976. It was a letter from</p> <p>21 Dr Wallace to Dr McIntyre in the SHHD. I don't think we</p> <p>22 need to bring the letter back up but in short, I think</p> <p>23 Dr Wallace was providing Dr McIntyre with the results of</p> <p>24 his comparison between the RIA test and the RPHA test to</p> <p>25 make the case for funding to continue testing by RIA.</p> <p style="text-align: center;">Page 131</p>
<p>1 not recall?</p> <p>2 A. I think the pro rata was on plasma but I may be wrong.</p> <p>3 THE CHAIRMAN: It is quite difficult, I think, on the</p> <p>4 documents to sort out exactly where one was at any one</p> <p>5 time, but I have seen population as a reference. I have</p> <p>6 seen contributions of FFP and I have seen variations on</p> <p>7 it. It's not easy to be sure.</p> <p>8 MR ANDERSON: I think, conveniently, we are going to have</p> <p>9 the author tomorrow. So we can ask him.</p> <p>10 THE CHAIRMAN: If that is as hopeful as you suggest, I would</p> <p>11 be delighted.</p> <p>12 MR ANDERSON: Very well, thank you very much, Dr Boulton.</p> <p>13 A. I would like to know the answer to that question, as</p> <p>14 well.</p> <p>15 THE CHAIRMAN: Mr Sheldon?</p> <p>16 MR SHELDON: I have no questions for Dr Boulton. Thank you,</p> <p>17 sir.</p> <p>18 THE CHAIRMAN: I can't undertake to make sure that you will</p> <p>19 get to know but perhaps Professor Ludlam will tell you</p> <p>20 if he hears it.</p> <p>21 MS PATRICK: I think we are continuing with the B2 topic</p> <p>22 tomorrow and we are moving on to the C1 topic just now.</p> <p>23 THE CHAIRMAN: Yes.</p> <p>24 MR MACKENZIE: Sir, good afternoon.</p> <p>25 We return to the topic of C1. Dr Dow has returned</p> <p style="text-align: center;">Page 130</p>	<p>1 Is that correct, doctor?</p> <p>2 A. Yes, what happened prior to this, they had been testing</p> <p>3 with CIAP for five years and on August 1975, they had</p> <p>4 started using RIA and this was nine months into that</p> <p>5 period of using RIA. They then asked for more money to</p> <p>6 continue testing with RIA.</p> <p>7 Q. We covered all of that last time. So we don't have to</p> <p>8 go back to that. If we can scroll down through the</p> <p>9 transcript, please, and stop there and look at the sixth</p> <p>10 line down from the figures you had seen on screen. When</p> <p>11 you gave your evidence you gave an answer that:</p> <p>12 "Using these figures, [you] would have to actually</p> <p>13 say that the IEOP technique was roughly about 35 to</p> <p>14 40 per cent sensitive as opposed to the 60 per cent</p> <p>15 I had estimated."</p> <p>16 I think you explained to me today that you had since</p> <p>17 had a chance to read the whole letter and look at all of</p> <p>18 the numbers.</p> <p>19 A. Yes.</p> <p>20 Q. And you had wished to clarify your answer from lines 6</p> <p>21 to 8. What's the clarification you would like to make?</p> <p>22 A. Well, the clarification is that the data in the letter</p> <p>23 is skewed and all you could look at is the new donors</p> <p>24 within that data to do a comparison of the various</p> <p>25 tests. Because obviously, five years' use of</p> <p style="text-align: center;">Page 132</p>

33 (Pages 129 to 132)

<p>1 counterimmunoelectrophoresis, we were obviously missing 2 samples that would have been detected by RIA, and these 3 regular donors kept coming back and were detected by RIA 4 within the first nine months.</p> <p>5 So you can only look at the new donors there. And 6 the new donors, 13 were detected out of the 22 by 7 counterimmunoelectrophoresis, and that's roughly 8 equivalent to about 60 per cent. So really I can't 9 actually agree with -- the way the data was presented to 10 me, obviously it appeared that there was 35 to 11 40 per cent but the data is skewed and it should really 12 be 60 per cent.</p> <p>13 Q. So having had a chance to read the whole letter, your 14 evidence is that the sensitivity of the IEP technique 15 based on the figures in that letter would be about 16 60 per cent?</p> <p>17 A. Yes.</p> <p>18 Q. I'm grateful.</p> <p>19 The second matter for clarification, Dr Dow, I think 20 you wished to make arose from the evidence of 21 Dr McClelland, given on 22 March of this year at 22 page 69. And if we could go to line 7, please, I asked 23 Dr McClelland a question about the English findings of 24 the higher incidence of Hepatitis B among prisoners and 25 in line 11, Dr McClelland said:</p> <p style="text-align: center;">Page 133</p>	<p>1 was done probably about 18 months ago. The data on 1970 2 to 1980 was already published within one of the 3 publications from the West of Scotland.</p> <p>4 Q. I understand. I think those were the only two matters 5 you wished to clarify, Dr Dow. Is that correct?</p> <p>6 A. Yes, really a point about these new donors I found was 7 that when we look at the higher risk in 8 institutionalised donors, which we have been going on 9 about, five types the normal level, that's based on new 10 donors. Obviously when you take prison donors as 11 a whole, the risk is a lot less than what we were 12 obviously going on about. It's not five times.</p> <p>13 Q. Yes. No doubt, when we come back to read these reports 14 again, we can bear all these points in mind.</p> <p>15 A. Yes, thanks.</p> <p>16 Q. Thank you. Moving on, please.</p> <p>17 THE CHAIRMAN: I'm not quite sure I follow the explanation. 18 I think that I had noticed that so far as new donors 19 were concerned, it was five times.</p> <p>20 A. Yes.</p> <p>21 THE CHAIRMAN: But the point you make here, that if you take 22 the totality of prison donors into account, the risk is 23 a lot less than 5 times, I'm not quite sure I understand 24 why that should be.</p> <p>25 A. Because the regular donors in prisons have already been</p> <p style="text-align: center;">Page 135</p>
<p>1 "It is possibly just worth mentioning that one 2 contributory reason for that is almost certainly the 3 fact that almost all the donors in prisons will be first 4 time donors. As opposed to donors from the community." 5 Et cetera. I think you wished to clarify something 6 in that regard in respect of the west coast of Scotland?</p> <p>7 A. Yes, I can't obviously comment on Dr McClelland's 8 experience in Southeast Scotland but certainly in the 9 West of Scotland the number of new donors in prisons 10 would be round about 20 per cent.</p> <p>11 Q. How are you aware of that, Dr Dow?</p> <p>12 A. I'm aware of that because I did a trawl of all the 13 prison donations between 1982 and 1984 and in that 14 period there was 5,700 donations taken in West of 15 Scotland prisons, and in a similar period from 1970 to 16 1980 there were about 10,000 new donors only from 17 institutions, which is prisons. So taking these 18 figures, 5,700, total donations in two years, multiplies 19 up to something like 25/26,000 in ten years, and taking 20 the figures for new donors, which is already published, 21 at being roughly 10,000 you are talking about roughly 22 20 per cent.</p> <p>23 Q. Is that an exercise you have carried out recently or 24 carried out a number of years back?</p> <p>25 A. Well, the trawl one, the donors between 1982 and 1984</p> <p style="text-align: center;">Page 134</p>	<p>1 screened for Hepatitis B on a regular basis.</p> <p>2 THE CHAIRMAN: Right.</p> <p>3 A. So really they could have given outside prison and then 4 gone into prison to give their next donation.</p> <p>5 THE CHAIRMAN: But one way or another, so far as return 6 donors are concerned, in or out of prison, there is 7 a prior screening test.</p> <p>8 A. That's right. The return donors are obviously cleaner 9 than new donors.</p> <p>10 THE CHAIRMAN: I think that satisfies me.</p> <p>11 MR MACKENZIE: I'm grateful, sir. Certainly, as ever, when 12 we read the literature again, we have to compare like 13 with like.</p> <p>14 THE CHAIRMAN: So far as Dr McClelland's qualification is 15 concerned, it rather assumes that people only go into 16 prison once and give a donation early on, whereas you 17 probably have a different experience.</p> <p>18 A. I don't know what sort it is: whether they go in there 19 and don't come out.</p> <p>20 THE CHAIRMAN: You have got a lot of return donors for 21 different reasons.</p> <p>22 A. Yes.</p> <p>23 MR MACKENZIE: Dr Dow, moving on, you had referred --</p> <p>24 THE CHAIRMAN: Sorry, yes. Just trying to make sure that 25 Professor James and I are on the same wavelength about</p> <p style="text-align: center;">Page 136</p>

<p>1 this.</p> <p>2 MR MACKENZIE: Dr Dow, moving on, you had mentioned last</p> <p>3 time around of becoming aware in March 1984 of the</p> <p>4 problem of drug use in prisons through reading</p> <p>5 a newspaper article. That was referenced in your PhD</p> <p>6 thesis and I think we have managed to track that down.</p> <p>7 Could we have, please, document [PEN0160456]. It may be</p> <p>8 this hasn't found its way to court book yet but that's</p> <p>9 not a problem, we can put it in, but perhaps I can read</p> <p>10 it out to you to see if it sounds familiar. It is</p> <p>11 headed, "Drug Boom in Prisons", and it's present in the</p> <p>12 Sunday Post. It states:</p> <p>13 "Scotland's prisons are fast becoming the country's</p> <p>14 largest drug centres. In the last ten years, there has</p> <p>15 been a 30-fold increase in the number of addicts</p> <p>16 becoming inmates. In 1973 only six people were</p> <p>17 diagnosed as dependent on drugs on admission to prison.</p> <p>18 The total for last year is expected to pass the 300</p> <p>19 mark. That's about 6 per cent of the prison</p> <p>20 population."</p> <p>21 Et cetera. I appreciate you are at the disadvantage</p> <p>22 of not having a copy of the text in front of you. In</p> <p>23 fact I can just hand you a copy. That may short circuit</p> <p>24 things. (Handed)</p> <p>25 THE CHAIRMAN: Mr Di Rollo, the Control of Drugs Act was</p> <p style="text-align: center;">Page 137</p>	<p>1 A. Not the Sunday Post, even The Telegraph or something</p> <p>2 like that, but probably the same story regardless, and</p> <p>3 I would agree with what's actually carried within it.</p> <p>4 It was certainly news to me at the time.</p> <p>5 Q. That was the date, March 1984?</p> <p>6 A. Yes, it was a Sunday, obviously.</p> <p>7 Q. Yes. Moving on to a separate paper again. This is</p> <p>8 [PEN0020582]. This would be a familiar paper to you,</p> <p>9 doctor, I think you were a co-author, "The prevalence</p> <p>10 and epidemiological characteristics of Hepatitis C in</p> <p>11 Scottish blood donors". I think in short, once testing</p> <p>12 for Hepatitis C of blood donors was introduced in,</p> <p>13 I think, September 1991, this paper reports on the</p> <p>14 results of the first six months of testing. Is that</p> <p>15 right?</p> <p>16 A. That's correct, yes.</p> <p>17 Q. I think we can see from this summary in the second</p> <p>18 paragraph commencing:</p> <p>19 "In the period under study between September 1991</p> <p>20 and February 1992, 180,658 blood donors attended. The</p> <p>21 prevalence of HCV infection was 0.088 per cent ..."</p> <p>22 Which is roughly 1 in 1,000.</p> <p>23 A. Yes.</p> <p>24 Q. The paper is also perhaps interesting, if we go over the</p> <p>25 page, please, looking at the risk factors of those</p> <p style="text-align: center;">Page 139</p>
<p>1 1972, was it?</p> <p>2 MR DI ROLLO: My recollection was it was 1971, I have to</p> <p>3 say. Misuse of Drugs Act.</p> <p>4 THE CHAIRMAN: 1971. I think we have to be conscious that</p> <p>5 drug testing might not have had a long history before</p> <p>6 the early 1970s.</p> <p>7 A. I don't think that's quite the same one as I remember</p> <p>8 but ...</p> <p>9 MR MACKENZIE: Unless, doctor, the Sunday Post carried two</p> <p>10 articles on that topic on that date which seems</p> <p>11 unlikely. In fact, the article actually appeared on the</p> <p>12 same page beside a photograph of a couple on their</p> <p>13 wedding day. We have actually cut that photograph out</p> <p>14 so it doesn't appear in the public court book. But if</p> <p>15 I give you the whole page of surrounding people it might</p> <p>16 help.</p> <p>17 THE CHAIRMAN: We are carrying sensitivity very far at the</p> <p>18 moment it seems to me. (Handed)</p> <p>19 A. That doesn't tally with my recollection of what was in</p> <p>20 the Sunday Post.</p> <p>21 Q. What was your recollection then, doctor?</p> <p>22 A. It was probably the same thing, it's just the style of</p> <p>23 this, it doesn't look like the Sunday Post. It looks</p> <p>24 more like a Dundee paper.</p> <p>25 THE CHAIRMAN: Is that not the Sunday Post?</p> <p style="text-align: center;">Page 138</p>	<p>1 positive donors, at page 122 under "Results". In the</p> <p>2 second paragraph we can see that 159 donors were found</p> <p>3 to be infected with HCV. Do you see that? Sorry, it's</p> <p>4 the left-hand column under "Results", the second</p> <p>5 paragraph.</p> <p>6 A. Yes.</p> <p>7 Q. 151, which is 95 per cent of these donors responded to</p> <p>8 the invitation to attend for further counselling and</p> <p>9 follow-up. 101, 68 per cent, were male and the analysis</p> <p>10 of risk behaviours that might have been relevant to</p> <p>11 transmission of HCV infection is shown in table 1. If</p> <p>12 we then go to table 1 at the top of the right-hand</p> <p>13 column, we can see the risk factors as follows:</p> <p>14 intravenous drug use, 39 per cent; other parenteral</p> <p>15 transfusion, 15.2 per cent. Then it's other parenteral</p> <p>16 exposure, 11.2 per cent. If we go down to just under</p> <p>17 the table, two lines down, we see what is meant by</p> <p>18 parenteral transmission includes tattoos, ear piercing</p> <p>19 and needle stick injuries. Do you see that?</p> <p>20 A. Yes.</p> <p>21 Q. Going back to the table just to complete it:</p> <p>22 heterosexual contact, 8.6 per cent; history of jaundice,</p> <p>23 5.9 per cent; non-UK origin, 1.9 per cent. Then down to</p> <p>24 unexplained, 29.1 per cent. We can see just below the</p> <p>25 table it's stated that some donors reported more than</p> <p style="text-align: center;">Page 140</p>

<p>1 one risk factor?</p> <p>2 A. That's correct, yes.</p> <p>3 Q. I think, doctor, at this stage, given the time, I will</p> <p>4 then, I think, move on to the second part of this topic,</p> <p>5 which is the consideration of accepting donors with</p> <p>6 a history of jaundice. So if I could please have your</p> <p>7 statement on screen, which is [WIT0030094].</p> <p>8 Sir, what I propose doing here, Dr Dow has set out</p> <p>9 in his statement quite fully various literature on this</p> <p>10 point, together with the main conclusions, and rather</p> <p>11 than have Dr Dow read or I read each paragraph, what</p> <p>12 I would intend to do, or seek to do, is simply take</p> <p>13 these paragraphs as read, provide all of the court book</p> <p>14 references, so people can cross-check the various</p> <p>15 literature and perhaps just choose two of the</p> <p>16 literature, which appear to me to, I think, provide</p> <p>17 a good summary of where things were at particular dates</p> <p>18 in terms of research into this subject. I think that</p> <p>19 may be a way of shortening things to make sure that</p> <p>20 there is an opportunity for cross-examination, while</p> <p>21 still getting the main points over.</p> <p>22 THE CHAIRMAN: Well, we will try that. But Dr Dow, you</p> <p>23 ought to be very certain of your ability to come in if</p> <p>24 it doesn't look as if you are getting your full story</p> <p>25 over.</p> <p style="text-align: center;">Page 141</p>	<p>1 parties. So we will make this available to you in the</p> <p>2 first place and you will let me know at some convenient</p> <p>3 time whether you have any advice for me. Yes?</p> <p>4 MR MACKENZIE: Thank you, sir. I have discussed my proposed</p> <p>5 approach with Dr Dow who I think is happy to proceed as</p> <p>6 I intend.</p> <p>7 So we had Dr Dow's statement and topic C1,</p> <p>8 [WIT0030094]. The subject of the history of jaundice is</p> <p>9 dealt with in paragraph 20 through to the end of the</p> <p>10 statement. What I propose doing, sir, is going through</p> <p>11 each paragraph, taking it as read but providing the</p> <p>12 court book reference for it so those reading the</p> <p>13 transcript can identify the article being referred to,</p> <p>14 and for my part, accurately summarised by Dr Dow in his</p> <p>15 statement.</p> <p>16 So in paragraph 20, the corresponding article is</p> <p>17 [PEN0020821]. Then the next reference is in</p> <p>18 paragraph 23; our reference for that article is</p> <p>19 [PEN0020850]. Then paragraph 24. Our reference for</p> <p>20 that article is [LIT0012155]. That is one of the</p> <p>21 articles I will come back to shortly with Dr Dow.</p> <p>22 Then paragraph 26. Our reference is [LIT0010430].</p> <p>23 Then paragraph 27, which I will come back to with</p> <p>24 Dr Dow. Our reference is [PEN0140067].</p> <p>25 Over the page, paragraph 28, there is a reference to</p> <p style="text-align: center;">Page 143</p>
<p>1 A. Okay.</p> <p>2 THE CHAIRMAN: We can easily mistake where we are in</p> <p>3 documents and it's your evidence I want at the end of</p> <p>4 the day. So we will stop briefly now to give the</p> <p>5 stenographer a chance to have a break.</p> <p>6 Have you shared any of this with Dr Dow?</p> <p>7 MR MACKENZIE: Any?</p> <p>8 THE CHAIRMAN: Your approach?</p> <p>9 MR MACKENZIE: No, I thought of it as the clock was ticking</p> <p>10 by and I was waiting.</p> <p>11 THE CHAIRMAN: Perhaps you could have a word with him and</p> <p>12 tell him roughly what you are going to do and that might</p> <p>13 help us get ahead.</p> <p>14 (3.17 pm)</p> <p>15 (Short break)</p> <p>16 (3.28 pm)</p> <p>17 THE CHAIRMAN: Before we start, gentlemen. Tainted Blood</p> <p>18 have sent a CD containing what they describe as two</p> <p>19 files with quite a lot of material on facts and figures.</p> <p>20 I don't want to view this first myself. What I'll do is</p> <p>21 make it available to parties with a short note on the</p> <p>22 contents and ask you for your advice after you have read</p> <p>23 it as to how I ought to handle the material.</p> <p>24 I don't want to reject any material without at least</p> <p>25 having had it seen and thought about by the interested</p> <p style="text-align: center;">Page 142</p>	<p>1 Dr Dow's PhD study. That runs to over 260 pages,</p> <p>2 unsurprisingly, and our reference is [LIT0013300]. That</p> <p>3 completes, sir, the reference to the articles.</p> <p>4 So if I may now take Dr Dow to three documents,</p> <p>5 which I think capture the thinking of the Blood</p> <p>6 Transfusion Service at the time, and Dr Dow can no doubt</p> <p>7 disagree with me if that's wrong.</p> <p>8 The first article is [LIT0012155]. From the top of</p> <p>9 the left-hand column we can see this is a letter in the</p> <p>10 Lancet of 21 July 1979, headed "Blood Donors with</p> <p>11 History of Jaundice". If we scroll, please, to the</p> <p>12 bottom of the left-hand column, we can see the authors</p> <p>13 were Dr Crawford and also yourself, Dr Dow, as well, as</p> <p>14 a co-author.</p> <p>15 A. Yes, correct.</p> <p>16 Q. Can you summarise for us, doctor, what was involved in</p> <p>17 this study?</p> <p>18 A. Really it was a look at the Hepatitis B surface antigen</p> <p>19 status of ordinary donors against donors with a history</p> <p>20 of jaundice. It really was a comparison of the two</p> <p>21 groups. It really just showed that there was really no</p> <p>22 difference between the two, which is what John Wallace</p> <p>23 actually said a few years earlier in another</p> <p>24 publication.</p> <p>25 Q. If we go to the final paragraph, please, we can see it's</p> <p style="text-align: center;">Page 144</p>

36 (Pages 141 to 144)

<p>1 stated: 2 "We conclude from these results that a history of 3 jaundice does not materially increase the prevalence of 4 Hepatitis B surface antigen among blood donors and is 5 likely to imply previous infection with Hepatitis A 6 virus rather than with Hepatitis B virus." 7 You can put that to one side, please. 8 THE CHAIRMAN: Just before you go, there is no reference 9 here, is there, to NANB hepatitis? 10 A. No, not at that time. 11 THE CHAIRMAN: So that would be another factor, if you were 12 doing it retrospectively et cetera, that you might be 13 looking at now? 14 A. Now, yes. 15 THE CHAIRMAN: Yes. 16 A. But at that time, non-A non-B was just coming to my mind 17 at that particular time. 18 THE CHAIRMAN: The point of the last paragraph is that HAV 19 is likely to have gone or what? 20 A. Say again? 21 THE CHAIRMAN: There has been a transient jaundice 22 experience at some time and then -- 23 A. Well, Hepatitis A is not really that important so far as 24 post-transfusion hepatitis goes because the Hepatitis A 25 carriage doesn't happen. It's an acute infection. Page 145</p>	<p>1 positive donor among those with a history of jaundice 2 was a drug addict ... Of the 36 donors who were 3 followed up, 16 gave a history strongly suggestive of 4 viral hepatitis, but in only six was it possible to 5 obtain the results of HBsAg testing at the time of 6 illness: all were negative. These findings show that in 7 this community, a history of jaundice does not define 8 a group with a high prevalence of HBsAg carriage." 9 Then the right-hand column, please, to the 10 conclusion. The authors state: 11 "We conclude that in the donor population of 12 Southeast Scotland, a history of jaundice is not 13 associated with an increased risk of HBsAg carriage. 14 This is in agreement with findings in the West of 15 Scotland reported by Dr Follett and colleagues. The 16 prevalence of antibody to Hepatitis A in our region is 17 similar in donors with and without a history 18 of jaundice." 19 Then the last sentence: 20 "This suggests that the viruses of non-A non-B 21 hepatitis may be a significant cause of jaundice in this 22 population." 23 Doctor, do you have any comments on that final 24 sentence? 25 A. Yes, well, there are a few comments throughout that Page 147</p>
<p>1 THE CHAIRMAN: Yes. 2 MR MACKENZIE: Thank you, sir. 3 On the question of non-A non-B, doctor, it may also 4 be useful, given the point has arisen, to look, please, 5 at [LIT0010429]. 6 We can see from the top of the right-hand column 7 this is a letter in the Lancet of 15 March 1980. Again, 8 it's on the topic of blood donors with a history of 9 jaundice. This is from the Edinburgh transfusionists, 10 in particular Dr Hopkins and colleagues. Is that right? 11 A. That's correct, yes. 12 Q. I think this reports a similar study. We can see from 13 the start of the letter: 14 "Sir, -- The former policy of the Scottish Blood 15 Transfusion Service was to reject as donors all persons 16 admitting a history of jaundice. Lately this policy has 17 been modified to exclude only would be donors with 18 a history of jaundice within the previous 12 months: 19 Donations are now accepted from most persons with 20 a history of jaundice, provided they are HBsAg negative 21 upon routine testing." 22 A little further down in the left-hand column: 23 "HBsAg was detected in 12 new blood donors -- one 24 out of the 792 with a history of jaundice plus 18 out of 25 the 8467 with no such history. The single HBsAg Page 146</p>	<p>1 little letter -- that I couldn't actually get to grips 2 with the mathematics in the second paragraph, I think it 3 was. 4 Just scroll down a bit. The third paragraph: 5 "HBsAg was detected in 12 new donors. One out of 6 the 792 with a history of jaundice, plus 18 out of 8467 7 ..." 8 I don't know what's wrong there but that should 9 either be 11 or the 12 new donors -- the 12 might be 19, 10 I don't know. 11 THE CHAIRMAN: I wondered if it was just bad punctuation. 12 A. Certainly the figures don't fit. 13 THE CHAIRMAN: They don't fit. 14 A. Then going back to the Hepatitis A prevalence in the 15 history of jaundice donors and normal donors that came 16 out roughly the same within this particular study, but 17 there is a study also by Dr Follett, Barr, Crawford and 18 Mitchell, which is [LIT0010430], the one after this one, 19 which actually gave the history of jaundice and normal 20 donor Hepatitis A levels for the West of Scotland, and 21 they were dramatically different. 22 MR MACKENZIE: What I'm interested in is the final sentence: 23 "This suggests that the viruses of non-A non-B 24 hepatitis may be a significant cause of jaundice in this 25 population." Page 148</p>

<p>1 A. That was based on that Hep A prevalence being similar in 2 history of jaundice donors and normal donors, 84 and 3 78 per cent. What I'm saying is, the West of Scotland 4 data on Hepatitis A prevalence in these two groups show 5 a lot higher level in those with a history of jaundice. 6 Q. From looking at the report of the study in this letter, 7 do you consider the authors had a sufficient evidential 8 basis for what they state in the last sentence? 9 A. I don't know how many they actually tested. They just 10 have: 11 "The prevalence of antibody to Hepatitis A ... is 12 similar in donors with and without ..." 13 We need to actually know the figures. I know 14 that Bob Hopkins at one point used to write papers based 15 on 100, whereas the West of Scotland, we tried to have 16 significant numbers like 1,000 or 2,000. 17 Q. In terms of looking at the Edinburgh data, as reported 18 in this letter, do you considered Edinburgh data 19 supports or establishes what is said in the final 20 sentence or do you consider the final sentence as more 21 in the way of speculation, albeit perhaps informed 22 speculation? 23 A. Purely speculation. Again, because we have contrary 24 evidence in the West about the Hepatitis A prevalence. 25 Q. Did you read this letter at the time, do you remember? Page 149</p>	<p>1 The next paper, doctor, is [PEN0140067]. Again, I'm 2 sticking with the consideration given in the Blood 3 Transfusion Service to the question of blood donors with 4 a history of jaundice, and we can see this from the top 5 of the page, a letter in the British Medical Journal of 6 23 October 1982. Again, we can see the title of the 7 letter if we scroll down a little, "Blood Donors: the 8 History of Jaundice", and if we go to the far right-hand 9 column, please, we can see the authors come again from 10 Glasgow, Dr Barr and others including yourself, Dr Dow. 11 A. Correct. 12 Q. Then going back, please, to the start of the letter, 13 I think it is worth reading all of this letter to give 14 a flavour for the work, a consideration on this topic at 15 the time. This letter states: 16 "The leading article from Dr P M Jones ..." 17 Who was Dr Jones? 18 A. I think he was Newcastle but I'm not very sure. He 19 certainly was south of the border. 20 Q. Involved in transfusion, perhaps? 21 A. Yes. 22 Q. "... reopens the question --" 23 THE CHAIRMAN: Is this possibly Peter Jones? 24 A. Yes. 25 MR MACKENZIE: It might be sir, yes. Yes, I'm grateful: Page 151</p>
<p>1 A. I remember reading it at the time and obviously 2 dismissed it because our data did not fit. 3 Q. It depends which data one looks at. 4 A. I'm blinkered. 5 Q. Even putting the West of Scotland data to one side and 6 only looking at the Edinburgh data, as reported in this 7 letter, does that data establish or prove what is stated 8 in the final sentence? 9 A. I think it indicates that potentially non-A non-B 10 hepatitis could explain what they found. By having only 11 84 per cent of those with a history of jaundice having 12 Hepatitis A antibody and 78 per cent of normal donors. 13 Q. To be fair to the authors, they do say: 14 "This suggests that the viruses of non-A non-B 15 hepatitis may ..." 16 So they don't, I think, present it as the data 17 having establish that, they simply offer that -- 18 A. They offer that as a possible explanation. 19 Q. In any event, you would say one has to have regard to 20 all of the data not just that from one study? 21 A. Yes. You don't believe one set of data from one group 22 of individuals. You continued to look around and have 23 an independent corroboration of that data before you 24 consider it as read. 25 Q. Yes. Thank you. Page 150</p>	<p>1 " ... reopens the question of whether blood from 2 donors with a stated history of jaundice is safe for 3 transfusion." 4 I suppose we would have to see the content of the 5 letter from Dr Jones, but it may be of interest in 6 itself that at this time, October 1982, Dr Jones had 7 written an article about the question of donors with 8 a history of jaundice. 9 Reverting to the letter: 10 "In an earlier study from the West of Scotland, we 11 found that these donors were much more likely to have 12 had an infection with Hepatitis A virus than with 13 Hepatitis B virus. In addition, we found that a history 14 of jaundice was no more common among carriers of 15 Hepatitis B surface antigen and hence was of little use 16 as a marker of Hepatitis B infectivity. A history of 17 jaundice is obtained from 2.8 per cent of blood donors 18 in the West of Scotland." 19 Then the letter goes on to report on the current 20 study: 21 "We have now studied a group of donors according to 22 the age at which the jaundice occurred. Almost all the 23 episodes of jaundice occurring before the age of 24 13 years were due to Hepatitis A but about 20 per cent 25 of those with jaundice in adolescence or later had no Page 152</p>

38 (Pages 149 to 152)

<p>1 markers for Hepatitis A or B. Other viruses can cause 2 jaundice ..."</p> <p>3 They are set out: 4 "... and many other agents can cause liver problems. 5 We cannot therefore equate unexplained jaundice with 6 infection by the elusive non-A non-B viruses."</p> <p>7 Is that perhaps, to pause, doctor, a rejoinder or 8 response to the last sentence of the letter by the 9 Edinburgh authors we looked at shortly previously?</p> <p>10 A. No, I think it was a response to Dr Jones' letter at the 11 time. That was really what this was about.</p> <p>12 Q. Yes, but could that equally be a response to the 13 Edinburgh letter we looked at shortly?</p> <p>14 A. I think the Edinburgh letter was in the Lancet, whereas 15 this is in the British Medical Journal. So you are 16 responding to whatever is in a particular journal.</p> <p>17 Q. Yes, I understand. Reverting to this letter: 18 "We cannot therefore equated unexplained jaundice 19 with infection by the elusive non-A non-B viruses. 20 Indeed, it is uncertain whether sporadic non-A non-B 21 hepatitis is caused by the same agent as the form of the 22 disease transmitted by transfusion, and it is not known 23 how often a carrier state follows sporadic infection. 24 Furthermore, it is possible that as with Hepatitis B, 25 clinical jaundice may be an indicator of elimination of Page 153</p>	<p>1 excluding blood donors with a history of jaundice?</p> <p>2 A. I felt there was no case to actually exclude these 3 individuals at that time, based on the data we actually 4 showed there: that the history of jaundice was mainly 5 due to Hepatitis A. I took then those whose history of 6 jaundice was before the age of 12.</p> <p>7 Q. Yes. What consideration was given to non-A non-B 8 hepatitis, and in particular whether or how many, if 9 any, donors carrying non-A non-B hepatitis could be 10 excluded if all donors with a history of jaundice were 11 excluded?</p> <p>12 A. If we excluded all the donors with a history of 13 jaundice, I don't think we would have excluded many with 14 Hepatitis C. They were a very small number.</p> <p>15 Q. Why do you say that?</p> <p>16 A. Again, because Hepatitis C, as we knew later on, tended 17 to have only moderately high levels of ALT. Most of 18 them didn't actually become jaundiced as such. They 19 would have high levels of ALT but it didn't become 20 icteric, as was the case of people with Hepatitis A or 21 Hepatitis B. Indeed, the likes of cytomegalovirus and 22 Epstein Barr virus that was mentioned in that letter, we 23 did a trawl of the SCIEH database at that time and they 24 actually showed the various symptoms for these viruses, 25 and 5 per cent roughly of people that were found to have Page 155</p>
<p>1 virus rather than carriage." 2 It goes on in the middle, half way through the 3 middle column: 4 "In the last three years, this region has transfused 5 nearly 400,000 donations of blood and their derivatives. 6 Only 12 cases of overt post-transfusion hepatitis 7 possibly attributable to non-A non-B agents have been 8 identified and of these, four were haemophiliacs who had 9 been receiving imported blood products in addition to 10 Scottish large pool factor concentrate. None of the 11 donors involved in the eight cases associated with red 12 cell transfusion had given a history of jaundice and 13 these cases could not have been prevented by the policy 14 proposed by Dr Jones." 15 Then the right-hand column: 16 "As the sensitivity and specificity of serological 17 tests for non-A non-B carriers have yet to be proved, we 18 could find ourselves excluding 2.8 per cent of donors 19 because of a history of jaundice ... the present British 20 policy appears to be correct and any change could cause 21 a serious loss of blood products when some regions are 22 still struggling to make 80 per cent of the blood plasma 23 they collect available for Factor VIII production." 24 In short, doctor, do you consider the case had been 25 made out on scientific grounds at that time for Page 154</p>	<p>1 infection with Epstein Barr virus or cytomegalovirus 2 presented with jaundice.</p> <p>3 Q. One final document I would like to take you to, please, 4 doctor, is [SNF0011109]. We can see, doctor, this 5 document is headed, "Surrogate tests for non-A non-B 6 hepatitis: a special report to regional transfusion 7 directors", by yourself, dated May 1986. Do you 8 remember writing this report, doctor?</p> <p>9 A. Yes, I was prompted to write it by Dr Mitchell. 10 I didn't actually attend the meeting when it was 11 discussed. It was just a report I had to furnish for 12 discussion purposes.</p> <p>13 Q. Do you remember why you were prompted to write it?</p> <p>14 A. I think it was topical at the time and it needed to be 15 discussed, all the things within it.</p> <p>16 Q. I think you had just completed a PhD --</p> <p>17 A. Yes.</p> <p>18 Q. On the question of surrogate testing for non-A non-B 19 hepatitis.</p> <p>20 A. That's correct.</p> <p>21 Q. I think in this report, if we look about half way down 22 we can see history of jaundice in the USA: 23 "Individuals with a history of prior jaundice are 24 excluded because of the possibility of their jaundice 25 episode being due to non-A non-B and subsequently Page 156</p>

<p>1 becoming chronic carriers of non-A non-B agent or 2 agents. Exclusion of such individuals in the 3 West of Scotland population would incur a loss of around 4 2 to 3 per cent of blood donors." 5 Over the page, please, to page 2. I think you had 6 considered in your study essentially three possible 7 surrogate markers for non-A non-B hepatitis. One was 8 donors with a history of jaundice, secondly, elevated 9 ALT levels and thirdly the presence of anti-Hepatitis B 10 core antigen? 11 A. Yes. 12 Q. Then if we look at the second paragraph: 13 "The effect of these strategies in identifying 14 implicated donors involved in NANB PTH cases." 15 I think when you speak of these strategies, you 16 refer to all three surrogate markers we have just 17 mentioned, and you say in the report: 18 "The acid test for either of these three means of 19 identifying potential non-A non-B carrier donors is to 20 examine the effect, if any, they would have in 21 identifying such donors amongst those implicated in 22 reported cases of NANB PTH. Of the 65 donors implicated 23 in 18 NANB PTH cases, only two had histories of jaundice 24 and both were involved in the cases in which the 25 jaundice may have been caused by the effects of drugs Page 157</p>	<p>1 actually make noises about anti-core testing ourselves 2 in 1991, I think it is, or 1992, as a means of reducing 3 the number of Hepatitis B post-transfusion hepatitis 4 cases. 5 Q. But we will come back to that, I think, after the 6 summer. In short, doctor, if we could perhaps just 7 conclude by -- 8 THE CHAIRMAN: Could we go back to the previous page just 9 for a moment before you reach your conclusion? 10 MR MACKENZIE: Yes. 11 THE CHAIRMAN: Dr Dow, on the page before this, you have the 12 paragraph right in the middle: 13 "Of the 65 donors implicated, in 18 NANB PTH cases, 14 only two ..." 15 What test were you using to determine NANB hepatitis 16 at that point? 17 A. These were cases of post-transfusion hepatitis, notified 18 either to ourselves or through the hepatitis reference 19 lab at the regional virus lab in Ruchill, where there 20 was no evidence of Hepatitis B and there was not any 21 evidence of Hepatitis A through IgM Hepatitis A testing. 22 Some of these individuals -- there were paracetamol 23 overdoses as well included because they had had 24 transfusions. So unfortunately they were included 25 because they had had a transfusion. Page 159</p>
<p>1 rather than transfused blood." 2 A. Yes, correct. 3 Q. So did that essentially provide further support for the 4 view that it would not be a materially effective 5 strategy to exclude donors with a history of jaundice 6 from donating blood? 7 A. That's right. 8 Q. Over the page, please, the final page. The conclusion 9 states: 10 "The present UK policy of accepting donors 11 with raised ALT levels (ie not routinely ALT testing), 12 anti-HBc or histories of jaundice would appear to be 13 correct. It would appear from the study that the 14 introduction of such surrogate screening procedures 15 would have little impact on reducing the already low 16 level of NANB PTH cases at present reported within the 17 West of Scotland region." 18 I think you have explained that this report was put 19 before a meeting of the SNBTS directors perhaps, and we 20 certainly know that at no point in the 1980s, for 21 example, was the policy introduced of excluding donors 22 with a history of jaundice. 23 A. No, but the thing was that ALT and anti-core was thought 24 of being introduced in the United States at that time. 25 As a measure of producing non-A non-B, and we did Page 158</p>	<p>1 THE CHAIRMAN: As Professor James said, it is heterogeneous 2 A. Yes. 3 MR MACKENZIE: Thank you, sir. 4 So finishing, doctor, with your statement, please, 5 which is [WIT0030094], paragraph 30, over the page, 6 please, at the bottom. You state: 7 "In conclusion, exclusion of donors admitting to 8 a history of prior jaundice would have excluded almost 9 3 per cent of the donor pool at a time when SNBTS was 10 attempting to be self-sufficient. The data linking HBV 11 with a history of jaundice was not scientifically proven 12 and thus attempting to link non-A non-B hepatitis with 13 a prior history of jaundice would even now seem 14 implausible, especially when it is recognised that non-A 15 non-B hepatitis has milder ALT elevations than either 16 HAV or HBV." 17 Doctor, what I have sought to do to conclude is, 18 looking at your evidence on this topic and also those of 19 previous witnesses, sought to draw certain propositions 20 together, which I like to put to you to see if you agree 21 or disagree or wish to revise or reformulate them. The 22 first proposition is this, that from the evidence 23 I derive that excluding donors in the 1970s and 1980s 24 with a history of jaundice is unlikely to have 25 materially reduced the incidence of Page 160</p>

40 (Pages 157 to 160)

<p>1 transfusion-associated Hepatitis C?</p> <p>2 A. I would agree with that.</p> <p>3 Q. Secondly, if we look at why that is, only approximately</p> <p>4 3 per cent of donors gave a history of jaundice and of</p> <p>5 those donors, that episode of jaundice may have been</p> <p>6 caused by a number of factors. Is that correct?</p> <p>7 A. Correct, yes.</p> <p>8 Q. In particular, including Hepatitis A.</p> <p>9 A. Mainly Hepatitis A, yes.</p> <p>10 Q. So mainly Hepatitis A, which we know is not blood-borne?</p> <p>11 A. No, it can be blood-borne. It's very rare, though.</p> <p>12 There is only about a handful of cases in 30 or</p> <p>13 40 years.</p> <p>14 Q. Yes. An episode of jaundice could also be caused by</p> <p>15 Hepatitis B.</p> <p>16 A. Correct.</p> <p>17 Q. For which we know there was screening introduced from</p> <p>18 the early 1970s.</p> <p>19 A. That's right.</p> <p>20 Q. An episode of jaundice could also be caused by</p> <p>21 non-hepatitis virus.</p> <p>22 A. That's correct.</p> <p>23 Q. For example CMV or EBV.</p> <p>24 A. Yes.</p> <p>25 Q. Thirdly, an episode of jaundice could in fact be caused</p> <p style="text-align: center;">Page 161</p>	<p>1 I don't know whether that's the same passage that I have</p> <p>2 actually. No, it's not. I don't know what has gone</p> <p>3 wrong there. It is perhaps the page numbering.</p> <p>4 The passage in your evidence is along the following</p> <p>5 lines, you said at a fairly early stage in your evidence</p> <p>6 that you realised the likes of prison donations were</p> <p>7 needed, actually to keep your stocks up. Without them</p> <p>8 obviously you would run into difficulties of supply.</p> <p>9 That's what you said.</p> <p>10 A. That was my understanding at the time, yes.</p> <p>11 Q. Right. What was that understanding based upon?</p> <p>12 A. I would walk into the blood bank and see how much blood</p> <p>13 was there. There was a lot more there then than what</p> <p>14 there is now.</p> <p>15 Q. There is no evidence that when any of the regions</p> <p>16 stopped taking blood from prisons, there was any</p> <p>17 difficulty in making up any shortfall. We have heard of</p> <p>18 no evidence of that kind.</p> <p>19 A. You may well have heard no evidence but I have heard</p> <p>20 anecdotal evidence where we had this supply of blood</p> <p>21 from the west through elsewhere in Scotland at times of</p> <p>22 critical need, as in the likes of Christmas, et cetera.</p> <p>23 Q. Yes. I understand that. A decision was taken in</p> <p>24 Glasgow at some point to stop taking blood from</p> <p>25 prisoners, and do you know if at that stage there was</p> <p style="text-align: center;">Page 163</p>
<p>1 by a non-viral cause.</p> <p>2 A. Correct.</p> <p>3 Q. For example, alcoholic liver disease, gallstones,</p> <p>4 reaction to medication and other causes.</p> <p>5 A. That's right.</p> <p>6 Q. The second one, I am afraid was quite long. The third</p> <p>7 one is short and it is this: most people who contract</p> <p>8 Hepatitis C do not develop jaundice.</p> <p>9 A. The ones that are known about -- one or two obviously do</p> <p>10 but the vast majority, I think, do not actually have</p> <p>11 clinical jaundice at the time they come down with</p> <p>12 infection.</p> <p>13 Q. So these propositions I have set out represent</p> <p>14 a reasonable summary of at least your evidence on this</p> <p>15 matter?</p> <p>16 A. I would agree with that, yes.</p> <p>17 Q. Sir, I have no further questions for Dr Dow.</p> <p>18 THE CHAIRMAN: Mr Di Rollo?</p> <p>19 Questions by MR DI ROLLO</p> <p>20 MR DI ROLLO: Yes, thank you.</p> <p>21 Dr Dow, there are just two points I want to take up</p> <p>22 with you. I think it would probably be best to get the</p> <p>23 transcript. It's at page 77 and page 78 of the</p> <p>24 transcript of your evidence.</p> <p>25 It's the foot of page 77 and the top of page 78.</p> <p style="text-align: center;">Page 162</p>	<p>1 any difficulty in making up any shortfall from</p> <p>2 elsewhere?</p> <p>3 A. I wasn't involved in supplying units of blood to</p> <p>4 hospitals, et cetera. I was really there to do testing.</p> <p>5 Q. It doesn't seem to be -- and I'm just challenging the</p> <p>6 proposition really -- that prison donations were in fact</p> <p>7 required in any sense to keep stocks up. It may have</p> <p>8 been an impression that you had but I'm suggesting to</p> <p>9 you that the reality was that prison donations were not</p> <p>10 required for that purpose.</p> <p>11 A. I can't answer that. I wasn't in the, you know, the</p> <p>12 supply of blood to the hospitals.</p> <p>13 Q. I understand, all right.</p> <p>14 The other thing I should suggest to you is that in</p> <p>15 this particular area we have had evidence from</p> <p>16 Professor Ludlam that a letter was sent to him by</p> <p>17 Dr Mitchell indicating that there was a surplus of</p> <p>18 factor concentrate in Glasgow, that he didn't need any</p> <p>19 more.</p> <p>20 A. I have heard of that as well.</p> <p>21 Q. Sorry, a letter was sent to Mr Watt, it was</p> <p>22 Professor Ludlam that gave that evidence. You have</p> <p>23 heard that?</p> <p>24 A. I have heard that obviously through the Inquiry.</p> <p>25 Q. That would tend to suggest that if there was a surplus,</p> <p style="text-align: center;">Page 164</p>

41 (Pages 161 to 164)

<p>1 there wasn't a shortage of blood that needed to be made 2 up by prison donations.</p> <p>3 A. You are talking about two difference things here. I'm 4 talking about blood on the shelf, which is red cells or 5 the remains of red cells, because the plasma has already 6 gone through to the Protein Fractionation Centre, and 7 what you are talking about is Factor VIII, the little 8 bottles of Factor VIII that we made. The two things are 9 completely separate.</p> <p>10 Q. I can understand that but we have heard some suggestion 11 that, in order to pursue self-sufficiency in Scotland, 12 it was needed to take blood from prisoners, and the 13 self-sufficiency of blood supply would also be going 14 into making factor concentrates as well as blood on the 15 shelf, as you put it?</p> <p>16 A. We were plasma driven way back in the 1970s and 1980s. 17 We were striving to get that 80 per cent target of 18 plasma to send through to PFC to make the Factor VIII 19 which was needed to become self-sufficient in Scotland. 20 We were plasma driven.</p> <p>21 Q. Can I just deal with another point then. You started 22 your evidence this afternoon and indicated that you 23 wanted to challenge the suggestion that in general 24 terms, prison donors would be more likely to be new 25 donors as opposed to being repeat donors. Is that</p> <p style="text-align: center;">Page 165</p>	<p>1 assumptions about donations taken between 1970 and 1980. 2 Is that right?</p> <p>3 A. Yes. I have looked at the data we have on file between 4 1970 and 1980, which amounted to only 10,000 new 5 donations from prisons.</p> <p>6 Q. Are those new donations from prisons or new donations -- 7 you said from institutions. Are "institutions" and 8 "prisons" synonymous?</p> <p>9 A. They were synonymous, yes. We use the word 10 "institutions" to mean prisons.</p> <p>11 Q. You didn't go to any other places other than prisons? 12 A. Such as?</p> <p>13 Q. I don't know. 14 A. I don't know either.</p> <p>15 Q. Right. So they may not be prisons that you are 16 referring to between 1970 and 1980?</p> <p>17 A. Of course they were prisons.</p> <p>18 THE CHAIRMAN: We are not having trouble over young 19 offenders' institutions?</p> <p>20 A. I would include them as prisons.</p> <p>21 MR DI ROLLO: You are assuming that the 10,000 new donors is 22 reflected equally in the period between 1982 and 1984, 23 that you can extrapolate from those two periods to the 24 other. 25 A. From 1982 to 1984 there were 5,700 donations taken in</p> <p style="text-align: center;">Page 167</p>
<p>1 right?</p> <p>2 A. No. I said the entire opposite to that. 3 Prison donors, if you went along to the session in 4 the West, the number of new donors amongst them would be 5 only 20 per cent.</p> <p>6 Q. Yes. That's right. I'm sorry, I am not making myself 7 very clear. I think the suggestion had been made by 8 another witness, I think, in passing, that prison donors 9 would be more likely to be donors for the first time. 10 You are saying that that's not correct, that they would 11 be repeat donors generally in the west. Is that right?</p> <p>12 A. Certainly in the west.</p> <p>13 Q. It does come as a surprise to me, I have to say, that 14 the statistics that you have given us result in the idea 15 that only 20 per cent of prison donors would be giving 16 blood for the first time in Glasgow. So that means that 17 80 per cent of prison donations would have been repeat 18 donations, I assume.</p> <p>19 A. Correct.</p> <p>20 Q. That does, I have to say, come as a surprise to me, 21 hearing that as I say, for the first time this 22 afternoon. 23 But you have arrived at that by extrapolating, 24 I think, not from the 5,000 or so donations that were 25 taken between 1982 and 1984, but by making certain</p> <p style="text-align: center;">Page 166</p>	<p>1 that period I looked at, which was between something 2 like April 1982 to March 1984.</p> <p>3 Q. Right. 4 A. Probably in the March 1984 we were actually at the stage 5 of stopping at that point.</p> <p>6 Q. And do you know how many donations in total were taken 7 between 1970 and 1980?</p> <p>8 A. I can't because the 1970 to 1980, the total number of 9 prison donations in that time, I certainly don't have at 10 hand. I did try to do an exercise to try and go through 11 all that but certainly it seemed to be roughly 2,000 to 12 3,000 donations a year were taken from prisons in that 13 period in the West of Scotland.</p> <p>14 Q. Without knowing exactly what we're dealing with there, 15 it is quite difficult to extrapolate from one period to 16 the other?</p> <p>17 A. Well, as I said, my extrapolation is more accurate than 18 what was written down by other -- in the transcript 19 book.</p> <p>20 Q. I think the general point you are making is that one 21 should not assume, I suppose, that a prison donation is 22 a new donation. One can't make that assumption. So 23 that -- 24 A. What I'm trying to say is that you can't say that all 25 the prison donations were from new donors.</p> <p style="text-align: center;">Page 168</p>

<p>1 Q. I think that's probably about as best we can do?</p> <p>2 A. When you look at the prison donations as a whole, only</p> <p>3 20 per cent, I'm saying, were from new donors.</p> <p>4 Q. It is the 20 per cent I'm perhaps taking issue with.</p> <p>5 A. The rest were from donors who had already gone through</p> <p>6 a Hepatitis B screen at some previous point.</p> <p>7 THE CHAIRMAN: Perhaps, Mr Di Rollo, if you told Dr Dow why</p> <p>8 you are surprised, he might be able to comment.</p> <p>9 A. We went back to these sessions on a regular basis. We</p> <p>10 were going to Barlinnie twice a year, and the same with</p> <p>11 quite a lot of the other institutions; it was on</p> <p>12 a regular basis we were going to them, and usually at</p> <p>13 holiday periods, to cover, obviously, when we had got</p> <p>14 shortfalls because our other donors didn't want to give</p> <p>15 blood.</p> <p>16 MR DI ROLLO: I suppose it just seems surprising that there</p> <p>17 should be that amount of repeat business.</p> <p>18 A. Our normal sessions at that time were roughly</p> <p>19 10 per cent new donors. That's the sessions outside</p> <p>20 prison.</p> <p>21 THE CHAIRMAN: Some people would be in Barlinnie for quite</p> <p>22 significant periods of time.</p> <p>23 A. They could have donated prior to going in there and,</p> <p>24 obviously, once they are in there, they go along and</p> <p>25 give blood again.</p> <p style="text-align: center;">Page 169</p>	<p>1 I have got about ten minutes' worth of miscellaneous</p> <p>2 matters to largely finish this topic but it need not be</p> <p>3 done now. We can easily come back at a time which is</p> <p>4 convenient to do that. It is entirely a matter for you,</p> <p>5 sir.</p> <p>6 THE CHAIRMAN: If you are going to complete the topic in</p> <p>7 ten minutes, I'm sure that we should do that now.</p> <p>8 MR MACKENZIE: I can complete the topic subject to one</p> <p>9 outstanding line, which relates to reports by the</p> <p>10 Secretary of State for Scotland on prisons and also</p> <p>11 reports by Her Majesty's inspectorate of Prisons as</p> <p>12 well. That's the one outstanding matter.</p> <p>13 THE CHAIRMAN: That's may be a self-contained chapter.</p> <p>14 MR MACKENZIE: I think it is.</p> <p>15 THE CHAIRMAN: I think we should go on with the</p> <p>16 miscellaneous points other than that.</p> <p>17 MR MACKENZIE: I'm grateful.</p> <p>18 Sir, the first thing was you had asked for a note on</p> <p>19 the various guidance documents on the selection of</p> <p>20 donors and the use of blood. That has now been done,</p> <p>21 sir. It has only very recently gone into court book.</p> <p>22 The reference is [PEN0120347] and this has been sent to</p> <p>23 the SNBTS, who have agreed it as being factually</p> <p>24 correct, so I won't go through it. I think this does</p> <p>25 explain, I hope, all of the mystery actually, including</p> <p style="text-align: center;">Page 171</p>
<p>1 THE CHAIRMAN: It might be good for your appearance before</p> <p>2 the Parole Board if you've got a good record of giving</p> <p>3 blood. You wouldn't know that sort of thing, Dr Dow, I</p> <p>4 suppose.</p> <p>5 A. And some of them, obviously, once they come out of</p> <p>6 prison, they give blood again.</p> <p>7 THE CHAIRMAN: Of course there are environmental and other</p> <p>8 factors within prison that can give rise to infection --</p> <p>9 A. That's true.</p> <p>10 THE CHAIRMAN: -- during the course of -- but what you have</p> <p>11 done is given us your best estimate?</p> <p>12 A. It's the best estimate, yes.</p> <p>13 THE CHAIRMAN: I doubt if we can go beyond that, Mr Di</p> <p>14 Rollo.</p> <p>15 MR DI ROLLO: I quite agree, I follow that.</p> <p>16 THE CHAIRMAN: Mr Anderson?</p> <p>17 MR ANDERSON: No, thank you, sir.</p> <p>18 THE CHAIRMAN: Mr Sheldon?</p> <p>19 MR SHELDON: No questions, thank you.</p> <p>20 THE CHAIRMAN: Dr Dow, thank you for coming back.</p> <p>21 A. Thank you.</p> <p>22 THE CHAIRMAN: I will read everything, even though we have</p> <p>23 only had little bits of it so far. Thank you very much.</p> <p>24 Presentation of outstanding matters on topic C1</p> <p>25 MR MACKENZIE: Sir, there are no further witnesses today.</p> <p style="text-align: center;">Page 170</p>	<p>1 the different red and orange books. I think I need say</p> <p>2 no more about that at this stage, but clearly if any</p> <p>3 party has any further queries on that, we can seek to</p> <p>4 address that.</p> <p>5 THE CHAIRMAN: Thank you very much. We will have to come</p> <p>6 back to the detail of it but that seems to provide a lot</p> <p>7 of information.</p> <p>8 MR MACKENZIE: Thank you, sir.</p> <p>9 Another point. Dr McClelland, on 22 March -- we</p> <p>10 don't have to go to this but on 22 March, at page 71/72,</p> <p>11 he referred to having seen a textbook by</p> <p>12 Professor Garrott Allen from 1972. In short,</p> <p>13 Dr McClelland said he couldn't remember having seen the</p> <p>14 1975 letter by Professor Garrott Allen to Dr Maycock but</p> <p>15 he had read Garrot Allen's book and we have provided now</p> <p>16 in court book an extract from that textbook, which is at</p> <p>17 [PEN0120164]. We don't have to go to any of these</p> <p>18 documents now but, in short, it's to provide the</p> <p>19 reference which Dr McClelland spoke to. I think one</p> <p>20 will see that it really fits in very nicely with</p> <p>21 Dr McClelland's evidence on that.</p> <p>22 Another loose end in that regard, sir.</p> <p>23 Professor Cash spoke to, in the United States of</p> <p>24 America, the FDA not recommending cessation of the</p> <p>25 practice of collecting blood from prisons until 1995,</p> <p style="text-align: center;">Page 172</p>

<p>1 and again we found a reference for that. It's 2 [PEN0120173], which is a recommendation from the US FDA, 3 dated 8 June 1995, and in particular recommendation 1. 4 Again we don't have to go to that. It's really for 5 completeness that's provided. 6 Sir, you may recall a reference to the letter dated 7 1 May 1975 by Dr Yellowlees, the chief medical officer 8 the England and Wales, on the question of continuing to 9 collect blood from prisons. I think one can see the 10 genesis for that letter if one goes to [SGH0030259]. 11 Again we don't have to go to that but, in short, this is 12 a February 1975 draft of the second Maycock report, and 13 if one goes to the first appendix of that earlier draft, 14 one will see in relation to prisons pretty much the same 15 text. That appears in Dr Yellowlees's letter of 16 1 May 1975. By way of contrast, if one were to go to 17 the final version of the second Maycock report 18 in September 1975, which is [SGH0030079], one would see 19 that appendix 1 no longer appears, the final version. 20 Again, I think that will all be self-explanatory if one 21 then looks at the documents in due course. 22 THE CHAIRMAN: So what one should understand is that the 23 second Maycock report had material of this kind in it in 24 appendix 1. Then Dr Yellowlees writes as CMO and 25 Maycock takes it out?</p> <p style="text-align: center;">Page 173</p>	<p>1 concerned with but I think it is of some background 2 interest. In short, sir, this study found a prevalence 3 of Hepatitis C infection among prisoners of about 4 20 per cent. The parties can no doubt read that paper 5 for themselves in due course. 6 The second slightly similar paper relates to an 7 English study. It's [LIT0013266]. Again we can perhaps 8 just see the paper to see the title and authors. In 9 short, sir, this was an English study carried out in 10 eight prisons in England and Wales between 1997 and 1998 11 and this found a prevalence of antibody to Hepatitis C 12 of 7 per cent. It's really quite a different finding 13 from the Scottish figure: different tests used and 14 detecting slightly different things. That's provided 15 for what it is worth. 16 Then lastly, on a slightly similar vein, sir, is 17 a paper looking at the background prevalence of 18 Hepatitis C in England and Wales, which I think was 19 touched on with the previous witness, and that's 20 [PEN0020822]. Given the time, I'm not going to go into 21 this paper in detail, sir, but essentially it gives an 22 estimated prevalence of Hepatitis C among the population 23 in England and Wales of between 0.55 per cent and 24 1.07 per cent. 25 The one other thing of interest, I think, in this</p> <p style="text-align: center;">Page 175</p>
<p>1 MR MACKENZIE: Yes, sir. 2 THE CHAIRMAN: Do we know anything more about the 3 circulation of the Yellowlees letter in Scotland? 4 MR MACKENZIE: There was evidence at the time, sir, that it 5 certainly went to the SHHD, who sent it to 6 Major General Jeffrey. Certainly, I covered that at the 7 time, sir. 8 THE CHAIRMAN: Yes, but is there anything that takes it from 9 the General outwards to medical officers in the areas? 10 MR MACKENZIE: No, sir. As far as we can take it is that 11 I think it was considered at a SNBTS directors meeting 12 at the time but we have no evidence that it went beyond 13 that. 14 There are three additional papers, sir, which 15 I haven't put to any witness. They really, I think, are 16 part of the general background, as opposed to being very 17 much in the forefront, and that's because they all 18 post-date events. I think it is worth the parties and 19 you, sir, at least being aware of the papers. 20 The first one is reference [LIT0013258]. It might 21 be worth just briefly going to that, simply to see the 22 heading, the authors and the subject matter. In short, 23 this was a study of the incidence of Hepatitis C 24 infection in five Scottish prisons between 1994 to 1996. 25 Obviously, that way post-dates the events we are</p> <p style="text-align: center;">Page 174</p>	<p>1 paper, is if we can, please, go to page 225, which is 2 0828. Go on to page 225, please, and the bottom of the 3 left-hand column, the paragraph commencing: 4 "Most of the HCV infections in the population ..." 5 It gives an interesting narrative about the drug 6 abuse epidemic in England and Wales. To what extent 7 that applies in Scotland isn't a matter we have heard 8 evidence on but it is there of some background interest, 9 I think. I think it has to be treated with some caution 10 and I think it doesn't really go beyond what it says. 11 THE CHAIRMAN: Up to the top of the right-hand column, 12 please? Yes. 13 Yes, thank you. 14 MR MACKENZIE: Two final matters. The second last matter: 15 we had hoped that Dr McIntyre, a former medical officer 16 of the SHHD, would be able to give evidence on this 17 topic. Unfortunately, Dr McIntyre is unable to attend 18 the hearings, so we will have to rest on his statement, 19 which is [WIT0030013]. 20 Finally, sir, the only, I think, outstanding matter 21 under topic C1 is that we had promised to look at what 22 reports there were on prisons, and in particular the 23 health of prisoners, including drug use. We have 24 identified a number of, I think, quite helpful reports, 25 which are presently going into court book and we will</p> <p style="text-align: center;">Page 176</p>

1 shortly be seeking to identify a witness via the 2 assistance of the Scottish Government to certainly 3 provide a statement and possibly, depending on the 4 statement, come along to the hearing, sir. 5 THE CHAIRMAN: Thank you very much indeed. Is there any 6 other business today? No? 7 So what's tomorrow? 8 MR MACKENZIE: We revert to B2 tomorrow, sir. 9 THE CHAIRMAN: And in human terms that means? 10 MR MACKENZIE: I knew you would ask me that, sir. 11 THE CHAIRMAN: Professor Cash? 12 MR DI ROLLO: And Dr Perry. 13 THE CHAIRMAN: And Dr Perry. 14 (4.25 pm) 15 (The Inquiry adjourned until 9.30 am the following day) 16 17 DR FRANK BOULTON (affirmed)1 18 Questions by MS DUNLOP1 19 Questions by MR DAWSON87 20 Questions by MR ANDERSON126 21 DR BRIAN DOW (continued)131 22 Questions by MR MACKENZIE (continued)131 23 Questions by MR DI ROLLO162 24 Presentation of outstanding matters170 25 on topic C1 Page 177	

A	88:14	110:19	alerted 81:23	Anne 48:20,21 122:10	32:24 52:6	171:18
abandon 37:24	Acquired 26:21 27:1	adults 89:13	Alistair 57:1,2	annual 87:22 88:1 107:24 108:1	appreciate 31:20 64:5 137:21	asking 48:12 87:15 106:4,6 106:25 114:25 119:17 121:22
Aberdeen 4:19 20:4,5 53:23 76:20	Act 137:25 138:3	advance 73:18 100:19	alive 10:16	answer 36:10 61:6 76:1 77:17 79:20,22 98:11 99:25 101:5 126:5 130:13 132:11 132:20 164:11	apprise 58:20	aspects 97:21
ability 44:21 122:15 128:1 141:23	action 7:23 8:10 8:14,18 13:2 18:6 90:3 91:6 116:5	advances 87:5	Allen 172:12,14	allocated 88:3 95:18	approach 87:4 142:8 143:5	aspersion 25:6
able 14:18 16:18 16:20 42:22 61:8,18 74:23 77:22 78:4 97:10 104:20 109:7,21 114:17 117:8 169:8 176:16	activated 54:25	advice 72:13 90:7,20 92:4,5 92:11 142:22 143:3	Allen's 172:15	allocation 60:15 62:15,19 64:15 74:4,10,12 94:3,25 108:8 129:25	approached 98:16 128:5	aspire 79:18
abuse 27:6,13,20 28:6 29:19 176:6	active 4:21,24 121:9	adviser 89:8	allotted 60:15	answered 96:1 100:21	approaching 16:23	assist 66:14
abscess 9:18	actively 74:15	Advisory 2:11	allusion 97:24	answers 77:9	appropriate 72:14 113:8	assistance 115:21 177:2
absolute 53:9 77:17,21 78:4 78:10,22	activities 75:17 93:8,9	advocate 16:11	ALT 155:17,19 157:9 158:11 158:11,23 160:15	Anthony 56:25	appropriateness 112:16	associated 18:8 27:5,13 45:3 46:25 112:24 113:15 126:7 147:13 154:11
absolutely 22:20 29:25 63:12 85:13 86:12 105:4	actual 5:9 29:15 45:5 67:10 78:7 120:24	affect 85:25	amazing 12:7	antibodies 75:19	approximateness 64:14 161:3	assume 166:18 168:21
abundance 98:10	acute 31:18 38:15 56:4 145:25	affirmed 1:6 44:15 177:16	amend 48:24	antibody 78:16 147:16 149:11 150:12 175:11	April 58:22 168:2	assumes 136:15
abuse 27:6,13,20 28:6 29:19 176:6	acumen 51:13	afternoon 34:15 126:14 130:24 165:22 166:22	amend 48:24	anticoagulants 32:5	apt 126:24	assuming 167:21
accept 38:12,15 39:14	acute 31:18 38:15 56:4 145:25	age 152:22,23 155:6	America 9:14 11:2 17:15,17 18:10 27:12 37:10,21 46:24 52:24 53:5 81:5 83:15 91:9,19 172:24	antigen 40:17 144:18 145:4 152:15 157:10	arbitrarily 80:15	assumption 21:6 36:6 168:22
acceptable 39:22	add 5:15 53:4 54:16 108:22	aged 32:7	American 10:5,9 10:11 17:1 40:23 81:9 91:9,21,24,25 121:12	anti-core 158:23 159:1	area 33:15 37:7 76:13 121:2 164:15	assumptions 110:25 167:1
acceptance 38:14 113:12 131:7	added 51:1	agencies 77:25	amend 48:24	anti-D 79:15	areas 174:9	assurance 65:13
accepted 52:16 56:4 146:19	addict 147:2	Agency 57:6	amend 48:24	anti-HBc 158:12	arguably 119:6	asterisk 3:3
accepting 141:5 158:10	addicts 137:15	agent 27:25 36:4 38:19 40:8 47:10 125:4 153:21 157:1	amend 48:24	anti-Hepatitis 157:9	arisen 146:4	atom 6:13
access 52:12,13	addition 152:13 154:9	agents 36:2 153:4 154:7 157:2	Americans 46:22 91:14	anxiety 51:21	arising 61:17 111:9 112:1	attempt 80:19
accompanied 21:17	additional 174:14	ago 41:20 51:1 59:1 64:6 70:7 95:23 108:15 114:24 116:16 135:1	American-deri... 91:11	anxious 18:18 31:8 35:6 36:19 38:16 44:19 61:16,24 80:25 101:14 119:11	Armour 54:7	attempted 94:6 160:10,12
account 135:22	additive 22:2	agree 39:16 45:9 52:19 53:2 81:12 110:9 125:8,25 133:9 139:3 160:20 161:2 162:16 170:15	amount 9:23 21:8,13 22:1 22:10 37:13 51:9 53:23 60:4,6,15,18 61:11 63:3 65:11 66:15,19 68:9 80:19 107:22 108:11 169:17	anyway 26:15 44:14 122:19	arose 111:12 133:20	attempting 160:10,12
accountable 59:14	address 89:2 106:4,10 172:4	agreed 171:23	amounted 167:4	apologise 50:10 51:12 107:3	arrangement 58:4,16 59:4 99:20	attends 140:8 156:10 176:17
accounted 108:7	addressed 33:11 120:25	agreement 147:14	amounts 39:20 73:9	apologising 64:10	arrangements 24:4 56:15 58:20 59:5	attendance 69:19
accumulating 51:5	addressing 124:9	agreeing 106:13	analogous 76:7	apparent 30:11 81:14 82:11	arrival 12:23 13:5,6,18 92:19,20 128:21	attended 11:9 33:24 139:20
accuracy 115:1	adequate 66:18 114:12	agreement 147:14	analogy 74:1	apparently 122:22	arriving 66:2	attending 113:10
accurate 6:5 93:7,10,11 97:13 99:4 101:4 110:11 113:1 168:17	adhere 109:16 109:21	ahead 13:22 22:15 48:1 89:1 101:16 142:13	analyse 88:23	appear 78:14 102:8 138:14 141:16 158:12 158:13	Arthur 33:18 43:25 44:18 46:10,15	attention 9:5 26:20 108:10
accurately 143:14	adhering 109:17	AIDS 29:12,14 34:16 36:16 41:4 49:20,21 50:19 52:23 81:13 111:25 115:12 116:3,9 118:18 119:15 119:19,21 120:20	analysis 140:9	appearance 170:1	Arthur's 45:11 46:13 122:13	attenuated 91:11
accusation 83:7 83:8,11	adjourned 177:15	agreed 171:23	ancestral 41:1	apparent 30:11 81:14 82:11	article 137:5 138:11 143:13 143:16,18,20 144:8 151:16 152:7	attitude 9:13 48:15 103:20 114:22 118:22 119:1 121:5 127:16
ache 84:15	adjournment 104:7	agreement 147:14	Anderson 126:11,12,13 130:8,12 170:16,17 177:19	appears 109:8 115:15,17 116:12 129:2 154:20 173:15 173:19	arriving 66:2	attitudes 89:15 119:8
achievable 78:23	adjust 106:15	agreement 147:14	animal 40:9	apparently 122:22	arthritis 32:12	attracted 62:11
achieve 78:4 121:3	adjusted 106:20	agreement 147:14	animosity 110:16	appear 78:14 102:8 138:14 141:16 158:12 158:13	Arthur 33:18 43:25 44:18 46:10,15	attraction 5:15 67:13 76:17
achieved 81:2	administered 94:9,12	agreement 147:14	Ann 17:8	apparent 30:11 81:14 82:11	Arthur's 45:11 46:13 122:13	attractions 33:1 154:7
acid 157:18	administratively 97:16	agreement 147:14		apparently 122:22	article 137:5 138:11 143:13 143:16,18,20 144:8 151:16 152:7	attributable 154:7
acknowledge 86:11 95:15	admirably 87:13	agreement 147:14		appears 109:8 115:15,17 116:12 129:2 154:20 173:15 173:19	articles 138:10 143:21 144:3	attuned 48:19 122:9
acquaintances	admission 137:17	agreement 147:14		apparent 30:11 81:14 82:11	arrival 12:23 13:5,6,18 92:19,20 128:21	audit 72:3

authentic 13:10	61:9 66:7	bearing 50:25	blood 2:2,5,8,12	45:14 46:10	brain 85:18	175:11,18,22
author 130:9	79:23 83:7	beat 103:12	3:9,11,13,16	blow 127:22	114:25	calculation
authorities 24:25	85:4 86:5	beck 14:14	3:19,20,20,24	blur 69:25	branch 38:25	60:17,23
authors 144:12	104:4 105:3	becoming 9:24	4:3,3,5,13,13	blurred 6:7	87:21 88:25	call 14:14 93:6
147:10 149:7	114:25 118:12	30:10 137:3,13	4:25 5:4,9,9	board 56:18 57:7	89:5 90:6	112:9 123:18
150:13 151:9	119:2,3 122:22	137:16 157:1	6:15,21 17:12	57:19 59:11,22	breached 95:10	called 14:11
153:9 174:22	131:5,22 132:8	began 32:1 64:21	17:13,22,23	76:9 170:2	breaches 95:15	23:22 39:2
175:8	133:3 134:24	beginning 12:24	18:1,4 21:13	Bob 75:11,11	95:17	78:14,18
autonomy 23:22	135:13 140:21	behaviours	21:19 24:5,11	149:14	break 55:25 56:5	102:25 126:19
126:19	143:21,23	140:10	24:12 27:10	bomb 6:13	56:8 83:24,25	calls 37:1
availability	148:14 151:12	believe 14:10	28:1,7 29:21	bombing 7:4	142:5,15	Cambridge
31:24 39:17	159:5,8 165:16	33:8 150:21	30:22 31:2	book 17:4,7,11	breaking 84:4	122:7,17,19
119:24 121:7	169:9 170:20	bell 70:2 73:22	34:25 39:15	17:21 90:16	Brentford 6:11	camp 63:17
available 9:24	171:3 172:6	belonged 36:3	40:15 42:9	137:8 138:14	Brian 1:21 35:17	capture 14:15
22:3 31:8 32:3	background	benefit 84:8	45:1 46:22	141:13 143:12	43:10 44:5,6	cardiac 72:1,4
37:22 39:20	99:4,15 115:9	99:25	47:11,17 57:5	168:19 171:21	45:11 47:14,19	72:12
75:2 79:13	174:16 175:1	benefits 31:13	57:20 63:18,21	172:15,16	73:11,14	Cardiff 45:18
83:14 100:13	175:17 176:8	38:15 121:21	65:7,7 67:7,15	176:25	122:20,21,25	care 2:12 3:11
106:17 142:21	bad 51:12 148:11	Berry 11:5	67:17 71:4,4,8	books 172:1	123:4 125:1	7:15,16 31:25
143:1 154:23	badly 32:11	best 22:13 66:24	71:9,12,14,20	Boom 137:11	131:3 177:20	38:6 39:11
average 21:16	bag 15:10	70:5,24 83:12	71:23 72:2,5,6	border 151:19	brick 88:17	45:20,23 67:3
108:1,4	balance 31:5	96:1 97:13	73:7 74:3	boring 2:20	brief 49:10 51:6	72:12 87:19
avoid 91:15	35:6,12 36:20	111:12 122:15	75:19 77:23,23	born 85:19	briefly 115:8	90:13 93:15
avoided 10:11	36:22 121:2	162:22 169:1	78:2,5,13,14	borne 55:20	142:4 174:21	95:5 111:16
92:1	124:10	170:11,12	78:21,24 79:1	109:5	brilliance 44:20	career 86:24
awakening 10:4	balanced 79:18	better 24:24	81:24 83:14	bottles 64:13	bring 59:5	careful 15:23
aware 8:7,16 9:7	120:17	28:25 47:19	86:16 87:23	165:8	131:22	85:21
13:14 14:22	balancing	51:23 63:1	88:19,22 90:8	bottom 24:17	bringing 108:10	carer 65:8
16:6,8 18:3,8	120:15	94:24 101:5	93:4,7,9,12,19	49:6 94:2	brings 8:21	caring 38:9 39:9
25:21 47:17	ban 42:9 78:7	102:19	94:13 95:3,19	116:6 144:12	Bristol 51:19	44:19 45:21
74:19,20 75:2	79:16	beyond 38:19	95:24,25 96:4	160:6 176:2	Britain 79:14	61:22 89:15
75:5 86:24	bank 4:5,25	103:10 170:13	96:6 97:5,20	bought 10:8 57:9	81:5 83:16,19	carriage 145:25
91:20 95:3,5	65:17 67:17	174:12 176:10	97:22,22 98:5	Boulton 1:4,5,6,8	84:17 86:17	147:8,13 154:1
100:2 107:14	71:9,9,20 93:7	bias 19:2	100:18 102:18	3:6 6:2 12:7	91:9,12,19	carried 59:11
109:25 112:22	93:9,19 95:3	bicycles 103:9	112:17,19	13:4 19:7	British 2:14	134:23,24
113:20 116:25	95:25 97:21	big 6:3,4 28:4	113:10,21,22	20:24 23:25	37:19 83:8	138:9 139:3
117:17,18	98:6 163:12	51:6 54:4	113:24 114:2	24:14,22 26:25	123:19 151:5	175:9
119:24 121:5,7	banned 78:2	63:22 67:2	114:13 115:12	28:2 29:23	153:15 154:19	carrier 153:23
121:11,13	Barlinnie 169:10	82:14,16	115:14 116:9	31:20 32:19	broke 83:23	157:19
127:10 134:11	169:21	126:21	116:11 117:6	34:18 36:7	brother 8:9,13	carriers 152:14
134:12 137:3	Barr 148:17	bigger 25:7	117:23 120:23	41:17 42:17,24	Brough 58:22	154:17 157:1
174:19	151:10 155:22	biggest 85:22	123:14 124:17	48:23 49:12	BSE 79:16	carry 25:1 53:13
awareness 31:1	156:1	biography 1:11	124:17 125:25	50:23 52:17	BTS 67:12 93:1	74:1
34:23,25 36:15	base 4:24	biological 40:12	131:7 139:11	53:8,15 56:12	94:15 95:1	carrying 47:4
45:1 82:5,25	based 40:20	bit 1:14 2:24 6:7	139:12,20	58:19 60:22	budget 25:16,19	76:14,15
86:22 106:9	60:15 75:12	6:16 15:10	142:17 144:5	64:3,5 66:1,11	59:19,20,20	138:17 155:9
111:24	94:15 129:25	29:2 31:15	144:10 145:4	68:9 69:10	87:22 88:1	case 4:22 6:12
awful 34:24 85:1	133:15 135:9	36:11 43:6	146:8,14,23	70:15 71:1	103:10	10:5 16:2
	149:1,14 155:3	46:9 59:16	151:2,3,7	77:5 79:21	building 88:18	25:14 29:11
	163:11	68:25 69:25	152:1,17 154:5	80:21 87:12	built 7:2	41:4 51:16
B	bases 14:19	70:20 76:11	154:9,21,22	104:10 107:4	bunches 113:23	66:17 91:7
b 10:2 16:1 30:20	basically 112:11	79:1 89:20	155:1 157:4	108:23 112:4	business 169:17	131:25 154:24
35:1 40:14	basis 3:19 38:10	98:20,20,22	158:1,6 163:12	115:19 118:11	177:6	155:2,20
81:23 131:8	62:19 73:5,22	105:23 112:15	163:12,16,20	126:10,14,18	busy 95:9	cases 27:4,12,24
133:24 136:1	113:6 123:21	115:6 117:9	163:24 164:3	128:9,19	buy 12:19 25:17	57:8,10 118:18
144:18 145:4,6	124:14 136:1	122:5 148:4	164:12 165:1,4	130:12,16	25:24 88:3	119:15 154:6
152:13,15,16	149:8 169:9,12	bits 52:8 170:23	165:12,13,14	177:16	91:24	154:11,13
153:1,24	batch 65:15 80:1	bladder 14:15	166:16 169:15	Boulton's 26:24	bypassing 55:3	157:14,22,23
155:21 157:9	80:1,2,5,10,11	blank 11:23	169:25 170:3,6	42:13,19	B2 130:21 177:8	157:24 158:16
159:3,20	80:12,13,18	20:16	171:20 172:25	bounds 22:1		159:4,13,17
161:15 169:6	94:3,3,7,9,10	bleed 82:16	173:9	boy 15:22 39:4	C	161:12
back 6:23 8:21	94:11,25 95:19	120:7	blood-borne	boys 16:22 31:5	C 56:24 83:2,9	Cash 20:21,23
9:15 14:25	95:21	bleeding 14:16	161:10,11	31:9 37:7,16	117:7,11,16	32:21 57:18
16:3 17:4 18:6	batches 23:10	18:10 35:8	Bloom 30:7	81:10 87:19	139:10,12	70:14 128:24
18:23 24:2,4	80:17 96:11	bleed-free 90:23	33:18 41:21,21	88:20,22 89:22	155:14,16	172:23 177:11
26:3 32:24	battle 17:16	blinker 150:4	41:24 42:4	90:20 103:9,13	161:1 162:8	Cash's 22:7
36:10 37:25	bear 135:14	block 55:4	43:25 44:18	120:6,8	174:23 175:3	
49:2 60:19						

category 117:1 126:4	83:19 94:5 123:11,17 129:11,12 165:6	138:4,17,25 141:22 142:2,8 142:11,17 145:8,11,15,18 145:21 146:1 148:11,13 151:23 159:8 159:11 160:1 162:18 167:18 169:7,21 170:1 170:7,10,13,16 170:18,20,22 171:6,13,15 172:5 173:22 174:2,8 176:11 177:5,9,11,13	66:20,21 72:11 80:3 103:17 104:1 111:18 chronic 157:1 chronological 24:1 chronology 34:22 61:19 CIAP 132:3 circle 6:3 circuit 137:23 circulation 14:22 115:15 116:12 174:3 circumstance 68:20 circumstances 54:21 85:11,19 97:1 110:20 114:1 117:15 cirrhosis 82:22 citrate 15:11 city 20:10 civilised 111:6 CJD 84:25 claimed 112:11 118:16 119:14 claiming 91:14 clarification 132:21,22 133:19 clarified 51:23 clarify 92:25 131:13 132:20 134:5 135:5 clarity 36:14 classify 50:1 clawed 61:9 cleaner 136:8 clear 4:7 6:10 13:21 19:16 38:5 96:22 166:7 clearly 9:9 10:10 11:3,8 13:10 17:11,21 36:21 46:17 51:2,5 54:14 61:9 67:20 70:24 72:10 75:2 79:8 90:19 98:11 103:19 117:8 120:25 172:2 clinical 4:24 5:24 33:2 45:15 52:3 63:1 72:15 86:21 97:23 119:20 120:13 121:20 122:2 153:25 162:11 clinician 5:8 57:25 109:19 126:2 clinicians 4:6,13 25:9 34:20	63:15 80:25 81:7,12 82:6 86:9 96:20 109:18 125:1 125:13,23 clock 142:9 close 16:1 25:11 35:1 38:23 41:8 73:20 108:3 111:4 closed 127:20 closely 75:16 92:20 closer 5:23 81:5 clotting 37:19 87:20,23 cloud 78:9,10 CMO 173:24 CMV 161:23 coagulation 72:9 coast 37:10 134:6 coincided 92:19 Colindale 6:16 colleague 110:1 colleagues 87:2 111:4 146:10 147:15 collect 154:23 173:9 collected 6:21 21:15,22 collecting 3:21 4:1 172:25 collection 66:12 93:4 College 1:17 Collins 48:20,21 122:10 column 140:4,13 144:9,12 146:6 146:22 147:9 151:9 154:3,15 176:3,11 Colvin 1:20,21 come 14:2 19:6 20:18 24:4 26:3 53:6 59:19 62:6,14 69:9 79:4 86:5 91:19 100:3 104:4 114:13 115:24,25 118:2,10 127:17 131:2 135:13 136:19 141:23 143:21 143:23 151:9 159:5 162:11 166:13,20 170:5 171:3 172:5 177:4 comes 28:20 47:24 70:15 111:3 comfortable 68:14	coming 4:14 19:9 30:7 53:13 57:13 73:21 76:17 81:4 83:6 105:14 112:23 115:19 133:3 145:16 170:20 commas 35:9 commenced 115:15 116:12 commences 93:25 commencing 139:18 176:3 comment 9:15 18:14 29:4 30:16 45:19 48:13 49:16 51:7 53:20 59:9 61:8 63:6 86:12 94:16 108:9 116:22 134:7 169:8 commented 44:3 50:6 comments 48:17 94:1 101:24 147:23,25 commercial 9:23 10:1,5,8 12:19 17:19 18:13 19:8 25:17 27:8 45:2 51:10,17 53:16 54:1,5,7,17 55:6 56:3,16 57:9,15,20,21 58:1,8 59:7 69:11,20 74:9 74:14,18 77:15 78:2,7 87:23 88:3 103:3,6 103:13 121:6,8 121:9,19 122:1 129:19 commercially 18:9 commercial/fi... 121:25 Committee 2:12 2:14 common 36:16 57:6 111:2 152:14 communality 78:25 community 33:9 33:17 47:15 77:22,24 81:24 85:15 90:12,23 91:3 134:4 147:7 companies 17:17 17:18 18:9 122:1 company 121:12	121:19 compare 27:14 54:23 55:5 75:15 136:12 compared 17:24 85:3 comparison 131:24 132:24 144:20 competent 127:9 competing 38:13 competition 63:19 complete 140:21 171:6,8 completed 131:10 156:16 completely 44:13 89:22 93:14 165:9 completeness 173:5 completes 144:3 complicated 72:19 complication 55:23 component 91:16 93:14 comprehensive 87:18 compromise 106:22 compromised 85:18 conceivably 106:16 concentrate 18:21 24:13 70:18 94:8 101:2,21 104:13 105:25 129:19 154:10 164:18 concentrates 14:5 16:25 17:2,2 19:8 34:11 75:1 81:9 96:7,24 98:9 103:22 165:14 concept 39:23 65:3 concepts 115:1 concern 10:10 44:16 47:21 48:3 51:15 60:5 61:17 81:18 84:2,6 100:7 105:17 107:22 114:2 116:24 117:21 117:25 118:1,3 concerned 12:21 38:6 45:20 46:23 47:8 59:7 63:25
--------------------------------	---	--	--	--	--	---

73:7 74:4 78:6 81:20 84:7 112:15 117:2 125:3 135:19 136:6,15 175:1	67:12,16 71:7 89:8 121:12 consultants 30:9 71:6 127:5 consumption 107:24 108:1 contact 33:8 41:8 113:5 123:15 140:22 contacts 89:2 contain 74:4 contained 23:1 containing 142:18 contaminated 80:8 content 5:24 26:16 61:11 152:4 contention 40:21 contents 142:22 context 28:15,21 36:25 47:12 112:4 115:6 127:23 continue 33:14 58:5 89:4 131:25 132:6 continued 18:15 131:3,4 150:22 177:20,21 continuing 9:12 130:21 173:8 contract 162:7 contrary 149:23 contrast 5:6 33:2 173:16 contributions 63:9 130:6 contributory 134:2 control 5:10 24:23 25:3 72:17 137:25 convenient 143:2 171:4 conveniently 130:8 consideration 43:10 44:7 46:1,4 51:15 53:1 102:1,7 112:7 118:13 conversations 8:20 47:14,15 100:7,12 conveyed 123:2 cooperate 127:2 cooperating 126:23 cooperation 127:2 coordinated 83:13,18 cope 46:21 copied 20:22 44:5	copies 64:10 copy 45:11 77:9 137:22,23 cordial 99:16 core 157:10 correct 2:6 57:24 59:12 88:7 92:15 93:20 109:9 110:14 118:7 132:1 135:5 139:16 141:2 144:15 146:11 151:11 154:20 156:20 158:2,13 161:6 161:7,16,22 162:2 166:10 166:19 171:24 correctly 120:16 correspondence 21:5 37:1 59:18,24 69:9 70:2 97:3 103:4 128:20 corresponding 143:16 corridor 88:19 corroboration 150:23 cost 57:5 59:15 council 88:13 counsel 98:24 128:19 counselling 140:8 countered 20:8 counterimmun... 133:1,7 counter-prod... 42:9 countries 84:11 country 51:21 53:10 78:4 79:10 83:10 country's 137:13 couple 13:18 98:13 115:10 123:8 138:12 course 22:2 39:11,23 41:12 54:16 56:2 62:13 63:9 64:1 79:14 89:11 101:19 101:22 102:15 105:11 109:14 167:17 170:7 170:10 173:21 175:5 court 17:18 137:8 138:14 141:13 143:12 171:21 172:16 176:25 cover 9:21 49:5 53:14 77:7 169:13	covered 132:7 174:6 cows 79:5 co-author 139:9 144:14 co-director 12:17 Craske 49:23 Crawford 75:11 75:11 144:13 148:17 create 77:18 creatively 110:20 crippled 31:6 89:14 cripple-saving 31:7 critical 163:22 crop 42:1 cropped 69:19 69:21 cropping 12:13 cross 8:12 crossmatching 75:17 cross-check 141:14 cross-examina... 141:20 crudely 24:21 crying 31:13,14 cryo 101:21 103:22 cryoprecipitate 9:20 14:8,9,16 14:20,21 15:2 15:8,14 16:16 16:24 22:23 23:1 25:24 38:1 52:10,13 52:13 68:25 71:16 74:25 96:8 101:1 102:11 107:12 127:19 cryosupernatant 22:24,25 23:4 23:6 71:16 cuckoo 78:9,10 current 49:20 152:19 curriculum 1:9 1:12 customer 62:3 cut 138:13 CVs 87:13 cytomegalovirus 155:21 156:1 C-positive 117:12 C1 130:22,25 131:7 143:7 170:24 176:21 177:24	dads 90:20 daily 15:13 71:2 73:5 75:22 damage 16:18,22 38:4 danger 57:16 81:15 84:9 dangerous 31:2 31:10 dangers 10:4 92:7,12 111:25 data 24:24 56:2 125:19 132:22 132:24 133:9 133:11 135:1 149:4,17,18 150:2,3,5,6,7 150:16,20,21 150:23 155:3 160:10 167:3 database 46:2 155:23 date 27:16 94:15 96:17 116:18 123:24 124:8 138:10 139:5 dated 42:4 101:8 105:2 107:19 125:12 131:20 156:7 173:3,6 dates 141:17 dating 48:3 daughter 17:8 86:1 Davidson 75:24 76:6 Davies 13:23 16:3 18:12 81:17 101:1 Dawson 87:9,10 87:11 104:3,5 104:9,10 106:24 107:3 177:18 day 15:6 18:2 29:24 32:9 44:11 89:21 95:2 96:19 123:12 125:10 138:13 142:4 177:15 days 5:12,19 28:14 39:1 79:12,14 80:7 87:18 113:14 113:14 day-to-day 98:6 DDAVP 94:17 deal 14:8 15:9 42:16 66:22 131:11 165:21 dealing 2:17 14:9 31:17 37:6 168:14 deals 42:13 dealt 143:9 dear 35:5	debate 12:12 18:2 debilitating 45:6 decade 82:12 117:14 decades 89:11 December 7:25 9:3,4,4 68:5 69:5 97:10 decided 115:18 decision 163:23 dedicated 20:10 80:1 dedication 94:3 deduction 64:25 65:10 deep 64:18 deeply 67:20 deferral 42:11 46:5 deficient 55:21 define 147:7 DEFIX 54:25 55:1 degree 40:21 43:19 106:22 117:25 delicate 114:6 delighted 130:11 deliver 14:21 delivery 97:22 demand 55:11 61:16 63:14 70:24,25 74:20 74:21 104:2 105:9,14 106:16,18,23 107:8,10 demanding 68:22 demands 37:20 62:25 104:17 104:21 demonstrate 40:9 demonstration 40:3 dental 9:17 department 5:3 74:15 76:3,14 94:14 95:4 124:7 departments 72:4 97:23 department's 59:20 depend 79:13 dependence 77:24 dependent 6:21 37:18 79:14 137:17 depending 63:1 65:6 177:3 depends 50:1 150:3 deputy 2:4 92:17	derivatives 154:5 derive 160:23 derived 72:18 Dermot 25:20 describe 108:12 142:18 described 14:17 53:9 73:21 76:4 78:10 126:2 describes 17:11 describing 73:1 75:10 description 126:24 deserving 85:16 designed 95:13 desire 66:21 100:24 103:17 desired 107:12 detail 54:22 61:8 61:14 64:7 70:4 84:10 108:15 172:6 175:21 detailed 10:25 22:17 63:7 details 20:19 41:5 59:9,17 65:3 70:8 detected 133:2,3 133:6 146:23 148:5 detecting 175:14 determine 159:15 determining 99:7 deterred 114:14 develop 55:23 162:8 developed 4:7,20 9:18 14:15 19:19 22:8 55:4 86:10 87:19 89:3 103:6 developing 40:7 86:21 107:13 development 3:16 17:20 23:14 72:1 79:8 developments 6:23 81:8 devise 106:21 Di 87:8,9 137:25 138:2 162:18 162:19,20 167:21 169:7 169:16 170:13 170:15 177:12 177:22 diabetes 89:21 diagnosed 137:17
D						

diagnosis 118:17 119:12,15	92:17,21 99:11 127:4	distributing 24:5	146:19 154:5	doubt 22:15	108:10,23	Dunlop 1:3,4,7,8 23:25 33:24 36:9 41:17 50:22 53:3,8 56:6,10,11,24 57:2 64:5 75:22 77:5 177:17
diagnostic 119:20	director 73:12	distribution 24:11,23 25:3 61:13 73:1 75:21 76:7 93:6	163:6 164:6,9 165:2 166:17 166:18,24 167:1,5,6,6,25 168:6,9,12,25 169:2	32:16 42:6 45:21 49:13 50:15 62:5 81:22 96:8 118:17 119:14 120:2 125:6 128:5 135:13 144:6 170:13 175:4	109:21 110:1 111:8 112:4,5 113:3 115:19 118:11,13,16 118:25 121:5 123:22 124:23 125:6 126:10 126:14,18 128:9,19,24 130:12,16,25 131:2,3,5,20 131:21,21,23 131:23 133:19 133:21,23,25 134:7,11 135:5 136:14,23 137:2 141:8,11 141:22 142:6 143:5,7,14,21 143:24 144:1,4 144:6,13,13 146:10 147:15 148:17 151:10 151:10,16,17 152:5,6 153:10 154:14 156:9 159:11 162:17 162:21 164:17 169:7 170:3,20 172:9,13,14,19 172:21 173:7 173:15,24 176:15,17 177:12,13,16 177:20	duplicate 26:1
died 30:23 39:2 84:16,17	directors 23:15 30:5,6,9 33:20 35:4,12 36:18 38:17 69:18,18 83:12,22 123:11,16,17 156:7 158:19 174:11	diverse 76:18	donor 17:13,14 22:1 46:15 47:25 67:22 72:21 93:20 94:6 102:18 113:17 115:3 117:23 147:1 147:11 148:20 160:9	Dow 130:25 131:2,3,5 133:19 134:11 135:5 136:23 137:2 141:8,11 141:22 142:6 143:5,14,21,24 144:4,6,13 151:10 159:11 162:17,21 169:7 170:3,20 177:20	128:9,19,24 130:12,16,25 131:2,3,5,20 131:21,21,23 131:23 133:19 133:21,23,25 134:7,11 135:5 136:14,23 137:2 141:8,11 141:22 142:6 143:5,7,14,21 143:24 144:1,4 144:6,13,13 146:10 147:15 148:17 151:10 151:10,16,17 152:5,6 153:10 154:14 156:9 159:11 162:17 162:21 164:17 169:7 170:3,20 172:9,13,14,19 172:21 173:7 173:15,24 176:15,17 177:12,13,16 177:20	DVD 90:4 91:7
differed 3:14 122:2	disadvantage 137:21	divided 6:18	doctors 4:2,6 15:13 25:10 31:23 46:20 47:21 84:11 86:24 89:15 95:4 122:13 124:25	dozen 4:12,12 25:8	E	D
difference 17:1 17:25 30:4 31:25 51:6 101:20 127:15 127:16 144:22 165:3	disagree 144:7 160:21	division 93:17	doctors 4:2,6 15:13 25:10 31:23 46:20 47:21 84:11 86:24 89:15 95:4 122:13 124:25	downplayed 30:2	ear 140:18	D
differences 111:4 127:13	discard 21:18	doctor 8:16 25:18 65:7,8 67:11 91:20 92:1 98:25 99:15,22 132:1 138:9,21 139:9 141:3 144:16 146:3 147:23 151:1 153:7 154:24 156:4,4 156:8 159:6 160:4,17	doctors 4:2,6 15:13 25:10 31:23 46:20 47:21 84:11 86:24 89:15 95:4 122:13 124:25	Dow's 143:7 144:1	earlier 6:25 35:7 54:5 58:19 62:1 81:17 92:6 97:24 116:14 119:11 128:15 144:23 152:10 173:13	D
different 5:16,21 7:9 16:4 23:22 26:5,7 41:15 48:13 50:2 52:8 62:25 63:10 79:9,22 87:3 89:14 110:24,24 111:1,17 113:11 119:20 120:11 122:7 123:2 126:20 136:17,21 148:21 172:1 175:12,13,14	discuss 123:22 discussing 9:9 29:14 57:19 77:8 143:4 156:11,15	document 2:22 2:23 24:9 43:8 46:2 56:17 93:24 107:4,15 109:1,24 112:2 112:3 114:15 115:4,21 118:9 125:11 128:21 131:18 137:7 156:3,5	doctors 4:2,6 15:13 25:10 31:23 46:20 47:21 84:11 86:24 89:15 95:4 122:13 124:25	dozen 4:12,12 25:8	early 2:15 9:11 15:8 22:3 33:21 34:18 38:4 39:12 69:24 77:15 78:1 81:15 96:5 104:15 127:20 136:16 138:6 161:18 163:5	D
difficult 15:20 16:16 34:21 36:14 39:23 52:17 64:6 78:20 117:24 121:3 130:3 168:15	discussing 24:14 46:21 70:4 110:3 116:3	documentation 96:22 107:7	doctors 4:2,6 15:13 25:10 31:23 46:20 47:21 84:11 86:24 89:15 95:4 122:13 124:25	Dr 1:4,5,6,8,20 3:6 6:2 12:7,16 13:4,6,23,23 14:12,13 15:3 16:3 18:12,15 19:7,20 20:21 20:23,24 21:3 22:18 23:5,8 23:25 24:14,22 26:24,25 28:2 29:9,23 31:20 32:19 34:18 36:7 41:17 42:13,17,19,24 46:1,4 48:14 48:23 49:12,16 49:23 50:23 51:25 52:3,10 52:17 53:8,15 56:1,12,19,20 56:20,24 57:3 57:12,15,18 58:19,22,22 59:4,13 60:1 60:22 64:3,5 65:24 66:1,1,6 66:11,14 68:9 69:10,21 70:13 70:14,15 71:1 75:24 76:23 77:2,3,5 79:21 80:21 87:12 92:20 93:2,17 94:11,24 99:12 100:8,24 101:1 101:16 102:2,8 104:10,13 105:10 106:3 107:4,20	draft 173:12,13	D
difficulties 91:2 95:1 105:18 109:15 163:8	discussions 12:10 13:5 23:19 28:14 61:4 113:2	documents 1:10 11:22 115:23 117:21 130:4 142:3 144:4 171:19 172:18 173:21	doctors 4:2,6 15:13 25:10 31:23 46:20 47:21 84:11 86:24 89:15 95:4 122:13 124:25	draw 160:19	draft 173:12,13	D
difficulty 65:4 108:23 128:8 163:17 164:1	disease 10:18 14:13 30:10 34:24 35:10 40:10 45:7 47:10 57:16 66:25 82:13,23 112:23 120:9 153:22 162:3	dogs 79:5	doctors 4:2,6 15:13 25:10 31:23 46:20 47:21 84:11 86:24 89:15 95:4 122:13 124:25	drawbacks 69:2	dramatically 148:21	D
dilemma 31:10 44:22	discussing 24:14 46:21 70:4 110:3 116:3	doing 22:13 93:13 95:9 126:23 141:8 143:10 145:12	doctors 4:2,6 15:13 25:10 31:23 46:20 47:21 84:11 86:24 89:15 95:4 122:13 124:25	drawings 37:12 62:2	dramatically 148:21	D
dire 54:21 117:16	discussing 24:14 46:21 70:4 110:3 116:3	donation 21:19 21:25 23:2 86:14 114:2 136:4,16 168:21,22	doctors 4:2,6 15:13 25:10 31:23 46:20 47:21 84:11 86:24 89:15 95:4 122:13 124:25	drawings 37:12 62:2	drawn 6:3	D
direct 7:15 26:20 65:12 98:21 111:15	discussing 24:14 46:21 70:4 110:3 116:3	donations 3:20 3:22 5:1 14:18 17:20 21:15,22 63:20 134:13 134:14,18	doctors 4:2,6 15:13 25:10 31:23 46:20 47:21 84:11 86:24 89:15 95:4 122:13 124:25	drawings 37:12 62:2	drawn-out 17:16	D
directed 44:16 45:9 81:18	disease 10:18 14:13 30:10 34:24 35:10 40:10 45:7 47:10 57:16 66:25 82:13,23 112:23 120:9 153:22 162:3	door 74:2 124:7	doctors 4:2,6 15:13 25:10 31:23 46:20 47:21 84:11 86:24 89:15 95:4 122:13 124:25	drawings 37:12 62:2	drive 39:18	D
direction 103:19 120:8	disease 10:18 14:13 30:10 34:24 35:10 40:10 45:7 47:10 57:16 66:25 82:13,23 112:23 120:9 153:22 162:3	doorstep 52:14	doctors 4:2,6 15:13 25:10 31:23 46:20 47:21 84:11 86:24 89:15 95:4 122:13 124:25	drawings 37:12 62:2	driven 21:20 98:4 165:16,20	D
directions 63:21 66:11	disease 10:18 14:13 30:10 34:24 35:10 40:10 45:7 47:10 57:16 66:25 82:13,23 112:23 120:9 153:22 162:3	doses 16:19 55:12	doctors 4:2,6 15:13 25:10 31:23 46:20 47:21 84:11 86:24 89:15 95:4 122:13 124:25	drawings 37:12 62:2	driving 39:9	D
directly 23:19 45:15,19 74:17 86:15 97:18 109:20	disease 10:18 14:13 30:10 34:24 35:10 40:10 45:7 47:10 57:16 66:25 82:13,23 112:23 120:9 153:22 162:3	dose 10:18	doctors 4:2,6 15:13 25:10 31:23 46:20 47:21 84:11 86:24 89:15 95:4 122:13 124:25	drawings 37:12 62:2	drop 18:1	D
director 1:24 2:4 2:25 3:8 7:22 11:5,11 25:12 32:22 37:2 44:18 48:22 52:1,6 83:8	disease 10:18 14:13 30:10 34:24 35:10 40:10 45:7 47:10 57:16 66:25 82:13,23 112:23 120:9 153:22 162:3	dosage 38:2	doctors 4:2,6 15:13 25:10 31:23 46:20 47:21 84:11 86:24 89:15 95:4 122:13 124:25	drawings 37:12 62:2	drug 27:6,13,20 28:6 29:19 116:25 117:2,5 117:13,15,20 118:5 137:4,11 137:14 138:5 140:14 147:2 176:5,23	D

116:25 117:19 123:10 128:4 128:21 129:10 129:12 146:9 149:17,18 150:6 153:9,13 153:14 Edinburgh's 4:22 edition 90:16 editorial 27:22 education 62:13 86:22 effect 9:13 19:17 20:10 44:24 62:1,15 64:25 121:14 157:13 157:20 effective 31:11 38:9 62:2 119:18 158:4 effectiveness 92:8 effects 44:24 45:6 83:1 157:25 efficacy 44:24 63:17 effort 104:17 efforts 22:18 67:8 eight 154:11 175:10 either 38:12 58:24 95:7 98:19 100:9 118:1 148:9 157:18 159:18 160:15 167:14 elderly 32:8 elevated 157:8 elevations 160:15 eliminating 83:4 elimination 153:25 Elstree 25:22 elusive 153:6,19 email 111:8 embark 16:20 embarrass 47:10 embarrassing 89:16 embody 105:17 embolism 32:7 emerge 61:15 emerging 63:16 63:17 emphasis 21:19 30:15 120:12 127:15 emphasise 29:3 emphasising 85:20 employed 52:7 87:16 employees 76:10	enable 24:25 encourage 113:24 114:13 encouraged 33:7 50:12 ended 65:21 96:13 England 3:15,17 4:8,25 21:17 22:16 24:15 25:2 26:2,4 33:18 37:2,11 43:3 58:21 76:16 173:8 175:10,18,23 176:6 English 7:11 12:13 25:7 30:4 33:2 37:20 44:17 45:9 133:23 175:7,9 enquiry 10:25 entered 117:23 entering 49:21 enthusiastic 103:12 enthusiastically 52:16 entire 166:2 entirely 31:3,12 53:24 103:20 171:4 entitled 1:11,11 environmental 170:7 enzymes 82:14 epidemic 37:9,9 53:5 176:6 epidemiological 40:2,11,12,20 139:10 epidemiology 35:1 36:16 51:22 112:22 117:7 120:25 episode 82:12,21 156:25 161:5 161:14,20,25 episodes 117:13 152:23 Epstein 155:22 156:1 equally 153:12 167:22 equate 153:5 equated 153:18 equation 96:21 106:19 equivalent 54:24 133:8 era 43:9 Eric 82:18 error 95:16 especially 23:17 87:19 160:14 essence 103:15	essentially 157:6 158:3 175:21 establish 150:7 150:17 established 16:15 17:21 21:1 38:8 52:23 80:6,9 establishes 149:19 estimate 57:12 170:11,12 estimated 132:15 175:22 et 33:3,4 48:17 74:6 75:3 94:18,18 110:18,18 114:22 118:24 134:5 137:21 145:12 163:22 164:4 Europe 53:6 European 10:9 Eve 9:22 event 150:19 events 41:18 68:5 174:18,25 eventually 83:1 everybody 3:4 71:4 78:16 ever-increasing 37:18 evidence 38:13 38:18 39:24 49:21 51:5 92:6 93:1 94:20 99:17 109:25 125:5 125:10,15,16 131:1,6,10,14 131:15 132:11 133:14,20 142:3 149:24 159:20,21 160:18,22 162:14,24 163:4,5,15,18 163:19,20 164:15,22 165:22 172:21 174:4,12 176:8 176:16 evident 40:16 evidential 149:7 evolve 41:13 exactly 10:14 75:14 130:4 168:14 exaggerated 8:14 examine 157:20 example 3:23 4:9 7:23 36:18 62:8,18 71:25 78:1 85:17 128:2,3 158:21	161:23 162:3 excellent 76:5 excess 21:18 exciting 47:1 72:1 exclude 118:4 146:17 155:2 158:5 excluded 155:10 155:11,12,13 156:24 160:8 excluding 117:5 154:18 155:1 158:21 160:23 exclusion 157:2 160:7 exercise 120:15 134:23 168:10 exercised 127:7 exercises 72:17 exhausted 94:11 exist 44:7 exists 44:8 expand 101:18 105:10 expanded 51:7 expanding 61:21 70:16 expect 65:9 expectation 70:10 expectations 89:9,18 expected 65:22 113:21 137:18 expecting 41:25 experience 2:16 10:13 14:9 86:7 105:24 106:7 134:8 136:17 145:22 experienced 8:16 98:25 expert 46:16 experts 110:8,9 111:10 expire 96:14 expired 96:20 expiry 96:16 explain 36:21 42:2 43:6 48:24 54:22 71:1 87:25 114:17 150:10 171:25 explained 33:1 36:23 52:11 114:15 132:16 158:18 explaining 114:9 explanation 135:17 150:18 explore 129:15 exploring 98:22 exposed 80:18,20 82:8 95:19 129:19	exposure 80:4 94:6,19 140:16 express 99:21 expressed 15:18 51:2 100:24 expression 85:9 extant 124:13 extended 127:19 extent 3:14 73:10 74:20 91:17 127:6 128:17 176:6 extra 3:2 25:24 29:2 extract 172:16 extraordinarily 78:13 83:3 extraordinary 41:12 extrapolate 167:23 168:15 extrapolating 166:23 extrapolation 168:17 extremely 45:20	104:14 105:25 107:22 108:12 119:23 121:8 129:13 141:1 145:11 154:10 154:23 164:18 165:7,8,14,18 Factorate 54:7 factors 37:19 62:5 63:10 87:20 106:19 139:25 140:13 161:6 170:8 facts 142:19 factually 171:23 faculty 2:9 failed 95:7 failure 38:12 127:2 faint 64:10 fair 3:15 18:14 36:6 39:13 42:18 81:16 90:11 91:4 101:25 116:22 150:13 fairly 9:17 16:1 33:12 41:11 70:3 95:6,14 163:5 familiar 26:19 41:5 72:4,6,24 95:11 137:10 139:8 families 15:25 19:21,24 31:5 67:1 family 9:6,7 15:22 far 18:2 54:2 59:7,8 63:17 64:16 73:6 74:3 75:4 76:19 78:5 90:10 94:12 105:21 107:14 112:18 135:18 136:5,14 138:17 145:23 151:8 170:23 174:10 fast 137:13 fatal 30:21 45:7 fathers 89:17 favour 19:2 86:5 FDA 172:24 173:2 feature 27:10 featuring 32:17 February 13:2 101:9 105:2 139:20 173:12 feed 90:22 feel 68:13 85:16 101:15,17 105:10 feeling 13:22	39:21 53:4 64:19 114:22 feelings 84:22 104:16 fell 6:13 fellow 1:16 felt 8:13 13:21 15:4 16:14 21:7 37:17 48:14 50:14,20 62:23,24 66:17 84:13 91:9 92:5 114:21 115:2 118:21 125:2 155:2 Festival 46:19 festivals 47:1 FFP 130:6 Fiba 53:23 54:7 54:16,24 55:1 55:5 75:3 field 73:11 fifth 48:14 fighting 6:8 figurative 74:1 figure 61:1 175:13 figures 53:18,20 108:3 132:10 132:12 133:15 134:18,20 142:19 148:12 149:13 file 167:3 files 29:6,13 44:8 44:9 142:19 final 40:3 65:17 80:21 122:3 129:7,14 144:25 147:23 148:22 149:19 149:20 150:8 156:3 158:8 173:17,19 176:14 Finally 176:20 finance 25:18 financial 59:15 find 12:1 40:18 40:19 43:22 78:20 154:18 finding 175:12 findings 133:23 147:6,14 fine 43:14 finely 86:10 finish 123:9 131:1 171:2 finishing 160:4 firms 103:3,6 first 1:13 13:18 14:15 27:18 32:2 35:18 38:25 40:15 49:5 56:14,17 56:25 59:25 60:4,9,10,22
--	---	--	---	--	--	---

61:20 67:10 77:12 81:14 90:16 96:3 99:3 105:24 106:25 107:23 112:8 116:6 118:24 133:4 134:3 139:14 142:20 143:2 144:8 160:22 166:9,16,21 171:18 173:13 174:20 firstly 13:13 28:4 74:24 131:12 131:13 fist 6:2 fit 13:12 148:12 148:13 150:2 fits 172:20 five 109:16 127:14 132:3 132:25 135:9 135:12,19 174:24 flavour 129:20 151:14 focus 38:21 43:2 46:4 focused 37:9 39:10 focusing 93:4 Follett 147:15 148:17 follow 68:5 135:17 170:15 followed 1:21 32:4 147:3 following 73:8 109:4 112:11 163:4 177:15 follows 30:12 43:18 140:13 153:23 follow-up 140:9 foot 162:25 forefront 81:7 174:17 forget 76:22 form 35:20 153:21 formal 124:1 formality 124:2 former 110:1 146:14 176:15 forms 16:4 forthcoming 128:7 fortunately 85:25 for-profit 17:17 Foster 22:18 23:5,8 Foster's 56:1 found 38:24 42:21 87:21 88:21,25	117:10 135:6 137:8 140:2 150:10 152:11 152:13 155:25 173:1 175:2,11 foundation 89:5 founding 88:6 four 3:25 6:18,19 52:3 71:6,18 116:6 123:16 124:4 154:8 fourth 42:15 fractionated fractionating 11:2 16:9,20 17:22 23:7 45:1,2 fractionation 18:5 fractionation 12:14 101:23 102:20,22 165:6 fractionators 105:14 Francisco 125:15 Frank 1:4,6 103:11 177:16 Free 24:7 freeze 64:18 freeze-dried 16:20 freeze-drying 127:18 frequency 128:17 frequent 96:25 124:14 frequently 32:4 110:9 124:6 fresh 14:18 fresh-frozen 101:23 friend 35:5 36:19 friendly 114:16 friends 67:2 88:14 111:4 front 47:25 54:13 137:22 frozen 76:8 fruitful 61:3 frustrating 43:22 frustrations 110:17 full 141:24 fully 59:12 66:21 95:11 141:9 function 76:12 functions 85:18 fund 57:7 funding 131:25 funny 75:19 78:13 furnish 156:11 furnishing 24:24 further 32:14	94:10 98:23 110:21 140:8 146:22 158:3 162:17 170:25 172:3 Furthermore 67:14 153:24 future 105:18 <hr/> G <hr/> gallstones 162:3 game 48:1 103:13 gap 60:7 Garrot 172:15 Garrott 172:12 172:14 gathering 34:19 gay 47:15,16 112:13 116:20 118:4 general 12:4 49:22,25 52:4 54:19 55:14 61:4 63:6 71:19 93:11 100:21 102:10 106:18 113:20 123:8 165:23 168:20 174:6,9 174:16 generally 90:12 100:9 166:11 generation 16:11 genesis 173:10 gentlemen 142:17 Geoff 51:12,13 51:15 geographic 20:2 geographical 20:7 geographically 7:12,14 geography 19:3 25:13 getting 21:3 33:10 36:22 38:3 61:24 63:2 66:14 80:16 82:7 103:12 141:21 141:24 Gift 17:4,11 gist 44:6 give 13:8 37:13 37:17 38:7 46:22 47:17 66:18 78:21 82:16 90:4 101:5 105:8 112:10 113:21 113:22,24 114:13 115:14 116:11 118:3 136:4,16 138:15 142:4	151:13 169:14 169:25 170:6,8 176:16 given 2:18 22:18 25:16 32:5 47:19 48:16,20 49:4 54:19,20 68:10 73:14 83:21 93:23,25 99:14 100:15 100:18 113:17 113:19,22,24 114:1 118:23 119:9 122:10 122:25 123:7 133:21 136:3 141:3 146:4 151:2 154:12 155:7 166:14 170:11 175:20 gives 56:2 110:13 115:9 175:21 176:5 giving 10:13 94:20 105:13 112:17 113:10 117:5 120:8,16 166:15 170:2 Glasgow 4:18 7:3 12:17 19:25 20:11 54:3,6 76:5,9 76:13 77:16 97:11 127:17 127:17,22 151:10 163:24 164:18 166:16 glimmerings 81:14 go 11:21 16:3 17:4 20:15,19 21:8 24:2,8 27:22 32:21 34:16 36:10 37:21,25 43:12 47:1 49:2 53:21 57:22 58:13 60:14 69:15 72:3 78:11 79:23 84:10,14 87:6 91:24 106:3 108:18 114:19 131:18 132:8 133:22 136:15 136:18 139:24 140:12,16 144:25 145:8 151:8 159:8 167:11 168:10 169:24 170:13 171:15,24 172:10,17 173:4,11,16 175:20 176:1,2 176:10 God 84:13	goes 15:7 59:8 119:2,3 145:24 152:19 154:2 173:10,13 going 1:8 5:24 13:13 14:23 15:1 18:2,6 24:9,25 25:21 27:3 31:15 34:19 36:9 39:8 41:23 43:12 63:5 66:12 68:19 69:23 70:11 72:23 73:6,19 75:23 76:1 84:2,8 85:4 87:9 98:13 101:16 102:16 107:3 113:2 115:9,24,25 126:25 130:8 135:8,12 140:21 142:12 143:10 148:14 151:12 165:13 169:10,12,23 171:6 174:21 175:20 176:25 gold 15:1 good 1:3,5,8 16:14 19:14 36:19 44:24 47:14 55:24 63:2 78:25 80:3,19 86:22 89:1 90:13 92:5 103:1,6 103:14 113:4 121:23 126:14 130:24 141:17 170:1,2 goodness 110:25 Gosh 78:9 government 69:18 177:2 grace 84:13 grade 67:12 gramme 65:21 Granada 8:10 grandiose 84:1 102:4 grateful 133:18 136:11 151:25 171:17 gravitated 19:24 great 19:19 33:1 51:15 66:22 83:16 114:2 118:3 greater 17:21 63:17 89:18 91:14,14 113:12 127:11 greatest 84:23 grips 148:1 grounds 16:14	16:15 40:20 78:22 125:3 127:21 154:25 group 41:14 46:25 78:14,14 85:17 86:18,18 117:1 147:8 150:21 152:21 groups 50:2 115:13 116:10 116:19 118:4 144:21 149:4 grow 31:9 81:10 growing 37:16 38:13,18 guarantee 86:17 115:1 guess 22:11 67:9 67:13 81:14 guessed 82:4 guidance 171:19 gun 81:12 82:2 83:5,11 84:4 84:19,21,23 85:6 gunking 15:11 <hr/> H <hr/> habit 32:13 haematologist 14:11 56:21 67:11 haematologists 5:7 52:4 76:5 haematology 1:23 2:2,15 5:3 63:17 76:3,14 95:4 123:19 haemoglobin 1:15 haemophilia 1:25 2:24 3:8 3:11 7:21 11:11 12:17 13:15 14:23 19:11,17 25:10 25:12 27:12 29:9 30:5,6 31:6,25 32:13 32:22 33:9,12 33:17,20 34:20 35:4,8,11 36:18 37:2,7 38:7,16,22,23 39:3,4,8,13,19 51:8 55:8 56:14 57:25 60:3 62:2,24 63:24 65:8 66:25 67:11 69:17 70:17 78:11 80:25 81:2,6,10 82:6 83:11 87:21 88:6,9,11,22 88:25 89:20 90:6,11,13,16	90:18,22,24 91:20 92:1,3 92:10,20 93:15 95:5,11 98:25 99:11,15,22 102:12 103:9 110:8 111:11 111:13,15 122:12 123:11 123:15 125:13 125:19,23 126:2 129:12 haemophilic 27:24 57:8 85:17 haemophiliacs 19:21,24 27:5 39:11 50:19 51:16 52:24 54:18,20 55:5 61:22 63:4 72:10 79:10 82:15,20 84:16 84:25 85:4 87:18 89:13 94:6 99:9 100:16 102:23 109:19,20 154:8 haemophilic 9:16,19,25 14:15,21 18:19 20:3 33:5 38:25 51:18 54:19 55:15 62:23,25 84:17 100:16 124:5 haemophilics 39:18 89:18 118:19 half 105:25 107:1 154:2 156:21 hand 14:25 31:3 83:24 137:23 168:10 Handed 137:24 138:18 handful 161:12 handle 142:23 handwritten 69:21 happen 3:12 60:21 70:12 97:6 145:25 happened 62:11 84:24 86:23 128:12,14,16 132:2 happening 86:17 86:20 happy 143:5 hard 79:2 Harking 32:24 hat 3:7 haunt 120:9 HAV 145:18
--	---	--	---	--	--	---

160:16	117:11,12,16	149:2,5 150:11	host 6:20	impending 82:22	incredibly	initial 14:9 20:25
HBsAg 146:20	133:24 136:1	151:4,8 152:2	hotspot 117:20	impertinence	120:18	initially 4:5 81:4
146:23,25	139:10,12	152:8,13,16	houseman 14:10	100:4	incur 157:3	initiative 23:8
147:5,8,13	144:18 145:4,5	154:12,19	14:22	implausible	independence	injecting 116:25
148:5	145:6,9,23,24	155:1,4,5,10	Howard 14:4	160:14	6:9	117:2,5
HBV 160:10,16	145:24 147:4	155:12 156:22	81:17	implemented	independent	injection 31:14
HCV 139:21	147:16,21	156:23 157:8	huge 81:1 87:5	20:20	150:23	117:15
140:3,11 176:4	148:14,20,24	158:5,22 160:8	human 31:12	implicated	India 78:18	injuries 89:21
HDO 14:1	149:4,11,24	160:11,13,24	79:12 83:21	119:17 157:14	indicate 13:17	injuries 140:19
head 63:5 120:7	150:10,12,15	161:4	95:16 177:9	157:21,22	18:17 106:9	inkling 102:15
129:25	152:12,13,15	HIV 31:16 40:24	humankind	159:13	indicated 30:11	inmates 137:16
headed 137:11	152:16,24	41:4,6,6,12,14	41:11 111:1	implications	74:19 165:22	input 49:4 73:4
144:10 156:5	153:1,21,24	80:8 81:22	humans 79:4	70:25	indicates 150:9	Inquiry 87:14
heading 116:1	154:6 155:5,8	82:9,24 83:14	human-type	implies 123:24	indicating	98:24 128:19
174:22	155:9,14,16,20	84:12 116:3	79:13	imply 145:5	164:17	164:24 177:15
heads 62:21	155:21 156:6	117:22 118:6	hundreds 85:3	import 10:23	indication 40:13	insight 111:17
health 24:25	156:19 157:7	124:17 125:24	hung 77:19	78:2	105:8 112:10	insights 120:14
56:18 57:7,19	159:3,3,15,17	HIV-2 41:10	hunters 41:9	important 31:4	indicator 153:25	insofar 106:11
59:11,22 76:9	159:18,20,21	HIV/AIDS 39:2	hybrid 76:11	37:4 106:20	individual 85:6	inspectorate
176:23	159:21 160:12	102:15	hypothesis 41:3	145:23	individuals 85:2	171:11
healthcare 87:1	160:15 161:1,8	hold 109:4	hypothetical	importation 42:9	150:22 155:3	Inspectorate's
healthy 31:9	161:9,10,15	holding 24:5,11	47:6	78:7	156:23 157:2	127:21
37:17	162:8 169:6	24:23 25:3	<hr/>	imported 50:6,8	159:22	institutionalised
hear 23:21	174:23 175:3	holiday 169:13	I	50:13,21 52:22	industry 86:8	135:8
126:15	175:11,18,22	home 10:3 13:7	ice 82:6	154:9	inevitable 65:16	institutions
heard 18:12	hepatitis-redu...	15:19,20 19:4	icteric 155:20	impossible 43:16	infect 117:16	134:17 167:7,7
40:22 69:2	34:10	20:25 42:11	idea 27:11 43:23	impression 11:4	infected 140:3	167:10,19
85:9 97:24	heterogeneous	60:3,11 66:2	63:3 80:3,19	22:17 77:19	infection 120:1,2	169:11
109:25 163:17	160:1	70:16 81:8,14	82:15 89:1	110:13 123:1,2	123:13,23	insularity 23:22
163:19,19	heterosexual	101:3,13,18	113:4 166:14	164:8	139:21 140:11	126:19,21
164:20,23,24	27:19 140:22	102:2 104:13	ideal 79:17	impressions	145:5,25	intellect 44:21
165:10 176:7	hiccups 20:25	105:11,18	identified 40:15	122:21	152:12 153:6	intend 141:12
hearing 166:21	hieroglyphics	107:13 108:6	40:24 120:24	improved 89:11	153:19,23	143:6
177:4	35:19	108:13 109:11	154:8 176:24	improvement	156:1 162:12	intended 44:24
hearings 125:10	high 55:12	homosexual	143:13 177:1	81:1	170:8 174:24	intensive 72:3,11
176:18	115:13 116:10	113:5,13 117:3	identifying	impure 102:25	175:3	99:19
hears 130:20	116:19 147:8	honest 44:14	157:13,19,21	incidence 50:19	infections 40:4	intention 102:2
heart 33:3 63:15	155:17,19	honestly 9:5	IEOP 132:13	52:23 133:24	176:4	interact 122:12
72:2 85:4	higher 16:19	10:24 45:8	133:14	160:25 174:23	infectious 29:3	interest 8:9 24:3
hearts 84:15	21:14,16 41:7	61:2 75:5	IgM 159:21	incident 30:21	35:10 40:8	33:15 38:5
heat 49:15	118:6 127:8	108:14,16	illness 120:22	128:13	120:21 125:14	121:19 122:1,2
Heathrow 33:25	131:7 133:24	121:23	147:6	include 116:20	infectivity	152:5 175:2,25
41:19	135:7 149:5	honorary 2:1	illustrated 90:19	126:3 167:20	123:13 152:16	176:8
heavily 100:25	highlighted 18:7	hope 171:25	120:18	included 67:18	Infirmary 4:22	interested 14:23
112:24	113:7	hoped 176:15	ill-defined	71:19,25 108:2	4:23 5:13 7:17	34:9 87:15
heavy 14:16	highly 25:10	hopeful 130:10	120:18	159:23,24	11:16 54:6	97:1 98:22
54:11 62:9	90:21	hopefully 131:1	imagine 28:8	includes 140:18	56:22 70:17	99:6 100:6
70:18	hint 30:1	hoping 115:4	50:15 118:8	including 2:11	71:10,11,17	142:25 148:22
heightened	hip 32:2,4	Hopkins 146:10	129:9,22	24:13 26:8	76:5 88:17	interesting 6:22
34:23 36:15	historic 94:19	149:14	imagined 8:22	39:19 42:20,21	94:15	11:20 19:7
held 1:18 41:19	historically	horrible 30:10	immediate 31:13	46:22 123:12	influence 63:10	29:17 34:11
help 68:2 128:2,6	19:18	30:19 44:23	35:8	151:10 161:8	influenced 120:5	40:5 71:8
128:7 129:6	histories 157:23	53:5 66:25	immediately	171:25 176:23	influx 46:21	103:5 127:18
138:16 142:13	158:12	86:3,4	28:16,21 46:1	incomprehen...	information 2:23	139:24 176:5
helped 25:13	history 3:16	hospital 1:19,23	58:12	114:15	3:2 25:22 28:9	interestingly
38:24 87:21	23:13 27:20	4:4,21 5:8,8,17	immense 89:16	increase 16:11	56:2 172:7	6:10 15:5
helpful 107:1	39:8 82:21	6:25 8:22,23	Immuno 10:19	18:18 21:7	informed 25:25	63:16
176:24	90:4 113:5,22	14:3 16:2 52:4	34:9 40:5,6	22:4,9 102:2	94:24 149:21	interests 48:16
Hep 149:1	114:5 131:9	71:19 76:10	Immunodefici...	106:23 137:15	infused 102:23	118:23 119:9
hepatitis 10:2,4	138:5 140:22	87:17	26:21 27:1	145:3	infusion 15:13	119:16,23
10:18 28:15,21	141:6 143:8	hospitals 3:22,23	immunology	increased 22:3	16:19 31:7	121:17,18,20
29:3 30:20	144:11,19	4:10,12,12	72:22	66:3 104:13	infusions 15:2	121:24
35:1 36:17	145:2 146:8,16	6:19,20 7:18	Immuno's 34:6	107:8,10	inhibitor 55:3	interfering
40:14 81:19,23	146:18,20,24	7:18 63:23	34:11	147:13	96:10	111:20
82:10 83:2,9	146:25 147:1,3	71:10,18 164:4	impact 120:2	increasing 44:25	inhibitors 54:18	intermediate
90:10 102:16	147:7,12,17	164:12	158:15	63:19 82:5	54:20 55:9,16	57:4 102:25
102:19 117:7	148:6,15,19	hospital's 5:2	impacts 120:3	111:24	55:22 68:22	interpretation

51:3 interview 114:18 interviewed 52:5 intimated 91:23 intravenous 27:20 29:19 118:5 140:14 introduced 94:22 117:11 139:12 158:21 158:24 161:17 introducing 83:9 introduction 15:8 83:17 158:14 Inverness 4:19 19:2 20:1,6 54:9 60:13 61:9,10 62:8 97:7,11 98:4 98:14 128:3 inverted 35:9 investigated 57:17 invitation 140:8 involve 38:14 involved 7:15 23:19 29:21 66:12,14 67:20 73:19 74:17 75:6,24 98:21 128:18 144:16 151:20 154:11 157:14,24 164:3 involvement 7:21 45:15 56:13 88:6,9 89:4,7 99:14 ironically 32:3 82:17 86:5 irrelevant 45:10 irresponsibility 84:5 Isles 20:3,6 Isobel 76:6 isolated 128:12 issue 42:2,14 44:22 60:8,24 67:15 112:16 112:18,21 169:4 issued 60:4,9,25 67:17 107:23 issues 110:2 123:12,23 issuing 94:14 item 28:16 29:12 IX 24:13 34:10 74:5 75:1 96:9 <hr/> J <hr/> James 136:25 160:1 January 11:13 13:1,1 33:25 41:20 56:19	69:17 70:10 92:16 jaundice 82:12 82:22 131:9 140:22 141:6 143:8 144:11 144:20 145:3 145:21 146:9 146:16,18,20 146:24 147:1,7 147:12,18,21 148:6,15,19,24 149:2,5 150:11 151:4,8 152:2 152:8,14,17,22 152:23,25 153:2,5,18,25 154:12,19 155:1,4,6,10 155:13 156:2 156:22,23,24 157:8,23,25 158:5,12,22 160:8,11,13,24 161:4,5,14,20 161:25 162:8 162:11 jaundiced 82:20 155:18 Jeffrey 174:6 job 9:10 15:13 33:5 67:16 68:2,2 71:2 73:2 75:9 76:7 76:18 98:23 102:6 111:16 111:17,18 John 14:12,17 19:16 21:7,9 22:7 32:21 39:2 73:13 76:6 85:5 88:13 103:10 103:15 105:8 128:24 144:22 joining 104:15 joint 16:18 31:24 32:1,10,16 38:4 69:16 jointly 106:12 joints 16:22 31:9 31:22 32:13 jolly 84:21 Jones 35:5 36:19 37:1 43:11 46:1,4 48:2,14 49:16 90:15 112:7,9,14 114:7,20 118:14,16,25 121:5 123:3,7 151:16,17,23 152:5,6 153:10 154:14 journal 151:5 153:15,16 judgmental	113:14 July 27:17 64:12 144:10 jump 84:21,22 115:23 jumped 81:12 jumping 82:2 83:5,10 84:4 84:19 85:6 June 30:11 73:8 115:11,16 116:8,13 131:20 173:3 junior 15:16 justifiable 103:20 justifiably 59:1 juxtapose 42:12 <hr/> K <hr/> keep 42:12 51:21 109:7 131:5 163:7 164:7 keeping 25:18 kept 15:1 25:19 25:25 44:6 96:16 133:3 kilogramme 65:9,11,21 kilogrammes 22:5,14 65:9 kind 163:18 173:23 kinds 109:6 Kingdom 12:5 59:6 116:5 knee 32:10 Knees 32:10 knew 33:18 37:3 39:5,6 51:14 88:11 99:16 155:16 177:10 know 7:24 10:14 11:3 12:16 14:5 18:2 20:8 20:24 27:3 33:11 35:13 38:16 43:6 47:6,13 53:12 54:4 55:2 56:1 62:8,18 69:16 69:21 78:1 84:10 85:4 90:18 97:1 99:6 101:15,24 102:15 109:22 121:3 124:3 125:6 126:1,22 126:25 128:11 130:13,19 136:18 143:2 148:8,10 149:9 149:13,13 158:20 161:10 161:17 163:1,2 163:25 164:11 167:13,14	168:6 170:3 174:2 knowing 100:6 168:14 known 13:23 33:17 45:17 153:22 162:9 knows 39:24 Koch's 40:4 41:3 51:23 120:25 <hr/> L <hr/> lab 95:8 159:19 159:19 laboratory 4:25 71:24 72:8,15 72:16 75:20 labs 71:11 88:18 lack 59:1 Lancet 144:10 146:7 153:14 land 78:9,11 large 37:15 53:10 85:17 128:17 154:10 largely 37:6 77:14 131:10 171:2 largest 54:3 137:14 lastly 175:16 late 52:25 75:11 85:25 88:17 90:1 91:2 92:1 Lately 146:16 Lauriston 5:13 Law 6:25 75:12 75:16,23 76:15 76:24,25 77:3 98:3 lay 35:12 90:25 92:3 leading 37:2 39:3 151:16 leaflet 115:12,13 115:17,19 116:9,10,14,15 116:17 119:5 leaflets 119:4 learning 104:25 leave 56:5 114:9 115:4 119:4 leaving 36:8 62:16 lecturer 1:23 2:2 2:9 led 70:19 left 33:7 44:9,10 left-hand 140:4 144:9,12 146:22 176:3 legal 17:16 legitimate 10:12 37:23 65:23 70:24 106:15 legitimately 47:3 68:1 120:4	Lehane 25:20 length 68:11 lesson 117:7 letter 13:3,8,9,17 16:7 18:17,22 19:1 20:12,14 20:21,22 21:10 22:6 30:7 41:21,24 42:3 42:4,12,19 43:13 44:1,2,4 45:12 46:10,13 46:15 58:21,25 59:25 60:1 61:3 64:8 66:7 75:2 97:8,9 101:7,10,11,25 105:1,7,17 107:18,19,21 108:24 109:1 122:13 128:23 128:24,25 131:19,20,22 132:17,22 133:13,15 144:9 146:7,13 148:1 149:6,18 149:25 150:7 151:5,7,12,13 151:15 152:5,9 152:19 153:8 153:10,13,14 153:17 155:22 164:16,21 172:14 173:6 173:10,15 174:3 letters 41:22 43:18 61:18 68:24 74:19 108:20 let's 127:10 leukaemia 63:18 leukaemics 72:7 level 73:20 85:1 85:6 127:8 129:23 135:9 149:5 158:16 levels 148:20 155:17,19 157:9 158:11 Lewisham 6:8 liaison 73:20 life 12:22 19:5 37:18 45:22 62:23,24 81:1 90:23 lifestyle 113:13 114:9 lifetime 84:24 85:1,22 86:15 86:23 life-saving 31:7 light 39:3,5 46:10 liked 22:9 85:5 likes 155:21	163:6,22 limitations 43:20 67:25 limited 44:2 line 59:5 113:9 125:11 131:17 132:10 133:22 133:25 171:9 lines 116:6 132:20 140:17 163:5 link 33:3 38:18 160:12 linking 160:10 links 38:23 liquid 76:8 list 2:17,18 109:6 listening 87:2 literally 9:22 literature 103:8 114:9 136:12 141:9,15,16 litres 129:10,11 129:12 little 2:24 6:16 23:21 31:13 36:11 43:6 44:20 46:9 55:10 59:16 79:1 85:20 98:20,22 112:15 116:23 119:10 120:6,8 128:7 146:22 148:1 151:7 152:15 158:15 165:7 170:23 LIT0010429 146:5 LIT0010430 143:22 148:18 LIT0010559 27:15 LIT0012155 143:20 144:8 LIT0013258 174:20 LIT0013266 175:7 LIT0013300 144:2 live 8:6 89:22 lived 19:10 liver 10:18 57:16 82:13,14,23 153:4 162:3 Liverpool 1:23 1:24,25 5:16 5:17,18,20,23 8:25 9:1,6,9,10 10:8 11:16 15:14 25:14,16 25:20 33:5 38:24 87:17,20 88:16 livers 82:15 lives 66:24 86:19	89:22 living 20:3 90:16 local 14:11 25:9 38:25 51:16 87:21 88:25 89:4 90:6 127:11 locally 88:7 located 76:23 logic 50:8,20 52:21 logical 50:23 London 1:15,19 3:23 6:3,3,13 6:14,17 9:6,15 87:17 88:11 89:2 long 17:16 19:10 42:6 64:5 70:7 96:16 109:4 111:5 124:15 128:20 138:5 162:6 longer 32:22 173:19 long-term 25:1 38:15 45:3,4 82:8 83:1 look 11:13 13:2,8 18:22,22 20:12 20:20 24:16,19 27:15,21 34:1 35:25 42:2 46:14 49:11 50:4 53:12,18 53:22 54:9,11 56:17 59:24 63:8 64:2,8 77:5 96:21 103:14 112:15 115:2 128:21 132:9,17,23 133:5 135:7 138:23 141:24 144:18 146:4 150:22 156:21 157:12 161:3 169:2 176:21 looked 42:19 96:22 97:3,8 101:8,11 105:2 106:2 107:6,16 153:9,13 167:3 168:1 looking 1:9 11:11 26:5 41:18 45:16 53:20 58:18 74:11 82:15 97:4 118:9 124:23 139:25 145:13 149:6 149:17 150:6 160:18 175:17 looks 13:4 20:20 24:21 34:5 35:19 36:2
--	---	---	--	--	---	---

45:8 53:24	171:8,14,17	materially 145:3	meat 41:9	mental 6:5,17	98:18	68:24
58:15 59:6	172:8 174:1,4	158:4 160:25	mechanics 97:22	mention 42:11	MLSOs 98:7	NANB 145:9
64:11,16 66:4	174:10 176:14	materials 63:20	medical 7:14,16	49:9 54:7 63:8	MMWR 27:15	157:14,22,23
70:9 109:10	177:8,10,21	67:22 71:21	86:23 91:3	79:24	30:11	158:16 159:13
123:4 138:23	magnet 19:20	72:18 74:5,18	151:5 153:15	mentioned 26:18	model 3:17,25	159:15
150:3 173:21	magnetic 19:17	75:3,5 80:5,13	173:7 174:9	31:21 36:7	4:8 7:10	narrative 176:5
looming 37:9	20:9 62:1	98:2 107:13	176:15	41:20 45:13	models 4:19	narrow 14:25
loose 172:22	magnitude 17:25	mathematics	medical/profes...	54:1 137:2	moderately	nasty 15:11
loss 154:21 157:3	main 27:11 71:7	148:2	110:7	155:22 157:17	155:17	39:15 45:5
lost 119:12	93:22 141:10	matter 26:19	medication	mentioning	modified 146:17	national 2:11
lot 31:17 42:18	141:21	34:13 53:12	162:4	134:1	modifying 87:3	21:16 61:7
45:15 52:12,13	maintain 39:20	80:22 128:19	medicine 1:15	mentions 29:13	moment 3:4 24:1	108:3
68:22 69:3	80:25	129:16 133:19	2:9	message 47:16	41:20 42:10	nationwide
77:20 79:9	maintained	162:15 171:4	Medicines	48:19 122:10	55:24 95:23	112:12
86:14 90:22	38:11,17	171:12 174:22	172:21	122:22	100:3 116:16	naturally 101:14
100:18 116:24	Majesty's 171:11	176:7,14,20	meet 14:1,2,4	messy 14:8 15:9	138:18 159:9	103:11
118:17 119:14	major 9:17 82:25	matters 70:11	37:20 64:19	met 13:19,25	money 59:22	nature 5:20,21
135:11,23	174:6	123:12 131:13	70:6,24 104:13	39:1 57:5	132:5	19:7 36:1 37:8
136:20 142:19	majority 79:9	135:4 170:24	104:17,20	61:23 123:20	monitoring	63:14 78:6,13
149:5 163:13	91:8 162:10	171:2 176:14	123:25	method 117:5	15:24	83:21 98:23
169:11 172:6	making 64:12	177:23	meeting 11:9,12	mid 10:16	monkeys 41:10	111:1,18
Lothian 56:18	100:2 108:16	maximise 15:9	11:18 12:3,9	middle 3:3 4:15	month 68:16,18	naval 14:19
59:10	111:8 127:9	21:25 22:14	24:2,6 26:6,6,8	9:2 13:1 32:7	73:25 92:22	Navy 14:14
lots 62:5	163:17 164:1	23:11 66:21	27:11 28:11,14	44:22 85:24	monthly 64:14	nearer 68:17
loud 70:3	165:14 166:6	67:7 81:8	28:18 29:6,13	86:3 95:20	73:5,22	nearly 154:5
loudly 74:2	166:25 168:20	maximising 67:4	29:16 30:12	107:16 117:22	months 68:12,16	necessarily
loved 33:5	male 140:9	67:22 119:23	32:19 33:11,24	154:2,3 159:12	68:17 73:16	19:14 73:20
lovely 39:9,10	males 27:19	Maycock 172:14	33:24 34:3,7	middleman	96:18 114:23	128:18
44:18 79:17	man 9:25 10:15	173:12,17,23	34:12 36:12	66:10 67:9,24	132:4 133:4	necessary 19:4
89:13 103:8	14:6,11,15,20	173:25	41:19 49:10	mild 9:19,25	135:1 139:14	60:12 69:15
low 74:10,12	14:24 32:11	McClelland	51:24 52:16	milder 160:15	146:18	105:6
158:15	39:1,10 44:18	35:17 43:10	56:18 58:4,19	military 3:18	month's 68:12	need 15:23 20:19
loyalty 127:12	45:21 51:13	44:5 56:20	61:16 64:20	million 4:11 54:2	morning 1:3,5,8	21:20 23:5,11
Ludlam 13:6	76:17 81:18	70:13 93:2,17	66:6 69:16,17	54:5,8	40:23 58:19	27:22 36:11
18:15 21:3	85:5	110:1 111:8	69:22 70:9	mind 13:12	77:8 128:3	37:21 64:19
56:19 57:3,12	managed 14:24	112:5 113:3	122:7,19 123:7	43:17 51:1	mortality 35:15	72:13 73:6,8
57:15 58:16,22	109:16 137:6	118:13 124:23	129:3,4,6	55:20 65:6	mothers 89:17	78:24 79:23
59:4,13 60:1	manner 111:6	133:21,23,25	156:10 158:19	70:3 91:25	mother-in-law	84:10 124:7
65:24 66:1,6	manufacturers	172:9,13,19	174:11	103:19 109:5	85:23	131:22 149:13
66:14 73:21	121:9	McClelland's	meetings 14:1	135:14 145:16	motivations	163:22 164:18
92:20 94:24	March 83:15	69:21 134:7	33:21 59:18	minged 47:2,17	108:16	171:2 172:1
99:12 100:8,24	125:12,23	136:14 172:21	72:3 73:12	mine 88:15	move 9:6 12:23	needed 9:16,18
101:16 102:2,8	131:14,15	McIntyre 131:21	99:19 106:3,8	124:24	26:5,23 100:24	55:9 58:1,8,11
105:10 106:3	133:21 137:3	131:23 176:15	123:16,19	minimise 96:15	101:1 102:11	60:21 71:4
107:20 109:21	139:5 146:7	176:17	124:11,13	minimising 47:3	103:22 131:12	106:10 114:15
110:4 123:22	168:2,4 172:9	MD 1:15	Melrose 71:19	minute 13:8	141:4	115:3 156:14
130:19 164:16	172:10	mean 13:17 40:2	member 95:8	24:16 68:19	moved 3:10 5:17	163:7 165:1,12
164:22	mark 50:22	70:8 77:21	members 87:1	minuted 52:9	19:21	165:19
Ludlam's 13:23	125:6,20	89:16 95:17	90:6,11,24	minutes 24:6	moving 5:16 9:2	needle 140:19
94:11 104:13	137:19	96:6 101:22	92:3,11	27:11 29:16,18	24:1 130:22	needs 66:15,20
108:10	marked 22:9	103:7 121:16	memo 43:9 45:25	31:14 51:24	135:16 136:23	70:5
lunch 104:4	44:3	124:2 167:10	48:13,25 49:1	58:18 66:5	137:2 139:7	negative 50:10
lurking 41:15	marker 152:16	meaning 11:24	49:7 112:5	69:15 125:17	multiple 80:4	110:13 146:20
lyophilised 16:19	markers 60:21	means 20:9	113:7 116:21	171:1,7	multiplies	147:6
	153:1 157:7,16	51:11 65:20	118:12	miscellaneous	134:18	negotiations
	marketing 103:7	88:1,2 107:25	memorandum	171:1,16	mums 89:23	127:6
	121:9	120:22 129:6,9	124:22	missed 33:6	90:20	neither 29:11
M	material 11:5	157:18 159:2	memories 25:5	missing 133:1	myeloma 86:6	net 110:21
M 151:16	39:17,20 48:9	166:16 177:9	memory 12:11	mistake 142:2	Myers 57:18	never 21:23
MacFarlane	58:8,15 64:18	meant 64:24	13:9 30:23	misunderstand...	mysterious	45:18 49:13
19:20	68:22 69:11,20	65:16 93:11	68:9 112:13	91:3	82:10	82:21 111:19
MACKENZIE	71:4 74:14	95:2 113:18	115:7	Misuse 138:3	mystery 171:25	nevertheless
130:24 131:4,5	78:8 79:13	121:18,24	men 47:16 89:13	Mitchell 76:23		15:14 20:4
136:11,23	80:12 84:18	140:17	112:16,17,24	148:18 156:9	N	51:20 82:18
137:2 138:9	94:20 103:14	measure 78:6	112:25 113:5,8	164:17	naive 10:7	86:7 103:1
142:7,9 143:4	142:19,23,24	158:25	113:9,16 117:3	mls 21:24 23:3,3	naively 102:17	113:18 117:18
146:2 148:22	173:23	measured 39:25	119:17,18	MLSO 97:20	name 56:25	new 13:6 15:6
151:25 159:10						
160:3 170:25						

59:4 83:13	149:2 150:12	94:19	operation 62:17	Oxford 11:18	115:8,23 116:3	pass 137:18
94:9 125:19	169:18	obviously 3:7,10	93:3	14:12 19:18,20	116:6,21	passage 50:7
132:23 133:5,6	normally 81:11	5:7 11:10 21:2	operations	19:21	118:15 119:12	163:1,4
134:9,16,20	89:22	37:3 42:5	100:22	O'Brien 14:12	122:4 129:2,7	passing 48:21
135:6,9,18	Norman 11:5	46:12 66:5	opinion 9:21	14:13,17 15:3	129:14 139:18	166:8
136:9 146:23	north 6:10	70:19 79:3	28:12,17 35:11	O-Bombay	140:2,5 141:11	pathologists 4:5
148:5,9 165:24	northeast 6:10	108:3 126:2	114:7,11	78:14,19,20	143:9,11,16,18	patient 7:15 9:16
166:4 167:4,6	northwest 6:15	132:25 133:1	124:16,24		143:19,22,23	10:13 38:10
167:6,21	note 24:3 26:24	133:10 134:7	126:8 127:22	P	143:25 144:25	45:5,20 55:8
168:22,25	26:25 27:2,23	135:10,12	opportunities	P 151:16	145:18 148:2,4	55:21 58:9
169:3,19	28:5,20 34:1	136:8 139:6	67:5	package 103:5	157:12 159:12	65:17,22 74:13
Newcastle 35:6	34:13 35:20	150:1 162:9	opportunity	packaging 103:7	160:5 176:3	75:21 78:19
37:7 48:22	36:3,8 49:11	163:8 164:24	91:23 141:20	paediatrician	paragraphs	80:1,4,9,11,15
151:18	49:13 59:3	169:13,24	opposed 132:14	37:6	42:15 141:13	85:15 94:10
newer 16:11	64:20,22 79:20	170:5 174:25	174:16	page 3:3 11:21	parental 27:6	96:13 99:24
news 139:4	79:25 142:21	occasion 55:15	opposite 75:8	11:23,24,25	27:13 28:6	108:1 111:16
newspaper 137:5	171:18	88:20 97:7	166:2	12:1,2 20:12	117:13,15,20	patients 5:2,4,10
NHS 2:8 9:20	notebook 28:10	occasional	optimal 22:2	20:15,16 24:8	140:14,15,18	5:23 7:17
16:9 17:2 52:8	noted 26:3	127:12	option 18:20	24:9,18,19	parents 15:23	12:20 15:21
53:24 59:8,25	notes 26:8 28:13	occasionally	52:11	26:15 27:21	Parker 56:20,24	16:17 18:19
70:18 129:21	28:21 29:14	54:25 79:4	orange 172:1	34:16 35:18,25	57:2	30:20 33:7
nice 103:14	34:12 69:22	110:16	order 15:9 75:22	49:6,8,14,14	Parkers 56:23	37:14,16 38:7
nicely 172:20	nother 65:15	occasions 14:4	80:3,9 165:11	49:15 50:4	Parole 170:2	39:1,17 45:16
night 95:2,8,20	notice 12:3 73:15	95:6,7 96:14	ordered 9:23	57:23 60:20	part 5:2 11:20	45:23 50:12
nine 132:4 133:4	100:15,19	98:13 124:8	57:21 58:2,9	65:25 79:21	15:17 46:3	51:10 52:9
noises 159:1	105:13	occupied 2:10	ordering 59:10	93:24 108:24	48:19 58:18	55:13,16,22
non-A 10:2,15	noticed 11:9	occur 7:22 53:1	74:17 75:7	108:25,25	69:24 73:2,12	56:14 60:3
82:10 83:1	135:18	104:18	ordinary 144:19	109:1 115:22	76:7 93:3,5	63:24 66:15,18
145:16 146:3	notified 159:17	occurred 27:4	93:16	125:11 129:7	122:9 141:4	66:22,24 67:1
147:20 148:23	noting 64:21	52:20 85:1	organ 86:13	131:16,17,18	143:14 174:16	68:21 69:6
150:9,14 153:6	nots 51:1	152:22	93:16	133:22 138:12	particular 26:19	70:5 71:17,21
153:19,20	notwithstanding	occurrence	organisation 4:2	138:15 139:25	29:12 38:17	71:23,24 72:10
154:7,17 155:7	69:2	27:24	79:1	140:1 143:25	55:3 58:1,9	72:11 74:22
155:9 156:5,18	not-for-profit	occurring	organised 3:21	151:5 157:5,5	65:14 68:23,24	75:18,18 78:12
156:25 157:1,7	17:18	152:23	organising 9:6	158:8,8 159:8	73:11 74:13,13	80:1,2,14 81:2
157:19 158:25	nuance 29:24	October 9:1 24:7	organism 40:18	159:11 160:5	94:2 95:18	81:10 82:7
160:12,14	number 3:6	49:10 151:6	40:19	162:23,23,25	101:2 107:5,7	84:2,8,9 94:8
non-B 10:2,15	21:14,15 26:7	152:6	origin 11:6 51:10	162:25 163:3	109:23 116:4	96:10 100:8,11
82:10 83:1	26:18 37:16	offenders 167:19	54:17 78:18	172:10 176:1,2	117:1 118:18	100:13,22
145:16 146:3	75:8 109:12	offer 150:17,18	140:23	pages 144:1	124:9 129:23	101:3 103:18
147:20 148:23	110:2 134:9,24	offers 68:8	original 23:2	pagination 79:22	131:8 141:17	106:16 109:11
150:9,14 153:6	137:15 155:14	officer 173:7	115:22	paid 11:8 17:12	145:17 146:10	110:9 111:11
153:19,20	159:3 161:6	176:15	originally 3:18	17:20,23,24	148:16 153:16	111:13,15,25
154:7,17 155:7	166:4 168:8	officers 128:10	Orkneys 20:5	18:1,4,5	155:8 161:8	119:24 121:21
155:9 156:5,18	176:24	174:9	orthopaedic 32:9	121:12	164:15 173:3	129:18
156:25 157:1,7	numbered 11:24	official 29:16,18	32:15 100:17	pain-free 31:9	176:22	patient's 15:22
157:19 158:25	numbering	51:24	ought 101:15	panel 52:5	particularly 4:16	PATRICK
160:12,15	163:3	officially 60:9	105:19 141:23	paper 22:17 23:9	12:21 16:22	130:21
non-haemophi...	numbers 53:9	officials 69:19	142:23	138:24 139:7,8	18:19 19:18	pattern 13:12
82:11	85:3 94:7	Oh 61:17 77:11	outbreak 30:19	139:13,24	25:10 30:17	26:1 55:14
non-haemophilic	132:18 149:16	90:9 112:20	outlook 111:2	151:1 175:4,6	32:11 33:14	56:3 75:7
75:18	nutshell 42:24	okay 85:6 95:22	outside 6:14 74:2	175:8,17,21	37:10,15,19,21	101:20
non-hepatitis		122:3 142:1	77:25 78:11	176:1	40:17 41:9,10	pause 3:5 13:8
161:21	O	older 88:16	136:3 169:19	papers 149:14	45:1 49:11	24:16,18,20
non-judgmental	O 78:14 86:18	89:12	outstanding	174:14,19	54:11 66:2	129:1 153:7
114:16	Oakley 17:8	once 73:25 94:8	170:24 171:9	par 103:2	80:24 87:14	paying 18:10
non-paid 18:1	observations	136:16 139:11	171:12 176:20	paracetamol	95:25 96:7	peak 53:16
non-profit-ma...	127:10	169:24 170:5	177:23	159:22	99:18 114:6	Peel 71:19
17:14	observed 29:5	ones 18:19 162:9	outwards 174:9	paragraph 27:18	119:11	PEN0020582
non-rejection	86:15	one's 70:23,23	oval 6:4	27:23 36:1	parties 25:25	139:8
112:13	obtain 147:5	85:4 110:18	overdoses	46:8 48:14,18	69:13 142:21	PEN0020821
non-teaching	obtained 18:9	120:3,5	159:23	49:5,6 57:11	143:1 174:18	143:17
6:20	58:4 103:2	onset 30:9 81:13	overseas 2:16	57:12,13,18	175:4	PEN0020822
non-UK 140:23	152:17	onwards 21:4	37:21 79:15	62:14 64:24	partly 15:16,16	175:20
non-viral 162:1	obtaining 24:5	on-call 95:4,8,10	overt 154:6	69:1 87:15	parts 51:20 93:3	PEN0020850
normal 135:9	56:16	open 113:19	overwhelming	101:13 105:5	party 128:23	143:19
148:15,19	obvious 65:25	opening 116:21	34:12	107:21 108:5	172:3	PEN0120164

172:17 PEN0120173 173:2 PEN0120347 171:22 PEN0131433 53:19 PEN0140067 143:24 151:1 PEN01500054 77:6 PEN0150054 93:25 PEN01500578 93:24 PEN0150226 42:14 49:5 PEN0150478 56:17 PEN0150480 58:17 PEN0150506 2:22 87:14 PEN0160456 137:7 people 4:11 19:9 19:10 27:12 39:9 41:8 42:19 47:4 50:2 67:3,5 77:20 78:17 80:24 81:6,25 82:18 84:14,14 85:18 86:17 88:18 90:25 91:9 92:4 95:18 111:1 113:20 117:10 118:6 136:15 137:16 138:15 141:14 155:20 155:25 162:7 169:21 people's 65:6 perceives 42:8 period 47:20 62:9 73:18 80:24 82:4 83:6 91:6 99:18 107:7 116:4 123:17 132:5 134:14 134:15 139:19 167:22 168:1 168:13,15 Periodically 80:23 periods 73:15 167:23 169:13 169:22 permanent 38:4 120:21 permanently 86:19 Perry 29:9 177:12,13 persisted 81:3	person 38:6 40:8 40:9 83:10 99:3,10,13 114:12,16 personal 28:12 28:17 37:17 44:9 88:14 personalities 110:24 personally 21:7 21:10 33:18 37:3 84:20 persons 146:15 146:19 Peter 35:5 36:19 37:1,5,24 43:11 46:11 48:2 90:15 112:7,9,14 114:7,20 118:14 121:7 122:23 123:3,7 123:18 151:23 Peter's 119:23 PFC 21:2,8 22:5 22:10,14,18,24 29:8 54:2,8 55:1,6,11 57:4 57:11 60:16,24 60:25 66:13 67:18 72:18 73:7,8,14,15 73:20,21 74:25 80:5,7,10 94:7 96:8,10,12 101:12 103:10 103:18 104:12 104:14 106:1 107:13 108:8 108:11 129:10 129:11 165:18 PFC-derived 18:20 74:5 pharmaceutical 86:8 121:12 PhD 137:5 144:1 156:16 phocomelia 86:4 phoned 98:18 112:14 phoning 128:11 128:14 photograph 138:12,13 phrase 83:5 126:18 phraseology 50:15 physician 44:19 Physicians 1:17 picked 122:6 picture 6:6,17 56:4 110:13 122:7 pictures 103:9 piercing 140:18 pigs 79:5	piling 73:19 pin 107:4 pint 86:18 place 5:13 26:7 34:15 77:12 90:4 143:2 placed 30:15 98:5 places 167:11 plan 20:18 planned 74:22 100:16,17 planning 25:1 83:17 102:1 plans 104:13 plant 127:20 plasma 7:25 10:19,21 11:1 12:13 18:5,9 21:8,20,25 22:1,2,5,10,14 22:23 23:4 60:16 63:9 65:9,12,21 66:12 67:18 71:15 72:17 76:8,8 79:15 101:23 102:20 105:13 129:11 130:2 154:22 165:5,16,18,20 plasma-derived 87:20 platelet 63:19 platelets 67:18 71:15 76:8 play 46:7 Playing 84:6 plead 59:1 please 11:21 13:3 20:13 24:9,20 26:23 27:22 34:2,17 35:25 49:8 50:4 53:21 57:14,23 65:25 87:25 101:9,23 112:2 128:22 131:15 131:19 132:9 133:22 135:16 137:7 139:25 141:6 144:11 144:25 145:7 146:4 147:9 151:9,12 156:3 157:5 158:8 160:4,6 176:1 176:2,12 pleased 15:3 plus 60:19 146:24 148:6 pm 104:6,8 142:14,16 177:14 pockets 127:11 point 7:6 19:1 34:6 36:22	38:19 40:25 41:2 44:23 48:12 50:23 51:25 62:13 70:18 80:22 82:25 99:23 100:21 102:13 103:6,23 105:1 135:6,21 141:10 145:18 146:4 149:14 158:20 159:16 163:24 165:21 168:5,20 169:6 172:9 pointed 57:15 98:24 99:2 points 26:18 46:14 64:12 77:7 87:3 101:24 108:16 109:4 135:14 141:21 162:21 171:16 policy 18:16 94:16 146:14 146:16 154:13 154:20 158:10 158:21 politely 15:6 ponderous 17:10 pool 154:10 160:9 pooled 38:2 poor 14:24 population 38:17 49:22 50:1,3 51:18 54:19 62:19,21 63:5 84:17 117:23 129:25 130:5 137:20 147:11 147:22 148:25 157:3 175:22 176:4 populations 85:15 porcine 75:4 79:6 Portsmouth 14:10 pose 113:6 position 5:25 13:15,20 45:19 59:7 65:24 100:20,23 109:7 111:19 111:20 positions 1:18 2:10 positive 110:22 111:6 140:1 147:1 possibilities 31:19 33:14 possibility 27:7,9 28:7 29:20	31:15 34:24 47:9 52:20 53:2 81:20 82:9 111:9,24 118:1 119:10 125:3 156:24 possible 11:1 19:23 27:25 28:5 32:1 36:1 37:5 46:5 66:24 67:23 68:3 92:2 97:2 101:15 102:21 106:11 110:6 119:16 123:13 129:17 147:4 150:18 153:24 157:6 possibly 25:13 27:5 37:15 77:16 81:19 116:18 120:4 134:1 151:23 154:7 177:3 post 91:6 137:12 138:9,20,23,25 139:1 posts 87:16 postulate 41:3 Postulates 40:4 51:23 120:25 post-date 174:18 post-dates 174:25 post-transfusion 145:24 154:6 159:3,17 pot 23:7 potency 15:10 potent 16:17 potential 47:18 47:25 119:25 157:19 potentially 45:6 150:9 powerful 78:16 practical 15:25 practically 78:16 practice 19:13 19:15 120:16 127:18,19 172:25 practices 17:19 76:1 120:5 practising 14:3 praised 25:17 preceded 77:3 preceding 46:2 precise 12:11 61:19 73:10 94:23 98:23 104:19 precisely 43:16 predecessor 13:24 52:2 predictable 123:24	preference 129:20 preferred 18:20 preferring 38:14 pregnancy 85:25 86:4 preheat 80:7 preliminary 53:19 83:17 115:8,22 116:2 Prentice 12:16 preparation 7:25 prepare 105:15 prepared 33:25 63:11 101:22 116:17 preparing 35:20 presence 157:9 present 33:20 57:17 73:13 81:21 137:11 150:16 154:19 158:10,16 Presentation 170:24 177:23 presented 133:9 156:2 presenting 87:3 presently 176:25 pressure 31:17 Preston 82:18 presumably 32:1 57:18 61:10 92:3 116:15 pretty 4:7 6:7 12:7 13:21 25:25 35:1 72:6 78:25 108:3 114:10 121:22 173:14 prevail 59:5 prevailing 13:15 16:25 prevalence 139:9 139:21 145:3 147:8,16 148:14 149:1,4 149:11,24 175:2,11,17,22 prevent 32:6 129:18 prevented 154:13 preventing 16:21 previous 50:5 100:25 111:18 112:12 145:5 146:18 159:8 160:19 169:6 175:19 previously 153:9 pre-AIDS 87:17 pride 127:22 primarily 34:5 primary 72:20 72:22 99:10,13 primate 41:7	Principally 107:12 prior 66:17 94:20 132:2 136:7 156:23 160:8,13 169:23 prison 84:11 134:13 135:10 135:22 136:3,4 136:6,16 137:17,19 163:6 164:6,9 165:2,24 166:3 166:8,15,17 168:9,21,25 169:2,20 170:6 170:8 prisoners 131:8 131:11 133:24 163:25 165:12 175:3 176:23 prisons 134:3,9 134:15,17 135:25 137:4 137:11,13 163:16 167:5,6 167:8,10,11,15 167:17,20 168:12 171:10 171:11 172:25 173:9,14 174:24 175:10 176:22 privacy 110:17 pro 24:22 129:3 129:6,8,16,24 130:2 probable 19:23 probably 6:4 12:1 16:1 19:15 20:4 39:22 44:1 47:19 70:12 74:8 81:18 101:7 116:22 122:8 124:5,12 135:1 136:17 138:22 139:2 162:22 168:4 169:1 problem 2:19 9:17 16:13 20:2,7 24:15 47:18,23 55:21 61:5,24 70:21 74:13 82:16 91:10,18 95:3 106:11,13,15 106:18,25 119:25,25 137:4,9 problems 8:15 16:8 18:3 33:10 35:8 40:6 61:15 65:5 72:25
--	--	---	---	--	--	--

106:5,7 124:6 153:4 procedure 58:10 100:17 114:2 procedures 98:21 158:14 proceed 143:5 proceeded 123:6 proceedings 28:11 process 73:19 99:14 102:18 102:22 104:25 procure 14:18 procured 11:2 produce 60:17 produced 115:12 116:9 producing 45:6 158:25 product 16:9,15 16:20 21:2 38:8 49:17 53:24 54:1,2,5 54:7,8 56:16 58:1 59:7,8,25 77:15 83:14 91:4 94:13 95:19 96:16 97:11 102:22 103:1 121:6 129:21 production 9:8 63:20 84:3 154:23 productive 47:14 110:14 products 4:4 5:10 8:1 9:13 10:11 17:22 18:13 24:5,12 24:24 25:4 27:10 28:1,7 29:21 37:22,23 38:2 39:15 40:15 42:10 45:1,2 56:13 57:11,20,21 63:18 71:5,12 72:14 73:7 74:4,9 77:23 78:2,5 87:23 90:7,8,14 91:15,21,25 92:7,8,12 96:4 96:6,9 97:23 99:8 123:14 124:17 154:9 154:21 professional 70:23 84:24 85:21 87:1 110:12 Professor 41:24 42:4 45:14 58:16 73:21 110:4 130:19	136:25 160:1 164:16,22 172:12,14,23 177:11 profit-making 17:13 programme 7:23 8:14,18,24 9:8 16:21 18:6 21:1 60:11 61:22 70:16 101:14,17,18 105:11,19 107:13 108:7 108:13 112:12 programmes 7:24 8:6,7 progress 24:1 111:6 projecting 73:5 promised 176:21 promotional 34:6 prompted 156:9 156:13 promptly 20:1 proof 39:23,25 40:2,3,10,13 40:14,19 propensity 41:13 proper 98:1,4,5 property 15:11 55:3 prophylactic 87:19 prophylactics 16:21 proportion 21:21 84:16 proportionate 63:9 proposal 20:23 102:10 103:21 104:22 proposals 22:6 propose 141:8 143:10 proposed 143:4 154:14 proposition 106:14 125:9 125:22 126:1 160:22 164:6 propositions 109:16 160:19 162:13 prospects 90:23 protected 127:6 protection 16:17 Protein 165:6 proteins 102:23 Prothero 39:2 85:5 88:13 proto 41:6 prove 40:19 150:7 proved 39:16	154:17 proven 160:11 provide 74:24 104:12 141:13 141:16 158:3 172:6,18 177:3 provided 57:12 58:16 77:6 87:13 146:20 172:15 173:5 175:14 providing 57:4 131:23 143:11 proximity 16:1 PTH 157:14,22 157:23 158:16 159:13 public 113:20 138:14 publication 144:24 publications 2:17 135:3 published 134:20 135:2 pulmonary 32:6 punctuation 148:11 purchase 25:3 69:20 purchasing 24:11,23 57:19 Purely 149:23 purity 103:1 purpose 164:10 purposes 11:20 65:13 72:5 156:12 pursue 165:11 pushing 68:1 put 6:12 23:6 35:9 36:25 40:8 61:18 67:15 68:3 83:12 84:9 96:3 108:24 109:11 112:4 115:6,21 125:5 125:16 137:9 145:7 158:18 160:20 165:15 174:15 putting 24:21 47:12 60:20 100:10 101:3 150:5	quantitative 120:19 quarter 60:5,9 60:10 107:23 quartered 6:5 quarters 6:18,19 queries 172:3 question 13:7 24:10 27:14 28:4 50:22 52:9 58:11 61:6 76:22 86:20 93:22 100:1 104:11 105:5 109:17 113:7 121:23 122:9 129:8 130:13 131:11 133:23 146:3 151:3,22 152:1 152:7 156:18 173:8 questions 1:7 56:12 87:9,10 96:1 111:22 120:23 121:1 123:8 126:12 126:15 130:16 131:4 162:17 162:19 170:19 177:17,18,19 177:21,22 quick 11:13 53:22 quid 24:22 quite 8:15,16 9:5 10:17,18,24 11:1 15:23 18:17 19:23 29:1 31:20 37:3 38:23 41:14 52:17 59:1 61:2 63:2 64:6 69:2 72:3 72:19 75:5 81:19 85:21 86:14 90:9 92:19 99:18 100:15 103:25 106:17 114:4 123:6 130:3 135:17,23 138:7 141:9 142:19 162:6 168:15 169:11 169:21 170:15 175:12 176:24 quo 24:22 quotation 125:5 quoted 58:25 quoting 49:23	ran 80:11 96:11 rank 83:23,24,25 ranks 84:4 rapidly 41:13 rare 99:1 161:11 rata 129:3,6,8,16 129:24 130:2 rate 21:18 raw 63:20 71:21 reach 159:9 reached 65:17 reaction 10:12 22:7 31:12 125:8 162:4 reactions 10:7 read 3:4 8:20 17:7 24:14 49:7 70:13 94:4 105:5 115:4 116:5 118:15 119:5 122:4 125:20 128:25 132:17 133:13 135:13 136:12 137:9 141:11,11,13 142:22 143:11 149:25 150:24 170:22 172:15 175:4 reading 137:4 143:12 150:1 151:13 real 20:7 33:2 47:21 84:15 realised 11:10 25:6 32:3 117:14 163:6 realising 43:20 realistic 89:9 104:2,12,20,23 reality 106:6 164:9 reallocations 61:13 really 7:8 9:10 15:19,24 19:6 19:12 22:18 24:3,14 35:6 37:3,7 38:22 39:15 41:14 42:22 43:23 44:19 47:20 48:7 50:1 51:11 52:15 54:23 55:5,9 58:10 60:7 61:2 64:11 66:10 70:19 75:15 76:12 77:7 81:13 85:5 86:22 93:2 104:18 117:22 127:9 133:8,11 135:6 136:3 144:18 144:20,21,21	145:23 153:11 164:4,6 172:20 173:4 174:15 175:12 176:10 reason 19:14 32:25 33:13 55:2 58:2,18 62:12 67:6 74:20 91:12 101:16 105:8,9 108:9 119:16 128:6 134:2 reasonable 38:20 40:14 51:3 162:14 reasonably 94:13 reasons 7:3 30:17 31:4 136:21 reassured 61:21 recall 34:21 36:12,14 51:14 61:3 63:6 64:7 74:17 76:19 94:12 105:4 108:15 115:18 129:3,5 130:1 173:6 receive 10:1 60:24 71:25 78:15 80:12 86:18 received 46:13 60:18 receiving 31:14 154:9 reckoned 102:17 recognise 110:19 111:15 recognised 67:25 160:14 recognition 102:21 recollect 59:17 65:3 70:3,8 75:4 90:10 98:17 101:6 116:17 121:23 122:18 128:16 recollecting 65:4 recollection 23:18 28:24 29:1 30:14 43:21 45:16 54:15 58:5,6 58:14 59:2,10 59:17 61:2 68:15,17 75:6 82:3,4 91:8 94:21 95:14 96:1 97:13 109:15 110:15 125:2 138:2,19 138:21 recombinant 79:8,11	recommendati... 173:2,3 recommendati... 43:24,25 recommending 172:24 reconsider 129:16 reconstruction 115:2 record 27:4 28:13 64:8 97:8 124:13 125:9 170:2 recorded 11:12 28:6 34:13,14 50:5 64:21 69:1 124:11,12 recording 42:7 60:5,7 records 106:2,8 recover 22:21 recreate 114:25 red 21:18,23,23 71:14 76:8 78:12 88:17 154:11 165:4,5 172:1 reduce 37:12 38:2 51:9,9 80:4,9,19 94:6 reduced 160:25 reducing 39:16 49:17 158:15 159:2 reduction 65:16 refer 77:17 105:3 115:7 157:16 reference 26:20 27:9 28:5 29:11,17 51:25 75:22 77:13 87:25 100:2 111:9 112:6 116:14,19 118:16 125:11 129:3,7 130:5 143:12,17,18 143:19,22,24 143:25 144:2,3 145:8 159:18 171:22 172:19 173:1,6 174:20 referenced 137:5 references 19:6 141:14 referred 41:25 53:15 61:25 68:23 81:17 116:20 118:14 122:16 128:22 136:23 143:13 172:11 referring 21:10 69:7 104:1 121:20 167:16 reflected 22:11
---	---	--	--	---	---	---

101:7 167:22 reflecting 125:17 reflection 8:13 18:11 83:6 117:13 reflective 80:22 reflects 23:11 reformulate 160:21 refresh 115:7 refrigeration 98:1 refurbishment 73:16 refusal 38:12 refuse 50:12 refute 108:19 regard 43:19 134:6 150:19 172:22 regarded 37:2 regarding 13:15 49:20 regardless 139:2 regards 111:12 121:16 regime 62:16 63:8 100:25 regimes 99:21 region 3:24 4:10 6:21 19:3,21 21:14 25:12 48:22 60:23 63:10,23 71:18 93:12 96:4 99:3,7 126:22 126:23 127:5 127:23 128:1,2 128:5,6 147:16 154:4 158:17 regional 3:19,25 4:8 5:12 25:9 57:21 58:3 61:12 83:19,21 97:5 98:2 129:11 156:6 159:19 regions 3:18 22:11 23:23 25:8 97:16 98:8,10 126:20 127:1,14,24 128:11 154:21 163:15 region's 71:23 registrar 95:10 regret 58:6 regular 15:2 73:24 100:6 123:21 124:14 133:3 135:25 136:1 169:9,12 regularly 15:15 100:7 123:10 123:22,24 regulatory 86:10 86:21	reintroducing 129:8,16 reject 142:24 146:15 rejoinder 153:7 related 7:18 86:6 relates 171:9 175:6 relating 108:11 118:13 123:12 relation 9:13 34:16 59:24 relationships 100:22 119:25 173:14 relationship 17:4 17:11 25:8,11 25:15 86:8 99:17 110:4,5 110:12 121:11 121:15,16 123:25 relationships 127:7 relative 20:2 relatively 15:25 61:21 76:17 128:12 129:22 relevant 37:11 97:23 140:10 reliable 54:15 reliant 92:4,11 relied 100:25 relieved 126:15 relieving 35:7 reluctance 35:4 36:18,21,24 38:11 51:8 69:10 reluctant 37:11 37:24 38:7 39:14 47:24 61:10 96:20 remain 2:8 remaining 23:3 remains 44:9 165:5 remember 7:23 8:3,11,19,19 9:12 10:16 12:8,9,12 13:20,25 17:2 23:6 25:2,16 28:9,19,25 34:2 38:22 39:3 46:17 56:25 58:23 60:22 61:15,16 62:16,17,20 64:25 69:24 70:1,7 85:12 85:14,22 94:5 105:21 112:18 114:24 124:15 138:7 149:25 150:1 156:8,13 172:13 remembered 8:2	12:7 remind 106:24 117:10 remit 5:5 remote 25:15 27:7,9 28:8,12 29:20 31:15,18 35:9 45:3,4 61:7 129:22 remoteness 20:2 renal 30:20 reopens 151:22 152:1 repeat 165:25 166:11,17 169:17 repeatedly 119:2 repeating 64:11 replacement 31:25 32:1,2,4 32:16 replacing 32:10 replied 66:9 reply 22:7 42:3 46:11 report 27:15 29:13 40:5 53:19 115:8,22 116:2 149:6 152:19 156:6,8 156:11,21 157:17 158:18 173:12,17,23 reported 140:25 147:15 149:17 150:6 157:22 158:16 reporting 35:20 68:7 73:8 reports 29:5 81:4 135:13 139:13 146:12 171:9 171:11 176:22 176:24 represent 162:13 representation 93:7,11 110:11 representative 33:19 request 128:7 require 78:12 79:10 100:18 required 32:14 56:17 63:18 80:10,16 100:17 106:11 127:3 164:7,10 requirement 57:13 requirements 109:4,18 requiring 75:19 research 33:15 141:18 reserved 80:14 96:10 resistance 23:15	38:18 resolve 70:11 resort 69:10 respect 89:16 134:6 respond 74:23 89:19 105:15 responded 55:12 140:7 responding 66:19 153:16 response 18:22 153:8,10,12 responsibilities 72:20 76:15,18 93:18 responsibility 5:2,11 37:17 45:22 67:2,21 72:21,22 responsible 45:24 72:16 76:6 93:18,19 97:17,21 99:6 99:10,13 111:14 120:6 rest 59:6 83:10 169:5 176:18 restrict 16:13 restricting 94:7 result 10:1 22:24 79:16 84:18 101:19 102:1 102:19 110:22 117:17 124:24 127:12 166:14 resulting 85:18 results 47:7 131:23 139:14 140:1,4 145:2 147:5 resume 123:5,6 retained 60:19 retaining 24:22 retired 2:7 retrospect 14:6 81:16 82:1 retrospectively 145:12 return 38:3 49:6 95:22 118:9 130:25 136:5,8 136:20 returned 130:25 returning 131:6 reverence 89:17 Reverend 39:6 39:10 88:12 revert 177:8 reverting 52:10 152:9 153:17 revise 160:21 RHA 87:22 88:1 88:3 RIA 131:24,25 132:4,5,6 133:2,3	Richard 17:5 Richard's 17:8 riding 103:9 right 6:4,17,22 7:5 8:13 9:2,4 9:12 12:25 13:22,22,23 16:3 22:22 26:3 29:11,22 31:5 32:24 34:7 35:7 36:5 36:20,23 43:4 43:13,15 44:19 44:22 49:25 52:14 58:8,15 62:4 65:4,18 65:24 66:3,4 66:16 69:8 74:3,9 97:19 102:5,14 103:18 114:3 116:19 118:3 121:15 123:3,4 124:10 129:21 129:24 136:2,8 139:15 146:10 158:7 159:12 161:19 162:5 163:11 164:13 166:1,6,11 167:2,15 168:3 rightly 18:18 right-hand 140:12 146:6 147:9 151:8 154:15 176:11 ring 73:22 74:1 rise 118:3 170:8 risk 17:12,21 18:1 28:15,22 29:3 30:2 35:9 36:15 38:3,13 38:14,15 39:14 39:22 40:15 45:3,5 47:4 49:17 80:9 81:19 82:8 83:4 90:10 91:10 111:25 113:6 115:13 116:10,19 117:1 118:6 124:16 131:7 135:7,11,22 139:25 140:10 140:13 141:1 147:13 risks 18:8 120:17 120:18,20 123:23 risk-free 102:21 rivalries 127:12 road 108:17 role 66:16 86:25 111:16 roll 105:23 Rollo 87:8,9	137:25 138:2 162:18,19,20 167:21 169:7 169:16 170:14 170:15 177:12 177:22 room 17:6 110:18 roughly 124:22 132:13 133:7 134:21,21 139:22 142:12 148:16 155:25 168:11 169:18 round 98:18 128:11 134:10 route 115:17 routine 146:21 routinely 158:11 row 91:16 Royal 1:17,23 4:22,23 5:13 7:17 11:16 14:14 24:6 54:6 56:21 70:17 71:10,11 71:17 76:5,13 88:17 94:15 RPHA 131:24 Ruchill 159:19 rude 10:3 ruled 105:19 run 33:6 163:8 running 21:3 74:10,12 98:6 runs 144:1 <hr/> S Sadly 30:3 safe 7:3 91:21 152:2 safely 9:21 98:1 safer 16:15 safety 37:23 44:23 90:7 91:4 sake 84:2 samples 133:2 San 125:15 satisfied 41:3 106:22 satisfies 136:10 satisfy 108:17 saw 70:2 114:23 124:4 saying 12:17 22:22 31:1 36:13 42:25 47:7,20 50:7 57:3 59:4,13 60:8 96:12 103:16 114:19 149:3 166:10 169:3 says 27:23 115:10 118:15 129:14 176:10	scale 85:2 scanned 11:23 scene 61:7 scepticism 43:20 schedule 77:9 school 36:4 SCIEH 155:23 scientific 30:24 154:25 scientifically 160:11 scientist 65:7 scientists 38:20 40:23 Scot 78:20 Scotland 2:4 4:16,17,18 7:8 7:10,19 11:25 12:14,19 14:19 19:24 22:13 23:17,20 30:4 53:17 60:24 61:7 63:23 64:1 68:8 75:9 75:10 76:2,9 76:21,24 77:14 78:19 94:14 115:11 116:8 127:5,15 134:6 134:8,9,15 135:3 147:12 147:15 148:20 149:3,15 150:5 152:10,18 157:3 158:17 163:21 165:11 165:19 168:13 171:10 174:3 176:7 Scotland's 137:13 Scots 25:7 44:17 45:10 Scott 51:12,13 Scottish 12:22 30:6,8,16 54:24 139:11 146:14 154:10 174:24 175:13 177:2 scrap 22:19,21 22:21 screen 87:12 113:4 115:24 115:25 118:10 125:21 132:10 141:7 169:6 screened 136:1 screening 114:3 115:14 116:11 119:19 136:7 158:14 161:17 screenings 102:19 screwed 114:13 scroll 24:17 132:8 144:11
--	--	---	---	--	--	--

148:4 151:7 scrutinised 50:16 SE 129:18 sea 81:24 second 3:19 7:6 11:23 20:12 27:21,23 40:16 42:15 60:20 69:1 74:25 101:13 105:5 108:24 109:1 112:10 118:14 129:2 133:19 139:17 140:2,4 141:4 148:2 157:12 162:6 173:12,17,23 175:6 176:14 secondly 157:8 161:3 Secretary 171:10 section 49:19,19 65:25 72:11 87:16 94:2 106:25 see 1:18 2:10 3:2 8:6 12:13,16 13:2 19:7 20:14,22 24:10 26:18,25 27:2 27:16 31:12,17 36:22 42:5 44:21 46:3 48:23 49:15 53:25 54:9,24 55:24 57:2,14 58:17,21 63:24 65:14 68:7,25 74:11 76:16 77:11 84:19 86:15 99:17 101:16 108:6 108:21 116:1 129:2,14 131:17 137:10 139:17 140:2,3 140:13,17,19 140:24 144:9 144:12,25 146:6,12 151:4 151:6,9 152:4 156:4,22 160:20 163:12 172:20 173:9 173:14,18 174:21 175:8,8 seek 90:6 141:12 172:3 seeking 177:1 seen 8:2 21:5 29:15 53:9 59:3 61:18 86:13 103:4 112:3 128:2,25 130:5,6,6 132:10 142:25	172:11,13 seesaw 121:4 select 50:3 selected 71:21,24 selecting 5:1 114:4 selection 2:12 46:5,15 72:21 91:15 93:15 98:21 102:18 115:3 171:19 self-contained 171:13 self-explanatory 173:20 self-sufficiency 77:13,18,19,21 78:5,23 79:17 165:11,13 self-sufficient 77:14 79:3,7 160:10 165:19 seminal 86:7 send 63:11 103:5 165:18 sending 101:11 128:3 senior 1:22 2:2 sense 7:12 45:4 49:25 52:18 84:5,6 105:13 164:7 sensible 38:20 62:22 80:5 sensitive 113:15 132:14 sensitivity 133:14 138:17 154:16 sent 12:14 22:5 22:10 14 66:5 77:10 84:11 102:20 112:5 142:18 164:16 164:21 171:22 174:5 sentence 50:17 52:18 112:10 147:19,24 148:22 149:8 149:20,20 150:8 153:8 sentences 115:10 sentiment 69:11 81:3 separate 76:3 93:15 128:19 139:7 165:9 September 26:6 26:7 30:13 32:20 64:23 66:9,9 83:15 139:13,19 173:18 sequence 17:7 series 4:10 serious 154:21	serological 154:16 served 71:11 service 2:5,8 3:9 3:17 4:20 30:22 57:5,8 57:22 67:7 72:15 83:3 93:12 95:24 99:1 104:16 112:19 144:6 146:15 151:3 services 57:6 97:5 session 114:8,18 119:4 166:3 sessions 113:17 169:9,18,19 set 3:20 6:15 43:7 72:19 89:14 114:25 141:8 150:21 153:3 162:13 setting 31:3 65:24 125:17 settings 4:21 settled 9:10 set-up 7:8 26:4 severe 32:12 63:3 82:13,22 severely 14:14 sex 112:17,24 113:9,16 119:18 sexual 113:22 114:5 sexuality 47:25 SGF0012836 131:18 SGH0030079 173:18 SGH0030259 173:10 shared 69:13 142:6 sharing 25:21 Sheffield 82:18 Sheldon 130:15 130:16 170:18 170:19 shelf 165:4,15 SHHD 131:21 174:5 176:16 ship 101:22 ships 14:18 short 1:12 20:14 21:23 44:20 56:8 70:15 87:13 98:12 104:7 131:22 137:23 139:11 142:15,21 154:24 159:6 162:7 172:12 172:18 173:11 174:22 175:2,9 shortage 12:18	40:7 165:1 shortages 96:23 shortening 141:19 shortfall 97:4 98:9,14 163:17 164:1 shortfalls 169:14 shortly 8:6 13:4 21:12 33:12 143:21 153:9 153:13 177:1 show 15:7,16 35:22 82:19 147:6 149:4 showed 144:21 155:4,24 shown 44:12 53:24 77:9 140:11 shut 73:15 sick 86:3,3 side 4:16,17,18 44:24 45:5 67:4,15 68:4 93:19,20 96:21 114:10,11 120:14 121:4 145:7 150:5 sides 44:21 106:19,19,21 sign 14:15 15:18 signature 26:15 signed 26:10 49:12 125:14 125:23 significance 29:23 significant 10:18 21:20 55:11 101:20 147:21 148:24 149:16 169:22 significantly 37:13 similar 76:19 134:15 146:12 147:17 149:1 149:12 175:6 175:16 simple 64:2 88:16 simply 95:2 107:6 141:12 150:17 174:21 single 77:23 80:18 96:12 146:25 sins 67:13 sir 42:18 55:24 104:10 126:9 130:17,24 136:11 141:8 143:4,10 144:3 146:2,14 151:25 160:3 162:17 170:17	170:25 171:5 171:18,21 172:8,22 173:6 174:1,4,7,10 174:14,19 175:2,9,16,21 176:20 177:4,8 177:10 sit 70:11 site 47:2 sitting 88:21 129:17 situation 3:13 12:22 22:16 49:20 51:22 64:21 76:16 106:21 124:9 situations 76:19 111:3 six 2:13 68:12 137:16 139:14 147:4 sixth 132:9 sizes 127:14 skewed 132:23 133:11 skid 91:16 slight 8:8 slightly 7:8 8:11 13:25 21:6 26:5 32:3 50:14 73:11 82:3 96:9 114:14 120:11 175:6,14,16 small 9:23 38:2 53:10 72:8 155:14 smaller 16:19 SNBTS 24:8 33:20 44:8 59:11 61:23 69:18 73:12 74:24 97:25 109:3 158:19 160:9 171:23 174:11 SNB0014033 34:2 SNB0015194 70:13 SNB0015199 59:25 107:17 SNB0015205 64:9 SNB0015207 64:20 SNB0015213 66:5 SNB0015219 68:6 97:9 SNB0015221 69:5 SNB0017245 11:14 SNB0017354 24:3	SNB0017494 26:10 SNB0017535 49:12 SNB0072566 13:3 101:10 105:4 SNB0072568 18:23 SNB0072571 20:23 SNB0073264 128:23 SNB015215 66:10 SNF0011109 156:4 SNF0013710 46:2 112:2 118:10 SNF0013711 42:3 social 17:10 113:15 114:1 society 29:10 33:12 38:22,24 39:3,5,8,13,19 67:2 86:25 87:22 88:7,9 88:11,25 90:24 92:3,11 113:12 123:19 127:11 socio-economic 46:25 solely 45:2 solution 64:2 somebody 74:15 75:8 somewhat 48:1 48:15 88:18 114:21 118:21 118:25 119:7 122:6 son 39:11 sons 89:10,10 soon 30:8 129:17 sorry 11:22 34:4 51:12 56:24 94:23 96:18 103:25 115:20 115:23 119:12 125:20 131:5 136:24 140:3 164:21 166:6 sort 20:18 23:25 54:24 55:13 70:10 72:24 73:17 75:20 79:12 89:8 96:18 103:15 106:12,20 110:7,19 111:5 114:17 121:25 130:4 136:18 170:3 sorted 111:5 sorts 63:21 121:1	sought 160:17,19 sound 81:15 128:6 sounds 102:4 137:10 source 28:9 64:25 65:10 74:14 sources 79:11 sourcing 73:6 south 6:7 151:19 Southampton 2:7,9 4:9 52:1 52:4,6 southeast 2:4 6:8 7:18 66:13 71:18,23 94:14 99:7 115:11 116:8 127:4 129:10 134:8 147:12 south-west 6:9 so-called 40:17 speak 48:25 69:23 76:10 123:10 157:15 speaking 6:2 7:7 90:25 special 31:2 62:5 74:22 78:13 156:6 specialised 96:9 specialist 4:1 72:13 75:20 specific 5:1 13:9 15:23 22:6 55:20 61:6,24 68:20 70:5 100:22 107:2 111:9 124:8 specifically 5:5 22:8 54:17 67:15 75:7 100:9 121:13 124:11 127:17 specificity 154:16 specified 94:8 spectrum 35:11 speculate 42:22 speculation 149:21,22,23 speculative 119:22 spelling 51:13 Speywood 64:18 75:3,3 spite 51:4 82:20 spleens 82:13 split 4:7 spoke 6:25 46:11 49:1 110:2 172:19,23 spoken 13:19 74:9 80:23 sporadic 153:20 153:23
--	---	--	---	--	---	--

spring 124:18,19	73:18 80:13,17	substantial	105:18,24,25	sustain 55:19	team 4:4 8:10	172:16
square 23:18	129:17	84:16	106:7,13,18,18	switch 107:12	14:12 83:12,16	thalidomide
staff 4:1 7:14,16	stocks 24:12	substantially	119:25 124:10	sympathy 15:12	83:18 84:7	85:12,23,24
15:16 30:25	60:19 74:11	41:14	163:8,20	66:23 85:16	87:2	86:2
94:13 95:2,8	101:12 163:7	successful 23:9	164:12 165:13	symptoms	technical 30:25	thank 2:21 5:14
stage 12:22 30:2	164:7	83:3 90:21	supplying 4:3,5	155:24	102:24	7:20 11:7
34:22 36:14	stop 51:9 132:9	suffer 67:1	4:9 164:3	Syndrome 26:21	technician 30:21	24:18 32:18
43:16 46:24	142:4 163:24	sufficient 125:2	support 15:16	27:1	97:20	33:23 41:16
47:5 62:18	stopped 86:2	149:7	101:14 158:3	synonymous	technicians	49:2 55:24
63:6 88:5 94:5	163:16	sufficiently	supported	167:8,9	88:23	56:6,11 57:2
108:22 113:1	stopping 120:6	46:23 47:8	103:17 104:22	system 3:21	technique	85:8 87:7,11
117:24 125:13	168:5	suggest 52:25	supporting	79:25 86:10,21	132:13 133:14	95:22 98:8,22
141:3 163:5,25	storage 58:11	91:7 97:3	109:18,19	94:3,21,25	technology 79:9	104:10 109:23
168:4 172:2	93:5	99:24 115:17	supports 149:19	95:5,7,9,10,12	teens 16:23	110:25 115:5
stand 131:2	store 98:3	124:2 130:10	suppose 35:13,22	106:21	Telegraph 139:1	122:3 125:7
standard 39:24	stores 97:4	164:14,25	41:22 53:8	systems 3:20	telephone 37:1	126:9,10,13,17
Standards 2:14	story 6:11	suggested 45:14	58:8 60:20		43:10 112:7,9	128:9 130:12
star 84:1	128:15 139:2	81:11 93:2	66:10 74:10	T	123:18	130:16 135:16
start 94:16	141:24	97:10 98:13	104:16,24	tab 59:11	tell 109:14	143:4 146:2
142:17 146:13	straight 17:23	105:20	152:4 168:21	table 56:2 60:3	118:24 122:15	150:25 160:3
151:12	straightforward	suggesting 88:5	169:16 170:4	70:12 140:11	130:19 142:12	162:20 170:17
started 36:13	55:6,6,13	164:8	sure 17:6 25:25	140:12,17,21	telling 81:9	170:19,20,21
102:5 106:24	strange 112:23	suggestion 52:15	26:1 29:4 44:4	140:25	tells 1:14	170:23 172:5,8
132:4 165:21	strangely 114:14	94:12 119:3	48:6 54:21	tables 54:10,12	tempting 84:20	176:13 177:5
starting 61:15	strategic 102:1	165:10,23	59:1 64:12	54:14	ten 25:7 37:25	thankfully 127:4
116:7	strategies 157:13	166:7	66:4 71:3	Tainted 142:17	53:13 134:19	thanks 135:15
starts 46:9	157:15	suggestions 42:7	79:21 95:6	take 3:4 4:2	137:14 171:1,7	theme 26:5
state 46:7 147:10	strategy 83:13	suggestive 147:3	101:5 114:10	21:24 24:15	tend 164:25	116:18
149:8 153:23	103:7 158:5	suggests 27:25	116:24 121:22	41:17 53:6	tended 155:16	theories 125:18
160:6 171:10	strengthened	122:24 126:22	130:7,18	74:16 107:4,15	tendency 98:8	theory 38:19
stated 27:17	86:9	147:20 148:23	135:17,23	108:21 128:25	tension 70:20	125:14,24
140:25 145:1	Strictly 44:3	150:14	136:24 141:19	135:10,21	110:7,14,20,23	therapeutic 38:8
150:7 152:2	strike 31:22	suitable 15:19	151:18 171:7	141:12 144:4	111:9,11	39:20
statement 42:13	striking 6:1	115:14 116:11	surface 144:18	156:3 162:21	120:13 127:25	therapies 63:18
42:16 43:7	89:12	summarise	145:4 152:15	165:12 174:10	tensions 110:15	therapy 13:7,16
49:3,9 50:7	striving 165:17	125:22 144:16	surge 74:19,21	taken 22:4 28:13	term 71:8	15:19,20 16:5
53:16 77:5,8	strong 30:24	summarised	surgeon 32:10,15	39:5 41:8	terms 44:20 45:4	19:4 21:1
79:21 93:23	55:21	143:14	105:9	43:19 49:18	74:23 86:23	37:13 60:3,11
141:7,9 143:7	strongly 100:10	summary 139:17	surgeons 4:6	65:20 88:19,22	102:24 120:19	66:2 70:16
143:10,15	147:3	141:17 162:14	33:3,3	107:19 116:5	128:16 141:18	81:8 99:25
160:4 176:18	struck 7:6 10:3	summer 47:8	surgery 9:18,21	134:14 163:23	149:17 165:24	101:13,18
177:3,4	structure 75:14	48:4 116:1,4	32:6,14,16	166:25 167:1	177:9	102:3 104:14
statements	75:15	159:6	72:2 74:22	167:25 168:6	terribly 36:13	105:11,19
108:19 121:14	struggled 62:21	Sunday 137:12	100:16	168:12	81:15	107:13 108:6
121:15	struggling	138:9,20,23,25	surgical 63:15	takes 173:25	test 37:8 83:9,13	108:13 109:12
states 8:1 9:14	154:22	139:1,6	72:1,5	174:8	83:17 115:14	thesis 137:6
26:22 52:24	studied 1:14	super 90:19	surplus 96:4	talk 8:22 34:14	116:11 117:11	thing 38:10
53:10 112:23	152:21	supernatant	164:17,25	34:20 47:25	131:24,24	41:12 44:11
137:12 151:15	study 17:10	23:14	surprise 166:13	124:5	136:7 157:18	48:12 60:22
158:9,24	82:19 139:19	supplementary	166:20	talked 43:12	159:15	61:25 73:17
172:23	144:1,17	42:13,16 49:3	surprised 50:25	81:3 128:10	tested 5:1 149:9	83:20 84:20
statistics 54:10	146:12 148:16	49:9 50:7	169:8	talking 21:21	testimony 47:20	86:22 103:15
108:11 166:14	148:17 149:6	53:15	surprising	34:9 79:5	80:23	106:20 114:24
status 63:1 84:12	150:20 152:10	supplied 3:22,24	127:13 169:16	89:23 116:4,15	testing 3:22 4:2	117:19 138:22
144:19	152:20 157:6	5:4 20:4,5,6	surrogate 156:5	122:16 134:21	5:4 91:14	158:23 164:14
stay 91:18	158:13 174:23	71:5,20	156:18 157:7	165:3,4,7	102:18 131:25	170:3 171:18
stenographer	175:2,7,9	supplies 37:19	157:16 158:14	tally 123:6	132:2,6 138:5	175:25
142:5	stuff 15:15 31:11	128:4	surrounding	138:19	139:11,14	things 6:1 8:16
steps 22:4 74:16	style 38:1 138:22	supply 3:20,24	138:15	tangible 47:7	146:21 147:5	9:5 16:2 38:12
stick 140:19	subject 17:9	4:15 5:9 6:14	survived 89:14	Tanner 39:6,10	156:18 158:11	39:15 44:19
sticking 23:25	34:12 40:21	12:4 21:25	surviving 6:14	88:12	159:1,21 164:4	47:1 67:17
151:2	46:16 114:6	22:1 55:19	109:8	target 165:17	tests 65:15 72:9	79:15 86:5
stigma 113:15	141:18 143:8	56:13 57:11	suspect 8:18 34:8	taskforce 2:14	132:25 154:17	89:20 109:6
stimulated 82:24	171:8 174:22	60:16 61:5	35:10,16 46:18	tasks 71:3	156:5 175:13	110:10 111:2
stock 9:21 64:16	submitted 1:10	68:4 71:12	65:19 94:23	tattoos 140:18	text 137:22	131:12 137:24
64:21,23 68:10	subsequently	72:2 77:22	98:17 102:4	teaching 3:23	173:15	141:17,19
68:12,12,13,16	90:12 156:25	103:13,23	suspicion 114:1	4:21 6:19	textbook 172:11	156:15 165:3,8

175:14	126:24 127:19	Thursday 1:1	title 101:12	86:16 154:4	111:10,14	108:3 117:23
think 1:11 2:5,16	127:22,23	ticking 142:9	151:6 175:8	158:1	122:13	118:18 119:15
3:15 6:12 8:13	128:10,14,24	time 1:19 3:13	Titmuss 17:5	transfusion 2:2,5	treatment 20:1	119:19 121:10
8:24 10:11	129:21,23	8:10,12,24	today 3:7 62:1	2:13 3:9,11,13	37:25 42:11	123:15,16
11:20 12:21,23	130:2,3,8,21	9:10,25 10:14	94:20 131:1	3:16,19 4:20	43:3 49:15	158:10
13:1,10,21	131:21,22	10:24 11:3	132:16 170:25	4:23 5:6,12,18	55:9 56:13	UKHCDO 24:6
16:10 17:6	132:16 133:19	13:7,21 14:4,7	177:6	5:20,22,22 7:7	62:12 65:12	26:6 58:19
18:7,14 19:9	134:5 135:4,18	16:7,14 19:16	told 2:23 11:4	24:12,25 25:9	66:18,22 80:7	ultimate 40:3
19:11 20:5,14	136:10 137:6	21:12 22:15	15:6 169:7	25:19,23 30:9	80:10,16 99:8	ultimately 45:23
20:18 21:5	138:4,7 139:9	24:7 25:20	tomorrow 130:9	30:22 31:2	99:22 101:3	unable 176:17
22:10,15,22,24	139:11,13,17	31:16 34:18,22	130:22 177:7,8	33:15 46:20	102:11 120:16	unaware 95:9
23:8,13 24:9	141:3,4,16,18	35:3,10 37:5	Tooting 6:9	47:22 48:3,22	treatments 38:1	uncertain 153:20
24:15 25:5	143:5 144:5	38:22,24 39:6	top 140:12 144:8	52:6,14 57:5	94:10	uncertainly
26:10 27:22	146:12 148:2	39:12 40:1	146:6 151:4	57:22 58:3	trend 73:14	121:2
28:15 29:8,23	150:9,16	43:1,8 46:16	162:25 176:11	60:2 65:7,7	tried 96:14	undamaged
30:3,3,6,7,15	151:13,18	46:17,18 52:2	topic 42:16 49:4	67:7 71:23	149:15	31:22
32:9 33:11	153:10,14	53:8 54:13	49:7 53:1	72:13 78:24	tries 79:2	undercutting
34:15 35:3,5	155:13 156:14	55:17 58:23	69:19 96:2	79:1 81:24	trimester 85:24	17:19
35:16 36:6,10	156:16,21	61:23 62:17,18	111:22 130:21	83:3,8,22	trouble 167:18	undergoing
36:20 37:11,15	157:5,15	63:2 64:5 66:1	130:22,25	93:12 95:24	true 6:12 30:3	100:22
39:12 40:22,23	158:18 159:2,5	66:17 67:21	131:1,6 138:10	97:5 99:1	63:25 170:9	underline 35:14
41:10 42:10,18	162:10,22	68:10,11,23	141:4 143:7	112:19 115:12	try 106:12 113:4	underlined 27:7
42:24 43:2	166:7,8,24	71:2 72:2,8,23	146:8 151:14	116:9 124:25	141:22 168:10	35:13,14 77:10
44:16 46:9	168:20 169:1	75:24 80:12	160:18 170:24	140:15 144:6	168:10	underlining
48:1 49:2,22	171:14,15,24	86:20 88:10	171:2,6,8	146:15 151:3	trying 51:4 66:14	35:16
50:17,23 51:3	172:1,19 173:9	90:8,12,15	176:17,21	151:20 152:3	103:12 106:15	underlying
52:1,18 54:14	173:20 174:11	91:2,12,21	177:24	153:22 154:12	136:24 168:24	36:23 69:10
55:2,15,17,19	174:15,18	92:23 93:13	topical 156:14	156:6 159:25	tucked 88:18	understand
56:18 59:16,21	175:1,18,25	96:3 99:12	topics 2:18	transfusionists	turn 44:11	18:15 19:12
60:7 61:3,6,19	176:9,9,10,20	100:4 102:7,14	tortuous 50:14	122:12 146:9	turned 113:23,25	38:6 39:25
61:25 64:9,13	176:24	105:7 107:2,11	total 32:2,4	transfusions	turning 28:4	55:8 56:21
65:5 66:6,17	thinking 37:8	108:11 112:19	60:10 62:21	159:24	turns 44:13	64:6 79:25
68:17,18,19	68:11 69:22	115:10 116:4	63:3,5 107:23	transfusion-as...	tussle 25:2	84:22 92:14
69:6,8,14,15	91:6,13,18	116:23,24	115:1 134:18	161:1	twice 169:10	100:23 108:23
69:16 70:15,19	128:1 144:5	117:4,19,21	137:18 168:6,8	transient 145:21	two 1:10 4:12 6:1	120:15 124:16
73:10 74:8	thinner 82:7	119:1 120:1,9	totality 135:22	translated 19:12	7:24 14:17	135:4,23
75:11,15,23	third 42:15 46:8	120:18 123:10	totally 7:11	19:15	29:5 30:12,23	153:17 163:23
76:4 77:6 78:9	85:24 93:14	123:17,23	15:20 44:14	transmissible	38:11 41:17,20	164:13 165:10
79:9,23 81:6	108:25,25	124:22 126:1,4	47:5 113:18	36:2,4 38:19	41:21 43:24,24	173:22
81:16 82:9,19	148:4 162:6	128:25 130:5	touch 44:6	125:25	53:7 55:16	understandable
83:6 84:21	thirdly 74:25	132:7 134:4	touched 111:23	transmission	56:23 62:9	10:12 31:4,12
85:7 86:22,25	157:9 161:25	137:3 139:4	175:19	27:7,25 124:17	63:22 68:7,21	91:13
87:5 88:5	thirds 71:22	141:3 143:3	town 4:15 52:7	125:4 140:11	69:6 71:22	understandably
89:20 90:17	thought 1:22	144:6 145:10	62:2	140:18	73:16 74:21	31:8 120:3,4
91:17 92:5,19	12:18 15:7	145:16,17,22	trace 6:22	transmittable	76:5 77:7	understanding
92:22 93:17	30:1 31:16	147:5 149:25	track 137:6	40:14	80:13,17 82:13	16:4 41:6
95:5 96:17,22	33:19 36:4	150:1 151:15	tragedies 86:12	transmitted	83:23 87:13	57:25 90:13,22
97:8 99:2,5	53:14 60:21	152:6 153:11	86:13,16	34:24 41:7	88:20 93:3	120:19 123:5
99:17 100:3,14	98:15 104:23	154:25 155:3	tragedy 79:16	120:22 122:21	96:18 102:5	163:10,11
101:7 103:19	104:24 106:4	155:23 156:14	81:13,22 84:23	123:14 153:22	117:13 126:15	understate 85:11
103:25 104:1	118:25 142:9	158:24 160:9	84:25 85:10,22	transplant 72:22	131:12,13	understood 42:1
104:20 106:2	142:25 158:23	162:11 163:10	tragically 55:4	transplantation	134:18 135:4	66:21 89:22
107:18 108:14	thousands 85:3	166:9,16,21	80:6	93:16	138:9 140:17	103:25
108:17,20,25	threat 7:4	168:9 169:18	trained 16:1	transport 97:25	141:15 142:18	undertake
109:3,7,25	three 3:25 4:12	169:22 171:3	training 15:23	travel 47:1	144:20,22	130:18
110:18,21	6:19 27:4,19	174:4,7,12	37:6 110:25	Travenol 122:7	149:4 157:23	unease 30:8,16
111:8 112:10	27:24 57:10	175:20	transcribed	122:17,19	159:14 162:9	30:17
113:7 115:6	63:22 68:16,17	timeframe 16:7	28:13	trawl 134:12,25	162:21 165:3,8	uneasy 63:4
116:14,22	71:6 73:16	107:5	transcript 8:20	155:23	167:23 176:14	unexpected
117:2,25 118:5	80:17 123:16	timeline 105:23	131:15,19	treasurer 88:2	type 17:10	48:16 118:22
119:2,3,5,7	124:4 144:4	times 25:7 79:18	132:9 143:13	treat 12:20 66:15	types 24:13	119:8
120:2 121:7,18	154:4 157:6,16	96:23 110:15	162:23,24	111:12	135:9	unexplained
121:19,22,24	157:18 174:14	113:11 114:6	168:18	treated 19:22	typified 35:5	140:24 153:5
122:1,4,8,11	thrombosis 15:5	124:4 135:12	transferred 98:2	100:9,11 176:9	U	153:18
122:13,20	32:5,6	135:19,23	transformative	treaters 51:8	UK 2:11 63:4	unfair 17:18
123:4,15,25	throw 46:9	163:21	38:9	treating 10:13	83:22 86:11	21:9 102:17
125:13,16,22	throwaway 29:2	timescale 96:19	transfused 82:12	86:6 110:8		119:10

<p>unfortunate 21:6 unfortunately 159:24 176:17 unidentified 47:5 unintended 44:23 45:5 unit 30:20 65:20 72:1,12,12 87:24 95:11 United 8:1 9:14 12:5 26:22 52:24 53:10 59:6 116:5 158:24 172:23 units 54:2,5,8 60:10,18 63:15 63:15 107:24 107:25 108:2,2 164:3 university 1:24 4:14 unpackaging 36:11 unrealistic 79:2 104:23 unreasonable 16:10 33:19 67:6 122:14 unreasonably 96:19 unsuitable 15:21 unsurprisingly 144:2 unusual 3:9 upfront 90:9 upgrading 73:17 USA 27:5 50:20 156:22 usage 16:11 54:11 55:7,15 56:3 60:8 66:2 101:21 use 16:13,16 18:13,18,20 22:19,21 23:15 50:6 51:17,21 52:22 53:17 54:23 56:1 67:22 72:5,6 81:8 87:20 95:25 96:20 101:2 102:12 103:17 117:20 121:5 132:25 137:4 140:14 152:15 167:9 171:20 176:23 useful 122:11 146:4 user 54:4 70:18 users 62:9 116:25 117:3,5 118:5 uses 21:9 65:23 usually 1:9 4:14 5:3 38:1</p>	<p>169:12 utilisation 19:4 <hr/>V vague 25:5 vaguely 12:11 34:4 valid 126:6 validity 39:14 86:11 113:13 value 43:21 108:21 van 73:21 97:24 variable 25:11 variant 84:25 variants 1:16 variations 100:13 130:6 various 2:17 35:18 100:12 128:11 132:24 141:9,14 155:24 171:19 vast 91:8 162:10 vehicle 97:25 vein 14:25 15:3,6 175:16 veins 14:24 vented 110:17 verbally 114:8 version 173:17 173:19 vestige 77:23 vial 95:20 96:12 vials 80:16 victims 30:21 Victorian 88:17 view 15:18 17:1 34:6 44:23 50:19 87:3 99:21,23 100:21 101:2 102:10,13,14 103:21,23 104:11 142:20 158:4 views 14:5 16:4,6 16:8 37:4 120:3 123:11 vii 79:22 VIII 9:16,20,20 9:24 10:1,6,8 12:5,19,20 16:12 18:18,21 22:25 23:2,4,7 23:12,14 24:13 25:17 27:8 34:10 50:6,9 50:13,21 51:10 51:18,22 52:22 53:17 55:7,12 55:13,21 57:4 57:9,15 60:4 65:11,14 67:19 74:5 75:4 79:6 79:10 80:7,10 80:16 82:17</p>	<p>88:4 91:11,24 94:7,9 96:13 101:12,21 102:12,24 103:18 104:12 104:14 105:25 107:22 108:12 119:23 121:8 129:13 154:23 165:7,8,18 viral 147:4 virtually 83:4 virus 40:24 41:1 41:6,15 46:24 47:4,9 117:22 120:24 125:24 145:6,6 152:12 152:13 154:1 155:22 156:1 159:19 161:21 viruses 41:13 81:20 147:20 148:23 150:14 153:1,6,19 155:24 visiting 2:8 visitors 46:21 vitae 1:10,12 vividly 10:3 volume 16:19 22:4 volunteer 16:9 17:14 <hr/>W wait 88:19 waiting 131:6 142:10 Wales 43:4 173:8 175:10,18,23 176:6 walk 163:12 Walker 76:6 Wallace 77:2,3 131:20,21,23 144:22 want 12:8 18:12 26:3 34:20 43:6 44:12,14 46:22 48:24 49:10 56:1 77:18 80:21 84:22 85:11 108:18 109:23 111:14 142:3 142:20,24 162:21 169:14 wanted 24:2 26:20 35:22 37:8 39:14 41:17 53:12 56:12,15 68:10 68:12 76:23 77:12 79:20,24 83:25 89:19 93:22 94:1 111:20 165:23</p>	<p>wanting 33:6 81:8 124:2 war 3:19 6:23 40:16 ward 64:17 wary 51:17 wash 15:10 wasn't 14:22 19:12,14 21:10 31:16 57:7 73:10 82:24 83:11 122:19 124:13 126:23 164:3,11 165:1 watch 8:4,4 watched 7:24 water 103:8 Watt 18:23 19:16 20:15,18 21:7 68:7 73:13 101:8,12 103:10,15 105:1,7,8 128:24 164:21 wavelength 136:25 way 3:20 11:23 13:22 19:11 20:24 22:8,15 25:24 31:3 44:17 60:24 65:23 67:5,9 71:13 74:24 83:12 87:6 93:1 95:13 100:8,10 105:14 106:3 111:12 113:19 114:3,17 119:18 120:17 121:1 133:9 136:5 137:8 141:19 149:21 154:2 156:21 165:16 173:16 174:25 ways 79:2 117:1 weak 23:10 wear 3:6 wearing 32:13 wedding 138:13 week 6:25 15:1,4 110:1 112:12 124:4 weekly 73:5 weeks 13:18 30:12 31:16 102:5 104:15 weighing 92:7 weight 121:4 welcome 131:5 welcomed 33:21 well-known 35:2 went 2:7 16:2,7 32:25 33:13 36:17 46:9,17 70:2 89:1</p>	<p>90:17 124:15 131:17 166:3 169:9 174:5,12 weren't 128:22 west 4:17 7:8,10 23:17,19 37:10 63:23 75:9,10 76:2,9,20,24 134:6,9,14 135:3 147:14 148:20 149:3 149:15,24 150:5 152:10 152:18 157:3 158:17 163:21 166:4,11,12 168:13 Western 20:3,5 71:19 we're 168:14 whatsoever 58:7 whirlwind 90:18 wider 70:25 85:15 87:1 widespread 19:3 wide-ranging 46:6 wife 14:2 Winter 52:10 125:6 Winter's 125:20 wise 14:6 81:16 81:17 wiser 14:6 wish 160:21 wished 131:13 132:20 133:20 134:5 135:5 wishful 91:17 witness 48:11 166:8 174:15 175:19 177:1 witnesses 2:17 3:6 160:19 170:25 WIT0030013 176:19 WIT0030094 141:7 143:8 160:5 WIT0030293 1:13 women 86:2 88:20 wonder 53:17 98:14 wondered 3:10 8:1 54:12 64:24 148:11 wonderful 17:4 86:2 90:19 98:17 wondering 94:18 word 21:9 100:3 114:4 126:6 142:11 167:9 worded 114:14</p>	<p>wording 43:23 words 17:19 21:19 37:25 39:21 40:7 46:23 48:13 54:23 59:19 61:20 65:20 71:9 91:25 94:8 114:16 122:24 work 5:20,21 8:17 67:21 71:7 72:23 81:23 83:17 97:15 111:18 111:21 151:14 workable 99:20 worked 3:8 45:18 87:18 93:1 95:14 working 4:21 8:9 43:1 110:5 world 3:19 7:23 8:10,14,18 18:6 40:16 41:7 48:3 66:24 78:11,17 78:24 79:3,7 81:25 90:3,18 91:6 103:2 worries 50:17 worry 55:18 worrying 31:18 worst 85:10 worth 129:13 134:1 151:13 171:1 174:18 174:21 175:15 wouldn't 20:8 30:5 41:3 45:18 50:25 58:10 65:22 85:10 91:19 104:22 128:18 170:3 write 43:17 105:6 149:14 156:9,13 writer 36:3 writes 173:24 writing 13:9 16:7 42:25 61:2 70:13 156:8 written 17:8 26:8 27:6 42:5 101:25 102:5 108:18,21 152:7 168:18 wrong 15:7 16:2 44:13 86:16 130:2 144:7 148:8 163:3 wrote 20:21 26:16 44:4 46:10,12 66:7 69:5 124:22</p>	<p><hr/>Y year 21:15,16 30:18,23 48:6 51:6 53:6,16 57:13 61:20 101:19 105:12 131:14 133:21 137:18 168:12 169:10 years 2:13 14:17 32:14 34:21 37:25 38:4 50:16 51:1 59:1 90:3 96:18 104:18 108:15 110:21 120:9 132:3,25 134:18,19,24 137:14 144:23 152:24 154:4 161:13 year's 68:13 yellow 31:15 Yellowlees 173:7 173:24 174:3 Yellowlees's 173:15 yield 22:3 65:10 65:17 yields 23:12 Yorkhill 54:3,4 young 8:15 14:20 15:22 18:19 32:11 39:1 76:17 91:25 167:18 younger 85:25 <hr/>0 0.088 139:21 0.55 175:23 0828 176:2 <hr/>1 1 66:9 101:9 105:2 139:22 140:11,12 173:3,7,16,19 173:24 177:16 177:17 1,000 65:9 139:22 149:16 1,500 84:15 1.00 104:6 1.07 175:24 1.1 54:5 1.75 54:2 1.9 140:23 1.95 54:8 10 3:23 55:22 60:2 64:9 107:20 169:19 10p 87:23 10,000 134:16,21 167:4,21 100 149:15</p>
---	--	---	--	---	---	--

101 140:9	1976/1977 89:25	1990 2:3 44:10	30 23:3 46:3,12	80s 10:17
11 12:1,2 53:13	1977 11:9,13	1991 117:11	49:7 112:6	827,200 107:25
133:25 148:9	1978 90:17	139:13,19	160:5 161:12	84 149:2 150:11
11.13 56:7	1979 90:17	159:2	30-fold 137:15	8467 146:25
11.2 140:16	144:10	1992 139:20	300 137:18	148:6
11.37 56:9	1980 1:25 2:3	159:2	300,000 60:18	87 177:18
118 131:16,17	12:24 13:1,2	1994 174:24	34 125:11	
12 1:1 3:23	18:3,16 21:3	1995 172:25	34,464 108:2	<hr/> 9 <hr/>
146:18,23	57:10 61:21	173:3	35 132:13 133:10	9 24:7,8,9
148:5,9,9	66:2 92:14,16	1996 174:24	350 64:13	9.30 1:2 177:15
154:6 155:6	100:23 101:9	1997 175:10	36 147:2	95 140:7
122 140:1	104:11,15	1998 175:10	39 140:14	
126 177:19	105:2 106:5			
13 26:7 133:6	124:19 134:16	<hr/> 2 <hr/>	<hr/> 4 <hr/>	
152:24	135:2 146:7	2 49:14 57:11	4 4:11 49:19	
131 177:20,21	167:1,4,16	107:21 109:12	57:13 62:14	
14 56:19	168:7,8	157:4,5	64:24 108:5	
1438 53:21	1980s 5:13 22:3	2(vii) 79:24	4(c) 65:1	
1441 53:23	32:17 33:21	2,000 149:16	4,000 129:10,11	
1444 53:25	39:12 77:15	168:11	129:12	
1446 54:3	78:2 96:5	2.00 104:8	4.25 177:14	
1449 54:6	105:25 107:1	2.8 152:17	40 132:14 133:11	
1452 54:9	127:20 158:20	154:18	161:13	
15 39:4 83:21	160:23 165:16	20 32:14 44:1	40,000 25:17	
115:16 116:13	1981 24:2,7	107:25 120:9	87:22 88:1,3	
146:7	56:19 82:1	134:10,22	400,000 154:5	
15.2 140:15	117:18	143:9,16	41,360 108:1	
15/20/25 21:22	1982 2:5 26:6	152:24 166:5	45 35:15	
151 140:7	27:17 32:20	166:15 169:3,4		
159 140:2	46:19 47:8	175:4	<hr/> 5 <hr/>	
16 27:17 125:10	48:4 51:7 60:2	200 21:24	5 21:21 55:22	
147:3	60:5,9 64:9	2000s 2:15	57:18 65:25	
160 64:14	71:2 81:15	2006 2:8,13	135:23 155:25	
162 177:22	82:5 92:17	2011 1:1	5,000 166:24	
170 177:23	97:10 99:18	206,800 60:11	5,700 134:14,18	
18 96:18 131:14	106:3,5,8	107:24	167:25	
131:15 135:1	107:6,16,20	21 69:17 144:10	5.9 140:23	
146:24 148:6	124:9 134:13	22 133:6,21	50 23:1	
157:23 159:13	134:25 151:6	172:9,10	50s 9:25	
180,658 139:20	152:6 166:25	225 176:1,2		
180/200 23:3	167:22,25	23 42:4,6 64:19	<hr/> 6 <hr/>	
19 56:2 58:22	168:2	143:18 151:6	6 11:21,24,25	
148:9	1982/1983 35:3	24 11:13 41:20	132:20 137:19	
1950 6:11	37:5 80:24	43:11 46:11	60 132:14 133:8	
1950s 41:15	1983 30:10 33:25	108:2 112:7	133:12,16	
1952 14:13	34:19 41:18	131:17 143:19	65 157:22 159:13	
196 115:22	42:4 46:7 48:2	25 32:12 131:17	68 140:9	
1967 14:10	49:10 51:7,19	25/26,000 134:19	69 133:22	
1970 17:5 134:15	53:16,22,23	26 131:20 143:22		
135:1 167:1,4	54:3,10,12	260 144:1	<hr/> 7 <hr/>	
167:16 168:7,8	58:22 69:17,24	261,530 60:10	7 79:21 97:10	
1970s 7:22 81:23	70:10 71:2	27 34:21 51:1	133:22 175:12	
90:1 91:2,5	82:19 112:6,22	108:15 143:23	70 71:22	
92:1 138:6	113:11 115:11	28 59:1 143:25	71/72 172:10	
160:23 161:18	115:16 116:1,4	29 69:5	77 162:23,25	
165:16	116:8,13 117:9	29.1 140:24	78 149:3 150:12	
1971 138:2,4	117:22 124:18		162:23,25	
1972 138:1	125:12,23	<hr/> 3 <hr/>	792 146:24 148:6	
172:12	1984 55:17 82:5	3 4:10 20:15		
1973 9:15,22	82:19 134:13	34:16 49:14,15	<hr/> 8 <hr/>	
19:8 137:16	134:25 137:3	57:12 66:9	8 125:11 132:21	
1974 9:15	139:5 166:25	124:20,21	173:3	
1975 1:25 7:25	167:22,25	157:4 160:9	8.33 115:8,23	
9:1 132:3	168:2,4	161:4	8.6 140:22	
172:14 173:7	1985 83:15,15	3,000 168:12	80 108:7 154:22	
173:12,16,18	1986 1:17 156:7	3.17 142:14	165:17 166:17	
1976 9:11 131:20	1989/1990 83:2	3.28 142:16		