SHARMAN WEIR (INQUIRY INTO THE DEATH OF SHARMAN WEIR)

SHERIFFDOM OF GLASGOW AND STRATHKELVIN

DETERMINATION

by

SHERIFF FIONA LENNOX REITH, Queen's Counsel, Sheriff of the Sheriffdom of Glasgow and Strathkelvin

In Inquiry into the circumstances of the death of SHARMAN WEIR, lately of 113 Peveril Avenue, Glasgow

In terms of section 6 of the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act 1976

GLASGOW, 23 January 2003.

The Sheriff, having resumed consideration of the cause, FINDS IN FACT:

(1)Sharman Weir was born on 31 March 1959. She had a brother, Dr Alan John Weir, who is now 46 years of age. He is a senior lecturer in philosophy at Queen's University, Belfast. Sharman Weir graduated in music in approximately 1980 from Glasgow University. She obtained further qualifications in information technology. She was thereafter employed by BP for a number of years in the 1980s, initially as an information technology consultant but latterly in a managerial position. In about 1990 she took up the position of business manager at the Citizens Theatre, Glasgow. After about 2 years she became the general manager of the theatre.

(2)From about 1996 Sharman Weir lived with her partner, Malcolm Fletcher. In 1999 Sharman Weir became pregnant with their child. The pregnancy was a planned one. The accepted estimated date of delivery was 10 November 1999. This was her first pregnancy. Prior to becoming pregnant she had had no significant medical problems. She was in good health.

(3)Apart from occasions when Sharman Weir attended the Early Pregnancy Assessment Unit at the Queen Mother's Hospital, Glasgow due to vaginal staining, the course of the

pregnancy was relatively straightforward until the weekend of 16 and 17 October 1999. At this point Sharman Weir was 40 years of age. She was still at work.

(4)The Early Pregnancy Assessment Unit is attended by women who experience bleeding or pain in early pregnancy. When Sharman Weir had first been referred to hospital in March 1999 due to vaginal staining, she was assigned to Dr Kevin Hanretty who was the consultant on call that day. He therefore became her named consultant at the Queen Mother's. He first saw her personally on 5 May 1999. She had been admitted at that point also with vaginal staining. She underwent an ultra-sound examination. The same occurred on 22 July 1999 when Dr Hanretty also saw her. She had a repeat ultra-sound scan on 18 August 1999.

(5)In the course of her pregnancy Sharman Weir had also attended for ante-natal checks. Her blood pressure reading on 16 March 1999 was 110/80. She was then in her fifth week of pregnancy. On 5 May 1999 her blood pressure reading was 110/70. On 23 June 1999 her blood pressure reading was 90/60. She was then in her twentieth week of pregnancy. On 18 August 1999 her blood pressure reading was 102/80. On 24 September 1999 her blood pressure reading was 120/80. There was also a trace of blood and a trace of protein in the urine. She was then in her thirty-third week of pregnancy. On 4 October 1999 her blood pressure reading was 120/80. There was a trace of protein in the urine. She was still feeling well and was still at work. On 13 October 1999 her blood pressure reading was 120/76. There was a trace of oedema.

(6)On Saturday, 16 October and Sunday, 17 October 1999 Sharman Weir had been complaining of headaches and general nausea. She took paracetamol for her headache. She also had a swollen face and fingers. In the run-up to this weekend she had generally still been well. However, this weekend she had not been feeling as well as she had been. Over a period of time she had been becoming more puffy. On the Saturday and Sunday she had complained about her fingers being swollen. Her face was probably also more swollen.

(7)On the morning of Monday, 18 October 1999 Sharman Weir went to see her GP, Dr Sandra Spilg. This was a routine ante-natal appointment. Crown Production No.1 comprises the general practitioner medical records relating to Sharman Weir. They were kept by the GP practice of which Dr Spilg was then a partner. On 18 October 1999 Dr Spilg noted blood pressure readings to be 140/90 and 146/90. These represented a sudden significant increase in blood pressure. There was a measurement of one plus of blood and one plus of protein on a dipstick test in a specimen of urine she had provided. Dr Spilg felt that, combined with the blood pressure readings, this was significant. Previously, Sharman Weir had had no more than a trace of either. There was also very significant oedema of the ankles. This was of sudden onset. Dr Spilg also recorded that Sharman Weir was feeling nauseated. She thought that that was an unusual finding for Sharman Weir as she did not think that she had had any problems with that before. Sharman Weir indicated to her that she was not feeling very well. Dr Spilg's view was that nausea was significant along with the other symptoms. If Sharman Weir had said anything about flashing lights it is likely that Dr Spilg would have recorded that. The fundal height corresponded to the gestational age. Dr Spilg recorded a query about whether Sharman Weir had a urinary tract infection. However, she did not think this was a very likely possibility. She obtained a mid-stream sample of urine

to see if there was such an infection. In light of her findings Dr Spilg referred Sharman Weir to the day-care unit of the Queen Mother's Hospital that day. At this point Sharman Weir was 36 weeks and 5 days pregnant. Dr Spilg did so because she was concerned that Sharman Weir was developing pre-eclampsia. Dr Spilg recorded her findings at page 72 of Production No. 1 for Yorkhill NHS Trust ("Yorkhill") entitled "Pregnancy Care Plan". This is a shared care plan to be kept by the patient. It is completed by both the patient's general practitioner and the hospital so that each is aware of the findings made by the other during the course of the pregnancy. In this way the patient has a complete record of what has happened in their pregnancy.

(8)Patients are referred to the day-care unit at the Queen Mother's Hospital by general practitioners across Glasgow for assessment and review. An initial assessment is carried out by midwifery staff at the day-care unit. The patients are then reviewed by medical staff. If the senior midwife in the day-care unit considers that the patient requires to be admitted to the hospital she will arrange for immediate admission of the patient to the ante-natal ward at the hospital. This is known as the South Wing. Once admitted, each patient is designated to a consultant. If a representative of the team headed by that consultant is not available, the patient will be seen by a member of the "on-call" medical team for the day. This is based in the labour ward at the Queen Mother's Hospital. It is available from 0900 hours until 0800 hours each day. The on-call team is led by a consultant. The senior house officer member of the team would always be available. There are consultants at the Queen Mother's Hospital between 0900 and 1700 hours each day. After 1700 hours there is an out of hours consultant service. There is therefore always a consultant available if required.

(9)Sharman Weir was seen at the day-care unit on the afternoon of Monday 18 October 1999 by Sister Midwife Mhairi Brown. Sister Brown developed the day-care unit and is the sister in charge of it. She has specialised in ante-natal care for the last 15 years. She is also qualified in obstetric ultra-sound. She started the assessment of Sharman Weir at about 1445 hours that day. Her record of the assessment is in Crown Production No.2 at pages 155 and 156. An assessment usually takes between about one and a half and three and a half hours. A further blood pressure reading was taken from Sharman Weir at about 1445 hours that day. This reading was 140/100. A urine dipstick test was carried out. The result of this test was recorded as "protein + + +". A sample of blood was taken for testing at about 1529 hours. Her assessment was that there was one plus of oedema. A further blood pressure reading at about 1530 hours indicated that it had remained moderately elevated, at 140/96. She was not symptomatic when Sister Brown saw her. If the vomiting and flashing lights, as subsequently recorded by Dr Solanki that day, had been reported by Sharman Weir to her it is likely that she would have recorded this. She carried out a full ultra-sound scan that day. The estimated foetal weight was 2.5 kg. This was below average for the gestational age but above the tenth centile. This was acceptable for that gestational age. There is a margin for error of approximately plus or minus 15%. The lower limit of the margin for error would therefore have been 2.125kg. The liquor volume was average. That and the results of the scan were reassuring. A biophysical profile, a score of well-being, was also done in relation to the foetus. There was a high score of 8 out 8. Sister Brown's conclusion was that the baby was perhaps smaller than average but that she was in good condition. In the event the child, Mairi, weighed 2.13 kg at birth when at a gestational age of 37 weeks. This was at the limit of the margin of error. This placed her below the fifth centile.

(10)In the light of the blood pressure readings and the presence of protein in the urine Sister Brown's differential diagnosis was pre-eclampsia, although she could not be 100 per cent sure that urinary tract infection could be excluded. Accordingly, at about 1530 hours on Monday 18 October 1999 Sister Brown decided to admit Sharman Weir to the ante-natal ward at the hospital for further assessment and monitoring. She wrote in the medical records that a 24-hour urine collection should be started on admission to the ante-natal ward. She also took a midstream sample of urine. This was sent for culture. It was reported back to the ante-natal ward on Wednesday 20 October 1999 as showing no evidence of infection.

(11)Sharman Weir was admitted to the ante-natal ward shortly after that, on Monday 18 October 1999. She was there by about 1625 hours when the results of the blood tests were telephoned through to the ante-natal ward. The results were normal.

(12)The ante-natal ward has 20 beds. Patients admitted to the ante-natal ward generally come under the regime of four hourly blood pressure checks when admitted with pre-eclampsia, except at night time when the patients are allowed to sleep. Sister Anne Dooley is the sister in charge of the ward. She has been Ward Sister for about twenty years and was in that position in October 1999. The midwives are responsible for any monitoring instructed in relation to patients with pre-eclampsia such as monitoring of blood pressure. It is routine for midwifery staff to arrange for a dipstick test to be done every day.

(13)On the afternoon of Monday, 18 October 1999 Sharman Weir telephoned Mr Fletcher to tell him that she was being admitted to the Queen Mother's Hospital for monitoring and observation. He went to see her in hospital that evening. That evening she appeared to him to have more swelling, particularly facially, than at the weekend. She was slightly nauseous. His impression also was that she had a bit of a headache. His understanding was that Sharman Weir was being kept in hospital as she was suffering from pre-eclampsia.

(14)Sharman Weir was seen in the ante-natal ward by Dr Ruchira Solanki at 1700 hours on Monday, 18 October 1999. Dr Solanki was a member of the on-call team that day. She was a senior house officer at SHO 2 grade. She was responsible for "clerking in" a new patient to the ward. This involved taking a history from and examining the patient and then recording this in the hospital records. Crown Production No 2 comprises the medical records relating to Sharman Weir at the Queen Mother's Hospital. Dr Solanki recorded in the medical records that Sharman Weir had been admitted from the day-care unit with a diagnosis of pre-eclampsia; that she was feeling well in general; that she had vomited twice the previous day; that she had complained of flashing lights (recorded as "flashing lights + +); that there was no headache and no epigastric pain; that she had ankle and finger oedema; that foetal movements were normal; that her abdomen was soft and not tender; that the baby was corresponding in size to the gestational age; that the baby was presenting head first; that the ultra-sound scan in the day-care unit had been normal; that there was significant proteinuria (protein in the urine); that the urate levels were within normal limits; that the platelets were regarded as being within normal limits at a level of 148; that the tracing of the baby's heart was fine, and that Sharman Weir was to give a 24-hour urine collection. Her blood pressure was also to be monitored. The degree of severity and duration of the flashing lights was not proved. It is unlikely that Dr Solanki advised any more senior member of the medical staff of

Sharman Weir's admission that day to the ante-natal ward. It is likely that her immediate senior would have been Dr Chitra Rajagopalan (known as "Dr Chitra"), who was an experienced senior house officer (SHO 3 grade). A further dipstick test was done at about 1800 hours that evening. It again showed three plusses of protein in the urine. The 24-hour urine collection was initially commenced at 1700 hours on Monday 18 October with a view to completion at 1700 hours the following day. The midwives are responsible for telling a patient how to go about this. Sharman Weir's blood pressure readings at 2200 hours on 18 October 1999 were 171/80 and 161/83.

(15) In the event, the 24-hour urine collection was recommenced at 1000 hours on Tuesday, 19 October 1999. That finished at 1000 hours on Wednesday, 20 October 1999. It is not uncommon for such 24-hour urine collections to have to be re-commenced. The collection was collected at about 1030 hours on the Wednesday morning for laboratory analysis that day, as it would have even if the collection had been completed at 1700 hours on the Tuesday. The delay in the start of the collection accordingly made no difference to the timing of the eventual results. The collection was received in the laboratory at 1347 hours that day. The results of the analysis were completed and available on the hospital electronic information system (computer system) at 1527 hours on Wednesday, 20 October 1999.

(16)At 0730 hours on Tuesday, 19 October 1999 Sharman Weir's blood pressure was 147/73. At 1000 hours that day it was 160/85. At 1400 hours that day it was 150/90 and at 1800 hours that day it was 158/92. A dipstick test that morning showed "protein + +".

(17)Dr Chitra first saw Sharman Weir on Tuesday 19 October 1999 at 0930 hours. At this point she was at 36 weeks and 6 days gestation. Dr Chitra noted that Sharman Weir had a diastolic blood pressure of 74 mm. She noted this from the blood pressure chart by the patient's bed. Midwives had taken that reading at 0730 hours that morning. Dr Chitra did not make a record of the systolic blood pressure reading. There was no headache, vomiting, epigastric pain or disturbance of vision. Sharman Weir told her that the episode of visual disturbance the previous day (on the Monday) had not been long lasting, that it had lasted only a few seconds and that it had settled completely overnight. There was plenty of foetal movement. The readings in relation to levels of proteinuria, urate and platelets were recorded from the figures from the previous day. The same was done in relation to the ultra-sound and trace findings. Dr Chitra recorded that her impression was that Sharman Weir was developing signs of pre-eclampsia. She meant by this that the diagnosis had not been confirmed. Sharman Weir's blood pressure had settled overnight from the Monday without any treatment. Her biodiversity and haematology blood results were normal. The foetal monitoring was normal.

(18)Dr Chitra had thought that there were other possible reasons why Sharman Weir had proteinuria, such as a possible urinary tract infection. There had been a suggestion from Sharman Weir's GP that there might be such an infection as Sharman Weir had had blood in the urine. Dr Chitra therefore wanted to confirm her first differential diagnosis of pre-eclampsia. Her plan was therefore to do a 24-hour urine collection, to repeat all blood tests on the following day (Wednesday, 20 October), to continue monitoring Sharman Weir's

blood pressure and to obtain a midstream specimen of urine to check for urinary tract infection.

(19)It is likely that Dr Chitra contacted her senior, Dr Judith Roberts, on Tuesday, 19 October 1999 to inform her about Sharman Weir's condition. This was in accordance with her duty to inform her senior of all patients who had been admitted to the ante-natal ward.

(20)Dr Roberts, Dr Chitra and Dr Solanki were in the team at the hospital led by Dr Hanretty, who was Sharman Weir's named consultant. At the material time it was Dr Chitra's duty as an experienced senior house office to do ward rounds every day. She would then report to her seniors, either to the consultant or to the specialist registrar, about the patients on the ward. The medical staff are arranged into "teams" at the hospital. There are eight consultants at the hospital. There are at most two or three specialist registrars at any one time. They rotate among the consultants, working for one consultant at any one time. There was at the material time in the team a senior house officer (SHO3 grade). There would also be a senior house officer at either SHO1 or SHO2 level. At the material time Dr Hanretty was on holiday. The specialist registrar, year 5, in charge of the team in his place at that time was Dr Judith Roberts. As part of Dr Roberts' responsibilities during this period she took over the responsibility for Dr Hanretty's patients in the ante-natal ward and overall responsibility for his patients in the day care unit. Dr Hanretty's team also covers the Western Infirmary, Glasgow, Gartnavel Hospital, Glasgow and peripheral clinics. His peripheral clinic is at Clydebank. At the material time, Dr Roberts was also covering her normal duties as well as covering for Dr Hanretty. Dr Roberts' week whilst acting in Dr Hanretty's absence only differed in responsibility. She was in effect doing the same things as she would do as specialist registrar when he was there. For example, even when he was there she would expect cases to be referred to her in the first instance by more junior doctors in her capacity as Dr Hanretty's specialist registrar. In relation to Dr Roberts' working week when specialist registrar for Dr Hanretty, every second Friday she was in the labour ward from 0830 until 1700 hours. She also had a recurrent miscarriage clinic every Friday afternoon at the Queen Mother's Hospital. She used each alternate Friday morning for administration and going round the wards at the Western Infirmary and Queen Mother's Hospital seeing both her own patients (from her own ante-natal clinic at Drumchapel) and those of Dr Hanretty. On Thursday's she would be at the Western Infirmary doing gynaecology, attached to another consultant. On Wednesday's she would do her own ante-natal clinic at Drumchapel Health Centre and then go to the Queen Mother's Hospital in the afternoon to do Dr Hanretty's ante-natal clinic on an out-patient basis. This would tend to finish at between 1500 and 1600 hours. She would then go as part of a team to see patients in the ante-natal ward there. On Tuesday mornings she would be at the Western Infirmary performing certain gynaecological investigations. On most Tuesday afternoons she would be at the Queen Mother's Hospital involved in post-graduate teaching sessions. She used Monday's to see patients of her own and those of Dr Hanretty, and to do paper-work and research. That would be mostly at the Queen Mother's Hospital. As a specialist registrar, Dr Roberts would usually go the ante-natal ward about three times a week. There was also a consultant on-call at all times at the Queen Mother's Hospital who Dr Roberts could have contacted had she felt the need for advice or assistance at that level.

(21)If Dr Hanretty had not been on holiday on Tuesday, 19 October 1999, he would have done the ward round in the ante-natal ward at the Queen Mother's Hospital at 9.30 am. He would therefore normally have known about Ms Weir on the Tuesday. He would usually have gone to speak to the patient himself after having spoken to Sister Dooley, the sister in charge of the ante-natal ward. He would tend to pay a visit to the ante-natal ward between 2.00 pm and 5.00 pm on a Tuesday afternoon. It would have been routine for him to have seen a patient such as Sharman Weir at some point on the Wednesday, usually in the afternoon. It is therefore likely that he would have seen Ms Weir himself on the Tuesday and that he would have seen her again on the Wednesday. On the Thursday he would also have been likely to have paid a visit to the ante-natal ward. Had he been there he would have expected either to have seen Sharman Weir himself or to have been informed by his registrar about the clinical situation on a daily basis. The sister's at the Queen Mother's Hospital are highly experienced. They do not hesitate to call senior doctors if they feel that they are needed. New doctors at the Queen Mother's Hospital change every 6 months. They might never have done obstetrics before.

(22)Dr Roberts completed her Certificate of Specialist Training in about November 1999. With this she received her accreditation from the Royal College of Obstetricians and Gynaecologists to become a consultant. She then became a locum consultant at the Queen Mother's Hospital on 1 January 2000. She was appointed to a post of permanent consultant there in January 2002.

(23)Dr Chitra was an experienced senior house officer (SHO3 grade) at the Queen Mother's Hospital at the material time. She was employed there in that capacity from about August 1999 until about August 2001. She obtained had her medical degree in 1995 at Madras University. She had obtained Part I of her examination for membership of the Royal College of Obstetricians and Gynaecologists by the time of the events with which this Inquiry is concerned. Since then she has passed Part II of those examinations and has been admitted to Membership of the Royal College. Dr Chitra also holds the Diploma of the Faculty of Family Planning. By the time of the events with which this Inquiry is concerned Dr Chitra had had 2 full years in obstetrics in the United Kingdom. Since August 2001 Dr Chitra has been working at the same level at the Royal Alexandra Hospital, Paisley. Most of her time has been spent in teaching hospitals. Teaching hospitals deal with higher numbers of deliveries than district general hospitals. At the Queen Mother's Hospital there are between about 3,500 and 4,000 deliveries per year. A general district hospital usually has between about 1,500 and 2,000 deliveries per year.

(24)Staff Midwife Christina Smith was on duty in the ante-natal ward on Tuesday 19 October 1999. Sharman Weir was one of the patients for whom she was responsible that day. Her hours that day were from 0800 hours until 2015 hours. She did her clinical rounds at 1000 hours that day. Her assessment of Sharman Weir was that she was well and uncomplaining. Her blood pressure at 1000 hours was 160/85. There were two plusses of protein on a dipstick test. There was a small amount of hand and ankle oedema. A cardiotocograph ("CTG") was in progress. It was monitoring the foetal heart rate. It was re-assuring. Staff Midwife Smith recorded in the Pregnancy Care Plan, Production Y1, at page 82, at 1130 hours: complained of "slight visual disturbance, no abdominal pain, CTG in progress, satisfactory, Bp 154/74, passed quickly, will observe." On the basis of her observations, Staff

Midwife Smith did not regard the episode as being of great concern or requiring the urgent attention of the medical staff. However, she brought the incident to the attention of the senior house officer on call in the ward that morning, Dr Branchfield for him to check her.

(25)Sharman Weir was seen at 1230 hours on Tuesday 19 October 1999 by Dr Branchfield. He was a senior house officer junior to Dr Chitra. He was then at the grade of SHO 1. It is likely that he assessed Sharman Weir and asked her to describe what happened. He recorded in the hospital records, Crown production 2 at page 136: "Episode of visual disturbance lasting approximately 1/2 hour earlier - describes as "stars in front of her eyes"". His understanding was that it had lasted about half an hour and that it had occurred earlier in the day. At the time, he recorded that the diastolic blood pressure was 77 and that the CTG was reactive throughout. This meant that there was good variability. The absence of variability would have been a sign of foetal distress. She was otherwise asymptomatic. He recorded that her management was to be continued as planned. He did not bring the incident to the attention of a more senior colleague. Unless he had felt that the patient needed senior review he would not have brought it to the notice of his more senior medical colleagues. A visual disturbance in isolation would not have unduly concerned him. Since the diastolic blood pressure recorded by Dr Branchfield was 77, it is unlikely that Ms Weir's systolic blood pressure was any higher than when recorded by Staff Midwife Smith at 1130 hours. Anti-hypertensive therapy was not required at either 1130 hours or 1230 hours that day.

(26)At 1900 hours on Tuesday 19 October 1999 Staff Midwife Smith recorded in Production Y1, at page 82, that Sharman Weir was uncomplaining. Her blood pressure was stable and foetal movements were good. Sharman Weir reported no further complaints to her that day. Staff Midwife Smith recalled Sharman Weir as being a very anxious, bright and vivacious lady.

(27)Mr Fletcher visited Sharman Weir again on the evening of Tuesday, 19 October 1999. She seemed to him to be a little better. That evening she told Mr Fletcher that she had not been told to collect the full amount of urine. She had therefore collected midstream samples, as she had required to do in the past. The process of collecting all her urine for a 24-hour period had accordingly had to be re-commenced.

(28)On Wednesday, 20 October 1999 Sharman Weir was first assessed by a midwife at 0730 hours. It was recorded that she had been satisfactory overnight. Her blood pressure was 154/83. The 24-hour urine collection was completed by 1000 hours that day. A further urine dipstick test that day showed "protein + +". At this point, she was at 37 weeks gestation.

(29)The blood tests, which Dr Chitra had on Tuesday instructed to be taken on the Wednesday, were not taken. In the event, blood tests were not repeated on the Wednesday in accordance with this instruction. In the event, because the results of the blood tests on taken on the morning of Thursday 21 October were essentially normal, it is likely that blood tests taken on 20 October would have been the same.

(30)Her blood pressure reading at 1000 hours on Wednesday 20 October 1999 was 166/80. There was a further (untimed) blood pressure reading of 147/96 that day.

(28)On the morning of Wednesday 20 October 1999 Sister Dooley spoke to Sharman Weir and asked how she felt. She replied that she was well. However, she was apprehensive about her blood pressures.

(29)That morning Professor Phillip Baker, Professor of Obstetrics and Gynaecology in Manchester, was acting as external examiner in relation to Glasgow University undergraduate medical examinations being held at the Queen Mother's Hospital. Sharman Weir had agreed to take part as a subject for the medical examinations. Professor Ian Greer, Regius Professor of Obstetrics and Gynaecology to the University of Glasgow, was acting an internal examiner in the examinations. Sharman Weir was one of two patients with pre-eclampsia who were being seen that day by two medical students. In the course of the examination of Mr (now Dr) Richard Locke, Sharman Weir later said to Sister Dooley that she had heard discussion, which had given her the impression that her pregnancy should be induced. In relation to Sharman Weir, Professor Baker asked Mr Locke whether there were any alternative management strategies. Mr Locke replied to the effect that he believed that some obstetricians would have delivered the baby. Professor Baker and Professor Greer indicated to him that they felt that that was a reasonable answer. The two professors were assessing the performance of the medical students involved in the examinations. They were not assessing the patients. It is likely that they had not had sight of the medical records relating to the patients. Following the discussions between the Professor's and Mr Locke, it is likely that Professor Baker would have told Sharman Weir that the discussions were in general terms and that what he had been talking about might not apply to her. The system of medical examinations has now changed.

(30)Sharman Weir was thereafter seen by Dr Roberts, the specialist registrar, year 5, at 1530 hours on Wednesday, 20 October 1999. This was the first time that Sharman Weir had been seen by Dr Roberts, or any senior doctor, since her admission to the ante-natal ward on the Monday. Sharman Weir's blood pressure was recorded as still being labile (Dr Roberts explained this as meaning that it was going up and down and was not completely settled within normal limits). Dr Roberts' overall impression was however that the pre-eclampsia was stable at that point. Sharman Weir seemed to Dr Roberts to be very well and not over-concerned or anxious. She was not asking for induction. She seemed to Dr Chitra, who was with Dr Roberts, to be the same as she had been the previous day. Sharman Weir did not complain of any symptoms. Dr Roberts mentioned to Sharman Weir that induction of labour was likely. Her plan was that blood tests were to be repeated the following day and that these were to be reviewed together with the results of the 24-hour urine collection. She indicated in her note in the medical records that if there were any worsening parameters Sharman Weir was to be induced and that the decision about this was to be discussed with her. When Dr Roberts saw Ms Weir at 1530 hours on Wednesday 20 October 1999 she did not check or cause to be checked the hospital's electronic information system for the results of the 24-hour urine collection which had been completed at 1030 hours that day. The collection had been booked in at the laboratory at 1345 hours. The results will usually be available electronically within 2 to 2 1/2 hours thereafter. There are computer terminals

throughout the hospital, including the ante-natal ward, where the system can be accessed to obtain results. The results of the 24-hour urine collection in relation to Ms Weir had been placed on the electronic information system at 1527 hours that day. This reporting was accordingly in an average time. Even if Dr Roberts had had these results on the Wednesday, she would still have wanted the blood tests to be repeated the following day. When she had read the entry for 12.30pm the previous day by Dr Branchfield she had understood that this had related to an episode of visual disturbance which had lasted for approximately half an hour earlier that day. She did not regard this episode as being particularly concerning as it was not associated with consistently raised blood pressure at that time, was not lasting and she was otherwise well. Her working assumption that afternoon was that the finding of three plusses of protein on the dipstick test was attributable to pre-eclampsia.

(31)At 1800 hours on Wednesday 20 October 1999 Sharman Weir's blood pressure was 147/96. At about 1930 hours that day Sharman Weir's condition was recorded by Staff Midwife Smith as being satisfactory. Her blood pressure reading was 146/76. At 2200 hours her blood pressure reading was 169/80.

(32)Mr Fletcher again visited Sharman Weir on the evening of Wednesday, 20 October 1999. That evening Sharman Weir told him about the medical examination. She said that she had been seen by two student doctors. There had also been two examining professors. She told him that one or both of the professors had told one of the student doctors that the correct course of treatment would be early delivery. That was what Sharman Weir was then expecting to happen. She seemed to Mr Fletcher to be slightly better that evening.

(33)Sharman Weir's blood pressure was next checked at 0600 hours on Thursday, 21 October 1999. It was 140/72. Sharman Weir was one of the patients allocated to Sister Dooley and a student midwife for that day. Sister Dooley recalled Sharman Weir as being an anxious lady who was anxious about her pregnancy and anxious to be admitted to hospital because of her blood pressure.

(34)Mr Fletcher visited Sharman Weir in hospital on Thursday, 21 October 1999 between about 0815 and 0900 hours. At that point she looked well and was in good spirits. She was optimistic that there would be a decision in relation to early delivery. She was expecting to discuss this at a ward round that morning. Sister Dooley also saw Sharman Weir between about 0830 and 0900 hours. Sharman Weir said to her at that time that she felt fine.

(35)At 0925 hours on Thursday 21 October 1999 a specimen of blood was taken for analysis. These were received in the laboratory at 1038 hours. The specimen was analysed for urea and electrolytes and for liver function. The results are at pages 98 and 168 of Crown Production No. 2. A further specimen was taken at 1016 hours for a full blood count. The results are at page 97 of Crown Production No. 2. At 1000 hours that day Sharman Weir's blood pressure reading was recorded as 155/86. Sharman Weir was seen by Dr Solanki that morning. She was recorded as being well.

(36)At about 1030 hours on Thursday 21 October 1999 Sharman Weir telephoned Mr Fletcher to say that she had been seen by a doctor (whose identity is unknown) in the ward round and that she had been told that she was to be primed for delivery that day with a view to delivery being effected that day or the following day. She was happy with that.

(37)Sharman Weir was then seen by Dr Chitra at about midday on Thursday 21 October 1999. When Dr Chitra saw her at this stage, Sharman Weir told her that she had been told the previous day that she was going to be induced on the Thursday morning. Dr Chitra was not aware of such a plan having been made. Dr Chitra did not have the results of the 24-hour urine collection to hand. She told Sharman Weir that so far as she was aware she was not going to be induced that day. Sharman Weir was upset about this. Dr Chitra then went to check the hospital electronic information system for the results of the 24-hour urine collection and the blood tests taken that morning at about 0925 hours. The results of the 24-hour urine collection had been posted on the hospital electronic information system at 1527 hours the previous day for perusal by authorised hospital staff, such as Dr Chitra and Dr Roberts. The laboratory would also have dispatched a paper copy of the results at about 1700 hours on Wednesday, 20 October 1999 for delivery to the ward at about 1800 hours that same day. The results of the 24-hour urine collection disclosed that the level of protein in the urine was significant, being 1.81 grams per litre and 3.32 grams per volume. The normal limit for urine is 0.3 grams over a 24-hour period. The blood results were essentially normal at that time apart from a minimal rise of urea and creatinine. These slight rises were not material. Dr Chitra also noted that the culture of the midstream sample of urine taken on 18 October (the result of which had been reported and available on Wednesday 20 October) had shown no evidence of infection. The results of the 24-hour urine collection confirmed the diagnosis of proteinuric pre-eclampsia.

(38)At about 1215 hours on Thursday, 21 October 1999 Sharman Weir telephoned Mr Fletcher. She was very distressed and tearful. She reported to him that she had now been told that delivery would not take place that day and that it might not take place until the following week. She mentioned a "senior registrar" in relation to the change of plan in relation to delivery. Mr Fletcher tried to calm her anxiety. She could not see the point in waiting. They had a discussion about Mr Fletcher leaving work early so that they could speak to the senior registrar to see if the decision could be changed. There was no evidence that had been any such change in plan in relation to delivery.

(39)In the meantime, shortly after having seen Sharman Weir at midday on Thursday 21 October 1999, Dr Chitra spoke to Dr Roberts by telephone about the blood and urine results and to see if a decision had been made about induction as had been understood by Sharman Weir. Dr Roberts had known nothing about this. However, Dr Roberts decided that Sharman Weir needed to be induced soon, by which she meant commencing that night. There was no particular urgency. The change from the previous day was that Sharman Weir now had an element of anxiety and concern and was now asking to be induced sooner rather than later. This was a factor that Dr Roberts took into account together with the finding of significant proteinuria. Dr Roberts instructed Dr Chitra to examine Sharman Weir and that, if the cervix was found to be unfavourable, she should arrange for the cervix to be "primed" that night with prostin (a prostaglandin gel) to make it more favourable for labour to start. That would have occurred after 2100 hours that evening for delivery the following day. Dr

Chitra then checked with the labour ward about induction that night. She then went back to Sharman Weir about 35 to 40 minutes after she had first seen her. Sharman Weir was still upset. Dr Chitra explained the findings and the discussion with Dr Roberts. Sharman Weir agreed to an examination. On examination Sharman Weir's cervix was found to be unfavourable. It was therefore decided that she should be "primed" that night in accordance with normal policy at the hospital with a view to delivery the following day, when more staff would be available than would be available at night. During the day experienced senior personnel are also available. Dr Chitra left Sharman Weir at about 1300 hours that day. At that stage Sharman Weir appeared to Dr Chitra to be content with the decision to induce labour. There was still nothing to indicate that there was any form of foetal distress or compromise.

(40)At about 1330 hours on Tuesday 21 October 1999 Staff Midwife Smith was doing the drugs round in the ante-natal ward. Sharman Weir was not one her allocated patients for that day. However, when she was doing the round, Sharman Weir told her that the doctors had examined her to assess her and that she was for induction of labour that evening. She seemed to Staff Midwife Smith to be quite anxious and worried about what was to take place. They then had a conversation about the likely procedures and their format. Sharman Weir expressed anxiety about early delivery of the baby given her gestational age. She said at this point that she was keen not to intervene before it was necessary. Staff Midwife Smith spoke to Sharman Weir for about five or ten minutes. Although anxious she appeared to be physically well at this stage.

(41)At 1410 hours on Thursday, 21 October 1999 Sharman Weir complained of epigastric pain ("the acute event"). Staff Midwife Smith, Sister Dooley and Dr Solanki attended. She was assessed. Dr Solanki recorded that Sharman Weir was in agony with sharp epigastric pain. She had vomited, there was fresh vaginal staining and her blood pressure reading was 159/106. Dr Solanki repeated the blood pressure reading. The diastolic reading was 113. The systolic was not recorded. She was given hot packs for pain relief. A CTG was commenced. Dr Chitra was summoned. She recorded that Sharman Weir had developed severe epigastric pain and that she had been complaining of headaches and blurring of vision. The CTG trace was reactive. There was epigastric tenderness. A full blood count was taken together with a coagulation screen, blood tests for urea and electrolytes and liver function tests. A decision was made to transfer her to the labour ward.

(42)The consultant on call for the labour ward, Dr Alan Cameron, was informed of this by Dr Chitra at about 1500 hours that day. He was told that Sharman Weir had been in the hospital that week for monitoring for pre-eclampsia, that she was in a lot of pain, that her blood pressure was elevated and that Dr Chitra wanted her to be monitored in the labour ward. Dr Cameron was in the ultra-sound department at the time. He did not attend at this stage. Sharman Weir had first experienced this pain when she had gone to the lavatory. She had experienced some bleeding there. This had followed the internal examination by Dr Chitra a short time earlier. Patients often experience some bleeding following such an internal examination. She had become upset at the bleeding and the pain. A student midwife and Dr Solanki assisted her back to bed. The CTG was discontinued in the ante-natal ward at 1440 hours and was re-commenced in the labour ward at 1457 hours. By 1510 hours she was in the labour ward being assessed. The staff in that ward took over responsibility for Sharman

Weir on her transfer. However, Dr Chitra remained in the labour ward until about 1730 hours to give help if needed. The full blood count and other blood tests instructed following the episode of epigastric pain were collected at 1445 hours. The results of the analyses were released at 1617 hours and 1622 hours.

(43)Sharman Weir was assessed in the labour ward commencing at about 1510 hours that day. This was with a view to addressing caesarean section after that. Her blood pressure at 1510 hours was 151/63. It was 163/130 at 1520 hours. At that stage she was complaining of severe frontal headaches. The protocol for the Queen Mother's Hospital, Crown Production No. 8, was commenced at 1520 hours. It is entitled "Guidelines for the management of severe hypertension in pregnancy". This has since been replaced by an amended protocol. The amendments made were not material to this Inquiry. The purpose of the protocol is to take steps to minimise the risks to the mother of severe pre-eclampsia by seeking to lower the blood pressure and to prevent cerebral seizures. Sharman Weir was put on the protocol due a combination of her blood pressure and abdominal pain. She was by now in the category of "fulminating pre-eclampsia". Dr Cameron was informed that she had been placed on the protocol. He was still in the ultra-sound department. At 1523 hours her blood pressure was 209/104. At 1530 hours it was 175/99. At about 1530 hours Dr Cameron was telephoned by Sister Humphries, the sister on the labour ward at that time. She was not happy with Sharman Weir as she was still in a lot of pain. He therefore went to see her. He saw her at about 1537 hours. This was the first time that Sharman Weir had been seen by a consultant obstetrician since her admission to the hospital on Monday 18 October. Dr Catriona Bain, the registrar on call for the labour ward that day, was already there. She had been in attendance since shortly before 1530 hours. At 1535 hours Dr Bain gave Sharman Weir an injection of magnesium sulphate (a "bolus dose") followed by an intravenous infusion of magnesium sulphate. Before Dr Cameron arrived Sharman Weir had already been given diamorphine as a painkiller but she was still in a lot of pain. Diamorphine also settles blood pressure to a degree. At 1540 hours she was settling but she was still complaining of severe headache and epigastric discomfort. She was to be delivered by caesarean section once she had been stabilised in terms of her blood pressure and once the results of blood tests (those taken at 1445 hours) were available. Caesarean section was the only option at this stage having regard to her condition. There was a delay due to the fact that the first coagulation screen had clotted as referred to in Finding-in-fact (44). It would have been potentially dangerous to rush Ms Weir into theatre for the caesarean section without waiting for the blood results and not following the protocol as the blood pressure can escalate dramatically with a general anaesthetic. Dr Cameron suspected that she had the HELLP syndrome, which is a complication of pre-eclampsia, and that she might go on to have problems from that. "HELLP" stands for "haemolysis", "elevated liver" (enzymes) and "low platelets", on a haematological diagnosis. At 1545 hours magnesium sulphate was commenced intravenously. At 1601 hours her blood pressure was 206/117. She was still complaining of frontal headache, visual disturbance and epigastric pain. It was decided that Labetalol should be commenced intravenously. She was commenced on Labetalol at about 1604 hours. This initially took the form of a bolus or stat dose by means of injection. This was administered in accordance with the protocol with a view to controlling her blood pressure. At 1615 hours Sharman Weir's blood pressure reading was 175/93.

(44)At 1625 hours that day the blood for the coagulation screen had clotted. It therefore had to be repeated. This was to enable a decision to be made about whether a general or a

spinal anaesthetic should be given. If there is impaired coagulation or low platelets a spinal anaesthetic would not be appropriate. A spinal anaesthetic is safer overall. At 1625 hours her blood pressure reading was 186/78. At 1628 hours she was taken into the operating theatre where the caesarean section was to be performed. Her blood pressure at that time was 176/102. At 1640 hours Labetalol on an intravenous basis was commenced. Her blood pressure at that time was 171/101. At 1650 hours it was 176/106. At 1656 hours it was 170/103. At 1700 hours a dipstick test of urine showed four plusses. The results of the second coagulation screen, which came back at about 1700 hours, were normal and showed that a spinal anaesthetic was not contraindicated. Dr Stone had wished to monitor the blood pressure accurately by means of an arterial line. This is a drip into an artery. Initial attempts to place this had failed. However, it was achieved at about 1700 hours once in theatre.

(45)At about 1510 hours that day Mr Fletcher received a telephone call from the hospital to say that Sharman Weir had been taken up to the labour suite with stomach pains. He arrived at the hospital at about 1530 hours. Dr Cameron told him that she had had a severe bout of epigastric pain, that her blood pressure was very elevated and that they were trying to stabilise her condition. Dr Cameron also indicated that the baby was going to have to be delivered that night. Mr Fletcher then spoke to Sharman Weir. She was in immense pain and discomfort and was worried.

(46)The results of the blood tests taken at 1445 hours that day, after the onset of the epigastric pain, showed slightly abnormal liver function. The results are shown at pages 99, and 168 of Crown production 2. The results were authorised at 1622 hours. However, her platelet count at that stage was still normal at 170. These results were authorised at 1617 hours. This was an increase from a figure of 147 from a blood sample taken that morning at 1016 hours, as recorded at page 113 of Crown production 2. In relation to the results of the tests taken at 1445 hours, she did not have HELLP syndrome at that point, but was developing it.

(47)At 1720 hours that day Sharman Weir was prepared for the spinal anaesthetic. At 1725 hours her blood pressure was 202/120. The spinal anaesthetic was inserted at 1750 hours. That would have been a factor in controlling the blood pressure. At 1800 hours her blood pressure was 172/121. At that time the rate of intravenous Labetalol was increased from 14mls per hour to 16 mls per hour. Dr Leong, senior registrar, commenced the caesarean section at 1806 hours. In the note on the operation, Dr Leong recorded that there was blood in the urine and some oozing from the tissues. There was free watery fluid in the peritoneal cavity. This was likely to have leaked from the tissue surfaces as a result of the pre-eclampsia. Due to the oozing Dr Cameron instructed that a drain be placed into the wound. Sharman Weir was to continue on high dependency care and the protocol with all tests being repeated, including blood tests. High dependency care meant that she was receiving one to one care from an experienced midwife. The midwife looking after Sharman Weir in the labour suite until about 2005 hours that day was Staff Midwife Margaret Morton. Staff Midwife Helen Main then took over, with the exception of a meal break when Sister Diane Anderson looked after Sharman Weir. Staff Midwife Main was a very experienced midwife with many years experience in the labour ward. Pages 201, 202 and 202A in Crown Production 2 are the notes made by the midwives in relation to Sharman Weir after her

transfer to the recovery room following the caesarean section and until her transfer to the Victoria Infirmary.

(48)The baby, Mairi Fletcher, was delivered at about 1815 hours that day by caesarean section. By 1816 hours the placenta had also been delivered and the wound stitched up. The baby was removed to the Special Baby Care Unit. She stayed there for about 2 or 3 weeks. She weighed 2.13 kg at birth. The combination of placental abnormalities in her case and her low birth weight placed her in the category of intra-uterine growth restriction ("IUGR"). The Apgar scale is used to assess a baby. She had a slightly low Apgar score when assessed by the paediatrician. At one minute following her birth she scored 2/10. This meant that she needed some resuscitation. Her five and ten minute Apgar scores were however normal. At delivery she was accordingly in good condition, responded quickly to minimal resuscitation and had none of the major complications of poor placental function. There was no evidence of pre-maturity or of immaturity of her organs.

(49)Sharman Weir remained in theatre until ready to be transferred to the recovery area. This occurred at 1945 hours that day. Once she was there Dr Cameron had a further discussion about the plan of management. He then left the hospital at about 1945 hours. He remained on call. When he left Dr Cameron did not see any need for him to return, but he would have been willing to return should the need have arisen. Dr Bain, obstetric registrar, was left in charge from an obstetric point of view at this point. Her immediate senior was Dr Leong. Dr Bain left the hospital at about 2000 hours. Dr Mohammed Allam, then registrar in obstetrics at the Queen Mother's Hospital took over from her at this point. Dr Leong was still on call. Dr Stone, consultant anaesthetist, last saw Sharman Weir at about 1945 hours just after results had come back showing a drop in the platelet count to 65. This was in relation to a sample of blood taken at 1843 hours. This was a low platelet count. Prior to theatre it had been 170. Dr Stone suggested repetition of all the blood tests, including the liver function tests. She also suggested that if the count fell below 60 Sharman Weir should have a blood transfusion. At that stage Sharman Weir was alert, orientated and comfortable. Dr Stone left Dr Orla Hayes, who was an anaesthetist at SHO 3 level, in charge of Sharman Weir from an anaesthetic point of view. Dr Stone was now off duty. Dr Hayes' immediate senior to be contacted for advice or assistance was Dr Lorraine Bell, senior specialist registrar at the Western Infirmary, Glasgow. Dr Stone indicated to Dr Hayes that she should refer to Dr Bell with any concerns. Dr Bell was known as "Duty 2". She was the on-call senior cover for the Queen Mother's Hospital. Dr Bell had already paged Dr Hayes in the course of the caesarean section to find out what cases there were at the Queen Mother's Hospital. She was therefore already aware of Sharman Weir. There was also a consultant anaesthetist on-call at the Western Infirmary, Dr Neil O'Donnell.

(50)In relation to a patient such as Sharman Weir, care is a shared responsibility between obstetricians and anaesthetists. Both Dr Allam and Dr Hayes had very regular contact with Sharman Weir during the course of the evening. Although they both had other duties to attend to that evening, they were both either in her room or very close by the whole evening. The midwives had no difficulty obtaining medical involvement.

(51)The platelet counts from a blood samples taken at 1959 hours and 2240 hours that day were 68 and 63 respectively. They fell to 48 in a blood sample taken at 0036 hours on Friday 22 October.

(52)Sister Midwife Anderson (who was an experienced labour ward sister) went to see Sharman Weir at about 2020 hours on Thursday 21October. Although she was in the recovery room, the facilities there were essentially the same as those in the High Dependency Room that was occupied by another mother at the time. Specialist monitoring equipment was moved into the recovery room. At this point Sharman Weir's condition appeared to Sister Midwife Anderson to be stable. The Queen Mother's Hospital does not have intensive care facilities. A patient there can be given ventilation on a short-term basis, but for long-term ventilation a patient requires to be transferred to another hospital with an intensive care unit. That apart, the level of monitoring there was similar to that in an intensive care unit.

(53)Between about 2030 and 2100 hours on Thursday 21 October 1999 Dr Mohammed Allam telephoned first Dr Leong and then Dr Cameron to advise them of the results of the most recent blood tests, the results having been received at about 2025 hours. Dr Allam had concluded from the results that Sharman Weir was suffering from HELLP syndrome. There had been an increase in the liver enzymes. This was consistent with the raised enzymes part of HELLP syndrome. Dr Cameron's instructions were to the effect that they would have to see if these were the peak of the liver enzyme tests. Dr Cameron was also told that the coagulation was showing signs of change. The blood tests were therefore to be repeated. It was agreed following discussion between the anaesthetists and haematologists that the blood tests should be repeated between about 2200 and 2230 hours. Dr Cameron was to be kept informed of the results. At that point, between about 2030 hours and 2100 hours, Sharman Weir was still stable. She was sitting up talking about the baby. The question of whether intensive care was appropriate was discussed by telephone between Dr Cameron and Dr Allam on the one hand and Dr Hayes and Dr Bell on the other hand at this point. However, no decision was made about transfer to intensive care facilities at this point. It was decided that they should wait to see the results of the further blood tests in about two hour's time. Dr Hayes took these blood tests at 2220 hours. The laboratory received them at 2249 hours.

(54)When Dr Hayes spoke by telephone with her senior, Dr Bell, between about 2030 hours and 2100 hours that day, she explained what Sharman Weir's condition was. She was concerned that her liver function test had deteriorated and wanted advice on how to proceed. She asked whether Dr Bell thought it was advisable to consider intensive care. Dr Bell said she would discuss it with Dr Louie Plenderleith, the consultant in charge at the intensive care unit at the Western Infirmary, and that they would get back to her. Dr Bell went to discuss the matter with Dr Plenderleith. By the time she spoke to him, Dr Hayes had already been in touch with him. Dr Hayes had asked him whether there was an intensive care bed at the Western Infirmary at that point and whether he thought that intensive care was appropriate. He suggested to Dr Hayes that the blood tests should be repeated. He also said that he would review the situation later and that they would find a bed if they needed to. Dr Hayes was told that there was no bed available at the Western Infirmary at that time. Dr Plenderleith would not have been prepared to accept such a patient in any event on the

basis of one set of blood results, with her otherwise being reasonably well at that stage. He felt that it would be appropriate to wait and see what happened with further blood tests. After his telephone conversation with Dr Hayes at that time, Dr Plenderleith did nothing more until further information came in regarding the second set of blood results received at about 2330 hours, which were relayed to him after Dr Hayes had spoken to Dr Cameron about them. He would not have put in hand steps for looking for a bed elsewhere at the initial stage at which he had spoken to Dr Hayes as circumstances might change. It is usually only appropriate to see if such facilities might be available elsewhere once it is known that a patient definitely needs intensive care.

(55)Dr Stone telephoned Dr Hayes at about 2115 hours that day, about an hour after she had got home. This was to satisfy herself that the plans they had discussed were progressing and that the communication was taking place with the senior anaesthetic team on duty at the Western Infirmary. She also offered her assistance should there be any problems in obtaining sufficient physical help, and offered to come back if required and if she, Dr Hayes, could not get help and assistance. She told Dr Hayes that she was not going out and that she should feel free to call her. Dr Hayes did not call her back at any later stage to ask for her assistance. Dr Bell was in theatre at the time. If Dr Hayes had asked for assistance at the Queen Mother's Hospital, Dr Bell would have telephoned the consultant on-call, Dr Neil O'Donnell. He was not in theatre at the time. Dr Hayes did not ask for either of them to come to the Queen Mother's Hospital to assist. Even if Dr Bell and Dr O'Donnell had not been available to assist Dr Hayes, had she requested assistance, in addition to Dr Stone who had offered to come back to assist if need be, there would have been other consultant anaesthetists on call in the Western Infirmary if need be.

(56)Dr Bell telephoned Dr Hayes at about 2245 hours that day, before a further set of blood results had come back, to find out how things were. She was told that things were okay. In the middle of the telephone call Dr Hayes said that the midwives were asking her to go and have a look at Ms Weir. An arrangement was made for one to contact the other about the further set of bloods results when they were available. Dr Hayes did not express concern at this point. If she had done, Dr Bell would have contacted Dr O'Donnell so that either she or he could go to assist Dr Hayes. At 2245 hours the midwife reported to Dr Hayes and Dr Allam that Sharman Weir had appeared to lose consciousness and that she had been twitchy for a few seconds, with fixed pupils. Both Dr Hayes and Dr Allam attended. They did a thorough neurological examination. She was very quickly responsive and able to talk and to communicate appropriately.

(57)Sister Midwife Anderson received a telephone call at about 2320 hours that day with the further blood results from the biochemistry section. They showed a further deterioration in her liver function. Dr Allam was busy. She therefore gave the results to Dr Hayes. It was known that the haematology results would follow within the next 5 to 10 minutes and that when they came back the doctors would telephone their respective seniors again to discuss plans. Coincidentally Dr Cameron telephoned at about 2330 hours to find out the results of the further blood tests. He spoke briefly first of all to Sister Midwife Anderson. He then spoke to Dr Hayes. The haematology results (showing a figure of 63 for platelets) came back at about the same time. The blood results showed a further deterioration in the liver enzymes. Dr Cameron noted that the coagulation was also starting to become more abnormal. They

had a discussion about whether she actually needed to be transferred to intensive care. They agreed following discussion that although not ventilated at that point she should be transferred for further supportive therapy. He therefore asked Dr Hayes to make the final request that the Shock Team transfer Sharman Weir to intensive care. Dr Hayes then made telephone calls to Dr Bell and Dr Plenderleith. The further set of blood results had showed that her liver function tests had deteriorated considerably, that her coagulation had deteriorated, that her haemoglobin had dropped and that her platelet count had dropped a bit more. On the basis of this, Dr Bell and Dr Plenderleith decided that Ms Weir needed to be transferred and that it would be appropriate to look for an intensive care bed at that time. Even although there was no bed available at the Western Infirmary, it nevertheless fell to Dr Plenderleith to telephone other units to identify an available bed. A bed was found shortly thereafter, probably within about twenty minutes. Dr Plenderleith telephoned Dr Hayes to tell her that there was a bed at the Victoria Infirmary. Since October 1999 the position has changed. There are now more beds available. In addition, the intensive care units are now linked by computer. He can therefore now identify where a bed is available in that way. That would not have been likely to have made any difference in this case because it had not taken long to find a bed for Ms Weir. At about 2355 hours Dr Allam telephoned Dr Cameron. They went through the conversation with Dr Hayes. Dr Allam told Dr Cameron that Dr Hayes had organised a transfer. The Shock Team was already out on a transfer. They telephoned back at about 0010 hours on Friday 22 October with an expected time of arrival, saying they would be with them in about 50 minutes.

(58)At 2350 hours on Thursday 21 October 1999 there was a further episode of fixed pupils with her being unresponsive and slightly twitchy. Staff Midwife Main again called Dr Allam and Dr Hayes. Both again attended and did a thorough neurological examination. She was again very quickly responsive and able to talk and to communicate appropriately. Dr Allam did not regard this or the previous episode as having been significant events. Dr Cameron was not told about these episodes until the following day.

(59)As at 2025 hours a decision had been made not to attempt to insert a central venous pressure (CVP) line at that point due to Sharman Weir's coagulopathy. The coagulation results were suggestive of disseminated intra-vascular coagulation. This meant that her blood was clotting, using up all the clotting factors and leaving Sharman Weir prone to bleeding. The purpose of a CVP line is to accurately monitor fluid levels within the body. When inserting a CVP line there is a risk of damage to major arteries in the area of the neck. If the patient is not clotting properly there is a risk of haemorrhage. Dr Hayes ordered blood products to address the clotting problem. The blood products were provided. At about midnight Dr Hayes attempted to insert a CVP line by an alternative route in the area of the elbow but without success. This was because Sharman Weir was swollen and oedematous. Sister Midwife Anderson was aware that Dr Hayes was a bit anxious when she could not get a CVP line in for Sharman Weir. A CVP line is of assistance in maintaining a fluid balance. However, the fact that it could not be inserted at this stage made no difference to the eventual outcome. The Shock Team did not put in a CVP line either when they arrived at the Queen Mother's Hospital. It would have delayed the transfer. It could also have caused Sharman Weir to go in pulmonary oedema. A CVP line was first put in at the Victoria Infirmary.

(60)At about 0115 hours on Friday, 22 October 1999 the Shock Team arrived at the Queen Mother's Hospital in order to transfer Sharman Weir to the Intensive Care Unit at the Victoria Infirmary, Glasgow. Production Y3 is the Shock Team's transfer form. A transfer by ordinary ambulance would not have been appropriate to her condition, as it would have put her more at risk. At this stage Sharman Weir was drowsy and very swollen about her arms, her upper body and face and the puncture sites from her drip were leaking blood and serous fluid. The Shock Team assessed her. This took about an hour. When they left, her condition was unchanged from their arrival. She was not ventilated prior to transfer.

(61)Sharman Weir was admitted to the Victoria Infirmary, Glasgow at about 0300 hours on Friday 22 October 1999. Crown Production No. 3 comprises the Victoria Infirmary medical records relating to Sharman Weir. She had been stable in the course of the transfer and on arrival. She was breathing spontaneously. After about 15 or 20 minutes the nursing staff decided to roll Sharman Weir to change the sheets on the bed in the intensive care unit. They had blood, fluid and plasma on them. In the course of this, her conscious level deteriorated, her blood pressure became very high, her heart rate became very low, her oxygen saturation dropped and she started to get frank, frothy pulmonary oedema coming up into her mouth from her lungs. There had been no evidence of pulmonary oedema before that. This was very sudden. She looked as if she was on the point of having a cardiac arrest at that point. They had had to move her to change the sheets. This had not involved a lot of movement at all. Sharman Weir was immediately intubated and connected onto a ventilator. Following intubation her blood pressure was noted to be 190/100. The pulmonary oedema did not play any part in the process of her eventual death. There was no relationship between it and the intra-cerebral hemorrhage that subsequently occurred. Dr Bell stayed until Dr Dell came at about 0345 hours. She then handed over to Dr Dell.

(62)Dr Cameron was telephoned to say that the transfer to the Victoria Infirmary had taken place. He was also told that Sharman Weir now needed ventilation. He therefore telephoned the intensive care unit at the Victoria Infirmary at about 0330 hours on Friday 22 October 1999 to discuss the position with the registrar there. The severe hypertension protocol was discussed. The doctors at the Victoria Infirmary had wanted to make some changes to the anti-hypertensive medication. Dr Cameron agreed to that. At this stage she had pulmonary oedema. She was stable, but on ventilation.

(63)Dr Cameron went to see Sharman Weir at the Victoria Infirmary at about 0800 hours on Friday 22 October 1999. He spoke to members of Sharman Weir's family who were at her bedside.

(64)At 1400 hours on Friday 22 October 1999 a continuous veno-haemodialysis line was inserted into the right femoral vein. It was noted that Sharman Weir was unresponsive despite decreasing sedation. Her pupils were checked and found to be fixed and dilated. There is a potential for patients with severe coagulopathy and with raised blood pressure for bleeding in the brain. It was suspected that some catastrophic event like that had occurred at some point. Usually, with a specific intervention such as this, the patient may be noticed flinching a bit or in some way responding to the line being put in. The fact that Ms Weir did not respond was of concern. Having regard to the fact that she was still conscious when she

left the Queen Mother's Hospital, it is likely that the catastrophic event happened at the Victoria Infirmary sometime between 0400 hours and 1400 hours on Friday, 22 October 1999.

(65)A CT scan was carried out. The findings in relation to the head were: "Right subdural haematoma, with acute and chronic blood. Depth about 1 cm. Also extends along tentorium on right-hand side. Large right posterior parietal intracerebral haematoma 5x 2 1/2 cm with surrounding oedema and some subarrachnoid blood. One or two smaller bleeds also, for example adjacent to vaults. Gross mass effect marked midline shift. Obliteration of basal cisterna". There had therefore been one very large bleed in the right parietal region and a pressure effect of the blood in the skull compressing the brain. This was the acute bleed and the catastrophic event. The small "chronic" areas of bleeding may well have occurred in the course of the "twitching" episodes noted at the Queen Mother's Hospital the previous evening.

(66)At 1800 hours on Friday 22 October 1999 there was discussion with the neurosurgical registrar at the Department of Neurological Sciences at the Southern General Hospital. They suggested that the sedation be stopped completely to allow a neurological assessment of the patient's condition with sedation. At 1915 hours the sedation had been off for more than an hour. The pupils were dilated and unreactive, there was no gag or cough response and there was no response to pain. The signs were that the conscious level was very low. At 1930 hours the neurosurgical department confirmed that there was no surgical option.

(67)At about 1800 hours on Friday, 22 October 1999 Dr Brian Stuart, took over from Dr Dell as consultant anaesthetist in charge at the Victoria Infirmary intensive care unit. He was made aware of Sharman Weir's condition. He spoke to Ms Weir's partner, Mr Fetcher, and other relatives that evening regarding the nature of the brain injury and the likely outcome of brain-stem tests. Dr Stuart and Dr Malcolm Smith, specialist registrar anaesthetist, carried them out. At 2230 hours they recorded: "Brain-stem tests confirm brain-stem death. Pronounced dead at 10.45 pm. Death certificate issued." On the death certificate was recorded: "Intracerebral haemorrhage, HELLP syndrome and pre-eclampsia".

(68)Dr Cameron went home via the Victoria Infirmary between about 1800 and 1830 hours on Friday 22 October 1999. He was told that Sharman Weir had had an intra-cerebral event at some point during that afternoon, that she had had a CT scan, that this had confirmed that she had had a large intra-cerebral haemorrhage and that it was likely that the ventilator would be switched off at some stage after discussion with the family. It was later switched off.

(69)Dr Hanretty was told of the death of Sharman Weir by Dr Cameron. Dr Hanretty reviewed the case and had a meeting with Dr Cameron. He then went to speak to Mr Fletcher in the Paediatric Department at the Queen Mother's Hospital on Monday 25 October 1999 to express the hospital's condolences and to assure him that he would investigate the case as fully as he could and that he would keep Mr Fletcher appraised of developments. At the end of his review, Dr Hanretty wrote to Mr Fletcher sending him a copy

of the letter to Sharman Weir's GP, Dr Campbell. The letters are at pages 85 and 88 of Crown Production No. 2.

(70)Following the death of Sharman Weir, Mr Fletcher met with Dr Cameron as he had been the on-call consultant when Sharman Weir's condition had deteriorated at 1410 hours on Thursday, 21 October 1999. Dr Cameron explained about HELLP syndrome. He also talked about APEC (''Action on Pre-eclampsia''), a support body for relatives of sufferers of pre-eclampsia, and said that there would be an internal review at the Queen Mother's Hospital in relation to what had happened. Mr Fletcher thereafter had a further meeting with Dr Cameron at which Dr Hanretty was also present.

(71)On Friday, 29 October 1999 Sharman Weir's brother, Dr Alan Weir, had a meeting with Dr Cameron and Dr Pauline Stone, the anaesthetist during the caesarean section. Dr Weir asked Dr Cameron why Sharman Weir had not been delivered on 18 or 19 October 1999. He was told by Dr Cameron that it was a matter of balance of interests. Dr Weir also asked whether, if Sharman Weir had been so delivered, she could have survived. Dr Cameron replied that he did not know. Dr Weir had himself had experience of a child having been born prematurely at 33 weeks. There had been no significant problems on that occasion. Dr Cameron also made a comment to Dr Weir to the effect that the hospital liked to keep pregnancies going until 38 weeks.

(72)Crown Production No 9 comprises a report by Dr Alan Howatson in relation to the examination by him of the placenta and cord relating to Sharman Weir. Dr Howatson is a Consultant in Paediatric and Child Health Pathology at Yorkhill NHS Trust. He has held that position for 10 years. He becomes involved in the examination of placentae and cords in situations where there is a problem during pregnancy, during the labour or in the immediate neo-natal period thereafter. His department examines about 1,500 of these a year. This is a function that he performs at Yorkhill for the Queen Mother's Hospital as well. The reason for examining the placenta and cord in this case was the known severe pre-eclampsia that the patient had manifested during the pregnancy. In this case, the placenta was on the small side. The weight of it was at the lower end of normal. The placenta was not abnormal as such until one came to the presence of infarctions. There were a number of infarcts, the largest of which was substantial. This is tissue death due to interruption of blood supply. The largest measured 3 x 2.5 x 2 cm. It was a definitively pathological lesion, which would imply that placental function was not normal. There are infarcts in the placenta because the blood supply is not adequate. There can be an infarction in any placenta even where there are no pre-birth problems. However, it is significantly more frequent in those of women who have suffered from pre-eclampsia and other hypertensive disorders. The largest infarct was almost a full thickness infarct. When there are lesions of this size there are very frequently problems of nutrition for the baby. The baby can still be of normal size. More commonly though when you have infarcts of the size in this case the baby is smaller than gestational age. The large infarct was not a fresh lesion. It did not have inflammation around it. It is therefore likely that it had been present for more than two weeks. There were findings that indicated that there had been previous bleeding from the placenta in utero. This is bleeding from the placenta while the pregnancy was ongoing. It is likely to have occurred when a part of the placenta was infarcted. Low birth weight could be attributed to the insufficiency of the placenta, of which the large infarct was an indicator. The findings made by Dr Howatson in

relation to this placenta were such as would be expected to be seen in relation to a lady who had had pre-eclampsia.

(73)On 26 October 1999 Dr Ian William Gibson, consultant pathologist, then at the Victoria Infirmary, Glasgow was responsible for supervising the post-mortem dissection of the body of Sharman Weir by Dr M Paul, trainee pathologist. On external examination there was, relevant to this Inquiry, evidence of generalised oedema, namely evidence of accumulation of fluid where it should not normally be. On internal examination, there was an abnormal accumulation of fluid within the pleural cavities, between the lungs and the chest wall. This was a likely consequence of the fact that there was fluid collecting in the lungs. In relation to the tissue of the liver, there was striking patchy congestion. On histological examination, there was evidence of cell death within the liver. This was consistent with the history of pre-eclampsia. In relation to the meninges there was found to be approximately 50 mls of clotted subdural blood. There was also a large intracerebral haematoma. It was concluded that the principal cause of death was a large intracerebral haemorrhage that was present towards the back of the right cerebral hemisphere. This caused the brain to be shifted over to one side causing damage to the brain stem. Following neuropathological examination it was concluded that there was no pre-disposing cause within the brain itself for the haematoma. In particular, no cerebral aneurysms were identified.

(74)Ms Weir was appropriately managed in the period of ante-natal care prior to her admission to the Queen Mother's Hospital on 18 October 1999. In particular, her medical treatment from her General Practitioner and at the Queen Mother's Hospital as an out-patient prior to her admission was appropriate. Appropriate assessment and management decisions were also made in the Day Care Unit of the Queen Mother's Hospital on 18 October 1999.

(75)Ms Weir was appropriately managed in the period from the acute event at 1410 hours on Thursday 21 October 1999 up to and including delivery of the baby. In particular, she was appropriately managed by being transferred to the labour suite with a decision being made to proceed to delivery by caesarean section; there was no unnecessary delay during this period; she was appropriately managed in accordance with the severe hypertension protocol; there was an appropriate and reasonable level of consultant attendance and support during this period, and her management and medical treatment during this period reflected good medical practice.

(76)Ms Weir was appropriately managed in the period from delivery of the baby until her transfer to the Victoria Infirmary. In particular, she continued to be appropriately managed in accordance with the severe hypertension protocol; there continued to be an appropriate and reasonable level of consultant attendance and support during this period, and her management and medical treatment during this period continued to reflect good medical practice.

(77)Ms Weir was appropriately managed at the Victoria Infirmary. In particular, her management and medical treatment during this period reflected good medical practice.

(78)It is not established that the protocols and practices followed by the Queen Mother's Hospital in relation to consultant involvement and delivery policy are out of line with standard practice

(79)It is not established that the doctors in the Queen Mother's Hospital have an insufficient understanding of the underlying balance of risk.

(80)It is not established that the doctors did not correctly appreciate the severity of Ms Weir's condition.

(81)Pre-eclampsia is a syndrome, not a disease. As a consequence of being a syndrome it does not admit of precise diagnosis.

(82)The paramount clinical diagnostic indicators of pre-eclampsia are two in number: hypertension and the presence of proteinuria.

(83)The threshold for hypertension is regarded as 140 systolic over 90 diastolic.

(84)The threshold for the protein component used in the United Kingdom is 0.3 grams per litre or 0.5 grams per volume.

(85)The present of protein at or above the threshold of 0.3 grams per litre is sufficient to confirm the diagnosis of pre-eclampsia.

(86)Above that threshold the degree of risk is not proportionate to the level of protein.

(87)Symptoms, which can be associated with pre-eclampsia, include nausea, vomiting and blurred vision.

(88)With a lady aged 40 there is a great risk of a more severe outcome for the mother.

(89)Pre-eclampsia is known to present in atypical ways. It can present with atypical symptoms. It can progress in different manners. It can progress in different manners.

(90)In relation to the Confidential Enquiries into Maternal Deaths in the UK, reviewers are appointed by the Royal College of Obstetricians and Gynaecologists and the Department of Health. The reports are now produced for the UK as a whole. They are published on a 3 yearly basis following a very extensive and detailed investigation into all the circumstances. When there is a maternal death in Scotland the Registrar General's office has a duty to notify every death. That goes to a central office in Edinburgh funded by the Scottish Executive. They then write to the Director of Public Health for the Health Board concerned. They then get a report from the doctor or the doctors involved. These go back to the central office in Edinburgh and are given to a local reviewer or reviewers. Independent assessors are then appointed to carry out the confidential enquiry. Senior people are asked to become central reviewers and locally people will be nominated to provide local review of the cases. The purpose of the Confidential Enquiry is to go through a range of cases where the mother has died. The whole process is conducted with care to anonomise the cases so that one can get to the essence of care in order to particularly identify factors that might have been managed in a different way and which, if they had been, would have led to a happier outcome. The fundamental principle is that by making it confidential the hope is to ensure the absolute co-operation of everyone concerned. It is published for use by practitioners as a learning exercise and for educational purposes. Doctors in this field are alerted when they are published.

(91)There has been consistent advice in reports on Confidential Enquiries into Maternal Deaths in the United Kingdom ("CEMD Reports") drawing attention to the need for consultant involvement in relation to women admitted to hospital with pre-eclampsia.

(92)The CEMD Report for 1988-1990 emphasised the continuing lack of awareness of the potential seriousness of seemingly mild symptoms and signs and the treacherous nature of pre-eclampsia, and a persisting failure by consultants to alert junior medical staff to these dangers.

(93)The CEMD Report for 1994-1996 recommended that each unit should identify a lead obstetric consultant to develop a system for the management of patients with pre-eclampsia and eclampsia. This was to include protocol development and updating, and appropriate staff training.

(94)A fair and reasonable implication of the CEMD Reports is that it is someone with the requisite experience and insight in relation to pre-eclampsia, including the variability of that condition, who is required.

(95)The Queen Mother's Hospital has not appointed a lead obstetric consultant to develop a system for the management of patients with pre-eclampsia and eclampsia.

(96)If Ms Weir been under the care and management of Dr Hanretty instead of Dr Roberts, it is unlikely that a decision for delivery would have been made at an earlier stage.

(97)If Ms Weir been under the care and management of Dr Cameron instead of Dr Roberts, it is unlikely that induction of labour would have been commenced before the evening of Wednesday 20 October 1999.

(98)There has been no material change in the system for the management of patients with pre-eclampsia at the Queen Mother's Hospital since the death of Ms Weir.

(99)It would have been in accordance with good practice for a doctor of registrar grade or above to have been advised that day of Ms Weir's admission to the ante-natal ward on 18 October 1999.

(100)It would have been in accordance with good practice for Ms Weir to have been seen by a consultant within the working day following her admission, namely on Tuesday 19 October 1999, in order to determine the immediate and subsequent management in detail.

(101)It would have been good practice for the episode of visual disturbance on Tuesday 19 October 1999 to have been brought to the attention of a senior doctor.

(102)It would have been good practice for the systolic blood pressure readings to have been noted in addition to the diastolic readings.

(103)It would have been good practice for the blood tests to have been repeated on Wednesday 20 October 1999 in accordance with the instruction given by Dr Chitra the previous day.

The Sheriff accordingly DETERMINES as follows:

(1)In terms of Section 6(1)(a) of the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act 1976: that the death of SHARMAN WEIR, born on 31 March 1959, occurred on 22 October 1999 at 2245 hours within the Intensive Care Unit at the Victoria Infirmary, Glasgow;

(2)In terms of Section 6(1)(b) of the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act 1976: that the cause of death of SHARMAN WEIR was (1)(a) intracerebral haemorrhage, (1)(b) severe hypertension, (2)(a) hepatic necrosis, (2)(b) HELLP syndrome (haematological diagnosis), and (3) pre-eclampsia;

(3)In terms of Section 6(1)(e) of the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act 1976:

(a)that there has been consistent advice in reports on Confidential Enquiries into Maternal Deaths in the United Kingdom ("CEMD Reports") drawing attention to the need for consultant involvement in relation to women admitted to hospital with pre-eclampsia;

(b)that the CEMD Report for 1988-1990 emphasised the continuing lack of awareness of the potential seriousness of seemingly mild symptoms and signs and the treacherous nature of pre-eclampsia, and a persisting failure by consultants to alert junior medical staff to these dangers;

(c)that the CEMD Report for 1994-1996 recommended that each unit should identify a lead obstetric consultant to develop a system for the management of patients with pre-eclampsia and eclampsia. This was to include protocol development and updating, and appropriate staff training;

(d)that a fair and reasonable implication of the CEMD Reports is that it is someone with the requisite experience and insight in relation to pre-eclampsia, including the variability of that condition, who is required;

(e)that the Queen Mother's Hospital has not appointed a lead obstetric consultant to develop a system for the management of patients with pre-eclampsia and eclampsia;

(f)that had Ms Weir been under the care and management of Dr Hanretty instead of Dr Roberts, it is unlikely that a decision for delivery would have been made at an earlier stage;

(g)that had Ms Weir been under the care and management of Dr Cameron instead of Dr Roberts, it is unlikely that induction of labour would have been commenced before the evening of Wednesday 20 October 1999;

(h)that there has been no material change in the system for the management of patients with pre-eclampsia at the Queen Mother's Hospital since the death of Ms Weir;

(i)that it is likely that on Monday 18 October 1999 no doctor of registrar grade (or SHO 3 equivalent) or above was advised of Ms Weir's admission to the ante-natal ward;

(j)that it would have been in accordance with good practice for a doctor of registrar grade or above to have been advised that day of Ms Weir's admission to the ante-natal ward;

(k)that no obstetrician of consultant grade saw Ms Weir until after the acute event at 1410 hours on Thursday 21 October 1999;

(l)that it would have been in accordance with good practice for Ms Weir to have been seen by a consultant obstetrician within the working day following her admission, namely on Tuesday 19 October 1999, in order to determine the immediate and subsequent management in detail;

(m)that in the week commencing Monday 18 October 1999 Dr Roberts' adhered to her ordinary working routine. Her week in the absence of Dr Hanretty on holiday differed only in responsibility;

(n)that the episode of visual disturbance on Tuesday 19 October 1999 was not brought to the attention of a senior doctor;

(o)that it would have been good practice for the episode of visual disturbance to have been brought to the attention of a senior doctor;

(p)that Dr Chitra did not note the systolic blood pressure reading on Tuesday 19 October 1999;

(q)that Dr Branchfield did not note the systolic blood pressure reading on Tuesday 19 October 1999;

(r)that Dr Solanki did not note the systolic blood pressure reading on one occasion on Thursday 21 October 1999;

(s)that it would have been good practice for the systolic blood pressure readings to have been noted in addition to the diastolic readings;

(t)that Ms Weir's blood pressure readings following the visual disturbance on Tuesday 19 October 1999 were not normal, albeit that anti-hypertensive treatment was not required;

(u)that the repeat blood tests which Dr Chitra had on Tuesday 19 October 1999 instructed be repeated on Wednesday 20 October 1999 were not repeated in accordance with that instruction;

(v)that it would have been good practice for the blood tests to have been repeated on Wednesday 20 October in accordance with that instruction;

I recommend:

(a)That the Queen Mother's Hospital should identify a lead obstetric consultant to develop a system for the management of patients with pre-eclampsia and eclampsia. This should include protocol development and updating, and appropriate staff training.

(b)That the training of all junior medical staff at the Queen Mother's Hospital should include their being taught (1) about the potential seriousness of seemingly mild symptoms and signs and the treacherous nature of pre-eclampsia, (2) the significance of both systolic and diastolic blood pressure readings in patients with pre-eclampsia or suspected pre-eclampsia, and (3) that written records should be made of both systolic and diastolic blood pressure readings in the hospital records of such patients to enable their significance to be monitored.

(c)That a doctor of registrar grade or above should be advised on the day of admission of the admission of a patient admitted to the ante-natal ward with pre-eclampsia or suspected pre-eclampsia;

(d)That a patient admitted to the ante-natal ward with pre-eclampsia or suspected pre-eclampsia should be seen by a consultant obstetrician within the working day following her admission in order to determine the immediate and subsequent management of that patient in detail;

(e)That blood tests instructed in relation to patients with pre-eclampsia or suspected pre-eclampsia should be taken in accordance with such an instruction.

(f)That there should be an opportunity for all junior staff to de-brief after a fatal outcome in relation to a patient in relation to whose care they have been involved.

NOTE:

Introduction:

The evidence led at the Inquiry extended over 39 days in January, April, May, August, September, October and November 2002. Submissions were then heard on 25, 26, 27 and 28 November 2002.

At the conclusion of proceedings in Court I indicated, in terms of Rule 11(3) of the Fatal Accidents and Sudden Deaths Inquiry Procedure (Scotland) Rules 1977, that I required time to prepare my Determination and that it would be issued in writing.

At the Inquiry Mrs G M Mawdsley, procurator fiscal depute, represented the Crown; Mr Gerry Moynihan, QC represented the family of Ms Weir; Mr Hugh Donald, WS, OBE of Messrs Shepherd & Wedderburn, WS, Edinburgh represented Doctors Judith Roberts, Alan Cameron, Kevin Hanretty, Pauline Stone, John Louie Plenderleith, Orla Hayes, Catriona Bain, Lorraine Bell and Mohammed Allam; and Mrs Susan Murray of the Scottish Health Service Central Legal Office, represented Yorkhill NHS Trust.

The witnesses adduced at the Inquiry are set out in Appendix A.

Purpose and Scope of the Inquiry:

Section 6(1) of the Fatal Accidents and Sudden Deaths (Scotland) Act 1976 ("the 1976 Act") provides that at the conclusion of the evidence and any submissions thereon the Sheriff shall make a Determination setting out the following circumstances of the death so far as they have been established to his satisfaction: -

"(a)Where and when the death...took place;

(b)The cause or causes of such death...;

(c)The reasonable precautions, if any, whereby the death...might have been avoided;

(d)The defects, if any, in any system of working which contributed to the death...; and

(e)Any other facts which are relevant to the circumstances of the death."

In the course of his submissions, Mr Moynihan made it clear that he was not seeking a Determination in terms of section 6(1)(d) of the 1976 Act. I therefore say no more about that sub-section.

These provisions re-enact, with some changes, provisions which have been in force since the Fatal Accidents Inquiry (Scotland) Act 1895. In my opinion, from the tenor of these

provisions and from the practice of the Courts over the years, Fatal Accident Inquiries may be regarded as having two essential purposes and one important corollary. The essential purposes are the enlightenment of those legitimately interested in the death, namely the relatives and dependents of the deceased, as to the cause of death and the enlightenment of the public at large, including the relatives, as to whether any reasonable steps should have been taken whereby the death might have been avoided so that lessons may be learned, or, at least, so that the attention of the relevant authorities may be directed towards practices, the existence of which has legitimately emerged in the course of the Inquiry, which may be thought to require change. The important corollary of the holding of a Fatal Accident Inquiry is that it affords to legitimately interested parties access to evidence which will enable them, if so advised, to seek to establish negligence or other culpability in the ordinary Courts. The proceedings in a Fatal Accident Inquiry are, to an extent, summary in that they proceed upon a minimum of written pleadings, namely, the initiating application at the instance of the procurator fiscal in the present case narrating that from information received by him it appeared that Ms Weir had died on the date in question at the Victoria Infirmary, Glasgow from complications relating to the birth of her daughter. The summary aspect of the procedure is, of course, dictated by the importance of focusing attention quickly on any practices which require change. However, the lack of written pleadings which would give advance notice of any line of evidence and, in particular, of any line of criticism, has the inevitable result that sometimes more questions are raised than are answered. Consequently, the Court must in my opinion be cautious in drawing too sweeping conclusions from evidence which may be incomplete.

It is also clear from the limited scope and purpose of the statutory provisions to which I have referred that a Fatal Accident Inquiry is not a public inquiry into the running of, in this case, the Queen Mother's Hospital or the management of pre-eclampsia by maternity units throughout the United Kingdom.

Different considerations are relevant to deciding on what Determination, if any, is to be made under the various sub-paragraphs of section 6(1) of the Act. In considering the time, place and cause or causes of the death (section 6(1)(a) and (b)) the Court simply exercises its traditional fact-finding function.

I am thereafter required in terms of section 6(1)(c) of the 1976 Act to set out the reasonable precautions, if any, whereby the death might have been avoided and, in terms of section 6(1)(e) to set out any other facts which are relevant to the circumstances of the death.

In relation to making a finding as to the reasonable precautions, if any, whereby the death might have been avoided, I respectfully agree with Sheriff Kearney in his Determination in relation to the death of James McAlpine that it is clearly not necessary for the Court to be satisfied that the proposed precaution would in fact have avoided the death, only that it might have done; but the Court must, as well as being satisfied that the precaution might have prevented the death, be satisfied that the precaution was a reasonable one. I say more below about how sub-paragraph (c) of section 6(1) of the Act should be approached.

In the James McAlpine Determination Sheriff Kearney also expressed the following view, which I gratefully adopt: -

"...Finally, the provisions of section 6(1)(e) are very widely stated and, in my view, entitle and indeed oblige the Court to comment upon and, where appropriate make recommendations in relation to, any matter which has been legitimately examined in the course of the Inquiry as to a circumstance surrounding the death if it appears to be in the public interest to make such comment or recommendation."

In view of the provisions of section 4(7) of the 1976 Act, the standard of proof and the rules of evidence are those applicable to civil business and, accordingly, the standard of proof is that of the balance of probabilities.

It is well-recognised that a Fatal Accident Inquiry is not the proper forum for determination of questions of criminal or civil liability. In Black v Scott Lithgow Ltd 1990 SLT 612 at 615 Lord President Hope said in relation to section 6(1) of the 1976 Act: -

"There is no power in this section to make a finding as to fault or to apportion blame between any persons who might have contributed to the accident. This is in contrast to section 4(1) of the 1895 Act, which gave power to the jury to set out in its verdict the person or persons, if any, to whose fault or negligence the accident was attributable. It is plain that the function of the Sheriff at a Fatal Accident Inquiry is different from that which he is required to perform at a proof in a civil action to recover damages. His examination and analysis of the evidence is conducted with a view only to setting out in his determination the circumstances to which the sub-section refers, insofar as this can be done to his satisfaction. He has before him no record or other written pleading, there is no claim of damages by anyone and there are no grounds of fault upon which his decision is required."

To similar effect, in his Determination in relation to the death of Steven Dekker, 2000 SCCR 1087, Sheriff Dickson said at p 1093: -

"For the reasons expressed by Sheriff Principal Mowat in the determination following the Lockerbie Air Disaster and in accordance with the judgment given by Lord President Hope in Black v Scott Lithgow Ltd, it is not appropriate that a Sheriff should make findings of fault after an FAI. As Sheriff Principal Mowat pointed out: -

"In a criminal case, or in a civil case based on delict, the accused or the defender is given full notice of the allegations made against him either in the form of a complaint or an indictment or by written pleadings. He is entitled to hear all the evidence against him before putting forward his defence. He is under no obligation to give evidence and may choose not to do so."

In an FAI no such notice is given and, subject to the provisions of section 5(2) of the Act, a potential defender or accused is not entitled to decline to give evidence. The circumstances between a criminal case or civil action on the one hand and a Fatal Accident Inquiry on the other are totally different. In terms of section 6(3) of the Act a Sheriff's determination may not be founded upon in any other judicial proceedings arising out of the death, and by this method Parliament has indicated that the finding of fault is not intended to be a purpose of the Inquiry."

In my opinion a Fatal Accident Inquiry is very much an exercise in applying the wisdom of hindsight. It is for the Sheriff to identify the reasonable precautions, if any, whereby the death might have been avoided. The Sheriff is required to proceed on the basis of the evidence adduced without regard to any question of the state of knowledge at the time of the death. The statutory provisions are concerned with the existence of reasonable precautions at the time of the death and are not concerned with whether they could or should have been recognised. They do not relate to the question of foreseeability of risk at the time of the death which would be a concept relevant in the context of a fault-finding exercise, which this is not. The statutory provisions are widely drawn and are intended to permit retrospective consideration of matters with the benefit of hindsight and on the basis of the information and evidence available at the time of the Inquiry. There is no question of the reasonableness of any precaution depending upon the foreseeability of risk. In my opinion, the reference to reasonableness relates to the question of availability and suitability or practicability of the precautions concerned.

I mention this because there appeared to be suggestions at pp 47 - 49 and 53 of Mrs Murray's written submission that she had in mind the foreseeability of risk at the time of the death by those involved at the time. That would involve an assessment of what was known and understood, or should have been known and understood, by those involved at that time. That would raise questions of the foreseeability of risk in the light of professional thinking at the time. It seems to me that such an approach would more properly be related to questions of fault, with which a Fatal Accident Inquiry is not concerned. In my opinion, the purpose of a Fatal Accident Inquiry is to look back, as at the date of the Inquiry, to determine what can now be seen as the reasonable precautions, if any, whereby the death might have been avoided, and any other facts which are relevant to the circumstances of the death.

The purpose of any conclusions drawn is to assist those legitimately interested in the circumstances of the death to look to the future. They, armed with the benefit of hindsight, the evidence led at the Inquiry, and the Determination of the Inquiry, may be persuaded to take steps to prevent any recurrence of such a death in the future.

I emphasise, because it is essential for the proper understanding of what I have set out in my Determination, that it is no part of my statutory duty under the 1976 Act to determine a case of fault against either the Queen Mother's Hospital or any of the doctors concerned on the basis of an alleged failure to take reasonable steps in the face of risks which they ought to have foreseen at the time of Ms Weir's death in October 1999. The proper forum for such an issue is a civil Court where both sides have advance notice in their pleadings of the others' detailed allegations.

In relation to section 6(1)(c) of the 1976 Act, a question arose as to the proper approach to be taken in terms of that sub-paragraph. Carmichael on Sudden Deaths and Fatal Accident Inquiries, 2nd Ed at p 126 states inter alia: -

"What is envisaged is not a probability but a real possibility (my emphasis) that the death might have been avoided by the reasonable precaution."

This was the way in which Mr Moynihan approached the matter in his written submission. However, Mr Donald and Mrs Murray also drew my attention to the way in which the matter had been put by Sheriff Kearney in his Determination in relation to the death of James McAlpine where he said: -

"The question then arises, if I am to make a finding in terms of section 6(1)(c) of the Act that if that precaution had been taken the death "might have been avoided". The phrase "might have been avoided" is a wide one which has not, so far as I am aware, been made the subject of judicial interpretation. It means, in my view, less than "would, on the probabilities, have been avoided" and rather directs one's mind in the direction of lively possibilities."

As I understood it, Mr Donald and Mrs Murray were content with either formulation, making the point though that the correct approach has to be distinguished from a situation where it is no more than speculation whether the death might have been avoided. In his reply, Mr Moynihan took issue with the expression "lively possibility". He submitted that it was generally recognised to be an error to substitute alternative language for a statutory phrase. However, as I have already indicated, in his own written submission he had himself substituted alternative language by submissions to the effect that there was a real possibility that the death might have been avoided by the precautions set out in his submission. I have no particular difficulty with either formulation, albeit that my own preference is probably to ask whether there was a "realistic possibility" that the death might have been avoided, in order to make clear the distinction from a situation where it is really no more than just speculation or a possibility in a theoretical sense, but which is not a "realistic possibility" at all.

In relation to the question of fault, Mr Donald pointed out that some of the language used by Mr Moynihan in his written submission was the language of fault, which is not appropriate for a Fatal Accident Inquiry. In that connection, he reminded me that Mr Moynihan had indicated in his written submission that it did not matter whether the findings were made under sub-paragraph (c) or (e) of section 6(1) of the 1976 Act. (Mr Moynihan in a verbal reply indicated that his primary invitation was for findings under sub-paragraph (c)). I have to say that I had some sympathy with Mr Donald's submission in this respect, as I indicate below.

A final matter of law arose concerning the approach to be taken to expert medical evidence led at a Fatal Accident Inquiry. The procurator fiscal depute submitted that in the case of

conflicting experts' evidence, which there was in the present Inquiry, it was a matter for the Court based on the interpretation of the evidence to form an independent opinion on the relative strengths of the two opposing views. I was referred to a passage in Davie v Magistrates of Edinburgh 1953 SLT 54 at p 57 where Lord President Cooper said: -

"Expert witnesses however skilled or eminent can give no more than evidence. They cannot usurp the functions of the jury or Judge...their duty is to furnish the Judge or jury with the necessary scientific criteria for testing the accuracy of their conclusions so as to enable the Judge or jury to form their own independent judgement by the application of these criteria to the facts proved in evidence."

Mr Moynihan likewise referred me to Davie supra. His submission was that in deciding whether or not to accept such evidence the factors to be taken into account include whether the experts' evidence "carries conviction". He reminded me that it was made plain by Lord President Cooper that it is evidence that is "intelligible, convincing and tested" that is probative.

Mr Donald reminded me that Davie was not a medical case. It concerned explosives' evidence. Mr Moynihan then referred me to a more recent medical negligence case, namely Bolitho v City and Hackney Health Authority [1998] AC 232, a decision of the House of Lords. His submission on the basis of Bolitho was that even although a body of medical opinion might sanction a doctor's conduct, that doctor could still be found guilty of negligence if it was not demonstrated that that body of opinion was reasonable and responsible in the sense that it had a logical base. I was referred in particular to a passage in the opinion of Lord Browne-Wilkinson who delivered the leading speech, where he said: -

"...in particular in cases involving...the weighing of risks against benefits, the Judge before accepting a body of opinion as being responsible, reasonable or respectable, will need to be satisfied that, in forming their views, the experts have directed their minds to the question of comparative risks and benefits and have reached a defensible conclusion on the matter."

Mr Donald submitted that such an approach did not apply in the context of a Fatal Accident Inquiry which was a statutory Inquiry into the circumstances of a death and where the Inquiry was not dealing with fault. Mrs Murray adopted his submissions in law. In other words, because this was not a medical negligence case, the approach desiderated in Bolitho did not apply. His submission was to the effect that in a Fatal Accident Inquiry the questions to be asked are whether an expert is from an appropriate discipline, whether he has the relevant expertise and whether his opinion is well-reasoned. If these criteria are satisfied, an expert does not need to back up his opinion with data as his opinion is given on the basis of his expertise. If the Court in a Fatal Accident Inquiry is faced with differing but equally sound opinions, it is not possible to seek to prefer one body of opinion to another. That is only appropriate in civil cases. I was in any event reminded that in Bolitho Lord Browne-Wilkinson said at p 243: -

"These decisions demonstrate that in cases of diagnosis and treatment there are cases where, despite a body of professional opinion sanctioning the defendant's conduct, the defendant can properly be held liable for negligence...In my judgement that is because, in some cases, it cannot be demonstrated to the Judge's satisfaction that the body of opinion relied upon is reasonable or responsible. In the vast majority of cases the fact that distinguished experts in the field are of a particular opinion will demonstrate the reasonableness of that opinion. In particular, where there are questions of assessment of the relative risks and benefits of adopting a particular medical practice, a reasonable view necessarily presupposes that the relevant risks and benefits have been weighed by the experts in forming their opinions. But if, in a rare case, it can be demonstrated that the professional opinion is not capable of withstanding logical analysis, the Judge is entitled to hold that the body of opinion is not reasonable or responsible.

I emphasise that in my view it will very seldom be right for a Judge to reach the conclusion that views genuinely held by a competent medical expert are unreasonable. The assessment of medical risks and benefits is a matter of clinical judgement which a Judge would not normally be able to make without expert evidence. As the quotation from Lord Scarman makes clear, it would be wrong to allow such assessment to deteriorate in seeking to persuade the Judge to prefer one of two views both of which are capable of being logically supported. It is only where a Judge can be satisfied that the body of expert opinion cannot be logically supported at all that such opinion will not provide the bench-mark by reference to which the defendant's conduct falls to be assessed."

In Bolitho, for example, Lord Browne-Wilkinson went on to say that it was implicit in the judgement of the Judge at first instance that he had accepted that the view of the expert was a reasonable view for a doctor to hold. He was read as saying that, without expert evidence he would have thought that the risk involved would have called for intubation, but that he could not dismiss the experts' views to the contrary as being illogical. Lord Browne-Wilkinson went on to say that when the evidence was looked at it was plainly not a case in which the expert's views could be dismissed as illogical.

I am not satisfied that any good reason has been advanced as to why the approach taken by the House of Lords in Bolitho should be limited only to cases of medical negligence, as opposed to other cases in which actions taken by medical practitioners are under review and in relation to which expert evidence is led. Mr Donald's position appeared to be that the traditional approach taken in medical negligence cases prior to Bolitho was the appropriate approach for the Court in a Fatal Accident Inquiry to take. However, it was not clear to me why, if the traditional approach taken in medical negligence cases is appropriate for a Fatal Accident Inquiry, the development in Bolitho may not equally be applicable in deciding how to approach conflicts in expert medical evidence (in particular in cases involving the weighing of risks against benefits) in whatever forum that might arise, which might include a Fatal Accident Inquiry such as this.

Accordingly, I am content to approach the assessment of the evidence given by the medical experts in this Inquiry on the basis set out by Lord Browne-Wilkinson. It was essential to the approach taken by Mr Moynihan in his submissions that the Bolitho approach be taken by

the Court in this Inquiry. This is because he required to contend with the fact that expert medical opinions had been given by apparently distinguished experts that differed from the opinions supporting his position. He therefore required by means of either Bolitho or by other means (such as by alleging bias) to persuade the Court to reject expert opinions contrary to those supporting his position. Put shortly, he confirmed in his written submission that he was inviting the Court to reject the evidence of Professors Calder and Professor Walker. I was invited to reject their professional opinions as reflecting reasonable practice. In relation to Professor Calder, this invitation was made on the basis that he stood confessed of bias in favour of the Hospital. In relation to Professor Walker, this invitation was made on the basis that his evidence about proper management practices at the gestational age in question was not logical and convincing.

In my Determination I have set out the various circumstances that I find have been established to my satisfaction. I would comment as follows: -

Section 6(1)(a): Where and when the death took place:

I have no comment to make on my finding under this sub-section. The issue was not in dispute.

Section 6(1)(b): The cause or causes of such death:

The ultimate cause of death was not in dispute. All were agreed that Ms Weir died of an intra-cerebral haemorrhage. However, the chain of events that led to that is very much less clear.

The Post Mortem Report, Crown Production No. 11, confirmed that following her admission to the Victoria Infirmary Intensive Care Unit a CT scan of Ms Weir's head had revealed a right subdural haematoma with acute and chronic blood. In addition, there was a large right posterior parietal intra-cerebral haematoma. Brain stem death was confirmed and she was pronounced dead at 10.45 pm on 22 October 1999.

A neuro-pathological examination was also undertaken. This involved a microscopic examination of the brain. This was reported on by Dr Colin Smith as Crown Production No. 9. That examination found evidence of a large intra-cerebral haematoma within the postero-lateral aspect of the right parietal lobe. A separate intra-cerebral haematoma was seen within the right posterior cingulate gyrus. There was found to be evidence of a mass effect with mid-line shift of up to 5 mm to the left.

The post mortem was carried out on 26 October 1999. I have narrated at Finding-in-Fact (73). The principal findings made at the post mortem. At the conclusion of the post mortem,

and as narrated at the end of the Post Mortem Report, the summary of autopsy findings was in the following terms: -

1.Intra-cerebral haemorrhage.

2.Hepatic necrosis.

3.HELLP syndrome (haematological diagnosis).

4.Pre-eclampsia.

In the course of his evidence Dr Ian Gibson, Consultant Pathologist responsible for supervising the post mortem, on being asked for his view as to the cause of death, confirmed that the principal cause of death was the intra-cerebral haemorrhage present on the right side of the brain. This had caused the brain to be shifted over to one side causing damage to the brain stem. His view was that the cause of the intra-cerebral haematoma was the low platelets part of the HELLP syndrome which Ms Weir had developed. Platelets are necessary to clot the blood. The intra-cerebral haemorrhage, No. 1 in the summary of autopsy findings, was therefore in his opinion a direct consequence of the HELLP syndrome, which is No. 3 in the summary of autopsy findings. The death of liver cells, being the hepatic necrosis listed at No. 2 of the summary of autopsy findings, was in his opinion a direct consequence of the underlying condition of pre-eclampsia. The hepatic necrosis had caused the elevated liver enzymes, which was part of the HELLP syndrome as well. Pre-eclampsia was the underlying condition which caused the HELLP syndrome and the hepatic necrosis. He agreed that the haemorrhage was occasioned by the low platelets part of the HELLP syndrome which was causing the absence of clotting.

Turning now to what was said by each of the expert witnesses who gave evidence about the cause of death in this case, I shall begin by summarising the position of each in turn as expressed in their respective reports.

In relation to Professor Calder, who was led in evidence by the Crown, his position was that Ms Weir's death was due to intra-cerebral haemorrhage, which was a recognised complication of HELLP syndrome and hypertension.

In relation to Professor Michael de Swiet, who was also led in evidence by the Crown, he recorded at paragraph 3.9 of his report that Ms Weir had died from intra-cerebral haemorrhage secondary to HELLP syndrome and pre-eclampsia. At paragraph 7.1 of his report he referred to Ms Weir as having died from post-partum HELLP syndrome.

Professor Gordon Stirrat, the expert led on behalf of the family, narrated at paragraph 8.6 of his report that the causes of death had been given as intra-cerebral haemorrhage, HELLP syndrome and pre-eclampsia. He did not address in any further detail the cause of death. However, it is clear from the way in which he expressed himself at paragraphs 9.15.1, 9.15.2 and 10.4 of his report that he associated the development of what he described as having been the development of "severe" HELLP syndrome with Ms Weir's death.

The final expert witness led in evidence was Professor James Walker. He was led in evidence on behalf of the doctors. Professor Calder gave evidence to the effect that Professor Walker could be described as an authority on the obstetric aspects of hypertensive disorders in pregnancy, which he has made his principal interest over the years. He said that Professor Walker would be seen as being more of a foetal/maternal specialist, whereas Professor Calder said that he personally had a broader portfolio of interests. Professor Walker expressed the opinion in his report that it was the failure of Ms Weir's blood pressure to respond to therapy that killed her, not HELLP syndrome or cardio-respiratory failure. His opinion was that the low platelets would have made little difference, as the levels were high enough to function adequately and not low enough to cause spontaneous bleeding. He also expressed the view that her HELLP syndrome was never severe.

Each of the expert witnesses spent on average 4 days in the witness box. In the course of their evidence each was asked to consider the mechanism of death. I take each in turn: -

In relation to Professor Calder, his evidence was that he understood the explanation to be that because of the hypertension and HELLP syndrome the blood vessels were more vulnerable to damage and that when that damage occurred the consequences were more serious because of the existence of the bleeding that had occurred both into the extradural space and into the substance of the brain itself. He was asked about the views expressed by Professor Walker in his report in relation to the question of cause of death. Professor Calder agreed with the view that the intra-cerebral haemorrhage that caused her death had been occasioned by the failure to respond to the treatment for the very severe hypertension. However, he told the Court that he did not know enough about what went on in the very strange and sudden condition to make it possible for him to rule out that the HELLP syndrome might have been another factor contributing to the cerebral-haemorrhage.

In the course of cross-examination, Mr Moynihan put to Professor Calder Professor Walker's report on the question of causation. Professor Calder said that he would have to acknowledge that Professor Walker had greater expertise in the area of vascular biology. At this point Professor Walker had not as yet given evidence. Professor Calder's reading of Professor Walker's report was that Professor Walker felt that the HELLP syndrome component (the low platelet part) was not important in the production of the cerebral-haemorrhage, which was more the result of the uncontrolled blood pressure following delivery. He told the Court that Professor Walker was a world authority on this. Professor Calder felt the intra-cerebral haemorrhage was caused principally by the hypertension. He could not rule out the possibility that the HELLP syndrome was a contributory factor though. He agreed with Professor Walker that the very high systolic blood pressure of over 200 mm

of mercury put the cerebral-vascular system at significant strain. Professor Calder believed the other component was the rapid increase in the systolic blood pressure rather than something happening more gradually, which would perhaps enable the vessels to adjust. He agreed that in all probability the intra-cerebral bleeding started before delivery. In cross-examination to Mr Donald, Professor Calder confirmed that his view was that the intra-cerebral haemorrhage that caused her death had been occasioned by the failure to respond to the treatment given for the very severe hypertension. He thought it was the only conclusion he could reach as to likelihood. He did not know enough about the condition to make it possible for him to rule out that HELLP syndrome might have been another factor contributing to the cerebral-haemorrhage. He also confirmed that he could not see any forewarning of the events of 1410 hours on the Thursday. He also confirmed that because it was not know what triggered this combination of features it could only be speculation as to why it happened at that particular time. He also agreed that if one did not know what the trigger was in relation to causation, one really had no foundation upon which to work.

In relation to Professor de Swiet, he confirmed in cross-examination to Mr Moynihan that he recognised the argument advanced by Professor Walker in relation to the question of cause of death and agreed entirely that it was the severe hypertension that caused the cerebral-haemorrhage and not directly HELLP syndrome. However, in cross-examination to Mr Donald he said that his opinion as to the cause of the intra-cerebral haemorrhage was a combination of high blood pressure and the blood clotting abnormalities caused by pre-eclampsia and HELLP syndrome. He said that he did not know what triggered those events because he did not fully understand the mechanisms of pre-eclampsia. He explained that nobody understood fully the mechanisms of pre-eclampsia. None of the experts suggested otherwise. He also confirmed that it was equally unknown why the events at 1410 hours on 21 October 1999 were triggered at that point. He explained that when he had initially expressed an opinion he had not appreciated the severity of her hypertension before she was delivered. On being asked by Mr Donald about this he thought one reason was that he had not looked at the blood pressure records carefully enough and that he had been thinking of causality in terms of HELLP syndrome rather than in terms of the hypertension. His view now was that the cause of her intra-cerebral haemorrhage was a combination of hypertension and the blood-clotting problem. The blood-clotting problem was her low platelet count and other abnormalities associated with her poor liver function. The low platelet count did not on its own cause her death but it would have contributed to it as a cause of ineffective blood clotting and therefore a pre-disposing cause of intra-cerebral haemorrhage. He agreed that the trigger, whatever it was, caused a spectrum that included severe hypertension and HELLP syndrome effectively almost simultaneously. He would not be so confident as Professor Walker was about the lack of involvement of the blood clotting system.

Professor Stirrat was asked in examination-in-chief about the question of causation. He said that he had found Professor Walker's report very helpful, as he believed that Professor Walker had put into greater relief than he had done the issue of the control of blood pressure. Professor Stirrat said that he believed that there were two elements to the cause of Ms Weir's death, namely the HELLP syndrome and the extremely elevated systolic blood pressures. In cross-examination to the procurator fiscal depute, when asked whether he saw the intra-cerebral haemorrhage as coming from the HELLP syndrome, he said that he saw the major contributor to the haemorrhage to be the hypertension. His position was that one

could not separate the two totally. He agreed with Professor Walker that it was the cerebral-haemorrhage that killed her, not the HELLP syndrome. One could have contributed to the other, but to him, on clinical grounds, the major risk marker was the uncontrolled hypertension for a period of time above the crucial levels of 170/110 after 1410 hours on the Thursday, not helped by the HELLP syndrome. Normally one did not see significant bleeding problems unless the platelet count was under 50. It did not fall to below that until 0036 hours on the Friday. That post-dated the initial evidence of haemorrhage. In cross-examination to Mr Donald, Professor Stirrat agreed that the cause of Ms Weir's death was cerebral haemorrhage. On being asked whether he agreed with Professor Walker that what brought this about was the very high blood pressure and not the HELLP syndrome, Professor Stirrat said that one could not divorce the two. The hypertension was the agent that led to the rupture of the blood vessel but at the time there was a distinctly lower platelet count and so the initial cause would be exacerbated by the poorer ability of the blood vessel to restore its integrity in producing thrombosis around the defect. The dominant reason for the haemorrhage was however the hypertension. The two work together in the overall clinical picture. When Professor Walker's report was specifically put to him at this point, Professor Stirrat agreed that it was the failure of the blood pressure to respond to therapy that killed her, and not the HELLP syndrome or the cardio-respiratory failure. He also agreed that the cerebral haemorrhage might have started prior to delivery when the blood pressures rose significantly and that by the time of the absences later in the evening of the Thursday, after delivery, the bleeding would have been established. He also agreed that this would have been accentuated by the intubation at the Victoria Infirmary. However, Professor Stirrat thought that the platelet count would have made some difference. It is below 50 that they become concerning. If in saying that the low platelets would have made little difference as the levels were high enough to function adequately and not low enough to cause spontaneous bleeding Professor Walker was referring to a period in time prior to delivery and also during the time of the absences, Professor Stirrat agreed with him. He agreed that it was not as such the HELLP syndrome that killed her. He also agreed that the HELLP syndrome was never severe. This appeared to me to be in contrast to what Professor Stirrat had said in his report at paragraph 9.15.1.

In relation to what the trigger was to the events at 1410 hours on the Thursday, Professor Stirrat said that it could very well have been a haemorrhage into the liver substance. He did not have evidence of that. He concluded that one could do no more than speculate what the trigger was. In relation to what caused the severely elevated blood pressure after the event at 1410 hours, his position was that there might have been some stimulus that was not understood. There might have been a link that related to the blood vessels themselves, both in the general circulation and in the liver. The reason for the high blood pressure is that the blood vessels are in spasm or have developed a high resistance. The two may be linked together. He did not know. He thought that Professor Walker's report and analysis of the situation in relation to hypertension was excellent. He agreed that it was not known what actually triggered severe hypertension or epigastric pain at 1410 hours. Likewise it was not known why it happened at that particular time.

Turning finally to Professor James Walker, in the evidence-in-chief he gave evidence to the effect that he suspected that the bleeding that occurred and which eventually led to her death ante-dated her admission to the Victoria Infirmary, although he suspected also that she had further intra-cerebral bleeding there, perhaps following intubation. For there to be

spontaneous bleeding platelets would usually require to go below 30. In this case the lowest platelet count was a reading of 48, which was noted at 0030 hours on Friday, 22 October 1999. In relation to what caused her deterioration and ultimately what caused her death, his position was that the significant events were those which occurred on Thursday 21 October 1999 producing abdominal pain, which he presumed was liver in origin, and the lability of the blood pressure. The liver pain was irrelevant so far as the outcome was concerned. It was a sign of liver damage going on but was not something that would have led directly to her death. The lability of blood pressure was something of more concern in that the systolic blood pressure reached over 200. He suspected that intra-cerebral bleeding occurred at about the time when the lability of the blood pressure led to systolic pressures above 200 prior to delivery. The bleed would initially have been relatively small. He explained that such bleeds tended to occur stepwise. The amount would not be a steady flow. The important thing was that the blood vessel was breached. The events then followed that included delivery, which would change cardiac output quite considerably by increasing it when the baby was being removed. That would put a further strain on cardiac output. He also thought that the episodes of absences later that evening were related to further bleeding even although the blood pressure was not that elevated at that time. He also suspected that on transfer to the Victoria Infirmary, although her deterioration was mostly due to the pulmonary oedema, the action of intubation would have tended to cause acute blood pressure rise. He noted that she had a diastolic blood pressure reading of 190 noted at the Victoria Infirmary. His suspicion was that further bleeding could have occurred at that time. That would have fitted with the CT scan that showed old clot as well as new bleeding, and would fit with the timescale involved. What he was explaining was he said to some extent hypothesis because it was difficult to prove, but his opinion was that it was the most likely combination. She had two areas of large bleeding. This was not "petechial" bleeding (meaning small areas of bleeding spread out over a large area). It was also not platelet bleeding which could be related to low platelet count. This was large vessel bleeding which was not related to coagulation or to platelets dysfunction. He was therefore discounting low platelets, together with any form of respiratory or cardio-respiratory failure associated with pulmonary oedema, as having any bearing on her fatal outcome.

Professor Walker also told the Court that he was not sure that HELLP syndrome ever occasioned intra-cerebral haemorrhage. He thought that there was an association of intra-cerebral haemorrhage with women with HELLP syndrome but that they were the ones who had high blood pressure. In other words, women who have HELLP syndrome without high blood pressure do not die of intra-cerebral haemorrhage. It is the blood pressure that appears to be more related to that than the HELLP syndrome itself. If someone has significant coagulation problems, that might well aggravate a bleed that occurred but it would not be the cause of the bleed.

His opinion was that there were no significant coagulation problems being faced by Ms Weir.

He was also asked in evidence-in-chief about the Post Mortem Report and evidence given by Dr Gibson in relation to the cause or causes of death. His opinion was that the HELLP syndrome was almost certainly caused by the hepatic necrosis. His opinion was that hepatic necrosis was a very significant finding because it was an unusual pathological finding in pre-eclampsia. It implied an acute event causing infarction and necrosis of the liver, which had

not occurred prior to the events at 1410 hours on 21 October 1999 because there was no evidence of damage before that. The hepatic necrosis would therefore have occurred before the HELLP syndrome. He went on to explain that this was occurring in someone with pre-eclampsia. The assumption would therefore be that it was linked in some way but he could not link pre-eclampsia to acute hepatic necrosis. He therefore found that pathology confusing. The most likely cause of the intra-cranial haemorrhage was the episodes of hypertension with systolic blood pressures higher than 200. HELLP syndrome is associated with cerebral-haemorrhage but only when the platelet count goes below 30. That did not occur. The likelihood therefore was that the haemorrhage occurred due to the high blood pressure and not due to the HELLP syndrome.

In evidence-in-chief he was also asked about the report, part of Crown Production No. 9, on the neuro-pathological examination of Ms Weir's brain. He said that the findings implied that there was one main episode of bleeding causing a haematoma but that this was not a widespread multi-vessel disruption. In other words, this was a single or two-vessel disruption more typical of a blood pressure bleed rather than a platelet bleed. The haematoma would have taken up space therefore pushing the brain over to one side. It can be sudden but it is more likely to have been a gradual effect as the haematoma got bigger. In his opinion, the examination supported the hypothesis that this event occurred due to acute bleeds related to blood pressure rather than a chronic ooze bleed from low platelets. The HELLP syndrome was a factor in her sickness, as was the pulmonary oedema, but she should have recovered from both. The HELLP syndrome had not been of sufficient severity to cause death. His belief was that the bleeding occurred prior to delivery and that the HELLP syndrome had no influence on that. However, he thought that after transfer to the Victoria Infirmary there was a small possibility that the HELLP syndrome had progressed enough to cause problems with coagulation which could slightly influence the amount of bleeding that she had, but the first and significant bleed had occurred already.

He summarised his position in evidence-in-chief by saying that the sequence of events was the sudden event occurring on 21 October 1999 that caused some form of acute liver pain and tenderness. This was on top of an apparently normal liver and normal liver function. The acute event that occurred also stimulated a rise in pressure and lability. These were the two major problems that occurred prior to the delivery. It was the blood pressure that was the significant problem at this point. It was important to try to stabilise the blood pressure and also to give an anti-convulsant. The probability was that the trigger could be the same. The pain itself could have made the blood pressure rise independently of everything else, or whatever triggered the lesion in the liver could also have triggered problems within the vascular epithelium which would then lead to acute blood pressure rise. The vascular epithelium is the lining of the blood vessels. This would produce constriction of the vessels and would lead to a rise in blood pressure. That is thought to be one of the main causes of high blood pressure in pre-eclampsia, namely some form of widespread inflammatory process. The lability of the blood pressure prior to delivery and the rise of blood pressure above 200 was what ultimately led to her death. The placenta was probably the site of the main trigger of the overall problem of pre-eclampsia. He did not know what had triggered the events at 1410 hours on 21 October 1999. He agreed that it could only be speculation as to what had triggered the epigastric acute episode and the severe uncontrolled hypertension. It could be that there were separate triggers but his opinion was that the likelihood was that it was the same trigger, whatever that was. As he put it: "...certainly the problems she had

were severe and very rapid, very explosive and unusual so this was an extremely serious situation when it occurred...it is unusual from the speed of onset from someone who was otherwise normal as far as all biochemistry was concerned, particularly the fact that there was significant liver impairment or liver necrosis and damage over a very short length of time on top of a liver which appeared to be completely normal". The HELLP syndrome Ms Weir had was not severe, as she did not reach Type 1, the most severe form as classified. However, she did "head towards" that when she was admitted to the Victoria Infirmary.

In cross-examination to Mr Moynihan, he again confirmed that he was of the view that the primary haemorrhage which he thought occurred in the afternoon prior to delivery was at a time when the platelet function would have been normal. There would have been further stepwise bleeding occurring over the next few hours but the platelet count was always above 50 until after midnight. He felt that it was almost certain that she had a further bleed in the Victoria Infirmary but that that was probably more related to the transfer and intubation which were factors which would increase blood pressure, which did rise again. There may at that stage have been a marginal factor involved in the degree of bleeding relating to platelets. He agreed that the broadest description of Ms Weir's underlying condition would be pre-eclampsia.

In cross-examination to the procurator fiscal depute, he confirmed that even the one reading of 209 systolic (which occurred at 1523 hours on Thursday 21 October and which was the first systolic reading over 200) could have been enough to give rise to a cerebral haemorrhage in itself.

In cross-examination to Mrs Murray, he pointed out that Ms Weir's blood pressure readings at 1520 hours and 1523 hours on 21 October 1999 showed a massive difference in pulse pressure. The reading at 1520 hours had been 165/130 giving a pulse pressure difference of 35 mm of mercury. Three minutes later the blood pressure reading was 209/104 bringing out a difference now in the pulse pressure of 105. Pulse pressure is a sign of how much the arteries are being stretched between the systolic blood pressure, when the heart pushes the blood out, and the diastolic blood pressure, the resting phase. That was therefore a very wide range and increased the potential for cerebral-haemorrhage. He said at this point: "This is actually an extremely unusual pre-eclamptic picture...209/104 is extraordinary and unusual." He confirmed that the nature of this change was of significance as it increased the probability that this was the timing of the event. Not only did one have a high systolic blood pressure but also there was an extremely wide pulse pressure. The blood pressure was repeated within 5 minutes and at that stage at a figure of 175/99 showed a relatively normal diastolic, albeit with an elevated systolic blood pressure reading.

Professor Walker, who was the last witness to give evidence to the Inquiry, was the witness who in my opinion had given the most detailed consideration to the question of the cause or causes of death and the possible mechanisms involved. He had analysed the situation in relation to hypertension in his report. Professor Stirrat had described this as having been "excellent". I had no reason to doubt that.

It is therefore principally on the basis of the evidence given by Professor Walker in relation to the question of causation, which I accepted, that I have concluded that probably the best way to record the position in relation to cause of death is that suggested by Mrs Murray, which I have reflected in the finding under section 6(1)(b) of the 1976 Act. At the end of the day the ultimate cause of death was not in doubt. She died of an intra-cerebral haemorrhage that was caused by severe hypertension. Pre-eclampsia was not per se the cause of that. However, it was a complication of pre-eclampsia. Professor Walker thought it likely that the trigger was the same for both the acute epigastric episode and the severe hypertension. However, that trigger remains unknown.

As to the underlying condition of pre-eclampsia, despite having heard 39 days of evidence it is apparent that the actual cause triggering pre-eclampsia in one woman as opposed to another remains unknown. Even Professor de Swiet (who Professor Calder accepted was an international authority in relation to pre-eclampsia) told the Court that he did not fully understand the mechanisms of pre-eclampsia, and that nobody did. Professor de Swiet agreed that whatever the trigger it was caused a spectrum that included severe hypertension and HELLP syndrome effectively almost simultaneously. It appeared to be accepted that it was the placenta that was probably the site of the main trigger of the overall problem of pre-eclampsia. It is for that reason that delivery of the baby and removal of the placenta is recognised as being the only "cure", as it were, to pre-eclampsia. For example, Professor Walker said that the placenta was probably the site of the main trigger of the overall problem of pre-eclampsia. Subject to what he later said about delivery releasing into the maternal circulation a lot of the placental debris causing a sudden influx of placental trigger that the mother then responds to, once the placenta is removed there is no further stimulation to the condition. However, there is still a "reaction" which will carry on for the next 24 - 48 hours before recovery. I say more about this aspect of the matter below in the context of section 6(1)(c) of the 1976 Act.

Section 6(1)(c):

The reasonable precautions, if any, whereby the death...might have been avoided:

I begin this section by recalling what Lord President Hope said about section 6(1) of the 1976 Act in Black v Scott Lithgow (supra) at p 615: -

"There is no power in this section to make a finding as to fault. The Sheriff's examination and analysis of the evidence is conducted only to setting out in his determination the circumstances to which the sub-section refers, insofar as this can be done to a satisfaction."

In the context of section 6(1)(c), those circumstances are, insofar as this can be done to the satisfaction of the Court, to indicate the reasonable precautions, if any, whereby the death might have been avoided. That therefore involves being satisfied (a) that the precaution concerned was a reasonable one and (b) that it might have prevented the death.

Mr Donald submitted that in parts of his written submission Mr Moynihan had used the language of fault, which would not be appropriate in the context of a Fatal Accident Inquiry. For example, at p 21 of his written submissions the Court was being invited to conclude that "...the fault lies with the consultants..." Mr Moynihan acknowledged that the Fatal Accident Inquiry was not being held to address fault. However, in his reply, after Mr Donald and Mrs Murray had spoken, he told me that he was now asking the Court to make specific Findings-in-Fact in relation to three questions that he had posed at the outcome of his written submissions. These questions were as follows: -

1.Are the protocols and practices followed by the Queen Mother's Hospital out of line with standard practice?

2.More subtly, do the doctors in the Queen Mother's Hospital have an insufficient understanding of the underlying balance of risk?

3.Did the doctors correctly appreciate the severity of her condition?

Specific Findings-in-Fact were now sought on the basis inter alia that "It was the failure to follow standard practice, to understand the risks associated with pre-eclampsia and to appreciate the severity of Ms Weir's condition that caused her death. The combination of these failings led to her delivery not being arranged as promptly as it should have been...the death would (or at least might) have been avoided had the doctors: -

(a)followed standard practice;

(b)a sufficient understanding of the underlying balance of risks; and

(c)correctly appreciated the severity of her condition."

In the event, I am not satisfied that it has been established that any of these questions should be answered as contended for by Mr Moynihan. It is fair to say though that I did have some doubts about answering the questions posed. That is because the first question might appear to be inviting a rather wider answer than a finding of facts relevant to Ms Weir's death and instead inviting a conclusion in relation to the protocols and practices followed by the hospital more generally, which might be more appropriate to a public inquiry into the running of the hospital rather than a Fatal Accident Inquiry such as this. Having regard to the basis upon which specific Findings-in-Fact were invited in relation to questions 2 and 3, I also had a concern that there might be a danger of falling into the category of fault finding. In the event, I have, with some hesitation, answered the questions specifically in Findings (78), (79) and (80). Whatever the position may be about appropriateness of specifically answering

these questions, the issues raised in the questions were however on any view relevant to my consideration of the circumstances to which both sections 6(1)(c) and (e) refer.

Before addressing the issues arising in the context of section 6(1)(c) of the 1976 Act, I propose to break-down the relevant events into the following sections, identifying the principal Findings-in-Fact pertinent to the events in question, and adding comments in relation to the few areas in relation to which it has been necessary to resolve factual conflicts in the evidence: -

1.The events up to and including the evening of Monday 18 October 1999:

Findings-in-Fact (2) through to (14) inclusive. I have also found at Finding-in-Fact (74) that Ms Weir was appropriately managed in the period of ante-natal care prior to her admission.

The only comment I require to make in relation to this section concerns Dr Solanki. She was not led in evidence. It was therefore necessary for witnesses to seek to interpret her written note in the hospital records, Crown Production No. 2 at p 135. She had written as part of the admission or "clerking-in" note for 18 October 1999: "flashing lights ++". Because she did not give evidence, it is not known exactly what she meant to convey by this notation. This phenomenon had not been noted by either the GP, Dr Spilg, or by Sister Midwife Brown at the Day Care Unit although both had seen Ms Weir earlier on 18 October 1999. Both Dr Spilg and Sister Midwife Brown impressed me as being conscientious professionals. If the "flashing lights" had been reported by Ms Weir to either of them I am satisfied that it is likely that they would have recorded this. A number of witnesses gave evidence to the effect that if they had been interpreting the note of "flashing lights ++" they would have read this as meaning that Ms Weir was having flashing lights quite a lot, possibly in terms of frequency or having been quite marked. On the other hand, Dr Chitra gave evidence that: "She (Ms Weir) did complain of flashing lights the day before, on the 18th, but when I saw her in the morning she was not complaining of any symptoms to me." And then later in evidence she said: "I enquired (with Ms Weir)...from the previous reading about visual disturbance. And she said to me that she had a visual disturbance but it wasn't long-lasting, it lasted only a few seconds, and it had settled completely overnight." On the basis of the evidence available I consider it more likely than not that Ms Weir experienced visual disturbance in the form of flashing lights at some stage on Monday, 18 October 1999 between seeing Sister Midwife Brown and being clerked in by Dr Solanki at 5.00 pm. As to the severity or otherwise of the visual disturbance that day there is a conflict between interpretations by the doctors of what they in their experience would interpret "flashing lights ++" to mean and Dr Chitra's recollection of what she was told on 19 October 1999 by Ms Weir. I do not feel that the evidence was clear enough to enable me to be satisfied one way or the other. I have therefore not made a specific finding on the severity or duration of the visual disturbance on 18 October 1999.

The second point in relation to Dr Solanki is that Dr Hanretty gave evidence to the effect that he would have expected her to have discussed Ms Weir's case on admission to the ante-natal ward with the on-call registrar, who he thought would have been the middle-grade

senior house officer (SHO 3), Dr Chitra, that evening. There was no dispute that neither Dr Chitra, nor Dr Roberts, had any recollection of having been informed by Dr Solanki of Ms Weir's admission. In the light of Dr Hanretty's evidence I consider it likely that if Dr Solanki contacted anyone, it would have been Dr Chitra. There was no suggestion in the evidence that she would, or should, have contacted anyone else such as the on-call consultant for the labour ward. I therefore consider it more likely than not that Dr Solanki did not advise her senior, Dr Chitra, or anyone more senior than that, of Ms Weir's admission on 18 October 1999, although it would have been in accordance with good practice to have done so.

2.The events on Tuesday 19 October 1999:

Findings-in-Fact (15) through to (21) and (24) through to (27) inclusive.

There was an issue about the nature and extent of a visual disturbance experienced by Ms Weir on 19 October 1999. Staff Midwife Smith had a vague recollection of Ms Weir having complained of visual disturbance that day. She had to refer to her note taken at about 11.30 am to be reminded of any detail. Her note records: "Slight visual disturbance...passed quickly..." Dr Branchfield was called to see her. He was the senior house officer 1 (SHO1). He had no recollection of having seen Ms Weir. His note at the time recorded: "Episode of visual disturbance lasting (my emphasis) approximately half hour earlier - describes as (my emphasis) "Stars in front of her eyes."" His evidence-in-chief was to the effect that, reading his own note taken at the time, his understanding was that the visual disturbance had lasted about half an hour and that it had occurred earlier in the day. It seems to me that there are two points of note about Dr Branchfield's note at the time. First, the use of the word "lasting" suggests to me that he specifically addressed his mind to the issue of duration of the visual disturbance, and recorded that as being approximately half an hour. Second, the use by him of the words "describes as" suggests to me that he had actually asked Ms Weir to describe for herself the symptoms, and that this was what he was then recording in the note. It is not clear to me that Staff Midwife Smith addressed these two issues in more than general terms. She also gave conflicting evidence about whether the words "Slight visual disturbance" were just her impression at the time of what the patient was telling her or whether these were the words actually used by the patient. Mrs Murray suggested in her submission that Dr Branchfield's note was ambiguous as to the duration of the visual disturbance. This was not however suggested to him in cross-examination. If it had been, I would have been interested to hear his response. It is not at all clear to me that he would have agreed with Mrs Murray in the interpretation of what was, after all, his own note. There was also a suggestion that Staff Midwife Smith had not been away from Ms Weir long enough for her to have had a visual disturbance for half an hour. Staff Midwife Smith thought that at the very most she would have been away from Ms Weir would have been about 20 minutes. I note however that although her evidence was that a CTG scan usually takes 20 minutes or so, in this case Ms Weir's scan began at about 10.30 am and went on until about 11.40 am, namely one hour and 10 minutes. It was not clear why it had gone on for quite so long if Staff Midwife Smith had been away for at most 20 minutes. Bearing in mind that, not surprisingly, by the time of the Fatal Accident Inquiry she had very little recollection of the actual event, I think it likely that she was mistaken in her recollection about timing that day, whatever her usual practice might be. Having said that though, it appears that both she and Dr Branchfield carried out appropriate tests. These tests included measurement of Ms Weir's blood pressure. At 11.30

am it was 154/74. This was accordingly hypertensive on the systolic scale, but not to the extent that anti-hypertensive therapy was required for it. Dr Branchfield recorded the diastolic of 77. He did not note in the medical records the systolic measurement. However, the blood pressure chart in the hospital records Crown Production No. 2, records both systolic and diastolic blood pressures taken not only on 19 October 1999 but also on the other days in the ante-natal ward. Anti-hypertensive therapy was not required. When Professor Walker was asked about the diastolic recorded as being 77, he said that it was very rare for systolic to be elevated in the absence of elevation of diastolic. He agreed that it would have been preferable though if both systolic and diastolic had been noted. However, since the diastolic was 77 it was in his opinion highly unlikely that her systolic was any higher than in the previous estimation by the midwife. I accepted his evidence to this effect. It was however apparent from the evidence of the expert witnesses that it would have been good practice for this episode to have been brought to the attention of a senior doctor. Having said that, two points require to be made about this. The first is that Professor de Swiet did not feel that a lot of blame should be put on Dr Branchfield for not having realising that, as Professor de Swiet saw it, things were "going wrong", as this was "a very atypical situation". Professor de Swiet thought that "paradoxically" one would have needed to be rather experienced to have realised the significance of the episode. He thought that better education of junior doctors was required in relation to the symptoms of pre-eclampsia and the wide spectrum of the disease. The second point is that it became evident from the evidence of the expert witnesses that there was a range of views about the significance of this episode. For example, even if Professor's Walker and Calder had been made aware of the episode, although it would have been factored in to their decision making, neither would have regarded it as indicating a need to intervene at that point. I say more below about the question of the differences of views held and approaches taken in relation to the management of pre-eclampsia, including the question of symptoms such as the episode of visual disturbance.

Dr Branchfield explained in evidence that when he attended on the Tuesday he would have made an assessment of Ms Weir, which would have included a general assessment of how she looked generally, how she felt generally and her blood pressure. He would have asked her about any other symptoms she had, looked for any oedema, looked at the most recent blood results, asked for a CTG to be performed and then he would have decided whether or not he was reassured. From what he read of his entry he feels that he was reassured at that time. If he had not been, he would have brought Ms Weir to the attention of a more senior medical colleague. Both Dr Branchfield and Staff Midwife Smith were satisfied that the foetal monitoring was normal. I have no reason to think that their factual findings were other than correct.

3.The events on Wednesday 20 October 1999:

Findings-in-Fact (28) through to (32) inclusive.

4.The events on Thursday 21 October 1999 - up to and including 1410 hours:

Findings-in-Fact (33) through to (41).

I should comment that although, as is evident from Finding-in-Fact (38), I am satisfied that Ms Weir mentioned a "senior registrar" in relation to what she thought had been a change of plan in relation to delivery. This was at no point put in cross-examination to either Dr Roberts (who was the senior registrar responsible for Ms Weir) or to Dr Chitra. I have therefore not found that there was any such change of plan in relation to delivery as I do not consider that the evidence led before me justified such a finding.

5.The events between 1410 hours on 21 October 1999 up to and including delivery:

Findings-in-Fact (44) through to (47) inclusive. I have also found at finding-in-fact (75) that Ms Weir was appropriately managed after the acute event.

6Evidence from delivery up to and including the transfer to the Victoria Infirmary:

Findings-in-Fact (48) through to (60) inclusive. I have also found at Finding-in-Fact (76) that Ms Weir was appropriately managed during this period.

My findings in this section reflect the fact that where the evidence of Dr Orla Hayes was at variance with the body of other evidence, and indeed any other evidence, I preferred the latter. Her notes for this period were written in retrospect, which is perhaps not surprising in view of all the matters with which Dr Hayes had to cope on the evening in question. However, by the time they were written some time after the event she was aware of the tragic outcome and would therefore have been written with the benefit of hindsight and knowledge of the tragic outcome. In my opinion, her recollection of events, where this conflicted with other evidence, had as a result of her knowledge of the outcome, and possible concern about her own position, become distorted and inaccurate. I do not believe that she was deliberately setting out to tell lies, but her recollection was certainly at significant variance with the evidence of many other witnesses whose evidence was quite consistent, and, in my opinion, more reliable. In resolving the unfortunate conflicts in evidence in this section, I found Dr Stone and Sister Anderson to be of particular assistance. They were particularly careful, considered and measured witnesses in whom I had complete confidence. In arriving at these views, I should however make it clear that I have no reason to think that Dr Hayes was and is other than a good, skilled and conscientious anaesthetist who, although she may have felt otherwise in retrospect, in fact coped well in what must have been a most taxing and difficult situation that evening. I also agree with the procurator fiscal depute that Dr Hayes should not be criticised for not having achieved insertion of a central venous line (Finding-in-Fact (59)). I am satisfied that Dr Hayes did all that she properly could in this respect. She was however faced with very real difficulties in the form of problems with coagulation. Her senior colleagues confirmed that a central venous line could be difficult to insert where there are such difficulties. I am satisfied that that was the situation here.

7.The events at the Victoria Infirmary:

Findings-in-Fact (61) through to (68) inclusive. I have found at finding-in-fact (77) that Ms Weir was appropriately managed at the Victoria Infirmary.

I turn now to the criticisms made by Mr Moynihan in his submissions. Based on the three questions posed by him together with the question posed at the beginning of the Chapter on causation in his written submissions (the word "would" being adapted by me to "might" in view of the wording of section 6(1)(c) of the 1976 Act), these criticisms seem to me to be as follows: -

1.That the practices and protocols followed by the Queen Mother's Hospital were out of line with standard practice. As I understand it, there were two main allegations under this head:

(a)That there was inadequate consultant involvement such that the Queen Mother's Hospital was out of line with standard practice; and

(b)That the Queen Mother's Hospital had a delivery policy, and that this was out of line with "standard practice".

2.That the doctors did not have a sufficient understanding of the underlying balance of risks associated with pre-eclampsia;

3.That the doctors did not correctly appreciate the severity of Ms Weir's condition; and

4.That if Ms Weir had been delivered earlier her death might have been avoided.

Mr Moynihan told me that the first issue was the over-arching one, with the second and third issues being subsidiary issues. It seems to me that these two issues are really bound up with Issue 1(b). They will therefore be addressed in that context.

The reasonable precaution suggested is that of delivery at an earlier stage (which Mr Moynihan suggested should have been on the afternoon of Tuesday 19th October or the evening of Wednesday 20th October). Ultimately, therefore, I have had to ask myself: -

(a)Whether I am satisfied on a balance of probabilities that delivery at such an earlier stage would have been a reasonable precaution and, if so,

(b)Whether I am satisfied that such earlier delivery might have avoided Ms Weir's death.

In order to answer these ultimate questions a number of issues arise:

Whether there was inadequate consultant involvement such that the Queen Mother's Hospital was out of line with standard practice?

To answer this question it is necessary, if it is possible to do so, to identify what is meant by "adequate" consultant involvement in accordance with standard practice in a case such as this.

Chapter 5 of Mr Moynihan's written submission was entitled "Correct" medical practice regarding consultant involvement. This was in contrast to the expression "standard practice" in his first question. In Chapter 5 he placed particular reliance upon advice given in a number of reports on Confidential Enquiries into Maternal Deaths in the United Kingdom ("CEMD Reports"). It is fair to say that there has been consistent advice in successive reports drawing attention to the need for consultant involvement. For example, in the 1985 - 1987 Report the following guidance was given: -

"The consultant in charge of the hospital obstetric team should emphasise to all of his/her staff the importance of hypertensive disorders at all stages of pregnancy, ante-, intra-and postpartum.

This can best be accomplished by insisting that in every case and at all hours, women with moderate or severe pre-eclampsia, whether seen initially or during observation in hospital, be examined, as a matter of urgency, by a consultant obstetrician whose duty it is to determine the immediate and subsequent management in detail."

In the 1988/1990 Report there was the following passage: -

"In the seven cases where consultant involvement was judged to be "too little" or "too late" or both, the majority had been handled by junior staff for too long with failure to appreciate the serious underlying nature of the case. Often when the Consultants became involved the situation was virtually irretrievable. This suggests a continuing lack of awareness of the potential seriousness of seemingly mild symptoms and signs and the treacherous nature of pre-eclampsia, and a persisting failure by Consultants to alert junior medical staff to these dangers."

In the 1994/1996 Report there was the following passage: -

"...the need is emphasised for appropriate protocols to prevent junior staff being exposed to potentially dangerous clinical situations of which they have little experience.

Each unit must identify a lead Obstetric Consultant to develop a system for the management of patients with pre-eclampsia and eclampsia. These will include protocol development and updating, and appropriate staff training. There should also be a clear system in place with regard to transfer of these patients at an appropriate stage."

In my opinion, it is a fair and reasonable implication of the reports that it is someone with the requisite experience and insight in relation to pre-eclampsia who is required. For example, in the 1985/1987 Report there is the following passage: -

"Whilst pre-eclampsia remains the danger that it still is, this is not the time to tinker with systems that are effective, unless there are better alternatives. What is needed is to upgrade and improve on what is in place.

Three developments are desirable. The first is that obstetricians need to have a broader and better informed view of the disease and its ramifications. The traditional teaching has so emphasised the signs by which pre-eclampsia is detected (hypertension and proteinuria) that these are frequently perceived as the totality of the condition. How often is it said or written in the case notes that a woman's condition is mild simply because she has slight hypertension even though there is proteinuria, a reduced platelet count and elevated liver enzymes. This woman is in danger of her life regardless of the level of her blood pressure. How often it is considered that a pre-eclamptic woman will not get pre-eclampsia simply because her hypertension is not severe? Contrarily, how often is severe hypertension left untreated, because the woman has no complaints and her obstetrician fails to understand the threat to her cerebral circulation of a high blood pressure combined with increasing vascular damage secondary to endothelial disturbances?

The second development is to recognise the limits of what the generalist can do for women with the severest (and rarest) presentations. This includes all but the mildest cases of eclampsia. These are so rare and so complicated that only the sub-specialist to whom these sorts of cases are referred can expect to acquire the insight (my emphasis) and skills that come with practice."

In the 1985/1987 CEMD Report at p 26 there is also reference to the setting up in all regions of local specialised teams who should include, along with experienced obstetricians and obstetric anaesthetists, physicians expert in hypertensive and renal disorders, who would take a special interest, and acquire wide experience, in the management of these difficult

obstetrical cases. In other words, and as Professor Michael de Swiet indicated in his evidence, it seems reasonable to conclude that a consultant with both experience and insight into the variability of the condition is what is required. Put another way, the label "consultant" is not the whole answer.

Mr Moynihan himself said in his written submission at p 33: -

"The medical profession has failed to implement the recommendations of successive Reports into Maternal Deaths."

In the light of the evidence I have heard from not only medical staff at the Queen Mother's Hospital but also from the many professors, all of whom were distinguished experts in this field, I am not satisfied that it can be said that it has as yet become "standard" practice to have the degree of consultant involvement recommended in the CEMD Reports. I therefore think that Mr Moynihan was correct in acknowledging this. In my opinion, this is material to a consideration of whether any perceived failure in this regard by the Queen Mother's Hospital is something which should more appropriately be addressed in the context of section 6(1)(e) of the Act, on the basis that there would be a clear public interest in making recommendations to the effect that the advice given in the successive CEMD Reports should be heeded and steps now be taken to act upon such advice in the public interest.

In Chapter 5 of his submissions, Mr Moynihan invited the Court to make as one of the principal recommendations from the Inquiry that the Queen Mother's Hospital "implements" the CEMD Reports and "ensures that patients admitted with suspected pre-eclampsia are seen by a consultant within 24-hours of admission". The procurator fiscal depute made a similar invitation. I have to say that none of the CEMD Reports to which reference was made in evidence actually made a recommendation in such terms. The only consultant who made such a recommendation himself was Professor Stirrat. However, even his own hospital, from which he is now retired, did not have such a specific requirement. Professor Calder confirmed that his view was that it is good practice for a patient with pre-eclampsia or suspected pre-eclampsia to be seen by a consultant within "the working day following admission." In this case, Professor de Swiet and Professor Stirrat were of the opinion that a consultant should have seen Ms Weir on 19 October 1999, namely the day following her admission. Professor Walker also indicated that it was his view that a consultant or a senior doctor should have seen Ms Weir within the next day after admission, although he did not consider that it would have made any material difference to how he considered Ms Weir should have been managed. Professor Walker in evidence-in-chief gave evidence to the effect that he would have made sure that blood tests (which Dr Chitra had instructed on 19 October 1999 to be done on 20 October 1999) were taken on the Wednesday morning and the results available for proper assessment by him or his senior registrar on the afternoon of Wednesday, 20 October 1999. The reason for the blood tests not having been taken on 20 October 1999 remains unknown although there was a suspicion that it might have been because Ms Weir consented to take part in medical examinations in another ward that morning, as referred to in Finding-in-Fact (29). In the event, it is likely that the blood results, even if they had been taken on the Wednesday, would not have given cause for concern because the blood tests that were taken even on the morning of 21 October 1999 did not.

However, the fact remains that it is unacceptable that such an instruction given was not implemented, particularly given that a deterioration in pre-eclampsia is often first heralded in blood results.

Mr Moynihan did not suggest in his submissions that a consultant should see patients in the ante-natal ward every single day of their stay. It was certainly clear from the evidence given by the professors in particular that this is something that would be difficult to achieve given the current system of team working in hospitals. As I say, however, this was not something suggested by Mr Moynihan and I say no more about it.

So far as the Queen Mother's Hospital is concerned, there is an on-call consultant in the labour ward. There is no on-call consultant for the ante-natal ward. This situation has been highlighted in the present case because Ms Weir's "named" Consultant, Dr Kevin Hanretty, was on holiday at the time of her admission and stay in the Queen Mother's Hospital. Dr Hanretty had seen Ms Weir at an earlier stage in her pregnancy in the Out-Patient Ante-Natal Clinic. In the course of his submissions on behalf of the doctors, Mr Donald told me that it was accepted, correctly in my opinion that, there was a need to review the role of the consultant on the ante-natal ward. He explained that he meant by this that the question of a consultant for the ante-natal ward to provide for holiday and similar absences was an issue that needed to be looked at. In my opinion, there is no doubt at all that this is so. However, it has to be recorded that, with the exception of Dr Thomas Turner, consultant paediatrician at the Queen Mother's Hospital and holding the position of Chairman and Clinical Director of the Maternity and Neo-Natal Board of the Queen Mother's Hospital, the other clinicians from whom I heard in evidence were rather more defensive generally and gave little obvious sign of acceptance that there might be (at least) such a need. However, in my opinion Dr Turner was correct to be rather more open to this suggestion.

So far as Ms Weir is concerned, had this not been a "holiday" week for her named Consultant, Dr Hanretty, it is clear from the evidence that he would have seen her on Tuesday, 19 October 1999, namely in the working day following her admission. Indeed, Mr Moynihan said in his submissions, and correctly in my opinion, that it was difficult to fault Dr Hanretty for his personal routine for consultant contact with the patient. However, it seemed pretty clear from the evidence of Dr Alan Cameron, another Consultant Obstetrician at the Queen Mother's Hospital, that he would not necessarily have seen Ms Weir on the day following her admission. His position was that pre-eclampsia is a very common complication of pregnancy and that it was something the junior obstetric doctors, as well as senior doctors, were familiar with. Despite having relevant passages in the CEMD Reports put to him for his comment, he adhered to his view to the effect that it was appropriate to rely on junior doctors, and midwives, to report up the line to consultants if they felt consultant attendance was required. The current approach of an apparent reliance on junior doctors, coupled with midwives, was confirmed by the tenor of Dr Turner's evidence. There was also the following exchange with Dr Roberts where she was asked: -

"Does the Queen Mother's Hospital have a practice with patients admitted with a diagnosis of pre-eclampsia of taking steps to ensure that a consultant or a senior registrar sees the patient in early course?"

Her reply was: -

"There is nothing in place that ensures that that happens, but with the proviso that if the midwife or the juniors felt that the patient should be seen then a senior registrar or consultant would be asked to see the patient, and would do so. There is always at least one consultant in the hospital."

At one point, Dr Cameron accepted that it was possible and that it did happen that women admitted with pre-eclampsia, with the possibility of that condition being symptomatic, might not be seen by a senior obstetrician for as much as 48 hours after admission to the ante-natal ward. In my opinion, such a state of affairs is a matter of concern, particularly having regard to the fact that this is a condition known for its variability and the potential, albeit rare, for disastrous consequences.

In the event, no actual consultant obstetrician saw Ms Weir until after the acute event at 1410 hours on 21 October 1999, namely nearly three complete days after her admission to the ante-natal ward.

Dr Roberts was Dr Hanretty's senior registrar in his "team". She saw his patients in his absence on holiday. Mr Donald said in his submission that she was "for all purposes" acting up as consultant. It is certainly true to say that it was accepted by the experts at the Inquiry that in the light of her qualifications and experience she was of sufficient seniority to be seeing Dr Hanretty's patients and making management decisions such as decisions in relation to delivery without reference to a "consultant". Dr Cameron confirmed that the group of consultants at the hospital felt that Dr Roberts "was almost of equal standing" to the rest of the consultants. Indeed, she has since been appointed as a consultant obstetrician at the Queen Mother's Hospital in her own right. However, it was clear from her evidence that she was not Dr Hanretty's direct replacement in reality. What happened was that she continued (and it is not suggested that she had any choice in the matter) her own day-to-day duties which included working in other hospitals and clinics and with other consultants. She went through her usual working week in detail in her evidence. Her work did not change in Dr Hanretty's absence. In particular, the only weekly routine when Dr Hanretty was present would have had Dr Roberts going to the ward with him to see his ante-natal patients on a Wednesday afternoon between 3.00 pm and 4.00 pm. Consequently, by having seen Ms Weir, for the first time, at 3.30 pm on Wednesday, 20 October 1999 Dr Roberts was simply following the ordinary routine, albeit without Dr Hanretty being present.

Dr Roberts was asked at one point: -

"How did your week differ in responsibility?"

Her answer was: -

"My week would only differ in responsibility in that I would be doing the same things as when he was there, but he would not be there."

It became apparent that the reason why Dr Roberts had not seen Ms Weir on Tuesday, 19 October 1999 was because her usual duties had taken her elsewhere. It therefore appears that she was adhering to her ordinary routine. The reality therefore is that each member of the team carried on as normal, in effect unmodified to compensate for the absence of the consultant.

I am not criticising Dr Roberts for this state of affairs. My impression was that she was having to cope with a very heavy workload, even without the added responsibility of "acting up" as consultant for decision-making purposes in Dr Hanretty's absence. I have no reason to think that she is other than a very competent, conscientious and committed senior obstetrician. She was in my opinion placed in a very difficult, and it respectfully seems to me unsatisfactory, position. However, it is in my opinion a matter of concern in the public interest that the Queen Mother's Hospital did not have a system in place to see to it that there would be an equivalent level of consultant contact with and management of patients such as Sharman Weir in Dr Hanretty's absence on holiday. There was no suggestion in the evidence that this was anything out of the ordinary, or that, for example, it would not equally happen in the absence of the other consultant obstetricians on holiday or for any other reason. My particular concern is that important initial consultant assessment in the day following admission to the ante-natal ward.

There are differing views as to whether there should be a system for consultant review of a patient such as Ms Weir every day. However, I am satisfied that whatever the position may be about the desirability of such a system in general for the daily review of each patient in an ante-natal ward, a consultant obstetrician should however examine a patient such as Ms Weir within the day following her admission in order to determine the immediate and subsequent management in detail (to adopt the wording of the 1985/1987 CEMD Report). I have therefore made Recommendation (3)(d) to reflect this.

It is far from clear that that is standard practice in the medical profession at present in maternity hospitals generally. In the light of the advice and recommendations given in the CEMD Reports it respectfully seems to me that the public are entitled to expect that recommendations in relation to such consultant involvement are heeded and acted upon by maternity hospitals such as the Queen Mother's Hospital.

Dr Turner gave evidence to the effect that it was "regrettable" that no consultant did actually see Ms Weir until Dr Cameron when she was in the labour ward in the afternoon of 21 October 1999 after the acute event at 1410 hours. He said: -

"I certainly think it does not give a perception that is in our favour."

In re-examination he said: -

"I am sure there is a solution. I would never say never, it would be a resource solution, I would imagine."

His position was that there would be difficulties about a consultant seeing someone such as Ms Weir within 24-hours of her arrival within the hospital, but that that was not unsolvable if one made the appropriate resources available.

I can well see that this might well be a "resource solution". However, it is difficult to see what the point is of having CEMD Reports with recommendations if they are not then heeded and acted upon by the medical profession, particularly having regard to the variable nature of pre-eclampsia and its potentially disastrous consequences, albeit that, fortunately, fatalities are now much reduced from the figures earlier in the last century. There are currently between about 5 and 10 maternal deaths per annum arising from complications of pre-eclampsia.

A further point made by Mr Moynihan was to the effect that it was apparent from the evidence that even if Ms Weir had been seen, and a plan of management made, by a consultant obstetrician at the Queen Mother's Hospital a similar management course would have followed. That means that the outcome would have been the same. On the evidence it appears likely that this would be so. Mr Moynihan argued that this was because there was a failure on the part of all at the Queen Mother's Hospital to take into consideration the known potential for an atypical presentation. There was no dispute that the presentation in this case had been atypical. This he said demonstrated that there was a lack of insight into the special challenges posed by pre-eclampsia. What was needed was not just a consultant with experience of pre-eclampsia but one who also had insight into the condition. His submission was that it was in recognition of such a situation that the CEMD Report for 1994/1996 recommended that each unit should have a lead obstetric consultant. The Queen Mother's Hospital does not have such a lead obstetric consultant. He invited the Court to recommend implementation of this recommendation. He further suggested that the appointee should be an external candidate. In this connection, it is perhaps pertinent to refer to a passage of evidence given by Professor de Swiet where, in saying that his view was that Ms Weir should have been delivered earlier than she was, he said that it might well be that the primary problem was a failure to involve a consultant obstetrician early enough in the patient's illness "who thinks the same way as I and many others do."

That raises a problem in the present case because I heard evidence from six eminent professors, four of whom gave opinions directly in relation to Ms Weir's case, and it is perfectly clear that they do not all think the same way as Professor de Swiet. As Professor Walker put it at one point in answer to Mr Moynihan in cross-examination: -

"I think one of the problems you have here is you have by your own admission collected together a group of people who are probably some of the best not only in this country but the best in the world in managing pre-eclampsia."

The fact is that, the more that the Inquiry proceeded, the clearer it became that there were very differing views about the management of a case such as Ms Weir's. If a lead consultant were to be appointed, even an external one, it is not possible to say that a lead consultant who thinks the same way as Professor de Swiet does would or should be appointed. It might equally be one who thinks the same way as Professor Calder or Professor Walker, in which case the management would have been similar and the outcome would have been the same. It is quite understandable to think that because someone has died there must have been something that was missed. Indeed, Professor Walker said that he had come into the matter assuming that this was so. However, his problem was that on looking through the matter he could not find anything missed in the investigations done or the interpretation of the investigations. It therefore seems to me that, even with the appointment of a lead consultant, it is not clear that a clinician from the more "aggressive" school of management contended for by Mr Moynihan in his submissions would necessarily be thought to be the "correct" appointment as it was not clear-cut on the evidence what would be "correct".

That apart, Professor de Swiet confirmed that he had himself had an input in to this CEMD Report. He confirmed that having a lead consultant was important. He explained that he saw the importance as being:

"That it can lead to a unified policy within a given hospital, granted the frequency with which junior staff change. A protocol is helpful so that people can all be thinking in the same way. One needs to be a little bit careful because if everything is totally protocol-driven then people may not make any allowance for variation, and also people stop thinking; but, on balance, protocols for guidance I believe to be very helpful."

He agreed with Mr Moynihan in cross-examination that what one should be aiming for is a consultant with specific insights into this condition to be involved in the management of his patients, as opposed merely to being the need for a consultant in name to be in the hospital. He also agreed that it would be desirable that a hospital such as the Queen Mother's Hospital should have a lead clinician leading practices in relation to pre-eclampsia.

Professor de Swiet also gave evidence about the episode of visual disturbance on the Tuesday. His view was that in relation to such a situation where a junior doctor was not reporting such an episode to a superior, better education of the junior doctors was needed in relation to the symptoms of pre-eclampsia and the wide spectrum of the disease with the aim of appreciating significant factors that may influence clinical management. He confirmed that he would like to see such a junior doctor not only noting such symptoms but also appreciating the significance of them by reporting them up the way. Although the expert witnesses would have placed differing significance upon it, they were at one that this

episode should have been brought to the attention of a senior doctor. Professor de Swiet was however reluctant to place too much blame on the junior doctor due to his relative inexperience. It seems to me that there is much merit in what Professor de Swiet had to say about the requirement for better education in relation to the symptoms of pre-eclampsia and the wide spectrum of the disease, particularly (1) in the light of evidence about the frequency with which the junior staff change at the Queen Mother's Hospital, (2) the potential seriousness of what may sometimes appear to be mild symptoms and signs and (3) the treacherous nature of pre-eclampsia. At the end of the day, the fact is that because this episode was not brought to the attention of a senior doctor, it was fully 27 hours until Ms Weir was next seen, this time by Dr Roberts on the Wednesday afternoon. That probably did not make a difference to the management in the present case, but in another case it could well do. That is a matter of concern in my opinion. It is also a fact that on a number of occasions, contrary to good practice, junior doctors did not note the systolic blood pressure readings. The procurator fiscal depute invited me to make recommendations about training in relation to systolic blood pressures. I have incorporated this into my recommendations. I also note that Dr Allam, the obstetric registrar (middle grade) who was responsible for the care of Ms Weir on the evening of Thursday 22 October did not think that the episodes of apparent loss of consciousness and "twitching" at 2245 hours and 2350 hours were significant. Dr Cameron, who was the consultant in overall charge of Ms Weir, therefore did not hear about them until the following day. All the experts who were asked about these episodes thought that they might well have been related to cerebral bleeding at those points in time. Dr Cameron also thought in retrospect that they might well have been significant as they were central nervous system symptoms. In the event, the experts confirmed that nothing else could have been done for Ms Weir at these points than was being done. However, it does seem to me to be of concern that the potential significance of these apparent symptoms was not recognised and that Dr Cameron was not told about them at the time.

Mr Moynihan also asked Professor Walker about potential lessons to be learned from this case. He asked Professor Walker:

"...there is a danger if junior doctors and non-expert consultants even wrongly equate the majority of women to what normally happens they will have diminished vigilance because they will not be preparing themselves to pick up those rare occasions where someone abnormal is occurring. Do you not see that as a lesson that we can learn from this?"

Professor Walker replied:

"I do see that as a potential lesson to learn from this. I would also say to some extent there is a systems failure around in this in that there were certain things not done precisely that should do (sic). The problem is that happens because no systems are perfect".

The fact remains that the recommendation of the 1994/1996 CEMD Report that each unit should have a lead consultant has not as yet been acted upon by the Queen Mother's Hospital, and it was not evident to me from the evidence why it should not be acted upon. In

all the circumstances, including the evidence of Professor de Swiet, it seems to me that it would be in the public interest that it should now be, particularly bearing in mind that the Queen Mother's Hospital is a teaching hospital and a tertiary centre taking referrals from other hospitals. I have therefore made Recommendation (3)(a) to reflect this. I have also made Recommendation (3)(b) about the training of junior doctors, particularly in the light of the evidence of Professor de Swiet.

I was impressed by Dr Turner in his evidence. For example, I am satisfied that he genuinely recognises that the consultant situation at the Queen Mother's Hospital on this occasion was unsatisfactory and that such a situation should not be allowed to arise again. As Chairman and Clinical Director of the Maternity and Neo-Natal Board of the Queen Mother's Hospital, Dr Turner would clearly have a significant input into the appointment of such a lead obstetric consultant, as one of his primary responsibilities is responsibility for personnel. He is also got a very clear interest in ensuring that the Queen Mother's Hospital operates to a high standard, having particular regard for its role in the community. Doubtless such a post would be advertised on an open competition basis, just as Dr Roberts' own consultant post was. It may well be that an external candidate turns out to be the best person for the job, but in my opinion it would be quite inappropriate to exclude from consideration anyone simply on the basis that they are currently holding the position as consultant obstetrician at the Queen Mother's Hospital. Indeed, I did not hear from all of the consultant obstetricians at the Queen Mother's Hospital and it would I think be quite wrong for me to suggest that any of them should be excluded from consideration for the post. I am therefore not satisfied that it would be appropriate for me to recommend that the appointee should only be an external candidate.

I would add that having seen and heard a number of the senior doctors from the Queen Mother's Hospital, and in particular Dr Cameron and Dr Roberts, I believe that they were deeply shocked and affected by Ms Weir's death and that they will be willing to look at whatever may required to be done with a view to avoiding a further maternal death.

There was also a question of whether a consultant or senior doctor should be advised on admission of the admission of a patient such as Ms Weir to the ante-natal ward. The consensus amongst the experts was that a doctor of at least registrar level should be informed of such an admission, albeit that they would not be required to see the patient at that stage. Dr Hanretty gave evidence to the effect that he would have expected the on-call SHO, Dr Solanki, to have assessed Ms Weir, as she did, and then to have discussed the admission with her registrar or the then equivalent (an SHO3). He thought it would have been Dr Chitra who would have been the registrar or equivalent on-call for the evening of 18 October 1999. In the event, it appears likely from the evidence that Dr Chitra was not informed of Ms Weir's admission and there was no evidence that anyone more senior was told either. I am satisfied that this apparent omission made no difference to the outcome in the case. However, it would clearly be good practice in cases where patients are admitted to the ante-natal ward with pre-eclampsia or suspected pre-eclampsia for a doctor of registrar grade or above to be advised of the admission to the ward of such a patient. The procurator fiscal depute invited me to make such a recommendation. In all the circumstances, I considered it to be in the public interest to make Recommendation (3)(c) on this matter under section 6(1)(e) of the 1976 Act.

Whether the Queen Mother's Hospital had a delivery policy and, if so, whether this was out of line with standard practice?

The issues raised by Mr Moynihan in his second and third questions will be considered in this context.

Whether the Queen Mother's Hospital had a delivery policy?

Chapter 6 of Mr Moynihan's written submissions were entitled "Delivery Policy at the Queen Mother's Hospital." He drew my attention to certain passages in the evidence of Dr Weir, Dr Cameron, Staff Midwife Smith, Dr Hanretty and Dr Roberts. He invited the Court to find that the Queen Mother's Hospital, first, has a practice of seeking to prolong pre-eclamptic pregnancies to at least 38 weeks' gestation unless the patient's condition deteriorates, second, that even at the gestational age of 36 - 37 weeks the Queen Mother's Hospital still postpones delivery absent any obvious signs of progression of the condition and, third, that Dr Roberts is a follower of this practice.

I have considered carefully the passages of evidence to which Mr Moynihan referred. I am, however, not satisfied that the evidence focused on this matter clearly enough and, in the whole state of the evidence, I cannot say that I am satisfied on a balance of probabilities that the Queen Mother's Hospital has such a practice involving pre-eclamptic pregnancies. It may well be the case that in general terms the consultant obstetricians at the Queen Mother's Hospital like to "keep pregnancies going to 38 weeks", as was the recollection of Dr Weir from his conversation with Dr Alan Cameron. I have no reason to doubt Dr Weir's recollection in relation to this conversation. But that is a different matter from saying, which Dr Cameron did not, that the hospital seeks to prolong pre-eclamptic (my emphasis) pregnancies to at least 38 weeks. It is fair to say thought that, if that had been the case, it would not in my opinion have been in accord with the spectrum of views expressed by the expert witnesses in relation to decisions at this gestation in the context of a pre-eclamptic pregnancy.

Dr Hanretty gave evidence to the effect that he would have tried to get Ms Weir to 38 completed weeks (namely, 38 weeks and 6 days) gestation. However, that was not a practice suggested by either Dr Chitra or Dr Roberts. I am not satisfied that Dr Hanretty's evidence as to what he would have sought to was representative of a "policy" of the hospital in relation to pre-eclamptic pregnancies. It has to be said though that if it had been representative of any such "policy", it would not in my opinion have been in accord with the spectrum of views expressed by the expert witnesses in relation to decisions at this gestation in the context of a pre-eclamptic pregnancy.

The suggestion also was that even at 36 - 37 weeks' gestation, the hospital still postpones delivery in pre-eclamptic pregnancies absent any "obvious signs" of progression of the

condition. This was founded upon one passage in Dr Roberts' evidence where, when asked: -

"What you were waiting on included a 24-hour urine sample and further blood tests?"

She replied: -

"I was waiting for any obvious signs of progression of her condition."

She then agreed that there had then been an "obvious sign of the progression of her condition" within the next hour when there were symptoms of epigastric pain. In his submission, Mr Moynihan has taken this (a) to mean that this was hospital policy and (b) to mean that Dr Roberts was really "waiting" for an acute event such as the catastrophic event at 1410 hours on 21 October 1999 to occur before making a decision for delivery. In my opinion, both conclusions would be unfair and unjustified. There is no evidence that the hospital (my emphasis) had or has such a practice. I therefore reject that contention. In the second place, I am satisfied that what Dr Roberts meant was that she was waiting for obvious signs in the form of, for example, "worsening parameters", such as blood test results, as she had indicated in her note in the clinical records Crown Production No.2 at p 137, dated 20 October 1999 after she had seen and assessed Ms Weir that day (although in the event she took the decision to proceed to delivery in the absence of what she would have taken to be any such signs but instead on the basis of the results of the 24-hour urine tests and Ms Weir's own request on 21 October to be induced). In my opinion, it is unfair to suggest that Dr Roberts was waiting for a catastrophic event to occur before doing anything. That is not in my opinion a fair reading of her evidence taken as a whole. On the other hand, if Dr Roberts does have a general approach, in the context of pre-eclamptic pregnancies at 36/37 weeks gestation of actually "waiting for any obvious signs of progression of her condition" that would not in my opinion appear to be in accord with the spectrum of views expressed by the expert witnesses in relation to decisions at this gestation in the context of a pre-eclamptic pregnancy. In the event, however, that was not what Dr Roberts actually did in this case, as I refer to further below.

Mr Moynihan suggested that Dr Roberts had a practice of prolonging pre-eclamptic pregnancies to 38 weeks. He posed that question by asking: -

"Was that what she was trying to do with Sharman until Sharman's threat to discharge herself prompted the doctor to concede that delivery should be initiated on Thursday?"

Further on in his written submission he repeated: -

"One can reasonably conclude that it was Ms Weir's threat to discharge herself that was the reason for the decision to induce that day."

I would observe at this point that it was to be a decision to commence induction that day, with delivery that same day being most unlikely.

In my opinion, the evidence does not justify the conclusion suggested by Mr Moynihan. Dr Chitra gave evidence to the effect that Ms Weir had told her that if she was not going to be induced she would not agree to stay in the hospital any longer. However, there was no evidence whatsoever that Dr Roberts, who was the decision maker, was told of this, and it was not put either to her or to Dr Chitra in cross-examination that this was so. In any event, I do not consider that it is a fair reading of Dr Roberts' evidence to conclude: (a) that she personally has a practice of seeking to prolong pre-eclamptic pregnancies to at least 38 or weeks or (b) that that was what she was seeking to do in Ms Weir's case. The fact is that her own note in the clinical records to which I have referred stated inter alia: -

"Repeat bloods tomorrow - review (my emphasis) with results (of blood tests) plus 24-hour urine (analysis). Daily CTG meantime. Any worsening parameters tomorrow - for induction of labour (discuss with me)."

I have amplified abbreviations used in the original notes in order to make the entry readily intelligible to others. Mr Moynihan said that in a passage of her evidence on Day 6 the discussion in evidence had been specific to a lady at 37 weeks' gestation with pre-eclampsia. On the previous page in the transcript of evidence for the day there had been a reference to pre-eclampsia. However, looking at the way in which the question from him started at page 918 of the transcript I am not clear that Dr Roberts would necessarily have appreciated that Mr Moynihan apparently had in mind at that point a woman with pre-eclampsia at 37 weeks' gestation as, at that point, his example did not include that information. On Day 7, Dr Roberts said: -

"When medical conditions are present that will over-rule the 38 weeks...at no time did I state that Sharman Weir should not be delivered until 38 weeks."

Dr Roberts is quite correct in that assertion and I accept as being her position what she said in the two passages I have just paraphrased. The way she explained her position was that an advantage in not delivering at 37 weeks was of giving a few extra days for the foetus to mature and to give the cervix more time to become more favourable for the induction process. Her understanding was that there is an increase in neo-natal morbidity at earlier gestation, even at 37 weeks compared with 38 weeks. The risk did not disappear from 37 weeks onwards but it became less. She confirmed that she recognised a trend of thought that said that at 37 weeks your presumption should be that you should proceed to induce labour rather than to manage the cases conservatively and to leave the woman. However, when asked what her position was in relation to that, she indicated that it was an awful lot

easier to make the decision at 38 weeks than 37 weeks. This was in terms of foetal well being, taking into account the risks to the baby associated with the induction process itself.

It is fair to say that there were on some occasions some inconsistencies in her evidence, but I do not consider that Mr Moynihan's suggested assessment of Dr Roberts' evidence represents a fair reading of her evidence taken as a whole.

For example, if Mr Moynihan was to be correct in his assertion that Dr Roberts was seeking to prolong the pregnancy to at least 38 weeks unless the patient's condition deteriorated, I find it surprising that the note made by Dr Roberts in the clinical notes on Wednesday 20 October 1999 did not indicate that as being the plan. Instead, the note made by Dr Roberts that day indicated that she was going to "review" the position the following day once she had the results of the blood tests and the 24-hour urine analysis. She explained in evidence-in-chief that when she saw Ms Weir on 20 October 1999 Ms Weir was not asking for induction. She had seemed very well. Dr Roberts decided that she wished to review Ms Weir again the following day. She particularly wanted to know what the results were of the further blood tests that were to be done the following day. She was also awaiting the results of the 24-hour urine collection. She said: -

"I really wanted to appraise the situation again the following morning and make a decision."

I accept her evidence to this effect. She agreed that she could have sent a junior member of staff to check the computer to see if the results were back. There is a printer with each computer so that a paper copy of results can be printed out. She did not do so. She said that she was not sure that she had expected the results of the 24-hour urine collection to be back. She said that she would probably have expected the results on the Thursday morning. She also said that she did not tend to use the computer system to obtain results, although agreeing with Mr Moynihan that pre-eclampsia is a potentially fatal condition. However, she said that even if she had had those results she would still have wanted to have the blood tests to be repeated the following morning.

So far as the results of the 24-hour urine collection were concerned, there was evidence as to the normal turnaround time for the reporting back of such results from Mrs Margaret Rae, Head of Biochemistry in the Department of Biochemistry at the Department of Biochemistry at Yorkhill NHS Trust, which covers the Queen Mother's Hospital. Mrs Rae gave evidence to the effect that samples are analysed in the laboratory. The results are evaluated and then electronically released onto the hospital's electronic information system from the laboratory computer system. Also, the final hard copy signed reports are distributed from the laboratory twice a day sometime after 12 noon and sometime after 5.00 pm. The information will be electronically available within on average 2 - 21/2 hours of receipt of the specimen. There are computer terminals throughout the Queen Mother's Hospital where the system can be accessed to obtain information. In this case, the specimen collection ended at 10.30 am, was booked into the laboratory at about 1.45 pm and the results were available on screen on the hospital electronic information system by 3.27pm that day. Mrs Rae said that that was a very appropriate and average turnaround time. In this case, the results would therefore have

been available on the computer terminal in the ante-natal ward had Dr Roberts caused it to be checked when she saw Ms Weir during the ward round on the afternoon of Wednesday 20 October. The results would have been available in paper form the following morning. In the event, the hospital's electronic information system was first checked for these results, by Dr Chitra, over twenty hours later, at about midday on Thursday 21 October 1999. I have to say that it is not entirely clear to me what the point is of having an electronic information system whereby such results are posted on the computer terminals unless these are checked sooner rather than later, and rather than simply awaiting the paper results which might not be seen until a ward round the following day. I make further mention of this towards the end of this Note.

In the event, it is unlikely that this would have affected the management in this case as I accept that Dr Roberts would still have wanted the results of further blood tests the following morning. She was supported in such an approach by Professor Walker and Professor Calder, by both of whom I was impressed. It therefore does not seem to me that it can be said that such an approach was unreasonable. On 21 October 1999 the only real difference was confirmation of the finding of proteinuria in the urine. This confirmed the diagnosis of pre-eclampsia. However, Dr Roberts decided that induction of labour should be commenced that evening. Ms Weir was now asking to be induced sooner rather than later. Dr Roberts explained that that was a factor that she took into account together with the finding of significant proteinuria. In cross-examination to Mr Donald, Dr Roberts said that on Wednesday 20 October 1999 Ms Weir had been told that she was going to be delivered (my emphasis) soon. Dr Roberts said that it was likely that she was going to make the decision (by which she meant the decision to commence the induction of labour, as opposed to delivery itself occurring) on the following day, 21 October 1999. She went on to explain that when she received the additional information on Thursday, 21 October 1999 that the urine protein level was of a significant level and that the patient now had an element of anxiety and concern, that on balance seemed to Dr Roberts to be a good time to proceed. It should be recalled that there is a difference between making a decision for delivery and the delivery itself, particularly if delivery is to be commenced by way of induction of labour because the process of induction can take many hours and so it may mean that there is a gap of, say, a couple of days between making a decision to commence induction of labour and the date of delivery itself. I mention this because Mr Moynihan in effect suggested that because Dr Roberts' note included the words "CTG meantime" that was consistent with putting off delivery until at least 38 weeks as it envisaged a continuation of the pregnancy for more than one day. If the decision to commence induction of labour had been taken on Thursday, 21 October 1999, delivery would have been most unlikely that day and would probably have been on the Friday or even the Saturday. That being so, it would not in my opinion be surprising that the CTG was to continue in order to monitor the condition of the child in the meantime as, in the event of a deterioration in the condition of the child, a caesarean section might have been indicated instead.

I therefore accept Dr Roberts' evidence to the effect that the reason why she made the decision on the Thursday to commence induction of labour that evening was because of the combination of the 24-hour urine collection results, which confirmed the diagnosis of pre-eclampsia, and the element of maternal anxiety.

Her position was that the protein in the urine was significant but she thought she would not have made a decision for delivery on the 24-hour urine collection results alone given that Ms Weir was clinically well as she, Dr Roberts, would still have wanted the blood test results which were to be repeated on the Thursday morning.

In his written submission Mr Moynihan invited the Court to find as a fact that the decision made by Dr Roberts on Thursday, 21 October 1999 to commence induction of labour that evening would not have been taken but for the request from Ms Weir that morning. Dr Roberts said that if there had been no maternal request that day she was not entirely sure that she could say now whether she would have made a decision to commence induction of labour that evening. In the event, that is a hypothetical situation that did not arise. Having considered her evidence as a whole I cannot say that I am satisfied on a balance of probabilities that the decision to commence induction of labour that evening would not have been taken but for Ms Weir's request that morning. The position is that it may not have been taken in those circumstances but I cannot say that it would not have been taken.

Whether the approach to timing of delivery in this case was out of line with "standard practice"?

In view of the fact that I am not satisfied that the Queen Mother's Hospital has a "delivery policy" in relation to pre-eclamptic pregnancies as contended for by Mr Moynihan, the question in my opinion now is whether the approach which was taken in this particular case was out of line with "standard practice" to adopt that part of Mr Moynihan's wording in his first question.

In order to answer this question it is necessary to identify if there is a "standard practice" in relation to the timing of delivery in a case such as this.

Is there a "standard practice" in relation to timing of delivery in a case such as this?

The heading of Chapter 7 of Mr Moynihan's submission was "Proper medical practice - the timing of delivery". Chapter 10 also bore on this issue. It was entitled "Proper management decisions and date of delivery." In both cases, the terminology differs from the issue raised in Mr Moynihan's first question, which related to that of "standard" practice. As demonstrated by the fact that I am not satisfied that the recommendations of the CEMD Reports are as yet standard practice in the medical profession, it is not clear to me that "standard practice" and "proper practice" are necessarily the same thing.

The expert witnesses:

At the outset of this section I propose to comment on the expert witnesses from whom I heard in evidence. I have already quoted the passage from the evidence of Professor Walker about the standing of the six professors from whom I was privileged to hear in evidence. They were all clearly distinguished experts of high standing and repute in their respective professions (Professor de Swiet being an obstetric physician and the other five professors being obstetricians and gynaecologists).

It is very difficult to single out any of the experts for particular comment, but I think it is appropriate to indicate that I was particularly impressed by Professor de Swiet and Professor Walker. Both clearly had complete command of their respective areas of expertise. My impression was that both Professor Calder and Professor Stirrat had perhaps slightly less specialist expertise in relation to pre-eclampsia. I should also record that I sometimes found Professor Stirrat less than easy to follow in his evidence and reasoning. There were for example a number of topics in relation to which he appeared uncertain in his evidence, with a tendency also to alter his position as to whether he was or was not criticising an aspect of management or care. To give but some examples, this happened in relation to (1) the length of time between the acute event at 1410 hours on 21 October and delivery about four hours later; (2) whether or not Labetalol should have been administered earlier during this period; (3) whether Dr Alan Cameron should have been more "hands-on" after the acute event, and (4) whether there was documentary support for the view that a consultant should see a patient such as Ms Weir within 24-hours of admission. In addition, when Professor Stirrat was giving evidence critical of the blood pressure treatment which had been given after the acute event at 1410 hours (which had not previously been put in cross examination to the anaesthetists or obstetricians then involved in her care) he accepted that this had not been in his report. He described his report as variously "interim" or "provisional", although this was not clear from the report itself or from the accompanying certificate, which is perhaps unfortunate. He explained that he had been focussing on the HELLP syndrome and had had taken his eye off the blood pressure aspect. He said that the advice he had been given was that he would be able to update his report "on the hoof, so to speak". Having seen and heard Professor Stirrat in the witness box I have to record that I felt that he was having to do quite a lot of his thinking "on the hoof", including that in relation to the important matter of causation and whether earlier delivery (or earlier administration of Labetalol) might have avoided the death. In all the circumstances, I did not feel that I could have quite the same degree of confidence in his evidence as I felt I could in relation to the evidence of Professor's de Swiet, Calder and Walker. I should however make it clear that I am not suggesting that Professor Stirrat was seeking to do other than give his evidence fully and frankly.

Professors Baker and Greer were primarily asked to give evidence in relation to a factual issue about student medical examinations conducted on 20 October 1999, which turned out to have little material bearing on the issues now requiring to be considered. They had not seen or studied the papers and case notes in relation to Ms Weir. They were both asked questions at a general level. I accept that both could give evidence both of fact and opinion.

In relation to Professor Baker, he is Professor of Obstetrics and Gynaecology in Manchester. Professor Walker described him as being more of a researcher on pre-eclampsia rather than in the clinical field. Professor de Swiet said that Professor Baker's particular expertise was in "basic science". He described him as having done a lot of work looking at the way blood

vessels behaved in pre-eclampsia. Professor Greer is Regius Professor of Obstetrics and Gynaecology to the University of Glasgow and Honorary Consultant Obstetrician and Gynaecologist to the Royal Infirmary and the Royal Maternity Hospital in Glasgow. Professor Walker told the Court that Professor Greer had been a Junior Doctor to him. Professor Walker had very much picked him out as someone who was one of the brightest people of his generation. In later years Professor Greer had moved slightly away from pre-eclampsia. His main expertise was on thrombosis and thrombosis in pregnancy. He still has research interests in relation to pre-eclampsia. So he was still seen in the UK as one of the main intellectuals within this field, although not so directly involved in it as, say, Professor Walker or Professor Redman are. Professor de Swiet described Professor Greer as being similar to Professor Walker, in that, like Professor Walker, he was an obstetrician with a formal training in medicine. His particular expertise was in blood clotting problems. Professor Stirrat described Professor Greer as one of the two (with Professor Walker being the other one) eminent obstetricians in research terms in the UK. I had less information about Professor Baker, but it was clear that both he and Professor Greer are experts of high standing in their profession. However, in view of the general level at which their evidence was given it was it seemed to me to be of less relevance to the particular circumstances of this case than that of the four professors who gave evidence specifically in relation to the circumstances of Ms Weir's case.

I turn now to those four professors. In relation to first of all Professor de Swiet, he is Emeritus Professor of Obstetric Medicine to the Imperial College of Medicine in London. He is also a consultant physician at a number of hospitals. He was not trained as an obstetrician and gynaecologist. However, as an obstetric physician he is responsible for dealing with medical complications in pregnancy. He is one of the very few physicians in the UK who work with obstetricians in their hospitals, being brought in at a point where the obstetrician feels that the problem is greater than he or she can cope with and to seek his advice. If one of his obstetric colleagues suspects that a lady has pre-eclampsia they would in general manage the patient themselves, as it is a major aspect of ante-natal care. Professor de Swiet is generally not involved in the actual decision to deliver, or how it should be best carried out. However, he would expect to be contacted if there were any features of the illness to worry them, such as if the presentation was unusual. If any patient is referred to him for care, he deals with them in conjunction with an obstetrician. Timing of delivery is a major area he comments on, and in particular in relation to maternal reasons for delivery. He would advise an obstetrician on the question of timing of delivery but not the manner in which it should be carried out. He said that he would expect his consultant obstetrician colleagues to accept his advice.

Professor Greer confirmed that Professor de Swiet is well-recognised internationally in the management of medical disorders in pregnancy, of which pre-eclampsia is one very important one. There are only three specialist obstetric physicians in the country who have approached this discipline (obstetrics) from the background of being a physician. Professor de Swiet is one of them, one of the other two being Professor Redman. Professor Stirrat said that Professor de Swiet and Professor Redman were the two pre-eminent people in pre-eclampsia in the UK. Both are recognised internationally. Professor Calder explained that obstetricians have responsibility for two patients (both the mother and the child) at once, and that the interests of the two were not always necessarily the same and needed to be considered separately. He explained that, by contrast, Professor de Swiet's principal area of

expertise and concern was the health of the mother. Professor Calder expressed the view that Professor Redman would have had a slightly narrower expertise of pregnancy hypertension than did Professor de Swiet. Professor Walker's view was that there was probably no one else in the world who had focused on personal care looking after pre-eclamptic women to the degree that Professor Redman does. He saw Professor de Swiet as having a more generalised role. He looks after pre-eclamptic women as part of his role of looking after medical problems in pregnancy. He described Professor de Swiet as being seen probably as the main obstetric physician in general terms in the UK. At one point Professor Calder described him as being the "father figure" of obstetric medicine.

In relation next to Professor Stirrat, he was at the time of writing his report dated 19 July 2000 Professor of Obstetrics and Gynaecology at the University of Bristol. He was at that time also Honorary Consultant in Obstetrics and Gynaecology at the United Bristol Healthcare Trust at St Michael's Hospital, Bristol. He retired at the end of 2001. He had therefore retired by the time he gave his evidence. In his evidence Professor Stirrat confirmed that he had a special interest in "risk management". This had been a dominant theme of his clinical career. His practice had been very heavily weighted towards the management of women who were at high risk of adverse outcomes from pregnancy. Pre-eclampsia was a significant part of that.

Professor Walker described Professor Stirrat as being a man of high intellect and moral value, and that one of his areas of interest was that of ethics in medicine. He had done a lot of work in relation to the immunology of pre-eclampsia, meaning how women react and their immune systems react to pre-eclampsia, and the role of the placenta in that. In more recent years he had not been involved in clinical medicine to the same degree. He had been involved in medical politics, for example becoming Dean of the Medical School and Pro-Vice Chancellor of Bristol University. He had therefore been less "hands-on" in relation to the management of pre-eclampsia in recent years. However, he was someone who was recognised in the UK as being involved with and being an expert in this area. Professor de Swiet described Professor Stirrat as primarily being an obstetrician and gynaecologist by training. He had done some work looking at response to drugs in the treatment of hypertension a little while ago but more recently had been more involved with University matters. Professor Calder said that Professor Stirrat was more of a generalist, probably more active in the realm of medical/legal advice than Professor Calder.

That leaves Professor Calder and Professor Walker. I have left them until now because Mr Moynihan in his submissions invited the Court to reject the evidence of both of these witnesses. In Chapter 10 of his written submissions Mr Moynihan said that the House of Lords in Bolitho (supra) had indicated that if one body of professional evidence has been rejected as reflecting reasonable practice the Court asks what those it accepts as representing "correct" practice would have done.

So far as Professor Calder is concerned he is Professor of Obstetrics and Gynaecology for the University of Edinburgh. He is Head of the Department of Reproductive and Developmental Science, which includes obstetrics and gynaecology. He is also Honorary Consultant in the Royal Infirmary of Edinburgh at that part called the Simpson Centre for

Reproductive Health. He is primarily responsible for the delivery of teaching in the discipline of obstetrics and gynaecology of under-graduates and post-graduates and examinations in those subjects. Regarding his clinical work, he fulfils the role of a clinical consultant obstetrician and gynaecologist. He continues to practice in both obstetrics and gynaecology.

Professor Walker knew Professor Calder from the time when Professor Calder had been a senior doctor to him and had given him guidance in his research interests. Professor Walker described Professor Calder's main area of interest as being the induction of labour rather than the management of pre-eclampsia, although Professor Calder had given him a lot of advice in general about how to approach the investigation and management of pre-eclampsia. He went on to describe Professor Calder as being "someone who is a hands-on obstetrician. He is highly regarded as an intellect within the speciality and has a good over-view of clinical problems." Professor Stirrat confirmed that Professor Calder was a very experienced consultant obstetrician.

Despite being an expert witness of such apparent standing Mr Moynihan had at one point in his written submission asked the Court to attach "little weight" to Professor Calder's evidence concerning professional practice. This was on the basis of an allegation of bias. He was, incidentally, an expert witness who had been instructed and led in evidence by the Crown. This allegation was made upon the basis of a single answer in his evidence. I have considered the reply given by him in the context of his evidence as a whole, which extended over some five days, and I am entirely satisfied that Professor Calder's evidence was properly given and does not fall to be rejected or even given "little weight" on the basis of bias. In my opinion, if he considered, as he clearly did, on the basis of his professional expertise and experience that the actions of the doctors from the Queen Mother's Hospital were appropriate and defensible, it was appropriate that he should advise the Court of that, particularly in circumstances where he was of the opinion that the criticisms of the doctors had been in his view "...quite inappropriate and did not take account of the real circumstances." I therefore had no hesitation in rejecting this serious allegation made against Professor Calder. In addition, despite the Court having been asked elsewhere in his written submission to "reject the evidence" of Professor Calder, rather than just attach "little weight" to it as had been the earlier invitation, Mr Moynihan nevertheless proceeded to select certain parts of Professor Calder's evidence which he wished to accept and rely upon as apparently representing valid opinion, such as Professor Calder's views in relation to the extent of consultant involvement.

There were also a number of further criticisms of Professor Calder by Mr Moynihan in his submissions. At p 8 of his written submission, Mr Moynihan referred to "the cavalier assertion" by Professor Calder where he had said in his report: -

"I believe that the course of management which was followed in this case was broadly in line with that which might have been expected in any maternity hospital in the land."

This was a passage in Professor Calder's initial report dated 19 April 2000. This passage was then referred to again at p 9 of Mr Moynihan's written submission in the following terms: -

"...it gave a totally misleading account of professional practice in the UK."

He referred to it again at p 69 of his written submission in the following terms: -

"A spread (of experience across the UK) that Professor Calder...flagrantly misrepresented."

These assertions were it appears made upon the basis of an assertion at p 9 of Mr Moynihan's written submission that: -

"Professor Calder was aware of departures from good practice which we glimpse in his supplementary letter dated 22nd January 2001 and which came to fruition in his evidence in Court."

The suggestion appeared to be that Professor Calder was aware at the time of writing his initial report (my emphasis) that there were departures from good practice, such as in relation to the question of consultant involvement to which reference was made in his supplementary letter. This is a serious allegation to make in relation to an expert witness. There was no evidence whatsoever that Professor Calder was aware of any such departures from good practice at the time of writing his original report, and I do not believe that he was so aware. Further, no such allegation was put to him in cross-examination. When Professor Calder was asked about the passage to which I have referred in his original report, it was by Mr Donald and not Mr Moynihan (who had by then completed his cross-examination). He was asked to what other maternity hospitals he had been alluding. His response was: -

"I would not claim to have worked in every hospital in the land, and there are many hospitals I have not worked in, but I have worked in two different maternity hospitals in Glasgow, one in Oxford and now two in Edinburgh...In addition, I have seen the views of others, sometimes looking at issues such as this from other hospitals... I concede that perhaps the term I used was a little ambitious. I was implying that I thought that type of management was in line with what would be expected in more modern units up and down the country."

The fact is that Professor Calder was made aware in the course of his evidence of further facts and circumstances, and as a result of being made aware of a fuller picture, he did in the event criticise the actions of the hospital and doctors in certain respects, such as in relation to the question of consultant involvement. I had no difficulty in understanding Professor Calder's position, which in my opinion he explained in a measured manner, such as in the passage I have just quoted. In my opinion, what appears to be an implication that

he was being deliberately misleading or making a flagrant misrepresentation is wholly unjustified. In my opinion, having seen and heard his evidence, I am satisfied that he was an independent expert of complete integrity.

So far as Professor Walker is concerned, he is Professor of Obstetrics and Gynaecology at the University of Leeds. He is also Honorary Consultant in Obstetrics and Gynaecology at the United Leeds Teaching Hospital Trust. His MD (doctorate) thesis was on pre-eclampsia. This covered the presentation, aetiology and management of hypertension in pregnancy. Pre-eclampsia has been his main area of both research interest and clinical practice over the past 20 years. From this work has come the largest proportion of his publications. He has also trained in general medicine. He is primarily an obstetrician but his interest is in high-risk obstetrics and obstetric medicine. He was responsible for inventing the concept of Day Care Units for management of pre-eclampsia, such as the one at the Queen Mother's Hospital, and the use of anti-hypertensive drugs. The management and treatment of hypertension has been an area of particular research for him. Professor Greer was his research fellow for a number of years. He has also recently been asked by the Royal College of Obstetricians and Gynaecologists to write guidelines for the management of proteinuric pre-eclampsia as there are no such guidelines for the UK at present. I refer to this further below.

In looking at what the other professors said about Professor Walker, Professor Stirrat gave evidence to the effect that Professor Walker and Professor Greer were probably the two eminent obstetricians in research terms in the UK. Professor Greer also gave evidence to the effect that Professor Walker had a particular interest in pre-eclampsia and that he had worked with Professor Walker in the past. Professor de Swiet also confirmed that Professor Walker was interested in hypertension in pregnancy. Professor Calder said, when being asked about Professor Walker's report, and in particular in relation to the question of causation, that Professor Walker had a greater expertise in the area of vascular biology. Professor Calder went on to say: -

"Professor Walker is clearly a world authority on this."

He also said that he would bow to Professor Walker's expertise in this area in relation to Professor Walker's opinion that it was the cerebral-haemorrhage brought about by hypertension, which had caused the death and not the HELLP syndrome. Professor Calder said that Professor Walker would see himself as being more of a sub-specialist in foetal/maternal medicine and an authority on the obstetric aspects of hypertensive disorder in pregnancy which he had made his principal interest over the years.

I will shortly summarise the range of principal views expressed by the professors involved with examining Ms Weir's case to see what they say about what was done and what they would have done in circumstances of this case.

Before doing so, however, I propose to narrate certain propositions which were put to Professor Walker by Mr Moynihan and which did not appear to be the subject of material dispute by him (except in so far as I record in due course) or by other parties: -

1.1Pre-eclampsia is a syndrome, not a disease and as a consequence of being a syndrome it does not admit of precise diagnosis.

1.2When dealing with pre-eclampsia we are dealing with risk assessment and management of risk.

2.1The paramount clinical diagnostic indicators of pre-eclampsia are two in number: hypertension and the presence of proteinuria.

2.2The threshold for hypertension is regarded as 140 systolic over 90 diastolic.

2.3The threshold for the protein component used in the UK is 0.3 grams per litre or 0.5 grams per volume.

2.4The present of protein at or above the threshold of 0.3 grams per litre is sufficient to confirm the diagnosis of pre-eclampsia.

2.5Above that threshold the degree of risk is not proportionate to the level of protein.

3.1Dipstick readings of three +++ almost invariably represent a level of protein that would be sufficient to pass the protein component of the diagnosis of pre-eclampsia.

3.2It is unusual to find that a level of three +++ on a dipstick is attributable to urinary tract infection.

3.3If there is concern about the possibility of urinary tract infection there is a relatively speedy laboratory test that can be carried out.

4The presence of protein indicates two things. First, it indicates that there is a probability of systemic disease. Second, the presence of protein indicates that systemic disease will probably be present.

5.1The presence of symptoms is relevant to the assessment of risk.

5.2Symptoms associated with pre-eclampsia include nausea, vomiting and blurred vision.

5.3Symptoms are relevant to the assessment of risk because there is more likely to be a crisis with this particular patient (although there is an issue about the need for such symptoms to be persistent).

6.1A lady who is a primigravida (a woman with her first pregnancy) is at a greater risk of developing pre-eclampsia.

6.2With a lady aged 40 there is a great risk of a more severe outcome for the mother.

7.1Pre-eclampsia as a syndrome is something that is known to present in atypical ways.

7.2It can present with atypical symptoms.

7.3It can progress in different manners.

7.4It can progress at different rates.

8.1Taken as a generality early delivery or expedited delivery is a standard management for a lady with pre-eclampsia (Professor Walker said that it was a matter of balance).

8.2How early the delivery should be in any particular case will depend on the balance of risks to the mother and risks to the baby.

8.3That assessment of risk is itself related to gestational age.

8.4The paediatric advice relating to an aim to achieve 39 weeks is related to elective sections. It does not of itself take into account complications of pre-eclampsia.

8.5Though there are studies indicating that on average with a lady with pre-eclampsia conservative management can achieve 15 days or so prolongation of pregnancy, whether an obstetrician will actually seek to prolong any particular pregnancy will depend in part on gestational age.

9It is preferable to intervene in anyone with pre-eclampsia before a serious crisis has occurred.

I turn now to summarise the principal views expressed by each of the experts involved in looking at Ms Weir's case in relation to her care and management at the Queen Mother's Hospital and what they would have done.

Professor Stirrat:

His view (in evidence-in-chief) was that from 36 weeks onwards, together with proteinuric pre-eclampsia, you would have to have a well-considered reason for not delivering. In relation to symptoms such as vomiting and flashing lights, they would not need to continue all the time. They can fluctuate, disappear and come back. They must not be ignored. They are an indicator of risk even if episodic. Persistence was he said "a stronger marker of risk". However, the fact that they are episodic cannot be ignored. In his hospital, blood tests were done daily. One did not wait until one got abnormal biochemistry because one was going to get it at some point. He would want to intervene before that. He would have expected Dr Solanki to have contacted a senior doctor in relation to the admission of Ms Weir on 18 October 1999. It would have been good practice in his opinion for such a senior doctor to have come to see Ms Weir at that point. He would have expected Dr Chitra to have recorded both the systolic and diastolic blood pressures on the morning of 19 October 1999, rather than just the diastolic. He was of the view that a consultant or other senior doctor should have seen Ms Weir to assess her on the Tuesday. He thought there were indicators of the possibility of a low birth weight baby. Had he been the consultant looking at Ms Weir at 9.30 am on the Tuesday, he would have instructed that the blood tests be repeated. He would also have wanted to make sure that he had got the results of the 24-hour urine sample as soon as he could. He thought it likely that he would have begun the process of priming that evening with a view to induction of labour. He would have done this in the labour ward. He would have had in mind 48 hours from 9.30 am on Tuesday to achieve a delivery, namely by 9.30 am on Thursday, 21 October 1999. In relation to the episode of flashing lights on the Tuesday morning, if this had lasted approximately half an hour, that would confirm to Professor Stirrat that he should proceed as he would have been planning to do at 9.30 am that morning regarding delivery. He did not think that it would have swayed him to act more urgently by caesarean section at that point. His view therefore was to prime the patient on Tuesday night with delivery to be achieved within 48 hours of Tuesday morning at the very outside. The fact that Dr Chitra had recorded on Thursday, 21 October 1999 that the cervix was unfavourable (which meant that on the Tuesday it would almost definitely not have been any more favourable) would not have altered his probable time as to the Tuesday. If by about 5.00 pm on the Wednesday, 20 October 1999 labour had not progressed as he had hoped he might have advised a caesarean section at that point. He considered that the period of 27 hours between Dr Branchfield seeing Ms Weir on Tuesday, 19 October 1999 and Dr Roberts then seeing Ms Weir for the first time at 3.30 pm on Wednesday, 20 October 1999 was unacceptable. If there were two inconsistent accounts of such an episode of visual disturbance (as there were here) he would have wished to have spoken to the patient herself to clarify the position. His position was that a fuse had been lit with Ms Weir who had proteinuria. One did not know either the length of the fuse or the speed with which the fuse

was going to burn. I have to say I found this piece of evidence rather confusing having regard to evidence he also gave to the effect that he would have felt he had had a 48 hour window for delivery, that being on the basis of his experience that it was very unlikely that something would happen before that. It therefore appeared to me that when he spoke of this 48 hour window, he seemed to have in mind some minimum length of fuse, as it were. He thought Dr Roberts was wrong not to be concerned about the visual disturbance on 19 October 1999. He also said that the systolic blood pressure could not be ignored. Ms Weir had demonstrated hypertension. The fact that it was not persistent but was labile meant that you had still got to pay attention to the hypertension, focus on those times when she was hypertensive and not put too much weight on the occasions on which her blood pressure seemed to be normal. Although there might be fluctuation in the blood pressure, it was the hypertension that was the risk marker. The fact that there were episodes of quietude would not be leading to his deferring commencement of his plan. In relation to Dr Roberts' reasoning for not having transient episodes of symptoms affecting her decision-making, Professor Stirrat thought this was possibly a sign of someone who was not yet experienced enough in the management of someone with pre-eclampsia. Ms Weir had proteinuric pre-eclampsia and she was having, however intermittent, symptoms which were known to occur as pre-eclampsia became more severe. It is dangerous to dismiss them as being not significant because they are transient and non-specific. This he believed to have been an error on her part. If one waited until one had clear evidence in terms of signs and/or symptoms, then one was on a potentially rapid downhill course as far as pre-eclampsia was concerned. He agreed that women with pre-eclampsia usually worsened for the first 24 or 48 hours after delivery. One of the objectives of delivery was therefore to deliver them before they got to that point. He tries to deliver patients before symptoms occur. He thinks that proteinuria in the presence of blood pressure is categorically a sign of progressive disease. If you get proteinuria in pre-eclampsia the disease will progress in his experience. His opinion was that proteinuric pre-eclampsia is never mild. It does not matter what it is called as long as one realises that by the presence of proteinuria one has got significantly increased risk of an adverse outcome. Ms Weir was therefore not in a "low risk" group.

In cross-examination to the procurator fiscal depute, Professor Stirrat confirmed that although he did not it was good practice to omit writing down the systolic blood pressure, on this particular occasion it did not look as if it had had a significant effect on her management. He also confirmed at this point that he agreed with Dr Turner (consultant paediatrician) that there was no real evidence of foetal compromise from admission date to delivery. He thought that Dr Branchfield should have passed the information about the visual disturbance to the senior registrar, although he did not think that it would have been absolutely necessary for the senior registrar or consultant to have seen Ms Weir at this point. He was concerned that Dr Roberts was "an extremely busy young woman" not only trying to do her own job but also acting up unofficially for Dr Hanretty. On the Tuesday morning he would have planned for delivery even although the result of the 24-hour urine collection was not back. If information came back which suggested that the risk was less he might have changed the plan. He could not recall a case with three +++ of proteinuria on a dipstick that had been anything other than significant on a 24-hour urine sample. As at 18 October 1999 Dr Solanki should have told someone more senior of Ms Weir's admission. He would be critical that no consultant came to see Ms Weir on the morning of Tuesday, 19 October 1999. After the episode of visual disturbance that morning a consultant or equivalent should, if they had not been down earlier, have come down after that. He thought it unacceptable that someone of any real seniority first saw Ms Weir for the first time on the Wednesday. He also thought that Dr Roberts' decision on the Wednesday was too conservative in leaving Ms

Weir until the following day. He agreed that it might well be that her view would have been supported by some obstetricians, but he did not think that that view could be justified. He thought the midwifery care had been exemplary. He was of the view that Ms Weir should have been seen by a consultant or Dr Roberts probably on Tuesday 19 October 1999 but no later than the morning of 20 October 1999 at the 10.00 am ward round. He agreed with Professor de Swiet that Ms Weir had a "stuttering" type of disease. He would use the term "intermittent". He agreed that there appeared to have been three bursts of activity, the first prior to her admission, the second being the visual disturbance on 19 October 1999 and the third being the acute episode at 1410 hours on Thursday, 21 October 1999. He agreed that looking at the blood results it was very difficult to predict what happened. It was usual in his experience for abnormalities in blood results to pre-date onset of pain of such severity as that which occurred at 1410 hours on 21 October 1999. Since no case of pre-eclampsia was typical all of them by definition must be atypical. He expressed the view that if this tragedy helped us to learn anything he hoped it would teach junior staff, if they think that there is such a thing as typical pre-eclampsia, that that is not so.

In cross-examination to Mr Donald, Professor Stirrat said that the mere fact that those managing Ms Weir did not take into consideration the symptoms that could be associated with pre-eclampsia and pass them on to their seniors showed that these young doctors who had seen her were not really cognisant of the potential risk that was presented. That suggested that they were not really made properly aware of the importance of the parameters that were being evidenced by Ms Weir on 18 October 1999. He agreed that it was really only after delivery that we started to see blood results very significantly increased. The symptoms on Tuesday 19 October 1999 would have confirmed his decision at 9.30 am that morning. If they had not existed he would still have proceeded. In general, he would have to have had very good reason not to have commenced delivery within 24-hours of admission of such a person with or without symptoms. In relation to his maximum period of 48 hours for delivery, in his experience it was very unlikely that something would happen before that time. He did not understand the basis upon which Professor de Swiet had arrived at his 48 hour period for avoiding a fatal outcome. In relation to Professor Walker's report where he had said something fairly similar, Professor Stirrat disagreed with it. To Professor Stirrat, 36 weeks is the cut-off where he has got to have a reason for not delivering rather than delivering. He agreed that even with a diagnosis of pre-eclampsia there may be factors why you will deem it appropriate to wait a few days before delivery and that this may be because you want to assess and gather information about the patient, although he pointed out that one had got to guard against waiting until tests taken began to become abnormal. He thought that was something which younger doctors tended to do. They tended to treat the biochemistry. Obstetricians who were older tried to focus on the woman and the baby. His position was that there was a balance of risks to be undertaken. Caesarean section was a major operation. If it is an emergency procedure, that is associated with much greater risk to the mother. There were no grounds to carry out a caesarean section on the evening she came into hospital on the balance of risks to the mother and the baby. One is doing one's best to reduce the risk of a crisis happening. One does not just take one snapshot of a condition at a particular time and act on that unless it is a very serious condition with which you are faced. You are wanting to observe what the situation is over a period of time. It is good clinical practice to continue to make observations. On the Tuesday morning the evidence would have been there to be analysed and to have allowed him to state the management timetable. The roles of the more junior staff are to assess and pass information up the ladder. That did not happen here. They did not appreciate the significance of the clinical signs and symptoms present. He agreed that in relation to the Tuesday, 19 October

1999 there was no sign of any worsening hypertension. He would not have started anti-hypertensive therapy. He would have established his management plan on the basis of the three +++ of proteinuria. If some information had come to light which reassured him, he would have changed it. He said that he would have liked to have had a 24-hour urine sample, but it had had to be re-started in this case and was not available on Tuesday morning. He would therefore have established his management plan on the basis of the three +++ of proteinuria. However, he confirmed that he would have preferred to have had a quantification (as opposed to a dipstick test only) unless the patient was so ill that he could not wait. To have set down his management plan he believes it would have been sufficient to have had the three +++ of proteinuria, coupled with the level of hypertension, the gestational age and the maternal age. He agreed that it was important to rule out urinary tract infection in this case. A culture takes some time to do but one can get an immediate indication from the laboratory by looking at the urine under the microscope. There were no clinical symptoms readily attributable to a urinary tract infection. On the Tuesday morning he should have had a sufficient indication of the presence or absence of urinary tract infection to allow him to proceed to set down his plan of management. He thought the note of vomiting twice referred to in the note made by Dr Solanki on 18 October 1999 had some relevance but was not a major factor. In relation to the visual disturbance at 11.30 am on 19 October 1999, Professor Stirrat confirmed that he would check the blood pressure because visual disturbance in the context of pre-eclampsia was frequently associated with an episode of severe hypertension. He agreed that there were no immediate signs of severe hypertension at that time. He agreed that this was reassuring. He also agreed from information of what the midwives, Dr Branchfield and Sister Dooley had reported as to how Ms Weir had said she was feeling that there was a general picture of well-being of the mother. He agreed that this was quite a significant finding. He also agreed that the blood results were normal until after 1410 hours on 21 October 1999. He confirmed that he would have put very significant weight on the wishes of the mother. He was not aware of there being any causal relationship between induction of labour and deterioration in pre-eclampsia. He agreed that what happened to Ms Weir was very rare, very uncommon to happen with a very atypical outcome and that the episodic nature of her presentation was somewhat unusual.

In re-examination, Professor Stirrat said that there were three phases of pre-eclampsia. One is the prodromal phase when there is really no outward manifestation of it. There is then the clinical phase when you get the hypertension and deranged blood tests. You then get to the acute and critical phase that is manifested by eclampsia, abruption or the sudden onset of HELLP syndrome. Proteinuria is included in the second phase. In relation to the second phase where there were clinical manifestations in the form of hypertension and proteinuria, this was on 18 October 1999. The third phase can come on at any time. Quite frequently this is very rapid on its onset and progression. That being so, it was not entirely clear to me why he thought there was a 48 hour window. The episode at 1410 hours on 21 October 1999 is definitely the third phase. He would have been anticipating this and wishing to prevent it. He confirmed that his own practice was designed for intervention in advance of the third phase kicking in. He agreed that when symptoms arose you were moving into the third phase and that you generally get very little warning before you move into that phase.

Professor de Swiet:

Professor de Swiet explained that pre-eclampsia is an extraordinarily variable condition. The standard presentation is high blood pressure first, then some protein in the urine. The patient then usually has to be delivered within 2 weeks. That tends to be a relentless progression, but that does not always happen and certainly did not happen with Ms Weir. Her condition developed much more rapidly. It also fluctuated in its severity. Her blood tests were normal. That was atypical. He therefore thinks his colleagues might well have consulted him because of concern about variability. His assistance might have been requested at any time but certainly on Tuesday, 19 October 1999. She had been symptomatic. She had proteinuria as assessed by dipsticks. Now her diastolic pressure was normal. That was a confusion situation. If he had been consulted on the Tuesday when she was again symptomatic (after the visual disturbance at 11.30 am) he would have said on the basis of proteinuria and the previous high blood pressure that they would be wise to get her delivered within 24-hours. Three +++ of proteinuria on a dipstick almost invariably represents significant proteinuria. It is unusual for people with just urinary tract infection to have three +++ of protein. He would be prepared to make the diagnosis of pre-eclampsia with three +++ of proteinuria even in the absence of a 24-hour urine/protein collection. If the patient was ill enough it would be perfectly reasonable to intervene on the basis of three +++ of proteinuria on a dipstick. However, he agreed that from when she was admitted on 18 October 1999 it would be reasonable to wait at that stage pending a 24-hour urine/protein collection, the result of blood tests and some further observations of the clinical course. Regarding the note of flashing lights in the entry by Dr Solanki on 18 October 1999, when you have a combination of raised blood pressure and proteinuria with that, that would cause him concern. The blood pressures on admission were "moderately" elevated. He thinks that the registrar should have been told about the admission on 18 October 1999 and that that person should have seen Ms Weir because of the three +++ of proteinuria and the symptoms the previous day. However, he thinks the registrar would probably have developed the same management plan. In relation to 19 October 1999, he thought that it was wrong for Dr Chitra only to have recorded the diastolic blood pressure. The systolic blood pressure is also a component in the overall picture. The systolic of 162 at 10.00 am on Tuesday, 19 October 1999 would have caused him concern because it is quite high. In relation to the visual disturbance later that morning, visual symptoms are worrying in terms of pre-eclampsia. For that to go on for half an hour is quite a long time. That would have worried him very considerably when considered against the background of a systolic blood pressure that seemed to have been quite high and with the presenting features she had had on 18 October 1999. Seeing stars in front of their eyes is specific and is likely to be related to spasm of blood vessels. He makes the same comment as before about the recording by Dr Branchfield of only the diastolic blood pressure. In relation to Dr Branchfield indicating at the end of his entry that management is to be continued as planned, Professor de Swiet thinks that that was a mistake because Ms Weir was now symptomatic again. She had unequivocal pre-eclampsia. On the other hand, he thought it was a very atypical situation regarding pre-eclampsia and therefore perhaps Dr Branchfield could not be blamed for not realising that things were going wrong. Had there been more senior involvement, hopefully they would have realised the serious nature of the condition. He confirmed that by the time of Dr Branchfield's entry at 12.30 pm on Tuesday, 19 October 1999 he was of the opinion that Ms Weir had pre-eclampsia. This was based on her elevated blood pressure, her proteinuria and her symptoms. That was the symptoms noted at the time of admission and again at 12.30 pm on 19 October 1999. He thought that a consultant should have been involved in Ms Weir's care on 19 October 1999. She had been admitted with proteinuric, symptomatic hypertension and her systolic blood pressure was still high on 19 October 1999. So much depended on the way of thinking within the hospital and the degree of involvement that the consultants had with their patients. In relation to the visual disturbance on the morning of 19 October 1999,

he thought that Dr Branchfield should have reported to the registrar or to the consultant. However, he was reluctant to put a lot of blame on Dr Branchfield because everyone else had been thinking that this was not a major problem, and Professor de Swiet felt that they had ignored all the symptoms that had occurred beforehand. In relation to the 24-hour urine collection, the total amount of protein in the volume was 3.32 grams per 24-hours, which was a very high level of protein to be present. He had said in his report at paragraph 6.3 that he suspected that the junior staff did not appreciate the significance of the three +++ of proteinuria and Ms Weir's symptoms. In relation to whether he thought Dr Roberts should on Wednesday, 20 October 1999 have been looking to see if the 24-hour urine collection results were back, Professor de Swiet said that it depended what her attitude was. If you are not prepared to deliver people with proteinuric pre-eclampsia at 37 weeks just because they have got proteinuric pre-eclampsia then the mere demonstration that the three +++ of protein really is genuine might not make any difference. He confirmed that the blood tests taken at 9.25 am on Thursday, 21 October 1999 were essentially normal apart from a minimal rise of urea and creatinine. However, he said that he would not pay too much attention to those slight rises. The blood results were therefore essentially normal at that point. Professor de Swiet went on to say that he did not use a grading system in relation to pre-eclampsia. He confirmed that Ms Weir's case was an atypical presentation of pre-eclampsia. He had in his experience seen a lady "go off" as quickly following what had been essentially normal results to the sorts of results seen later at 8.25 pm on 21 October 1999. This had happened in relation to a lady who had not had very bad pre-eclampsia before she was delivered. (It therefore appears that this occasion had involved a lady who had already been delivered.) However, it was very uncommon. It was very severe and was the sort of thing that occurred very unusually. He confirmed that one was looking at the balance of risks and that one of the factors was the gestational age of the baby. The risk of severe illness from respiratory complications in the baby delivered at 37 weeks is very low. He accepted that others might hold the view that at this gestation the risk of respiratory distress syndrome was not "trivial", which had been the expression used in his report. It depended on what one thought of as trivial and what one thought of as "risk" because the baby might still get respiratory distress syndrome, but in his experience it was rarely very severe. In relation to risks to the baby, he would defer to what neo-natal paediatricians may say. In relation to a view expressed by Dr Hanretty that if the symptoms of flashing lights were connected with her pre-eclampsia he would have expected Ms Weir to have shown symptoms such as worsening blood pressure within 12 - 24-hours thereafter, Professor de Swiet said that he would not have made that mandatory. It came back to the variability of pre-eclampsia. He still thought that a consultant should have become involved on the day after admission, on 19 October 1999. He said that he hoped that a consultant would have had the experience to have recognised the variability of pre-eclampsia, to have recognised that not only did Ms Weir have proteinuric pre-eclampsia, but also that she also had symptoms. He also hoped that a consultant would have ascribed to Professor Redman's thought that there have to be very good reasons for not delivering somebody after 36 weeks with proteinuric pre-eclampsia. In relation to what he would describe as being "compelling special reasons" (not to deliver) Professor de Swiet thought that to amount to that there would have to be doubts about the diagnosis. What he would have been hoping was that a doctor of reasonable seniority and experience in obstetrics would have reviewed the patient; whether that was somebody who was in name a consultant or a consultant minus 2 months (such as Dr Roberts was at that time) he did not think mattered. It was therefore that degree of experience that he wanted brought. In relation to Tuesday, 19 October 1999 at 9.30 am, he confirmed that he would have thought that a consultant should have made the decision for delivery. This is because he believes that in people with proteinuric pre-eclampsia at about 37 weeks' gestation the risk of one of the crises occurring is much greater than the risks to

the baby of pre-term delivery and/or the extra risk of caesarean section. He also accepted that there was a body of thought that would have gone along with a more conservative pathway prior to 12.30 pm that day, namely to wait until the 24-hour urine collection and blood results and so on were obtained.

In relation to the visual disturbance later that morning, he said that it was generally accepted that proteinuric pre-eclampsia with symptoms was a more serious disease than proteinuric pre-eclampsia on its own. The recurrence on 19 October 1999 emphasised the symptomatic nature of her disease and therefore the increased severity. Regarding whether it would still be reasonable for a consultant not to take a decision regarding delivery after the visual disturbance that morning, he said that that was much more difficult because it depended on the consultant's appreciation of the variable nature of pre-eclampsia. It depended on the level of experience and attitude of the consultant. He thought that if someone who was a junior consultant, and who did not have much experience of pre-eclampsia, was faced with this problem he might well understand why they did not opt for delivery. To what extent that meant that the care was inadequate he said he found difficult. He confirmed that there was undoubtedly a range of opinion. He said that he had no doubt that one would find experts who would state that such an opinion was acceptable. He just did not happen to be one of them. However, to him, post 12.30 pm that day the situation was quite clear-cut regarding management strategy. He would have said that this person ought to be delivered within 24-hours. He would expect his obstetric colleagues to accept his advice. He meant completed within 24-hours. That was complicated because if one was inducing a primigravida woman, the risk of caesarean section was about 50 per cent. So his suggestion of delivery within 24-hours carried with it an implication of a very high likelihood of caesarean section. Before the visual disturbance episode on 19 October 1999 he would still have wanted a decision for delivery to have been made that morning. He would not have been quite so prescriptive about timing and would have let the obstetricians get on with delivering her in whatever style they thought best. However, he would not have wanted them to delay the priming until the evening. He thought one was looking at something like 36 hours from 9.00 am or 10.00 am of the morning of 19 October 1999. If she had then suffered from flashing lights later that morning he would have wanted to see delivery completed by mid-day on Wednesday, 20 October 1999.

In relation to paragraph 4.08 of his report, Professor de Swiet now accepted that there was no evidence of foetal impairment and so no real indication to repeat an ultrasound scan. He went on to say that he did not feel that Ms Weir had received the standard of care that would be expected at a major teaching hospital because she was delivered too late in her illness. He thought that she should have been delivered on the day after her admission. He said that he speculated that it might well be that the primary problem was a failure to involve a consultant obstetrician early enough in the patient's illness, adding "A consultant obstetrician who thinks in the same way as I and many others do." Regarding "many others", there was he said a range of opinion regarding timing of delivery in proteinuric pre-eclampsia. It would be possible to find people who would employ a conservative approach. There are no controlled trial data to support that at this gestation. He thought about the consultants in the three hospitals in which he works and said that he did not know anybody who would have delayed delivery in the way that happened with Ms Weir. The approach of conservative management was in his view unreasonable once the second episode of symptoms had occurred, being those on the Tuesday. Conservative management was not his way of

thinking. "Aggressive" management (meaning intervention) would be what he was proposing. In relation to the patient's symptoms, just because they remitted at times that did not mean that they were not significant. That came back to the variable nature of the disease. He reminded the Inquiry that the tendency for inadequate consultant involvement in many obstetric units had been highlighted by the CEMD Reports. Most of the errors referred to in those reports had occurred in the delivery suite rather than in the ante-natal wards. However, he thought that when errors did occur within the ante-natal wards (in 20 per cent of cases where there had been errors) the lack of consultant involvement was just as great. The reason for earlier delivery was based on his more "aggressive" style of management. He agreed that tacked onto that was the fact that he felt that the standard of care Ms Weir received was not reasonable. He thought there might be a tendency for older consultants to be more "conservative". He thought it was a criticism that some of the entries in the medical notes did not have a systolic reading.

In cross-examination to Mr Moynihan, Professor de Swiet said that if the patient had new onset proteinuria, as Ms Weir did, it was important because it pretty much defined the condition as pre-eclampsia, not some other cause of hypertension, and also indicated that the condition was more severe than if she just had hypertension alone. He also said that it was perhaps important not to over-emphasise the importance of proteinuria because, for example, if one was considering when to deliver, an increase in the degree of proteinuria was not necessarily a reason for delivering. He agreed that when one had the presence of a significant level of protein, 0.3 or 0.5 grams per litre in 24-hours, that that was sufficient for him to indicate clinical significance. Put simply, if people have pre-eclampsia with proteinuria they should be in hospital. He also agreed with Professor Walker that if you have that base level of proteinuria, that a greater amount of protein from that minimum it is not necessarily itself of prognostic significance. He agreed that the symptoms here were signposts to organ involvement in the disease process and that that was a reason for increased concern. Professor de Swiet had put to him a passage from Medical Disorders in Obstetric Practice (3rd Ed), which he had edited. The passage was from a chapter entitled "Hypertension in pregnancy" which had been written by Professor Christopher Redman. The passage read:

"There have to be compelling special reasons to leave women with proteinuric pre-eclampsia undelivered beyond 36 weeks. Indeed, after 34 weeks it becomes increasingly difficult to justify conservative management..."

Professor de Swiet shared this view and agreed that this was good practice. In looking at how significant risks to the foetus are if a pre-eclamptic pregnancy is prolonged if ante-natal tests of foetal well-being are normal and the foetus is well-grown, he thought the risks to the foetus of a sudden catastrophe were small. He confirmed that he thought the order of magnitude of "a crisis" in someone with proteinuric pre-eclampsia was 10 - 100 times greater than the risks of the baby dying from Respiratory Distress Syndrome caused by pre-term delivery. As an "indicative feel" for the degree of risk to the mother's health if pre-eclampsia is allowed to go unchecked, there may be 10 deaths per year, so the risk of a woman dying from pre-eclampsia was still "pretty small". The only way to cure pre-eclampsia is to deliver the patient. Arguments about timing of delivery therefore depend on the risk to the foetus from prematurity versus the risk to the mother from continuing pregnancy. Towards the end of pregnancy there are "softer" risks to be considered relating to the mother's dislike of

intervention and the increasing risk of caesarean section associated with induction of labour. He said that he did not think that Ms Weir's life was threatened at 36 weeks with modest hypertension (which he otherwise described as "not very high") and proteinuria. However, regarding a lady who is symptomatic with proteinuric pre-eclampsia, he confirmed that he would describe that as "severe". Allowing the pregnancy to continue is referred to as "conservative" management, the term applied to intervention is "aggressive" management, but only by comparison with conservative. There are many people who would not consider that there was anything particularly aggressive; they would say: -

"we are doing the normal thing."

It is simply a term in contrast with conservative management. He believes that when one was looking at the risk itself, those who subscribe to conservative management are running a greater risk of complications to mother and baby than people who apply the aggressive intervention approach at 34 - 36 weeks. He believed that the opinion he expressed was one that was shared by the majority of obstetricians. He confirmed that the passage read out from Professor Redman's text regarding 34 - 36 weeks' gestation would be something he would expect to guide obstetricians throughout the world. Professor de Swiet indicated that had he been involved on 18 October 1999 he would have thought there should have been delivery as a non-emergency in the next few days. At 9.30 am on 19 October 1999 he would have still been thinking that she should be delivered when convenient, but he would not like to have been prescriptive between 12 hours and a few days. At 12.30 pm that day he would have said: -

"She has already had symptoms before she came in. I think you should deliver her within the next 24-hours."

He confirmed that that meant completed delivery within 24-hours. Where the cervix was not favourable the probability is that that equated to caesarean section. That would be up to the obstetrician, but he would still want delivery in 24-hours. There has to be a quantitative or qualitative assessment of the severity of the symptoms. For example, if the woman said: -

"It was the worst episode of pain in my stomach that I have ever had"

then he would pay more attention to it than if she said: -

"I was just a bit uncomfortable."

If there was a complaint of flashing lights and it was just a single episode within 24-hours of assessment he would not put that into the category of an obstetric emergency. He therefore confirmed that as at 5.00 pm on Monday, 18 October 1999, that would not alter his opinion

and he would still be looking at delivery within a period of some days. He did not think that the symptoms occurring on a single occasion outside hospital would have been definite or genuine enough for him to recommend urgent delivery on 18 October 1999. His own attitude would have been to allow 24-hours of assessment on the Monday night. He agreed that at 36 weeks' gestation, with symptomatic pre-eclampsia, the only management was to deliver the patient. Professor de Swiet said that depending on the severity of the symptoms he would advise delivery within hours rather than within 24-hours. If the symptoms were not so severe and there was a background of normal blood tests and not very high blood pressure he still thought it would be reasonable to stick to the 24-hour scenario. He confirmed that, with his own obstetric colleagues in London, if they formed the conclusion that there was going to be a caesarean section anyway (there was however no evidence on that matter), he thought it was likely that he would expect them to be looking at a section that day, rather than wait until the following morning. In relation to Dr Roberts' saying that the episode of visual disturbance on the Tuesday did not particularly concern her because Ms Weir's blood pressure was normal at that time, Professor de Swiet said that he thought it really "demonstrated a lack of familiarity with the variability of pre-eclampsia". Usually people with deteriorating pre-eclampsia the blood pressure goes up and at the same time they develop symptoms, but not necessarily, and it was quite possible to have symptoms of pre-eclampsia, caused by pre-eclampsia, without having a particularly high blood pressure. He pointed out, incidentally, that her blood pressure was not normal. Dr Roberts was he said therefore incorrect to say that it was normal. He also made the point that half an hour was a very long time to see sparking lights. In relation to the blood pressure, the mere fact that when the systolic was high the diastolic tended to be low did not discount the importance of the systolic. Attention should be paid to the systolic. He also agreed that it was incorrect in the management of this condition to look for what Dr Roberts had said was a definitive symptom because he thought that she had not appreciated the fact that the symptoms of pre-eclampsia might be intermittent. He thought that that was the basic problem. He therefore thought that Dr Roberts had not appreciated the importance of the symptoms and that she had not appreciated the risk of crisis in a woman with proteinuric pre-eclampsia in view of the variability of the disease. He therefore did not think that she had really appreciated how variable and how dangerous pre-eclampsia might be. That was therefore why she had, according to her own explanation of her approach, needed some further evidence of the deterioration in the condition, such as symptoms that she believed in, before she was prepared to sanction delivery. He confirmed that in his opinion the errors here were: -

(1)a failure to appreciate the significance of systolic readings.

(2)a failure to appreciate the significance of proteinuria in the context of what might otherwise have been thought to have been moderate hypertension and

(3)a failure in the context of hypertension and proteinuria to appreciate the significance of the intermittent symptoms.

His opinion was that the doctors had not realised the severity of her pre-eclampsia. However, he added: "in all fairness it was difficult granted the variability of her condition". He

mentioned that one of the things in this case was the "stuttering nature" of the disease and that that was part of the problem that the clinicians had had in dealing with it as it was actually not relentlessly progressive.

In cross-examination to Mr Donald, Professor de Swiet said that Dr Branchfield's comments about stars in front of her eyes were quite specific in terms of the visual abnormalities that people characteristically get with severe pre-eclampsia. He thought that proper attention had not been paid to Ms Weir's symptoms before she came into hospital. He would have expected the midwifery staff to have said, as Dr Solanki did in her record, that Ms Weir was currently well but had been symptomatic beforehand. He thought that the midwives were aware of the findings but that they had not made a note about it. He agreed that it was entirely appropriate to wait on the Monday evening to commence full monitoring, to assess her once results were completed and wait to see how things developed. In relation to the Tuesday, on the basis of her still being hypertensive and her continuing proteinuria he would have wanted her to be delivered within the next few days. He would have been cognisant of the fact that she had had symptoms before she was admitted. They strengthened the case. He thought some obstetricians would have delivered entirely on the basis of hypertension and proteinuria alone, and others would have wanted a little bit more in the way of symptoms, either those prior to admission or a second set of symptoms as occurred on 19 October 1999. He agreed that this demonstrated that there was a range of views from a spectrum of consultant obstetricians. He would have wanted her at this time to be delivered within 48 hours (9.30 am or 10.30 am) on 19 October 1999. That is what he meant by "a few days". He agreed that that 48 hours might start when priming might start at 6.00 pm. He added that Ms Weir was "an elderly primigravida" with an unfavourable cervix. He thought the likelihood was that they would have had very early recourse to caesarean section. In relation to the mechanism and process of delivery, he would defer to the consultant obstetrician. The second category of consultant obstetrician would be one who would also put some weight on previous symptoms. The third category would be one who would continue to monitor and await results. He confirmed that for him the important trigger would have been the episode that occurred at some point on the morning of 19 October 1999. If that episode had not occurred, he agreed that one came back to the range of consultant obstetricians which would include those who were continuing to monitor and seeking to identify what would be the optimum time for delivery based on the information being gathered in. However, he thought they would be wrong to be including efforts to rule out any form of urinary tract infection and to have a more definitive measurement of urine analysis on a 24-hour sample as three +++ of proteinuria was almost never due to urinary tract infection alone and almost always represented significant proteinuria in terms of pre-eclampsia. However, he acknowledged that many would continue to do that. It gave people "an excuse to delay". There was a natural reluctance to intervene. People like to let nature take its course. He did not think this was a correct view. To wait purely for an additional 24-hour urine specimen result to come in was "wasting time" and giving time for a crisis to develop. He agreed that in the "normal" manner of pre-eclampsia you would see some progression of the disease, such as in relation to blood pressure. He also agreed that until 1410 hours on 21 October 1999 the blood pressure did not require any form of treatment. He also agreed that the foetal assessment was entirely satisfactory and that the blood results were effectively normal. He confirmed that he would advocate an "aggressive" policy but agreed that there were many consultant obstetricians who did not go along with that. He accepted that there was a not insignificant body of opinion that would be more "conservative". What was being balanced was the rather uncertain risk of crisis occurring at any time against the small but specific problem of maternal and foetal morbidity and mortality

from pre-term delivery. If you come from his viewpoint, you have a certain degree of pre-eclampsia at 37 weeks, so deliver the patient. If you are a bit more conservative, the question of symptoms is an additional reason for delivering the patient. He agreed that the blood pressure was not extensively elevated in this case. That would be of significance it you were more towards the conservative school of thought because then you want more abnormality than simply hypertension and proteinuria. He agreed that what Dr Roberts did fell within the more "conservative" school of thought. He confirmed that if there was an episode of visual disturbance it would be routine to check the patient's well-being and to take her blood pressure. If it is not significantly elevated that is somewhat reassuring but not absolutely. At 11.30 am on the Tuesday it was 154/74. That is not particularly high, but that would not negate his concern about the symptoms. He would have taken some reassurance from it though. He accepts that there are some who would not place the same significance as he would have done on the event on the morning of 19 October 1999 and that there could be a spectrum of opinions. He agreed that there would have been no need for a consultant to have seen Ms Weir on the night of 18 October 1999.

In re-examination, Professor de Swiet said that the difficulty in this case was in assessing the severity of Ms Weir's pre-eclampsia. He thought Dr Branchfield should have brought the incident to the attention of his superior. He thought though that one would need to be rather experienced to realise the significance of this episode and therefore to report it to superiors so, having regard to the relative inexperience of the SHO, it was not unreasonable not to report it because he just did not appreciate what was going on. Professor de Swiet thought that better education of junior doctors was required in relation to the symptoms of pre-eclampsia and the wide spectrum of the disease.

Professor Calder:

In evidence-in-chief, Professor Calder said that he used the terms mild, moderate and severe pre-eclampsia. If there was significant proteinuria, then, provided there was also significant high blood pressure, the person would move into the severe category. Regarding the recordings of blood pressure at the time of admission at 140/100 and 140/96, the upper limit of normal is 140/90 so anything over that would be cause for concern. Regarding the vomiting and flashing lights noted by Dr Solanki, both should be paid attention to. He would be more concerned about the flashing lights. He would have expected it to have been associated with higher blood pressure. He would not have felt that immediate action was required on the basis of those observations. When a patient is admitted to hospital it is very important to see what happens to signs and symptoms and to institute appropriate investigation. He would have proceeded to do a 24-hour urine collection. A more precise quantification than the rather crude, semi-quantitative estimation by dipstick, is needed for accurate assessment of the patient's condition. The baby would be monitored. Ultrasound would be done, as it was here on 18 October 1999. On the information he had he was satisfied of the baby's well-being. Regarding the report of stars in front of her eyes at 12.30 pm on Tuesday, 19 October 1999, the diastolic blood pressure was 77. That is much the more significant of the two observations, as between diastolic and systolic. It more accurately reflects the general condition of the circulation. However, he was surprised that Dr Branchfield did not note what the systolic blood pressure was at the time. He would have expected that. The level of 77 diastolic would have afforded a degree of re-assurance,

although not absolute. He agreed that systolic readings should not be ignored but thought that the diastolic was the more important value. The incident pointed clearly to the need to continue closely watching the condition of Ms Weir. It did not by itself require an immediate plan for delivery. He would still have been content to wait for the 24-hour urine collection and monitoring of 4 hourly blood pressures. There had been a failure to perform the instruction to repeat the blood tests on Wednesday 20 October 1999. That could not be excused, although he did not think it would have altered the observations. Looking at Ms Weir's overall condition, he thought it would have been appropriate for Dr Roberts to have tried to find out the result of the 24-hour urine analysis on 20 October 1999. If the urine result had been available to Dr Roberts on the afternoon of 20 October 1999 she might have put the process of induction into action at that point. However, he agreed that he could reasonably have said "Let's get this lady delivered by the end of the week." He agreed that the induction of labour decision made by Dr Roberts on 21 October 1999 was perfectly reasonable and that he would have taken a similar decision if he had been in her place. In relation to his criticism of the 27 hours before Dr Roberts saw Ms Weir on the Wednesday afternoon (after the episode of visual disturbance on the Tuesday), he would have taken a similar decision on the Wednesday if he had been in her place. By Thursday morning, this is at a time when intervention is sensible and should go ahead. He agreed that there was little to be gained for the baby from continuing beyond 37 weeks. The chances of this baby getting severe respiratory problems from delivery at that stage were "really quite, quite small". In relation to the dipstick, in this case the number of plusses that were recorded varied from day to day, which indicated the relative crudeness of the test. If all the factors pointed to a clear diagnosis of severe pre-eclampsia, with very high blood pressure and other symptoms and signs then he would have been perfectly happy to see that observation of the dipstick as being sufficient to cover the issue of proteinuria. The point in the present case was that the hypertensive element was at very best mild, occasionally to moderate, and if there was a lot of protein and a relatively normal blood pressure then the possibility could be that the reason for that was some disease process other than pre-eclampsia. That is why he felt it was appropriate to do the 24-hour urine collection. That would also allow a longer period of assessment of the other dynamics in the case such as blood pressure. Regarding the three +++ on a dipstick and whether they could sometimes be wholly attributable to a urinary tract infection, he did not think he had seen that happening. He thought that would be unusual. In relation to the complaint of flashing lights on the Tuesday, if these had truly been signs of worsening pre-eclampsia, he would have expected them to have been followed by a raised blood pressure of a more significant level. He would have expected to see consistent, raised blood pressure of a significant level within 12 - 24-hours. He thought the symptom would have been an ongoing feature, although maybe not all the time. He thought though that the flashing lights was a manifestation of the overall condition, but by itself he did not think it was enough to point to the likelihood of imminent and sudden deterioration. He thought that pre-eclampsia was the likeliest explanation from the moment of her admission. It was really a clinical judgement that enough evidence now existed that intervention was appropriate. The majority of women who have this condition follow a fairly standard pattern. When you get all three of the elements that confirms this is the position, at some point the evidence points to the need for intervention. He thought that if he had had the information regarding the proteinuria results and the other issues on the afternoon of Wednesday, 20 October 1999 he would have perhaps have instructed that priming should have been started that evening, but there would have been very little prospect of delivery by the early afternoon of Thursday 21 October 1999. That is the earliest he would have seen induction of labour as having been justified. He could see no persuasive indication that completion of delivery by caesarean section on either 18 or 19 October 1999 would have been the right policy in the circumstances. He agreed with Professor Walker that the risk of complications persisted for

48 hours after delivery. If you have confirmed significant proteinuria, he agreed that that suggested that the disease itself was severe provided that there was other evidence of pre-eclampsia. In his report he said that although the risks to the baby were smaller than those facing the mother he believed that the clinical course that was followed in this case was reasonable in view of the need to establish the extent of the problem, gathering all the necessary clinical and laboratory information on which to base the management. While there were signs that Ms Weir's pre-eclampsia was of a more severe degree, this was entirely based on the observation of proteinuria, the blood pressure remaining more or less normal through the course of 19 and 20 October 1999. The presentation here was really highly unusual and the extent to which it proceeded was unusual. He thought it unfortunate that no person of consultant grade saw Ms Weir prior to Dr Cameron's involvement, although he did not think it had any direct bearing on the outcome in relation to the investigations done and decisions taken. He agreed that it would be good practice for a referral up to registrar/SHO3 grade to be made on the day of admission, although not necessarily to come and see the patient. He agreed that it would have been preferable if somebody of consultant grade had reviewed Ms Weir's admission within a 24 - 48 hour timescale, but that thereafter Dr Roberts could have conducted the "hands-on" management at specialist registrar grade. He does not think however that he personally would have made any different decision. He did not think it was clear-cut that she had severe pre-eclampsia when admitted. It required a period of assessment and observation before a diagnosis could be made. Knowing the outcome was different by the time one was having to review a case such as this. That put a very different slant on the way one looked at things. It is very difficult to blot out the impact that has on what one might have judged to be the right action at the time. Regarding when a firm diagnosis could appropriately have been made, his view is that he would have expected it was clear-cut and that there were grounds for intervention by the time the information was available on the morning of Wednesday 20 October 1999 that the proteinuria was clear-cut and the blood pressure had by then had several episodes where it was on the borderline or a little higher. He might have made the decision on 20 October 1999, although he thinks he would have made it on Thursday 21 October 1999. It is the results from the 24-hour urine collection that would have been a factor that would have tipped the balance for him, as it was a significant level of proteinuria. He could not at that point see what would be gained by allowing the pregnancy to continue. He did not think that one was ever going to get a body of medical experts to agree with each other completely on an issue. Each case has to be assessed on its own merits. It is quite inappropriate to take routinely interventive steps before a clear picture as to what these different parties (mother and baby) face in terms of risk. An atypical feature in this case was that for the first few days after admission the blood pressure was not consistently significantly raised and the blood parameters were normal. That led to great difficulty in making an assessment of the problem.

In cross-examination to Mr Moynihan, he confirmed that he thought it was correct that a consultant should see Ms Weir within 24-hours of admission. However, his view is that the appropriate investigations were in place and that the management would have to await the results of those investigations. He thought that the delay, because of the need to re-start the 24-hour collection, was justified in the circumstances in order to get the information that was appropriate. In relation to the note made by Dr Branchfield of the episode of visual disturbance on the Tuesday, he confirmed that this was something worthy of attention. The blood pressure test recording a diastolic of 77 would have been reassuring. In relation to the graph of blood pressures for Ms Weir, it is mildly elevated and in some circumstances within the normal range. In relation to the note by Dr Branchfield of a visual disturbance, Professor Calder confirmed that it would have been good practice for him to have alerted a senior

doctor. However, he could not see any circumstances in which he would have altered the management as a result of that contact. The failure to re-do the blood tests on the Wednesday morning was a departure from standard practice. He confirmed that as at 3.30 pm on the Wednesday afternoon he would have wanted to know the results of the 24-hour collection. He probably would have asked someone to check whether the results were available. He said that if he had been looking after Ms Weir he would have said from watching her condition that an underlying concern for the diagnosis of pre-eclampsia was likely, and that they were awaiting confirmation of that, and that once the information on which to make a decision was available then a decision could have been taken. He confirmed that three plusses on the dipstick was rarely associated with false positives. The results fill in the developing picture. He thought that now all the evidence had accrued one could see that the balance had now shifted in favour of intervention and that there was no particular justification in delay. That would have been on the Wednesday afternoon if he had had the urine analysis results. He would have been happy to make a decision (to commence priming with a view to induction of labour) on sufficient evidence that this was significant pre-eclampsia to instruct delivery once the urine result was available. However, he could see the advantage of seeing another blood test, although the blood test on the Thursday morning was essentially normal as well. He agreed that the visual disturbance on the Tuesday morning might have been an indication of a worsening condition. However, all the symptoms were transient and did not worsen in any obvious way. The episode of flashing lights could well have been caused by the overall condition. It was therefore something that could enter into the decision making process. He agreed that maternal anxiety could well have been a factor in the decision for induction. In relation to the timing of delivery, he would have had in mind the risk that the baby could be harmed by prolongation of the pregnancy. He thought what encouraged the clinicians in this case, and what would have encouraged him, was the tests in relation to the well-being of the baby. He confirmed that at least by 37 weeks with a lady who was 40 with significant pre-eclampsia there was little to be gained for the mother or baby in delaying delivery. However, he said if one intervened when there was one sign of trouble without clear evidence that allowed a balance of the benefits of intervention against conservative management, one would end up interfering with nearly every pregnancy because nearly all pregnancies have some deviation from normal at some stage. Interventions are the key to good obstetric care but must be applied with appropriate assessment of the benefits and risks of carrying them out. He agreed that all proteinuric pre-eclampsia was severe. However, the urinary tract infection as an explanation for the dipsticks results required to be excluded. With the information available at the time there was no reasonable expectation that there should suddenly be this quite unheralded deterioration in the condition. Professor Calder said that he did not fundamentally disagree that at 36 weeks he should be delivering as soon as convenient unless there was a good reason to delay, but in addition to Ms Weir not being at stage 3 when she was admitted, she was not at stage 3 on 21 October because nothing had fundamentally changed. One had to see the two components to the classic challenge of obstetrics, which was looking after two patients at once and trying to make some balance involving all those risks. He agreed that it would seem to be the logical conclusion that from 36 weeks practice should err on the side of delivery of the baby. However, he said that that would imply that one should put babies at increased risk of what was known to be a measurable incidence of neo-natal complication against uncertain and quite rare possibilities that might affect the mother. He still felt that clinicians were inclined to try to be conservative until the point where it seemed clear that intervention was the better option. He thought one of the problems was that text books tended to preach "A + B = C", and that is what you do. He thought that was inevitable because text books had to put things in simple terms, but the point he made was that in all

these circumstances there are several more factors than A + B to be considered before reaching a balanced decision.

In cross-examination to Mr Donald, Professor Calder confirmed that notwithstanding the material provided to him he was still of the view that, broadly speaking, the management of Ms Weir had been appropriate and in line with his own practice. He pointed out that Professor Redman, for whom he has the very highest regard, sees things from a very different perspective from Professor Calder, in that his training and expertise is principally related to the medical condition of the mother, and that also applies to Professor de Swiet, whereas the obstetrician has to take account of the foetus as the other component. While not suggesting that either Professor Redman or Professor de Swiet had no regard for the foetus, he thought that they had a different view to the one a general obstetrician would have. It was also necessary to make a firm diagnosis in this case. The quantification of proteinuria and the blood pressure readings were required to allow a clear diagnosis to emerge. His own practice is to rely on at least some signs that the next step might be about to happen. He thought that the opinion expressed by Professor Stirrat was very much coloured by the outcome of this particular instance, which was exceptionally unusual and unpredictable. Professor Calder said he (Professor Calder) was not at the end of the spectrum that would be striving to continue the pregnancy until there was a real obvious sign of trouble for mother or baby. The blood pressure readings had not been on a sustained basis that would have required hypertensive treatment in this case. In this case there were times when Ms Weir had complained of symptoms that could not be ignored as being of no significance. However, all of them seemed to be quite transient and between these times she felt quite well. Many women in the course of pregnancy will have some nausea, vomiting and visual disturbance. Clinicians looked out for people when it became more persistent, in which case that would be an indication of some ongoing underlying process that was not going away. He confirmed that he did not see that as a picture which was developing here at all. He confirmed that it was a two-stage process, first, to make your diagnosis, and, second, to determine the optimum time to deliver. Dr Roberts' approach had coincided with his own management approach. He accepted that, against the background of how Ms Weir presented, it was not necessary to chase up the results of the 24-hour urine collection if he knew he was going to get it on the Thursday morning. He thought that the thought process articulated in the passage of evidence from Dr Roberts about her actions (namely, as to what she had actually done) demonstrated someone who had an understanding of pre-eclampsia and its management. He also thought that the junior staff seemed to be aware of what to look out for in relation to pre-eclampsia. In relation to the visual disturbance on the Tuesday, the appropriate step would be check the blood pressure and make sure it was not excessively high. He confirmed that if he had become aware of it, it would not have indicated a need to intervene.

In re-examination, Professor Calder said that he would not be particularly critical of the absence of Dr Branchfield mentioning the visual disturbance to anyone more senior because of the reassurance that was gained at that time. He thought that recording in the notes was adequate because it could then be factored into the process once the other information was available. He confirmed that there is a range of clinical practice. From the time he started doing obstetrics he has seen this spectrum of intervention as against allowing nature to take its course. There are just different philosophies.

Professor Walker:

In evidence in chief, Professor Walker explained that in general women who have more acute severe pre-eclampsia occurs before 32 weeks gestation. In relation to women who have pre-eclampsia in later pregnancy, in general this develops more slowly. It may not progress. It may progress if you wait long enough, meaning weeks rather than days. The majority of these women will not progress though, they will not progress quickly and you can usually see signs of the progression by blood monitoring of the women on a daily basis. The presence of proteinuria confirms the diagnosis of pre-eclampsia and therefore the increased risk of that group compared with women with hypertension alone. The definition of pre-eclampsia is based on clinical findings that can be found in the community by midwives or GPs. Blood pressure is something that is easily measured. A one-off reading is not an accurate one. You have got to do repeat readings. In general, the consensus is that a diastolic blood pressure of 90 is a gateway into the investigation and assessment. If you have proteinuria that is a marker that there is a capillary leak occurring across the kidney so you get protein in the urine. The mother therefore has a systemic effect of her pre-eclampsia. It is therefore a method of diagnosing pre-eclampsia. It is the combination of these two tests which are easy and can be done in the community that are a useful gateway for referral to a specialist unit for assessment. A dipstick reading is inaccurate. You are measuring just one sample of urine and all urine has different degrees of concentration depending on the time of day and how much water has been drunk. The dipstick therefore has to be confirmed by some other method. The higher the dipstick measure the more likely it is that it is true. A 24-hour urine collection should be used to quantify the proteinuria to make sure that it is true. As far as the risk to the mother is concerned, the blood pressure is more important than the proteinuria, but as far as the baby is concerned the proteinuria is more important as a risk factor. He would think that 3 plusses of proteinuria on a dipstick might be likely to be true but that a one-off measure of anything should not be taken. A 24-hour collection is less likely to be contaminated and is more likely to be accurate. Urinary tract infection is probably unlikely to reach three plusses but it is one of the things to be excluded. He made the point that the importance was that if you were going to make decisions on management you had to have accurate information upon which to make that decision. The level of proteinuria does not appear to increase the risk to the mother of anything apart from the fact that she has got pre-eclampsia. There are increased risks for the mother of complications related to pre-eclampsia. The presence of proteinuria greatly increased the chances of the baby being poorly grown. In the past, proteinuria used to be a trigger for delivery, which caused a great increase in morbidity both for the mother and baby because of early interventions. Once the lady is in hospital, having passed through the gateway of these two tests these are checked again to confirm their presence but other tests are used, particularly uric acid levels and platelet count, as two measures of systemic effect of their condition. The hospital will also look at specific effects on the baby by ultrasound. You have to do liver function tests because not all women will have these tests abnormal. You have to look at the results and assess what risk that means for the mother and the baby. In general, if uric acid is normal you do not have a significant systemic effect going on. The most significant signs that occur in pre-eclampsia are nausea, vomiting, headaches, visual disturbance and epigastric pain. The condition can present in occasionally rare and bizarre ways, but these are the most common signs to look for. Once women are in hospital through the "gateway", the presence of these signs are not surprising as some can occur in women without pre-eclampsia. If they persist, that is a sign that there is a continuing problem that is not going to get better. What is important is that you assess the signs. For example, with headache and visual disturbances you should check their blood pressure, as these are

primary signs that they are pre-disposed to eclampsia. It is the persistence of such symptoms that suggests that the condition is progressing. You carry out a CTG to tell you the immediate well-being of the baby. You would not deliver a baby purely on the baby's weight but you would deliver a baby if the ultrasound was abnormal, the liquor volume was low or if the CTG was abnormal. He explained that symptomatic proteinuric pre-eclampsia was when someone had persistent symptoms associated with high blood pressure and proteinuria. A one-off clinical symptom that is not repeated and is not associated with clinical abnormality cannot be taken as a definition of "symptomatic", in the same way that a one-off of proteinuria will not be a diagnosis of proteinuric pre-eclampsia or one blood pressure over 90 is not a definition of hypertension. None of the complications of pre-eclampsia are an inevitable progression of the condition. In earlier pregnancy they would maintain the pregnancy as long as they could, and the average length of prolongation was about 15 days before delivery. He would normally expect to see signs of progression in women who progress. There are a small number of women who will "go off" very quickly over a number of hours where you have to monitor and watch for that progression but that is less than 5% of all the women who present with this condition. So the majority of women will either progress slowly to allow you to pick up signs of progression and intervene when necessary or may never progress at all. The problem with the term "severity" in relation to the definition of pre-eclampsia is that it depends on whether one is talking about severity of risk or severity of the condition, and it also depends on the point at which you are assessing the woman. A woman with proteinuric pre-eclampsia is on the severe risk end. She therefore needs to be admitted to hospital and assessed. It is used in that terminology to emphasise the need for referral to hospital. Once the woman has pre-eclampsia on the definition of hypertension and proteinuria the "severity" is usually divided into either two or three groups. The Americans use the terms "mild" or "severe". In this country practitioners tend to use a three-stage severity of "mild", "moderate" and "severe" based on blood pressure. He said that definitions of proteinuria were not used to define severe pre-eclampsia. When someone has proteinuria they have pre-eclampsia. Once you have got the pre-eclampsia there is very little correlation in separating levels of proteinuria into degrees of severity of risk of anything. The presence of proteinuria is the main factor that puts a person at a more severe level of risk. You have then got to assess other things to assess the relevance of risk within that group. That is where the other tests, in particular for hypertension, come in, as it is the hypertension that is the greatest risk to the mother. He explained that a woman might be clinically quite well but have a severity of risk because she potentially can get worse. That is related to the chances of something happening. That is why they are being monitored to clarify that risk because you can change the risk by increasing or lowering it depending on the other tests that you do. So far as severity of condition is concerned, that relates to the actual clinical condition where, if something like HELLP syndrome develops, then they are severe as a condition. In relation to Ms Weir, the probability was that she had pre-eclampsia when admitted. She then needed to be assessed to decide when to intervene. You have to balance the risk for both (mother and baby) of prolongation of the pregnancy as against the risk of morbidity for both her and the baby of delivery. In general, it is a progressive decision-making process based on information collected, assessment of the woman clinically and by chemical testing. The risk of delivery lessens as you progress in pregnancy. It is important to make sure that the mother is stable prior to making the decision to deliver because delivery itself is a trigger to a potentially worsening condition. Most women will worsen after delivery. It takes about 24 to 48 hours to reach a level where the risk is minimal. You have a high chance of a caesarean section if you induce someone earlier, which again has an increased risk of complications for the mother, particularly if she requires a general anaesthetic which puts her at greatly increased risk in the presence of pre-eclampsia. In principal, prolongation of the pregnancy is better for the mother because it reduces her morbidity from the delivery process. That has

to be balanced against the risk of morbidity if you do not do that. So you have got to balance these two things together. So far as the baby is concerned an intensive care unit is not as good as the uterus as a nurturing environment so you need to have a good reason to remove the baby from the mother if it is doing okay there.

Professor Walker was referred to Chapter 24 of Turnbull's Obstetrics (2nd Ed), Family Production 2/13. Chapter 24 is entitled "Hypertension in pregnancy" and the author of this chapter was Professor Redman. The particular passage to which Professor Walker was referred was under the heading of "Pre-eclampsia, Organisation of Antenatal Care". The first paragraph reads:

"The principles of management are early diagnosis, early admission to hospital, well-timed delivery to pre-empt complications, and postpartum follow up to find underlying medical problems and the outlook for another pregnancy. Although this sounds simple in theory, it is difficult in practice. Only if the clinician can keep one step ahead of events at all stages will dangerous situations be avoided".

Professor Walker said that he would largely agree with what the paragraph said, namely that it was early diagnosis of the problem when it occurred, and then admission to the hospital which was important, and then timing the delivery at the optimum time. The last sentence was he said also important, because what that meant was that you should monitor women for signs of progression, so you intervened before events had occurred. Professor Walker was then taken to Table 24.5 at page 449 which referred to the progression of pre-eclampsia as being divided into three stages, which lead to eclampsia and other crises. This Table defined "stage 1" pre-eclampsia as being hypertension; "stage 2" as being hypertension and proteinuria, and "stage 3" as being hypertension, proteinuria and symptoms. In the accompanying text at page 449 Professor Redman went on to say:

"This grossly oversimplifies the problem: every clinician will regularly see cases that do not conform to this pattern. However the staging dovetails with the requirements of management and provides a convenient framework for dealing with the problem in everyday practice. Ideally, cases should be diagnosed in stage 1, admitted to hospital as soon as stage 2 is detected, and delivered before the onset of stage 3. Stage 3 is an obstetric emergency that, in a perfect world, should never occur. This sequence requires that delivery is expedited before the patient herself begins to feel unwell. But diagnosis and management depend on the results of screening symptomless women. This is one of the central features and requirements of antenatal care".

In relation to this Professor Walker said that he again largely agreed. The point was though that the definitions into the three stages were not as precise as that. What clinicians want to do is to look for the signs of progression before the acute event occurs in stage 3. There is therefore a blurring between stage 2 and stage 3. It is very unusual for someone who is in stage 2 of pre-eclampsia to be well one minute and the next minute unwell. They progress over a period of time, with the changing of biochemical and haematological parameters that point towards a worsening condition. So you would then intervene before a stage 3 event.

He thinks there are in virtually all instances warnings of progression of disease before an acute event occurs. There are risk factors referred at page 450 of the same text, such as where there is a first pregnancy. These risk factors are relevant for screening but not for management. This is because they are risk factors for development of the condition itself. It is not a risk factor of maternal death or maternal morbidity resulting from the condition. The risk of developing the condition itself is not the same as the risk of morbidity from the condition. Once someone has a condition, and they are admitted to hospital, then it is not a risk of whether they get it or not because they have it. The only proviso to that is age as older women are at risk of all things in pregnancy and with a higher mortality rate of every complication. Once a woman has proteinuria she is put into a higher risk category for further assessment by hospital admission and investigation. In his view where Professor Redman says: -

"all proteinuric pre-eclampsia is severe",

what he is saying is that all women with proteinuria should be referred to hospital. He then has a passage put to him from Professor Redman at page 454 of the same text where it states:

"Some admitted with apparent stage 2 pre-eclampsia will not have the diagnosis confirmed and can be allowed home. However, if the diagnosis is confirmed, even if her condition appears stable, it is dangerous to allow the woman home - she is now committed to staying in hospital until delivery".

Professor Walker points out that Professor Redman is saying that the woman stays in hospital and is not saying that delivery is mandatory at that point. She is to be in hospital and monitored accordingly. In relation to the passage at page 461 of the same text where Professor Redman states:

"There have to be compelling special reasons to leave women with proteinuric pre-eclampsia undelivered beyond 36 weeks",

Professor Walker thought this was a term that was difficult to assess because you have to have reasons to deliver first of all and then compelling reasons to overrule that decision. He then said:

"If a woman has a significant problem requiring intervention and stabilisation then, yes, after 36 weeks the risk to that woman is such that delivery would be sensible, because once you have then stabilised her you do not want to leave her to go unstable again...but just because someone is in hospital with high blood pressure and proteinuria is not an indicator to deliver just because 36 weeks has been reached".

His view is that it is a reason to assess the condition and the fact that she is 36 weeks or over will come into the equation in making a decision to deliver. It is not a sudden change because 36 weeks has been reached. He agrees that after 36 weeks his threshold for delivery is a lot lower than it would be at 32 weeks. In relation to the concept that once someone has proteinuric pre-eclampsia a fuse is lit, he would argue that you have a fair estimate of how long the minimum length of fuse is by looking at parameters such as platelet count and liver function tests. You can have a reasonable "guestimate" of how progressive that condition is. If all the parameters are normal then it is a slow burning fuse and you would say: "lets assess things, lets see how severe the problems are". In relation to the "why wait?" approach, he said that the modern management of pre-eclampsia was based on the assessment of the woman and the baby and the necessity of delivery. This has greatly improved the management of mother and baby and reduced the morbidity for both by getting a "better handle" on what is actually going on. If you rush women into delivery without proper assessment of their risk then you do not know quite what is going to happen after delivery and prepare for that. Caesarean section during labour as a failed induction of labour carries the highest risk to the mother's life of any caesarean section. Delay of induction of labour for a matter of even a few days at 36/37 weeks will increase the chances of a successful outcome so delay in delivery, if all things are stable, would be of benefit to mother and baby. The "why wait?" philosophy, if you ignore the balance of risk, will increase intervention, increase caesarean section and increase potential morbidity for mother and baby.

In his report Professor Walker expressed the view that Ms Weir's disease progression was atypical and could not have been predicted. He had never seen or read of someone who had been of such low risk on admission progress so explosively and die in the circumstances. The outcome did not in itself imply substandard medical care. He explained that he had not seen someone who had completely normal liver function tests in the morning develop such an acute onset of HELLP-type syndrome within a few hours. Something appeared to trigger this event which also triggered very high levels of blood pressure, and particularly levels of systolic blood pressure above 200 which was a rare presentation in pre-eclampsia. The biochemical and haematological findings did not predict this development occurring in that timescale; and that is very unusual. When he had looked at the case he had assumed that there would have been signs that had occurred before the event, which had been missed by the medical staff. He had therefore come into this assuming that there must have been something that was missed. However, he cannot find anything that was missed in the investigations done or in the interpretation of the investigations. In relation to the finding of the "clinically compact abdomen" in the day care unit, the midwife was right to refer to ultrasound scan for an estimation of growth. The foetal weight was quite reasonable for the gestation. More importantly there was average liquor, which implied foetal well-being. They also did a full biophysical profile that showed 8 out of 8, which is the top score and meant that the foetus was well. What is more important is the wellness of the baby rather than the baby's size. Therefore you do not need to intervene at that time because of foetal risk. He would have been happy with the foetal well-being and therefore that did not come into the equation when considering the need to deliver. He thought it was appropriate that on admission CTG, blood pressure checks and a 24-hour collection of urine were commenced. At the time of admission he would have expected a senior doctor to have been notified about Ms Weir but not necessarily to see her. In relation to blood pressure readings, what is important in the assessment of someone's blood pressure is to take the average of what the blood pressure is over a number of readings. This is because everyone's blood pressure is labile. So a single reading cannot be taken as right. On 18 October Ms Weir had hypertension but there was no requirement for anti-hypertensive drugs. A 24-hour urine

collection analysis is the correct thing to do to verify the presence of proteinuria and to quantify it. On admission, there were no signs that caused him particular worry. An infection could itself make the blood pressure rise. Confirmation of what was actually going on was important. You do not want to manage someone for presumed pre-eclampsia when in fact that diagnosis is wrong. If symptoms were significant for pre-eclampsia you would expect them to be persistent. You must take the reported symptoms seriously but what was important was that you need confirmation of persistence. It is just like any one parameter. One blood pressure reading is not in itself a diagnosis. He would not have been managing Ms Weir in any different way on the evening of 18 October. Decisions to intervene, particularly with caesarean section, must be undertaken for a good reason. In this case there was no indication to carry out caesarean section on the Monday night. On the morning of Tuesday, 19 October she had, if anything, settled. There was no sign of any deterioration of her condition. It was important that she had not had any more symptoms since her admission. Dr Chitra carried out a good examination and assessment of Ms Weir on the Tuesday morning. Her management and plan was perfectly correct. There was no indication to carry out a delivery at that stage. If anything, things are slightly better. It was reasonable to say let us wait for the further investigations and make a decision at that point. At worst she had a mild state of hypertension that morning. She certainly did not require any therapy for hypertension. The diagnosis of pre-eclampsia remained as probable, even although her blood pressure had settled to a degree, but she was on the mild end of this condition. He accepted that there would be some who would have felt that hypertension and proteinuria alone was enough to say that Ms Weir required delivery because of pre-eclampsia at this gestation. However, he would have wanted confirmation of this information and confirmation of the seriousness of her condition because intervention itself carries morbidity for both mother and child. Before he would be willing to make that decision he would therefore have wanted further information to confirm the diagnosis. When it was put to him that Professor Stirrat would have started priming on the Tuesday morning, Professor Walker said that his concern was that he did not know enough about Ms Weir to know what was going to happen. If he had had further biochemical and haematological information on her he would have had a better idea of what the possibilities of her condition worsening during induction and labour would be. It may be that the signs would tell him that induction of labour was the wrong approach and that someone with an unfavourable cervix and a worsening condition may be better off being delivered by caesarean section. He does not have that information at the moment at this point to make that decision. To embark on induction of labour at this time without that information would mean that you would have really no idea of what problems you might encounter and what the risks of emergency caesarean section might be in the middle of the night. In relation to the complaint of visual disturbance later on the Tuesday morning, what is important is that the visual disturbance itself is not dangerous but it might be dangerous if it demonstrates evidence of hypertension. So what is important is that her blood pressure is checked. You are not treating the visual disturbance. You are treating the potential underlying clinical problem that might be causing the visual disturbance. The blood pressure reading of 154/74 at 11.30 am would not have given him cause for concern. Whether it was stars in front of her eyes or some other form of visual disturbance he did not think mattered very much. He thought the important thing was that it was transient (on the basis of Dr Branchfield's interpretation of duration being half an hour) and it had gone. The blood pressure had been checked together with other aspects of the clinical management. In the absence of persistence of symptoms and hypertension there is no further action that needs to be done apart from noting this as part of the equation that you use in making a decision about when and how someone should be delivered. In relation to Dr Branchfield not having noted the systolic blood pressure, he agreed that it would have been preferable if both had been noted. However, since the diastolic was 77 it was highly unlikely that her

systolic was any higher than it had previously been at around 155 when noted by the midwife at 11.30am. It is very rare for systolic to be elevated in the absence of elevation of diastolic. If he had been called in he would still have wanted to see the new results before embarking on a decision to deliver. The concern is whether it is heralding a sign of developing or worsening hypertension. It was not here. No anti-hypertensive therapy was needed. It was therefore a coincidental sign, which may have had something to with the disease process, but it was not a sign of any worsening in the disease. Maternal mortality in pre-eclampsia is something in the region of 1 in 4,000, so it is a very rare event. Visual disturbance is a very common event in pre-eclampsia. What is important is whether it persists and whether it demonstrates elevation of blood pressure requiring intervention. If it does not, it is one factor involved in the equation but is not a paramount factor. He would agree that any symptom in a woman having suspected pre-eclampsia is concerning but that its use is that it confirms the diagnosis of a systemic disease. It does not necessarily make that disease worse. It confirms that the woman should be in hospital and should be monitored closely. He would disagree with Professor de Swiet that this is "symptomatic" pre-eclampsia, because it is not persistent. She has a symptom that might or might not be related to pre-eclampsia. In addition, her blood pressure did not rise. You put it into the equation when you are deciding on management but it is not obvious enough to be taken as a paramount decision-making point. After that there were no further symptoms that day and no evidence of the worsening of the clinical situation. In relation to Dr Roberts' entry on 20 October 1999, she was correct to want to see further blood results and the 24-hour urine collection. He thought it was unfortunate that the blood tests were not available at the time Dr Roberts saw Ms Weir on the Wednesday. The pattern of the blood pressure on the Wednesday was similar to the previous day. In relation to whether he thought Dr Roberts ought to have pursued the results of the 24-hour urine analysis on 20 October 1999, he pointed out that the results would not have completed the picture as she was wanting the second set of blood results. He thought that some obstetricians by the Wednesday afternoon or evening could well have decided to commence induction of labour that evening. He thought that that would have been within the comfort range of decision-making but that it would still have been preferable to have more information, as he would be concerned if he was embarking on priming for induction without knowing the prospects of the worsening condition for Ms Weir. On the Wednesday, he would have been more concerned about the lack of blood results than the 24-hour urine collection. He said: -

"I must admit I feel that I would have been upset that the bloods had not been done on the Wednesday morning, good medical practice, and the reason is I would be concerned that it was becoming abnormal and I didn't know about it."

In the event they were essentially normal on Thursday, 21 October 1999. His personal preference would have been to have had more information before making the decision and since the condition was stable there did not appear to be any reason to rush that decision. However, induction should be decided upon and embarked upon within the next few days and certainly before the end of the week. The weekend is not a good time to deliver someone who is high risk. He would have thought waiting until the following week would have been inappropriate, so delivering prior to the weekend would have been preferable because of the complications of delivering at the weekend. There would have been a likely period of between 24 and 36 hours between commencement of priming and delivery. In relation to the Thursday, the proteinuria result is confirmation that she has proteinuria of a

significant degree. However, the level of proteinuria makes no difference as far as the severity of the disease is concerned. The fact that she has this proteinuria does not mean that her delivery must be timed sooner rather than later. It confirms the diagnosis and that is all. The fact that she had stable blood tests told us that her disease was stable. He was perfectly comfortable with the decision that Dr Roberts made with the results that were available. He felt that if we knew now that Ms Weir was stable, induction of labour would be a reasonable and safe way to embark on delivery. The fact that the mother is anxious increases the need to bring things forward because it is important to relieve her of any anxiety she has. In his report he fully supported the management that was carried out on 21 October 1999 and did not think a different plan should have been followed. There was no definite indication to deliver Ms Weir before 21 October 1999 and, although some obstetricians may well have done so, most, including Professor Walker, would not have. He was asked to read an extract from the evidence of Dr Roberts about her decision-making process. He said that this looked like a very reasonable and balanced approach that he would expect from a highly qualified doctor looking after a complex situation such as this. He confirmed that it demonstrated to him someone who knew what pre-eclampsia was and how it should be managed. He agreed that you aim to try and stay one step ahead but that that is what monitoring was for so that you can see the earlier signs before major events occur. In normal circumstances, he would have expected that either Dr Roberts, the senior registrar, or the consultant in the team would have reviewed Ms Weir on the afternoon of the Tuesday. That is a general observation as to how he feels patients should be appropriately managed. Someone senior should be on top of each case and making the decision plans on them on a regular basis. In the event, he confirmed that he would fully support the decisions made. However, he thinks that the one thing that might have been done is if a senior doctor had seen her on the Tuesday they might have made sure that the blood tests were done on the Wednesday morning as they should have been done for proper assessment of Ms Weir on the Wednesday afternoon. In relation to the doctors junior to Dr Roberts, Professor Walker said that the notes appeared to be well-written, they appeared to ask the right questions and to be assessing Ms Weir appropriately. If he or his senior registrar had seen her on the Tuesday they would have made sure the results were available from the blood tests and urine analysis to review the situation on Wednesday afternoon when he would have put in place the plan. If that information had been available that afternoon, that might have brought forward to the Wednesday evening the decision to commence induction. His understanding from all the monitoring was that the foetal condition gave no cause for concern throughout. In relation to the report and evidence from Dr Howatson, it is not important what the placenta looks like. What is important is how the baby is finding placental function. That is why you assess the well-being of the baby. It is a sign of poor foetal well-being that will influence your decision-making, not the size of the baby or the expected pathology of the placenta. The baby also seemed to cope with the acute event without evidence of any great distress. He did not agree that there was any evidence that this baby was lucky to be alive or that it could have had problems within the next day or two. That could not in his view be said by looking at the pathology report in relation to the placenta. In relation to the acute event, the blood results did not show any evidence of prodromal signs of progression towards an event like this. This was a very surprising event. The severity of the event occurring in someone who had previously been so stable was extremely unusual. You would also expect elevation of liver enzymes occurring before the onset of the pain. The fact that the blood tests were normal at 0923 hours with this acute event occurring at 1410 hours on 21 October 1999 was extremely unusual. The fact that the blood tests at 1445 hours were also normal was extraordinary. He was now referred to his report at p 23 where he referred to the basis of modern management being the use of a diagnostic gateway followed by investigations.

There are certain signs used for screening purposes to get the patient through the "gateway" into the management process in hospital: -

"Once they are in hospital they start from a zero state again as far as risk is concerned because they are in hospital with a certain risk classification, but then further investigations are carried out to verify what the disease is, how widespread it is - is it a systemic disease - and whether it progresses or not. That way they can intervene before any major event occurs. In parallel with the maternal assessment there is a foetal assessment. With these pieces of information they can then make decisions about the progression of the disease and the best time to deliver the mother in the best interests of the mother and baby. Delivery is only the start of the recovery process because of the trigger response problem in pre-eclampsia once delivery has occurred and in particular the placenta removed. It takes about 48 hours for the response mechanisms which kill the mother to start to dissipate and go away."

It is a "step-wise process" from the community through to and after delivery. At each point less and less women move through to the next stage because the vast majority with hypertension do not develop proteinuria and the majority with proteinuria do not progress to a worse condition. In relation to Professor Stirrat's problem with understanding his logic about this aspect, Professor Walker thought that the problem related to the two stages of the step-wise management. If proteinuria is present then the decision to admit to hospital is absolute. So, as far as the management at that point is concerned, the proteinuria was very important. When women are admitted to hospital they therefore have proteinuria. They are therefore into that risk category. The presence of proteinuria is therefore no longer involved in the management decision-making because they have it. People with proteinuria are not automatically delivered. It is a generally accepted and well recognised practice to prolong pregnancy, even with proteinuric hypertension, as long as the mother is stable and the baby is well. Proteinuria is not the paramount decision-making factor in hospital. It is other factors such as biochemistry, well-being of the woman and baby and the gestational age. The risk for the mother of progression of proteinuric hypertension is no greater at 36 or 37 weeks than it is at 26 or 28 weeks. What changes at 37 weeks is not the maternal risk but the relative foetal risk. It is also important to know what disease you are actually monitoring and looking after, because intervention, particularly induction of labour, can and probably will make someone worse if they have that progressive disease at that time. So, information on the accuracy of your diagnosis is important to have prior to embarking on an induction policy. In relation to Professor Stirrat's evidence, Professor Walker commented that people who say that by waiting for the crisis you are increasing the risk have an implication that the crisis will occur and obviously if that is so then why are you waiting for it. Professor Walker's argument is that in the vast majority of cases the crisis will not occur and, if it does, there are prodromal signs of that crisis going to occur such as changes in biochemistry and blood pressure. The fact that someone has proteinuric hypertension does not mean that this disease is progressive. It means that she has got pre-eclampsia. Proteinuria sometimes goes away. In that event, pregnancy can continue often until term. He agrees that the presence of proteinuria puts a woman into a high-risk category relative to a woman who does not have proteinuric hypertension. They are therefore in a higher risk category. Proteinuric pre-eclampsia is then divided further relative to the proteinuric pre-eclamptic woman into a "mild" and "severe" grouping. Once a woman has got through the gateway, in other words is seen as a higher risk from her non-proteinuric hypertensive friends and other

women, then the classification is re-set as a relative risk in that group of women. A woman with proteinuric hypertension but relatively normal blood pressure and normal blood parameters is by definition a mild pre-eclamptic. It means that she has got less risk than someone who is severely pre-eclamptic who has other signs such as high blood pressure, abnormal biochemistry and persistent clinical symptoms. She was therefore low risk as far as that category of proteinuric hypertensive patients was concerned. The age of 40 increases the risk not of complications but of morbidity from these complications. That is true of all aspects of pregnancy. So the problem of using age as a factor to intervene is that it is also a factor of risk of intervention. So you have got to balance both. As long as things are stable then it would be wrong to rush to delivery and to plan a delivery without knowing exactly what is going on because you can increase the risk for the mother and the baby, and the fact that she is aged 40 increases the possibility of that risk if you have not properly assessed before inducing. The risk of the 48 hour window is for all complications of pre-eclampsia. The blood pressure in a woman post-delivery is generally higher at 24-hours after delivery than it is beforehand. Professor Walker thinks that there are aspects of the care that should have been better from the point of view of consultant or senior doctor input. He thinks though that there is a probability that if everything had been perfectly managed then the decision to deliver may have been made on the Wednesday. There should have been a senior registrar or equivalent level seeing her on the Tuesday and the Wednesday making decisions so that everyone knew what was happening. In relation to Professor Stirrat's report, Professor Walker would accept that there was a reasonable body of people who would on 20 October 1999 probably have made the decision to deliver, but not that delivery should have occurred that morning. In relation to lessons to be learned, this event was not predicted by normal guidelines of care. The biochemical test is the most accurate diagnostic and predictive test in relation to the outcome for women. What distressed him here was that something had occurred in the absence of the biochemical markers.

In cross-examination to Mr Moynihan, Professor Walker explained that hypertension and the presence of proteinuria are the paramount clinical diagnostic tools used in the screening process of ante-natal care for the potential diagnosis of pre-eclampsia that takes people into being properly investigated. In relation to Mr Moynihan's general proposition 8.1, Professor Walker said it was difficult to have a yes/no answer to that. He thought that there was no doubt that delivering prior to significant events occurring for the mother was the aim, but they also tried to prolong the pregnancy as long as it was safe for the benefit of the baby. Delivery therefore starts the ultimate cure for the mother but it can in itself cause problems for the mother and the baby. It was therefore all a matter of balance. In relation to Mr Moynihan's general proposition 8.3, Professor Walker said that in general they were assessing and making a decision to deliver on the baby's risks because the maternal risks stayed relatively static depending on the investigations. The tests on the mother could change the maternal risk. The risk for her was not related to gestation. It was related to the disease process and the tests being done. In relation to Mr Moynihan's general proposition No. 9, Professor Walker said that it was preferable to intervene in anyone with pre-eclampsia before events occurred which could be deemed to be serious. That was the whole philosophy of management of pre-eclampsia. That is what they do at 26 weeks for prolonging pregnancy. They will monitor that woman until there are signs of progression occurring that may herald the crisis and then intervene beforehand. So at 36 weeks they would do the same thing but they would obviously want to intervene before a serious crisis had occurred. He made the point that in this case Ms Weir had a very high proteinuria but relatively normal blood results and relatively normal blood pressures. A different diagnosis could therefore have been made of renal disease, which was important. In relation to the 24-hour urine test as opposed to the

dipstick tests, Professor Walker said that what was also important was that the three +++ was persistent. It was the same as finding an elevation of blood pressure on a one-off occasion that was then less elevated the next time. You cannot use a one-off test for making diagnoses unless it is adjunctive to other signs and symptoms that make the situation clearer. He defined "severe" pre-eclampsia as pre-eclampsia existing in someone who had blood pressure probably above 170/110, had persistent symptoms such as headache or abdominal pain and also biochemical tests confirming the presence of systemic disease such as elevation of uric acid, elevation of liver function tests and diminished platelet count. However, all did not need to be present to make it "severe". Severe pre-eclampsia can be monitored and stabilised. It does not mean that you have to deliver. Once someone has passed through the "gateway" for admission to hospital for further investigations, albeit that she has a probability of having a systemic disease and a probability of that progressing, this is not then relevant to her management because these probabilities do not necessarily mean that she actually does have a systemic disease which is significant and severe and which is progressive to the point of requiring management based purely on the criteria of hypertension and proteinuria. He went on to explain that all areas of medicine have gateways into management and investigation. That management and investigation then sub-divides that group into different classifications. For example, if every woman with an abnormal smear had a hysterectomy because there was an increased risk of an abnormal smear leading to cancer there would be a lot of hysterectomies. Other investigations are required over and above the initial risk threshold that brings someone from the community into hospital. In relation to Professor Redman's chapter in Family Production No. 2/13, Turnbull's Obstetrics (2nd Ed), at page 454 to the effect that all proteinuric pre-eclampsia is severe, Professor Walker explained that this was related to ante-natal care. The definition of a severe problem in the ante-natal screening period was paramount that if proteinuria was present this was someone with a severe problem requiring admission to hospital. In relation to proteinuria, this points to a poorer prognosis for the baby and not the mother. It does not demonstrate increased risk for the mother. He went on to explain that pre-eclampsia is something that is a gradual thing that goes on for a long period of time. The pre-eclamptic process will probably have been going on and been fought and altered over a number of weeks or months before presentation of the proteinuric hypertension. He also made the point that the progression of the disease was slower the later it presented because the mother had compensated and was coping with the underlying process until that time. He did not like the concept of a fuse having been lit because that implied that something was burning and waiting to explode whereas the probability was that there would be no explosion. The vast majority of women did not have an explosion. You were trying to deliver prior to an explosion, but you are looking for signs to suggest that an explosion may occur. He thought he would have a reasonable estimate of how safe it was not to deliver on the information he would have at the time. If there was more information then it might change your decision. It just meant that on the information he had available and the assessment of the woman as now presenting he would not have to deliver now. He agreed that on the Tuesday there was a departure from good practice because a consultant or someone of senior grade did not see Ms Weir. He also agreed that on the Wednesday there had been a further departure from good practice because a blood test that was scheduled was not in fact taken. He confirmed that if he had had the test results available on the Wednesday afternoon the probability is that he would have taken a decision to proceed to delivery, by commencement of induction of labour, that day although there was no specific reason to deliver as she was stable and he would have been content that there was probably nothing else going on about which he would be concerned. However, at 36 weeks the balance of risk for her and the baby would mean that he thought it would be better off being delivered and that he would rather have had her delivered by the Friday so that there were not any problems over the

weekend. He would therefore probably have been arranging priming on the Wednesday evening for induction on the Thursday. You do not prolong a pregnancy to "wait" for signs of progression as a rule. You "can" prolong pregnancy and usually you can see the signs of progression by biochemical testing or other signs which allow you to intervene before an event occurs. At other times you plan a delivery even although there are no signs of progression because other factors come into play, whether for the baby's life or the mother's life or gestation. What is important before making a decision to intervene is that you have all the information so that you can make the right decision. If may well be that if there are signs of disease progression in the mother that a caesarean section would be the better form of management rather than induction of labour. Without knowing further information you cannot be sure of that. An induction of labour could be potentially very dangerous for the mother if you do it without adequate information on her clinical state. In this particular case, he went on to explain that if he did not make the decision on the Wednesday or at latest the Thursday he would probably not make the decision until the following Monday because of the weekend. The weekend is always a factor in the care of women in a maternity unit. Rather than put the woman through a full week of hospital even although she may well have managed that quite successfully with monitoring, he would not want to be in the situation of having to make a decision on a Friday night, for example, for an emergency delivery. He would rather have a planned delivery at a time that was considered best for the care of the mother and the baby. He would therefore in this case have taken the decision to deliver even in the absence of signs and symptoms of progressive disease if he had the biochemistry results and the 24-hour urine collection results. Mr Moynihan then put to Professor Walker that Dr Roberts was: -

"sitting and waiting for the actual crisis which occurred."

Professor Walker's response was that he thought the problem with that was that he would not have predicted that that event would have occurred. He therefore did not think anyone would have been "waiting" for that event. It was extremely unusual for someone to present in that way with completely normal biochemistry, and the biochemistry was even completely normal when she presented with pain. That was extraordinary. He therefore agreed that she had said that she was "waiting" for signs of progression. However, that did not mean that she was waiting for someone to have abdominal pain or headache or to convulse. She was waiting for signs from the blood parameters that may suggest this disease was progressing and therefore intervention should occur. Whilst he did not think that that was necessary in this situation he did not think that it could be presumed from her evidence that she was waiting for an acute crisis to occur. In this particular, case Professor Walker would have been wanting to intervene now because he did not want to have to intervene at a time that was less suitable for her care. It was therefore not prevention of a progressive sign that he was trying to achieve. He would not have been feeling that an acute event would have been what was going to happen. In all his experience, and in the experience of the literature, people do not develop HELLP syndrome without prior biochemical warning. There are some crises that could develop without biochemical warning, but with other signs of warning. He agreed that one did not take the biochemistry as the sole determinant. He agreed that systolic blood pressure was just as important as diastolic blood pressure as far as treatment was concerned in hospital, so that it would be wrong for a doctor to ignore systolic blood pressure in hospital. However, once she is in hospital the assessment of the blood pressure is related to what to do about the blood pressure. Her management in hospital depends on

how you manage that and whether you need to give treatment to lower it. His position was that the definition of mild pre-eclampsia was based on the level of blood pressure and not the level of proteinuria. Professor Walker was then referred to a passage from Turnbull's Obstetrics at page 461 by Professor Redman in Family Production No. 2/13 under the heading "When to deliver" which said:

"The timing of delivery is a matter of judgment, with few absolute guidelines to help the inexperienced clinician. However, all women who have either stage 3 pre-eclampsia or eclampsia should be delivered without delay once their condition has been stabilised. This must be done regardless of gestational maturity. In the rare instances where these problems present earlier than 26 weeks the decision is, in effect, one of late termination of pregnancy...There have to be compelling special reasons to leave women with proteinuric pre-eclampsia undelivered beyond 36 weeks. Indeed, after 34 weeks it becomes increasingly more difficult to justify conservative management. The same arguments can be transposed to women with definite non-proteinuric pre-eclampsia at 38 to 40 weeks. However, the practice of inducing all women with hypertension indiscriminately before term has little or no justification".

Professor Walker commented that people were not always delivered with stage 3 pre-eclampsia because people can settle on therapy and the classification of the risk can therefore change. If someone has a severe disease that is uncontrollable and cannot be stabilised then delivery is the only other option you have. The rushed delivery of someone with severe disease was equally wrong. In relation to the passage where Professor Redman said: -

"There have to be compelling special reasons to leave women with proteinuric pre-eclampsia undelivered beyond 36 weeks."

Professor Walker said that this referred to stage 2 pre-eclampsia by Professor Redman's definition. Professor Walker did not think that we could be prescriptive in this situation. He thought one had to consider the situation and assess it. It was a balance. He would agree that unless there was clear benefit from prolonging the pregnancy after 36 weeks then you are better off getting the lady and baby delivered. After 36 weeks your threshold for delivery is lower. The decision he would have made on the Wednesday to deliver Ms Weir, although on the balance of probabilities he feels that her pregnancy would have been fine and stable to the following week, on the balance of risk you would be better delivering her by the end of that week in case something did go wrong over the weekend that made it difficult. So he would have made that decision based on various factors, not just because she was 36 weeks per se. He described the idea of two lines on a graph of risk. The risk to the mother stayed the same really throughout her gestation. If anything, the risk to the mother of prolongation of pregnancy got less as the gestation increased, but the risk to the baby gets less far faster, and at some point these lines will cross which makes the risk to the mother relatively greater than the baby. It is not because her risk has increased, but because the risk to the baby has reduced. Professor Walker accepted that the reason for the "aggressive" school of thought was that by 36 weeks the balance of risk had fallen on the side of early delivery, taking into account the unpredictable length of time between someone seeming to

be normal and a critical event occurring. However, there were other bits of the equation he wished to put in, namely that there had not yet been a decision as to how she was to be delivered. If there was a decision for delivery by caesarean section the chance of her dying was far higher than 1 in 4,000 (which is the risk to the mother of prolonging the pregnancy). When it is put to him that Dr Roberts' school of thought is: -

"Even at 37 weeks she would have still waited for signs and symptoms of progression."

he said that he did not subscribe to that school of thought. He made the point that Professor de Swiet did not say that you must deliver immediately when she came into hospital. Professor Walker's point therefore is that there has to be some sort of timescale over when that decision is made. It is a matter of degree of when that decision is made. What he would have said on the Wednesday was that on looking at all the parameters there was no specific reason to deliver her then any more than the day before or the day before that because there had been no change in the information and she was stable. However, that did not mean that you waited another week. In relation to symptoms, they should persist and be linked to other signs that explain why they are there because they do not necessarily forewarn anything. He agreed that someone with "symptomatic" proteinuric pre-eclampsia would be regarded as a very high-risk type of patient. He agreed that he would interpret the visual disturbance on the Tuesday as being indicative of systemic disease and as having something to do with her disease process. It was probably a symptom of her underlying condition. However, he did not agree that Ms Weir was manifesting "symptomatic" disease, because the symptoms were not persistent. They went away and had no associated parameters such as high blood pressure, which is what they would have been looking for. It is a factor you take into account but you would want confirmation of other things going on. He would want further information on biochemistry to see what sort of progression was actually happening so that he could make a decision on mode of delivery. He does not agree that this would be entering the third phase referred to by Professor Redman, because it is not persistent. You take the symptoms into account but you do not necessarily think that she has probably got so much worse because, clinically, she has not got worse as there is no evidence of high blood pressure and the symptoms have gone away. He would view this as a potentially serious condition that needed to be closely monitored rather than saying that she needed to be delivered immediately as an obstetric emergency. If there was high blood pressure you would in the first instance lower that with an anti-hypertensive drug. In that event, there would be no need to deliver on an emergency basis. Urgent delivery in someone who is unstable is extremely dangerous. Delivery does not solve the maternal problem immediately. Instigating emergency caesarean section increases the risk of death for that mother over vaginal delivery. All these risks therefore have to be balanced. He therefore agreed that all the symptoms were important, that you would be concerned and that you would have to monitor this lady very closely. However, none of these things was absolute. He agreed that if one ignored the symptoms as being unrelated to pre-eclampsia that could lead to a disaster if he did not take the appropriate action by observation and monitoring. The flashing lights was a parameter that could potentially have been a prodromal marker of an eclamptic convulsion. That is what you are trying to prevent. That did not happen in this case. He thought it important that a senior doctor should have assessed the situation. If she had had flashing lights on the evening of the Monday and then again on the Tuesday morning that was more concerning because these were two visual disturbances within a reasonable timescale implying recurring symptoms. If the account had been of two

episodes of visual disturbance within a 12 hour period, a decision to commence priming on the Tuesday evening might have been taken on the Tuesday. He would have less concern if they occurred within a 24-hour period than he would do if they occurred within a 12 hour period because they are more likely to be associated with a similar event if they occur within a short timescale. It is the same with blood pressure readings. The symptoms need to be close enough together to be linked to be persistent. If they are too far apart they are not necessarily persistent. Here they were more than 12 hours apart. The fact that she was not delivered for 48 hours and did not develop eclampsia means that this sign did not herald an increased risk of that event. In his opinion, this visual disturbance and the high blood pressure on 21 October 1999 were unrelated. There were no other signs associated with it. She was not particularly hypertensive at the time. Although it has to be taken into account, Ms Weir had not gone through the threshold from being a proteinuric hypertensive to a "symptomatic" proteinuric hypertensive because the occasion was not "hard" enough. A passage of evidence from Professor Stirrat was put to Professor Walker, where Professor Stirrat had said that since no case of pre-eclampsia was typical, all of them by definition must be atypical. Professor Walker commented that most pre-eclampsia is typical. Most pre-eclamptics present in certain ways. By definition, most pre-eclamptics must be typical because if they are atypical you would have to write a guideline for every single pre-eclamptic scenario that exists, so the assumption is that the majority of women presenting with pre-eclampsia are typical and have typical presentations and they have typical risks. There are those who present in a way atypically. Professor Walker has looked after about 5,000 women with pre-eclampsia. He has never seen someone do this. He agrees that this is something that can happen and has to be in the back of your mind but it is an extremely unusual case. The problem is if you change management to rushing in to deliver somebody who appears with similar parameters as Ms Weir did you will potentially increase the morbidity for the women and the babies that are there. It was put to him that there is a danger if junior doctors and non-expert consultants wrongly equate the majority of women to what normally happens they will have diminished vigilance because they will not be preparing themselves to take up those rare occasions where someone abnormal is occurring, Professor Walker said that he did see that as a potential lesson to learn from this case. He also said that to some extent there had been a systems failure in that there were certain things not done precisely that should have been. That happens because no systems are perfect. One of the lessons that can be learned is that a consultant or a senior person should have seen her on the Tuesday. On balance, he would have brought forward the start of her induction to the Wednesday evening. The mortality rate for Mother's in this country is now of the order of 5 per annum.

In cross-examination to the procurator fiscal depute, Professor Walker explained that he had a problem with the words "stuttering nature" in relation to Ms Weir's progression which had been used by Professor de Swiet as that implied that there was an inevitable progression, like a lit fuse. In pre-eclampsia that did not necessarily occur. He would not see the Tuesday morning visual disturbance as a burst of activity because there was not enough happening to use that analogy. He has never seen someone who is so stable in hospital produce such a sudden event prior to delivery. Looking at all the literature and in his experience results can tell you how a woman is going to progress. That does not necessarily mean that you do not deliver but it means you do not expect an acute event such as occurred on 21 October 1999. The blood results remained normal until after the acute event. Even at the time of the event they were basically normal apart from a very minor rise in the ASP and bilirubin. Normally he would want blood tests to be repeated about 24 - 48 hours after initial blood tests in the Day Care Unit. If they are still normal she has not got a strongly progressing disease. If he had

been seeing Ms Weir on the Wednesday afternoon he would have wanted to know whether the blood tests had been done. If they had not been he would have asked for them to be checked the following day for review then, as Dr Roberts had done. He confirmed that one of his concerns about a decision on the Wednesday was the greater chance that the completion of the delivery process would take place on the Friday afternoon.

In relation to the guidelines he has been asked to draft by the Royal College on pre-eclampsia, his fear was that to some extent these guidelines would largely be based on opinion of experts apart from things like the use of anti-hypertensive drugs where there is good evidence. He told the Court that the problem was that in relation to things like the decision when to induce there is no evidence. All the evidence that there is, which is in favour of prolongation of pregnancy, is on early gestation data whereas he said that one's feeling as a specialist was that you do not want to prolong pregnancies too long if there is no benefit from it. He then said: -

"So you need to give some form of advice, as Chris Redman has done, but I couldn't write what he has done in his chapter, because that is not evidence-based so I would have to give an opinion based on a range of opinions of what is acceptable practice. Now, the only way to improve that would then be to audit the results of the guidelines to see what the outcomes are...you cannot say someone must be delivered immediately on admission. What we will say is "You should assess the pregnancy, you should assess the situation, you should stabilise the mother and delivery in the best way on the best day. And that is a clinical decision. There is no evidence that we have or guidelines we can give to tell any individual clinician whether any individual woman should be delivered on any particular day.""

In relation to the Tuesday, a senior doctor should have been notified and should have come to see her that afternoon. He would have expected a consultant or senior registrar to have come to see Ms Weir within the next day after admission, although that may not have been within 24-hours.

In re-examination to Mr Donald, Professor Walker said that on the Wednesday he would have wanted to have thought about starting the delivery process, not because it was necessary, but because on balance he would have felt that he would not be trying to prolong the pregnancy into the following week and he would have wanted to try to avoid the weekend. Therefore, pragmatically, you start the induction process on the Wednesday evening to allow the process to be completed by the Friday evening. There may have been other factors which would have meant that the wrong decision, such as availability of space within the labour ward. Such things would have meant that he would have been happy to delay the decision to the following day, the Thursday. That was still within his comfort zone. However, waiting until the following week would not have been. He thinks that if he had been in Dr Roberts' situation without the results there on the Wednesday he might well have made the same decision she did, namely to delay the decision until the Thursday when the results were available. In relation to the question of shades of opinion or schools of thought, he thought that within the UK there were people who follow his thinking on managing hypertension and those who follow Professor Redman's thinking on management of hypertension in pregnancy. Over the years these differences were a lot less than they were,

the main difference being what drugs are used. Professor Walker also thought that in relation to the visual disturbance on the Tuesday, it was necessary to remember that the people putting a lot of emphasis on that event were people who were coming from the thought that Ms Weir should have been delivered anyway, and therefore the sign they saw that day was confirmation of the belief they already had that this was a problem that needed to be intervened with. He however was coming from a situation where he did not think that this was a problem that required to be intervened with at that time. So when an event occurred he did not just assume a blanket response. He wanted to find out why the event occurred, what it meant and were there other signs such as high blood pressure requiring therapy. It was transient. She felt well. There was no change in her blood pressure. There was no change in the biochemical parameters. She was a stable pre-eclamptic. That did not mean that she had no risk. It did not mean that she would not progress, but at that point in time there was no evidence to change his opinion. In relation to symptoms, for example, two blood pressure readings more than 12 hours apart cannot make a diagnosis of pre-eclampsia. So therefore two symptoms more than 12 hours apart similarly cannot be linked together, but you have to ask why are we having these symptoms, what does it mean and what is producing them. So you look for evidence of raised blood pressure if you have got visual disturbance. If it is not there you think that it cannot be a significant problem because the visual disturbance in itself is not dangerous. It is what it might imply that is dangerous. The incident recorded by Dr Solanki was he confirmed clearly outwith the 12 hours before 11.30 am on the Tuesday morning.

Professor Baker:

Professor Baker emphasised the unpredictable nature of pre-eclampsia. His approach is that after about 34 weeks if a diagnosis of pre-eclampsia is made he would want a good reason why the baby was not being delivered. He said he would want there to be a clear rationale for not delivering after 34 weeks once the diagnosis has been made. He said there would be few patients under his care with pre-eclampsia after 34 weeks. However, he said that that would not necessarily be the opinion of all obstetricians within the country and went on to say: -

"I would accept that I have a particular view in relation to the management of pre-eclampsia."

The confirmation of pre-eclampsia to him would be sustained hypertension in the presence of significant proteinuria. He said that a dipstick test was a screening test that determined whether more investigations were required. The normal dipstick test was not a particularly accurate test. A patient with "proteinuric hypertension" should be admitted to hospital for investigation and vigilance. The first thing to do is to establish the diagnosis. You cannot establish that diagnosis by one blood pressure measurement. With a patient admitted to his hospital they would commence a 24-hour urine collection and there would be 4 hourly pulse and blood pressure measurements. They would also test renal function by a blood test and a patient's liver function in the same way. They would then test the baby to see if there was a problem from the foetal side. It is preferable to have a vaginal delivery as compared to a caesarean section. His own practice reflects his belief that there is little to be gained by waiting once the diagnosis is made. There is little evidence to suggest that continuing while

there is pre-eclampsia, where the baby is not in a good environment, that babies do better left within the uterus. He would tend to suggest that babies would do better with delivery because of the unpredictable nature of the condition, which can deteriorate unexpectedly. He accepted that his view was not one reflected by all of his colleagues, not even within his hospital. He then said: -

"There will always be cases, grey areas, which would be managed differently by different obstetricians."

He takes the view that if you do not deliver, the disease will inexorably progress. The rate of progression is variable, but it will progress. In delivery it is quite common to see patients deteriorate following delivery. In relation to guidelines for pre-eclampsia, they would have to be flexible because patients present in a tremendously varied way at different gestational stages.

Professor Greer:

Professor Greer's opinion is that any patient with symptomatic pre-eclampsia should be delivered as a matter of urgency. A patient with severe disease (which he defined as meaning a significant amount of proteinuria with "high blood pressure" indicating that it had reached a significant stage in the variable disease process) should be delivered if the foetus is both viable and mature (namely between 34 and 36 weeks' gestation) when the risk of continuing the pregnancy in such a patient far outweighs the very small risk of minor pulmonary lung problems for the baby being delivered slightly earlier than scheduled. He was not asked to define what he meant by "high blood pressure". Significant proteinuria is more than 0.3 grams in a 24-hour collection. He would rarely do a 24-hour urine collection. In the management of a case you would consider both diastolic and systolic blood pressure. Whilst diastolic is used for "definition" of the condition, in practice he considers both. In relation to the question of delivery, it is critically important to take into account the overall patient situation, namely her age, how many previous pregnancies, what gestation she is at, how severe the disease is, any evidence of liver dysfunction since proteinuria has developed and whether the baby is well-grown and happy. All would be weighed up to come to an appropriate management course.

In cross-examination to Mr Moynihan he confirmed that the cause of pre-eclampsia was unknown, but that there were a number of risk factors. If there is significant proteinuria that in itself indicates that the disease is severe. When symptoms arise you are moving into the third phase, of which you generally get very little warning. Headache and flashing lights are consistent with the third phase and are a warning that the condition may now be affecting the brain. Pre-eclampsia is one particular form of high blood pressure in pregnancy associated with proteinuria. To make it clear that it is the proteinuric type of condition, he sometimes uses the expression "proteinuric pre-eclampsia". He entirely agreed with a passage by Professor Redman under the heading "Mistakes that are commonly made in diagnosis" in Family Production No. 2/13 at page 454:

"The commonest mistake is to discount a raised blood pressure and ascribe it to nervousness. Systolic readings should not be ignored: a pressure of 160/80 needs to be viewed with the same caution as 140/90. Ante-natal screening not infrequently fails to include urine testing or at least a record of the result if the test is done: this is an unacceptable omission. The importance of proteinuria is often under-estimated if it is associated with moderate hypertension. Such presentations are frequently labelled as mild pre-eclampsia, whereas all proteinuric pre-eclampsia is severe. The significance of abdominal pain and vomiting may be dismissed, particularly by general practitioners, who encounter such symptoms every day in their non-pregnant patients with trivial problems. All too often the complaints by the patient of prodromal symptoms are not heeded, even by specialist staff; as elsewhere in clinical practice, the patient tells you the diagnosis. Jaundice is a rare and regularly misunderstood presentation. Finally, clinicians still fail to appreciate that the unseen complications of the disorder may be worse than those that are visible (hypertension and proteinuria). This is particularly true of the foetal, coagulation and hepatic complications."

Professor Greer went on to say that when systolic pressure is above 160 it must not be ignored. He agreed that once proteinuria is at a significant level, all proteinuric pre-eclampsia is severe. His opinion is that there is no such condition as "mild" pre-eclampsia because once proteinuria is established it indicates damage to the organs in the body. If somebody develops pre-eclampsia at 24 weeks you may try to progress the pregnancy as much as possible: -

"In contrast, if you are at 36 weeks or so, because the baby is more mature we don't need to gain that amount of time, and you would be less likely to adopt a conservative management plan."

Conservative management means you are not delivering the patient but you are continuing with the pregnancy. At another point he said that in view of the risks to the mother, conservative management was rarely if ever indicated in severe disease beyond 34/36 weeks' gestation. By that time his emphasis would be to organise the delivery as soon as possible. His opinion was that once proteinuria was significant (meaning two ++ or more on a dipstick), unless you had a very good reason to ignore dipsticks, you would manage the patient based on the dipstick test alone. However, he accepted that some of his colleagues would in circumstances such as this case go for a 24-hour urine sample to get a confirmation of the diagnosis. He agreed with Professor Redman that delivery was required before the patient herself began to feel unwell because pre-eclampsia has no symptoms until it reaches the tertiary stage. It has signs, the only two reliable ones being high blood pressure and proteinuria. That is why they are focused on. The patient will only experience a feeling of being unwell, with symptoms, when there starts to be significant damage to organs which she is not coping with. His position was that for there to be "symptomatic" disease, symptoms did not require to be persistent. This is because the disorder does wax and wane in terms of how it is affecting the individual at any given moment. In other words, you do not have continual visual disturbance. It will be intermittent, as the brain briefly seeks to cope with the stress it is under and the damage that has occurred to it. Eventually, you may get a problem such as eclampsia where the woman has major convulsions, but they want to stop

things before that. He would therefore not anticipate that the symptoms would be completely persistent. They might be recurrent but not persistent in a continual sense. If the patient has elevated blood pressure and significant proteinuria and has a history of other symptoms, you have to assume, until you prove otherwise, that these symptoms are related to pre-eclampsia. The presence of such symptoms would influence your management plan for delivery. He went on to say: -

"If these symptoms are significant (my emphasis)...this is symptomatic pre-eclampsia, an obstetric emergency, and the patient should be delivered urgently."

An example was then given to Professor Greer that included an account of an admission to hospital with an account of headache, visual disturbance and two episodes of vomiting over the immediately preceding weekend. He said that he would have wanted to try and look at the symptoms and make sure there was no alternative cause. If the symptoms came over as being genuine, and there was no other cause, he would be concerned that she did have symptomatic pre-eclampsia. If she was feeling well at that time he would seek some corroboration by laboratory assessment but he would be thinking about delivery. If he was concerned about her symptoms and she had significant hypertension (which he did not define) and proteinuria he would probably have been thinking about delivery that evening. If the symptoms had all resolved or there was some doubt about them he would have wanted to get a fuller assessment of the situation certainly overnight or possibly as long as 24-hours and re-assessing her biochemical parameters the following day. Simply because the biochemistry and haematology the next day was normal does not exclude the fact that she has got pre-eclampsia. You still cannot ignore the proteinuria or hypertension, or the symptoms, because these can occur even with a relatively normal biochemistry. If there is an account of a further visual disturbance that is brief, limited in time, he said that he would look at the quality of the information that was obtained. Ideally, he would go and see the patient himself and listen to how she described the visual symptoms. If convinced that they were consistent with pre-eclampsia, there were now several sets of symptoms from Mr Moynihan's summary as well as a diagnosis of pre-eclampsia based on proteinuria and hypertension. Unless you can find a reason not to attribute symptoms like that to pre-eclampsia, at 36 weeks' gestation, with "symptomatic" pre-eclampsia, the only management is to deliver the patient. That would be within hours. For symptomatic pre-eclampsia most obstetricians would probably go for caesarean section, particularly when it is a first baby, as you do not know how successful labour is going to be.

In cross-examination to Mr Donald, Professor Greer said that it was difficult to formulate guidelines on the management of pre-eclampsia at earlier stages than those where it has reached the stage of being severe hypertension, eclampsia or fulminating pre-eclampsia because of the large number of variables. That makes protocols for the precise management difficult. They would be extremely convoluted and it would in his view probably be best to have principles of management rather than protocols. At 36/37 weeks if you have hypertension and proteinuria but in the absence of symptoms what he would do is make a fuller assessment of the woman's condition to confirm the hypertension, the proteinuria and obtain more information from biochemistry. You do not just deliver because in the first instance you want to confirm your diagnosis. To define proteinuria properly you need at least two dipsticks 4 hours apart at least. He agreed that the length of time taken to assess the

patient would be determined by the presentation of the patient. He confirmed that there is a distinction between classification of the type of condition that the patient has and the devising of a management plan. He went on to say: -

"Classification has implications for management but the classification system is not the only thing that management is based on. For somebody at 36/37 weeks with hypertension and proteinuria the management is delivery, and one focuses then on the timing of it."

The timing of delivery will be dependent on factors such as how severe the patient is perceived to be. If she has reached the third stage where her organs are no longer coping, delivery is very urgent. If she is still in the second phase where there is evidence of the kidneys being upset but no other symptoms you have some time to organise for it. In that event there are many who would induce labour. He would talk to the patient and see what she would like. He accepted that many clinicians with a dipstick finding would seek to confirm the diagnosis with a 24-hour analysis. The main issue regarding delivery is to recognise whether the patient has progressed to the third phase, indicating an urgent situation. He thinks that a dipstick when repeated and with high levels of protein showing is reliable for the diagnosis of proteinuria in a patient with pre-eclampsia. He said that there are arguments both ways about how accurate the 24-hour urine collection was. He also said that you would need a very good reason to continue with a pregnancy at an advanced gestation where there was a slight rise in blood pressure with three +++ of proteinuria on a dipstick, from 34 weeks onwards. You first have to make a diagnosis of the condition and then decide what you are going to do as a clinician. In relation to the time it takes to gather information and to make the diagnosis, the key issue is whether the patient has symptoms. If the patient is asymptomatic it would be perfectly reasonable to assess the situation at least overnight and perhaps as much as over 24-hours. If proteinuric pre-eclampsia is confirmed you are then looking at the process of delivery. In his opinion, the overall risks from delivering a baby at 37 weeks in the context of the risks from pre-eclampsia if you continue the pregnancy are "undoubtedly trivial".

I have deliberately set out at reasonable length a summary of the principal views of the expert witnesses. In my opinion, each of them explained the rationale for the particular approach favoured by them on the basis of their respective experiences and areas of expertise and I could understand the basis for their respective points of view. The range of views expressed by them and explained by each of them appeared to me to be capable of being, and indeed was, logically supported. Mr Moynihan did not suggest that any expert witness other than Professor Walker should be rejected on the basis of having been illogical and unconvincing.

Should Professor Walker's evidence be rejected?

At page 86 of his written submission Mr Moynihan said that "some considerable caution" required to be taken with Professor Walker's evidence. However, at page 116 he went on to invite the Court to "reject the evidence" of Professor Walker. As I understand it, this was on the basis that his evidence was not "logical and convincing". In other parts of his submission

Mr Moynihan nevertheless relied upon certain passages of evidence given by Professor Walker where these fitted with the position for which Mr Moynihan wished to argue.

So far as Professor Stirrat was concerned, he had found aspects of Professor Walker's report illogical and difficult to understand. For example, he had not understood the logic of what Professor Walker had said at page 23 of his report where he had said: -

"The presence of proteinuria confirms the diagnosis of pre-eclampsia and therefore increased risk but it is not a paramount sign as far as management is concerned...it does not grade the severity of the disease or help you time delivery."

Mr Moynihan submitted that he was also "baffled" by Professor Walker's evidence that: "Once they are in hospital they start from a zero state again as far as risk is concerned because they are in hospital with a certain risk classification..." However, Professor Walker explained in evidence that there are certain risk factors which are relevant for screening, but which were not paramount so far as management was concerned, because they are risk factors for developing the condition (pre-eclampsia) but they are not risk factors of maternal morbidity or death as a consequence of having developed the condition. Further assessment was therefore required to assess the risks of such maternal morbidity or death. Put another way, as I understood his position, just because someone had pre-eclampsia did not mean they would necessarily have such consequences. He agreed, for example, that the presence of proteinuria puts a woman into a high-risk category as compared with a woman who does not have proteinuric hypertension (namely, only having hypertension). However, he went on to say that proteinuric pre-eclampsia is then divided further, relative to the group of proteinuric pre-eclamptic women, into mild, moderate and severe. Consequently, a woman with proteinuric hypertension but relatively normal blood pressure and normal blood parameters is by definition, in that sub-grouping of proteinuric pre-eclamptic women, in the category of "mild". He went on to say: "It does not mean that she has got no risk, but it means that she has got less risk than someone who is severely pre-eclamptic who has other signs such as high blood pressure and abnormal biochemistry and persistent clinical signs." In this case, his view was that Ms Weir would be classified as "a mild proteinuric pre-eclamptic patient and therefore low risk as far as proteinuric hypertensive patients go". She was still however a "high risk" patient, as are all patients in an ante-natal ward as that is why they are there being assessed and monitored, with a view to confirming the diagnosis and deciding on delivery "on the best day in the best way" rather than being managed on an out-patient basis. His position was that he did not assume a "blanket response". He would rather try to find out why something had occurred and what it meant to the individual. I also noted incidentally that Professor de Swiet acknowledged that an increase in the degree of proteinuria was not necessarily a reason for delivery. He accepted Professor Walker's opinion that if you have a base level of proteinuria then a greater amount of protein is not necessarily itself of prognostic significance. This seemed to me to be what Professor Walker was in effect saying in the passage in his report at page 23 with which Professor Stirrat had had difficulty in terms of logic. Professor de Swiet's position was that, put simply, if people have pre-eclampsia with proteinuria they should be in hospital. In other words, he was not saying that in such circumstances they should necessarily be delivered.

Professor Stirrat also did not understand Professor Walker's logic in stating what he did about the causality of death from HELLP syndrome (namely that she did not die of the HELLP syndrome) and then considering that it would not have made any difference had Ms Weir been delivered earlier. Again, Professor Walker explained the position about this at some length in his evidence (which came after that of Professor Stirrat) and in my opinion he was readily understandable and logical. In particular, he pointed out that for a period of up to 48 hours after delivery there is a known risk of a woman developing all complications from pre-eclampsia, not just the HELLP syndrome. This therefore included the risk in that period of a hypertensive crisis. He explained that blood pressure in a woman post-delivery was generally higher at 24 hours after delivery than it was beforehand. I note incidentally that the other experts to whom Professor Walker's report was put, namely Professor de Swiet and Professor Calder did not express any such difficulties in understanding what Professor Walker had said. Professor de Swiet said that he differed from Professor Walker in relation to two aspects of Professor Walker's report but he made no suggestion to the effect that Professor Walker was being illogical. Unlike Professor Stirrat, I had the advantage of hearing Professor Walker explain in evidence what he had meant by this second passage with which Professor Stirrat had expressed difficulty. I have to say that I did not have any difficulty in understanding his position in relation to this point, and also in relation to other points upon which he was subsequently challenged by Mr Moynihan.

Mr Moynihan submitted that neither Professor Walker nor Dr Roberts had attached any weight to the results of the 24-hour urine collection. I do not accept that this was a fair interpretation of the position of either Professor Walker or Dr Roberts. The implication of the submission, coupled with a submission in Chapter 8 to the effect that the doctors at the Queen Mother's Hospital "did not need to gather information", was that the doctors should have been proceeding by use of dipsticks alone. However, even although it is correct to say that Professor de Swiet expressed the view that at the gestation with which the doctors were concerned in this case they "can" proceed on a dipstick test, it is in my opinion a different matter to say that they "should" have done so. Professor Walker explained the merit of the 24-hour collection as compared with the dipstick approach. Professor de Swiet agreed that although he would have "been prepared" to make a diagnosis of pre-eclampsia on +++of proteinuria on a dipstick it would be reasonable to wait as at 18 October for a 24-hour urine collection, the results of blood tests and some further observations of the clinical course. Professor Stirrat also said that he would have preferred to have had a quantification rather than a dipstick test.

Mr Moynihan also submitted that Professor Walker's approach to risk assessment was flawed. However, it also seems to me that he overlooked an important feature of the approach advocated by Professor Walker, and Professor Calder, namely that of the need first to establish the diagnosis. The next stage is to decide when and in what way delivery should be achieved, in the best interests of both mother and baby, and that by obtaining adequate information on the clinical position. Professor Walker explained that the modern management of pre-eclampsia was based on the assessment of the woman and baby and the necessity of delivery. They were in this way getting a "better handle" on what was going on in the condition rather than taking just two fairly arbitrary parameters (hypertension and proteinuria), which are now used as a gateway, but not necessarily the definitive decision-making parameters. He went on to explain that it was important to know what disease you were monitoring and looking after because intervention, particularly induction of labour, can

and probably will make someone worse if they have that progressive disease at that time. If he has better biochemical and haematological information on her he has a better idea of what the possibilities would be of her condition worsening during induction and labour. It might be that the signs would tell him that induction of labour was the wrong approach and that caesarean section, albeit that it carries its own risks of mortality to the mother (particularly if it has to be done as an emergency due to a failed induction), would be better. Professor Walker's concern was that at the stage when Professor Stirrat said he would have been deciding to proceed by priming for induction there was not enough information upon which to make that decision. In such a situation you have he said no idea what problems you might encounter and what the risks of emergency caesarean section may be in someone who was already at high risk. If on the other hand there are signs of disease progression then a caesarean section may be the better form of management. An induction of labour could potentially be very dangerous for the mother if you do it without adequate information on her clinical state. I accept Professor Walker's evidence in relation to his approach, and the rationale for it. I am not satisfied that his approach to risk assessment can be said to be flawed.

Mr Moynihan also founded on a part of a passage in Professor Walker's report where he had indicated that to "continue to observe and intervene when signs suggest that the disease is progressing is the correct management decision". This was on the view that he had told the Court in his evidence that he "would" have decided on delivery on the Wednesday in circumstances where there had been no new evidence to indicate progression of the disease. I agree that, on the face of it, that passage is puzzling in that he explained things somewhat differently in evidence, as I mention below. However, Professor Walker's position about what he might have done was I think not quite as straightforward as saying that he "would" have decided on delivery on the Wednesday. What he had indicated was that if, in an ideal world, the test results had been available on the Wednesday (which they were not) he would probably have taken a decision that day to proceed to induction of labour. He went on to explain just why it was that he would probably have done that in the circumstances then being discussed in evidence, as I mention two paragraphs below. Unfortunately, he was not specifically asked about the passage I have just quoted in the course of his evidence. I therefore do not know what his explanation about it would have been. However, what I do know is what he explained in his evidence, and it seemed to me that his position was readily understandable and logical, although I recognise that others take a different approach on a different logical basis. It seemed to me that it was again a product of, and depended on, the "school of thought" from which one came.

Mr Moynihan also founded on a passage in Professor Walker's evidence where he had indicated that at 36 weeks the balance of risk for Ms Weir and the baby would have meant that he would have thought that the baby would have been better off delivered, which Mr Moynihan suggested was an acceptance by Professor Walker that "at this gestational age there is simply no (my emphasis) benefit in delaying". It is not clear to me that Professor Walker was really going as far as this. Indeed, I do not think that any of the experts suggested that there was no benefit from allowing the pregnancy to continue further, as there was evidence to the effect that this can enable a foetus to achieve further maturity. In relation to the balance between the risks associated with continuing the pregnancy as compared with those associated with intervening, the way Professor Walker put it was that he preferred the idea of two lines on a graph of risk. The risk to the mother remains the

same really throughout. If anything, the risk to the mother of prolongation gets less as the gestation increase. The risk to the baby gets less far faster. At some point these lines will cross. It s not because to risk to the mother has increased but that the risk to the baby has reduced.

I also note that the passage to which I have referred concerning the balance of risk at 36 weeks appeared in the context of explanations by Professor Walker as to why (if in an ideal world the test results had been available on the Wednesday, which they were not) he would probably have taken a decision that day to proceed to induction of labour. The wider picture of factors to which he was referring included (a) the assumption that all the test results were then available (to provide adequate information on the clinical state), (b) contentment on his part that Ms Weir was stable but (c) that he would not have wanted her pregnancy to have gone on until the following week in case something did go wrong over the weekend. Consequently, although he would have felt that there was no actual need to deliver he would on balance probably have decided to arrange things so that delivery could have been achieved by the Friday. He explained that he would therefore have been making that decision on various factors, not just because she was 36 weeks per se, but on the balance of information he would have had, on those assumptions.

In relation to his position about observation and intervention, Professor Walker went on to explain, in the context of a woman who had turned 37 weeks gestation on the Wednesday that you do not necessarily wait for signs of progression. In other words, you do not prolong a pregnancy to "wait" for signs of progression as a rule. However, his position was that you can prolong pregnancy and usually see such signs by biochemical testing or other things that allow you to intervene before a serious event occurs. However, at other times, you plan a delivery although there are no signs of progression because other factors come into play. In this case, his position was that the weekend issue would have come into play. This was also all in the context of his approach that it is important to know what disease you are monitoring and looking after because intervention, particularly induction of labour, can and probably will make someone worse if they have that progressive disease at that time. It is for that reason that information on the accuracy of the diagnosis is important to have prior to embarking on an induction policy. In this case, he explained that there was information on Ms Weir on her admission that she had hypertension but that it was not bad enough to treat; although she had proteinuria that simply confirmed that she was proteinuric and was therefore pre-eclamptic; the biochemistry and the haematology were normal and there were no signs of acute risk or progression. Delivery is not delayed for the sake of it. The idea is to gain more information to assess the position and timing of delivery. He takes the view that as long as things are stable it is wrong to rush to delivery without knowing exactly what is going on. For example, it may well be that if there are signs of disease progression that a caesarean section would be the better form of management rather than induction of labour. Against that background though, his position was that unless there was clear benefit from prolonging a pregnancy beyond 36 weeks, you are better off delivering the baby.

At another point in his submissions, Mr Moynihan suggested that in arriving at his opinion Professor Walker had not directed his mind to the comparative risks but only to the question of the risks of premature delivery (the suggestion therefore being that he had ignored the question of the risks associated with prolonging the pregnancy when pre-eclampsia is

present). I do not accept that that is a correct or fair interpretation of Professor Walker's evidence. For example, he was the witness who drew attention to the fact that the risk of maternal mortality in pre-eclampsia is in the region of 1/4000. Indeed, elsewhere in his submission, Mr Moynihan relied on Professor Walker's evidence to this effect. In any event, Professor Walker specifically explained that you had to balance the risk to both mother and baby of prolongation of pregnancy as against the risk of delivery as regards morbidity for both. He explained that, as in all areas of high-risk obstetrics, it is trying to deliver in the best way on the best day, and that is a clinical decision based on the risks of intervening against the risks of not intervening. So far as the risks to the baby are concerned, Professor Walker agreed that the risk of delivery had to be contrasted with the risk of the baby remaining in utero where it might be compromised. As far as risk factors are concerned he explained that proteinuria is more important as regards the baby than the mother. Professor Calder mentioned this as well, when he explained that with proteinuria the disease begins to impact on placental function. Professor Walker explained that what was important was to assess the well-being of the baby using tests such as liquor volume, ultrasound, biophysical profile and CTG testing. He explained that it is a sign of poor foetal well-being that will influence the obstetrician's decision making, not the size of the baby. If the findings are abnormal that means the in utero environment is hostile, so the baby may be better off being delivered. It is a balance. His position was that if a baby is healthy, albeit small, it is not necessary to deliver at that time. In the present case, all the well-being tests were being done and showed good scores for the baby. In the event also, the baby appeared to cope well with the acute event without any evidence of significant distress. She was also born in a good condition, as confirmed by Dr Turner.

Mr Moynihan was also critical of what appeared to him to be a concept of a "minimum length of fuse" on the part of Professor Walker. Professor Walker had indicated that you have a fair estimate of how progressive the condition is on the information you have. He explained this by saying that if there were signs of elevation of liver function tests, low platelet count and high uric acid then you can say the woman is progressing and will progress fast. If however all the parameters are normal then you can say that it is a slow burning fuse, and you would assess things to see how severe the problems were. It does not mean that you do not need to deliver for a set time. It just means that on the information he has and on the assessment of the woman now, she does not need to be delivered now. I notice, incidentally, that Professor Stirrat seemed to have a similar concept in his evidence when saying that as at the Tuesday he would have felt that there was a 48 window within which he thought it would have been very unlikely that anything would happen. That is why he would have been having in mind delivery within that period at the outside from that point.

Professor Walker was also criticised for saying in cross-examination to Mr Moynihan:

"The problem is if you then change the management to rushing in to delivery for someone who appears with similar parameters as Sharman Weir did then you actually will increase the morbidity potentially for the woman and the babies that are there..."

The criticism, in submissions rather than in cross-examination, was on the basis that Professor Walker had failed to back this statement up with comparative statistics. However,

it did not seem to me that Professor Walker was really saying anything very different to Professor Calder, when he had cautioned against intervening every time there was one sign of trouble without clear evidence that allowed a balance of the benefits of intervention against conservative management, and that although interventions were the key to good obstetric care they had to be applied with appropriate assessment of the benefits and risks of carrying them out.

On the question of data at the gestation concerned in this case, Mr Moynihan is correct to point out that there are no data supportive of prolongation of pre-eclamptic pregnancies. Professor de Swiet said:

"...we have already alluded to the fact that there is a range of opinions with regard to the timing of delivery in proteinuric pre-eclampsia. So it would be perfectly possible to find people who would employ a conservative approach, and to find experts that would support that. It is interesting that there are no controlled trial data to support that, but there are controlled trial data that look to a conservative approach to pre-eclampsia developing at 28 to 30 weeks. But there are no controlled trial data at this gestation, and I believe the reason for that is it would be considered unethical to do so".

It would therefore appear from what Professor de Swiet says that there is simply no data either way at this gestation. Indeed, that would appear to fit with Professor Walker's evidence to the effect that the Redman advice is not "evidence based" and that such an absence of evidence was part of the problem that he and his fellow drafters would have in trying to draft parts of guidelines for the Royal College, such as any part dealing with the question of when to deliver.

Mr Moynihan correctly reminded me that Professor Walker had provided a statistic relevant to the debate, namely that the risk of maternal mortality in pre-eclampsia is 1 in 4000. Mr Moynihan suggested in submissions that this statistic should be compared with a risk of mortality to the baby due to respiratory distress syndrome ("RDS") of 1 in 65,000, in order to get an insight into the considerable order of difference in the gravity of risk associated with a prolonged pre-eclamptic pregnancy. It is unfortunate that this, and the basis for the figure of 1 in 65,000, was not put to Professor Walker for his comment. However, in the light of the evidence that I heard about the figure of 1 in 65,000, it is not clear to me that these two figures are necessarily appropriate comparables. The figure of 1 in 65,000 was discussed with Dr Turner in his evidence. It had come from a passage in Family Production 2/18. He agreed with Mr Moynihan in cross-examination that this was a figure for death of babies due RDS relating to the general population of births, and not just related to pre-eclamptic pregnancies. Professor de Swiet was referred to Production D11 as well in this connection. He confirmed that the figure of 1 in 65,000 was a figure for the risk of death in the general population of births by elective section attributable to respiratory distress. However, Ms Weir's pregnancy was a pre-eclamptic pregnancy and it was not an elective section. In view of the fact that this was not put to Professor Walker for his comment I do not consider that this particular matter was focussed closely enough to enable me to reach a concluded view.

It will be recalled that in Bolitho (supra) Lord Browne-Wilkinson said at p 243: -

"...if, in a rare case, it can be demonstrated that the professional opinion is not capable of withstanding logical analysis, the Judge is entitled to hold that the body of opinion is not reasonable or responsible. I emphasise that in my view it will very seldom be right for a Judge to reach the conclusion that views genuinely held by a competent medical expert are unreasonable...it would be wrong to allow such assessment to deteriorate into seeking to persuade the Judge to prefer one of two views both of which are capable of being logically supported. It is only where a Judge can be satisfied that the body of expert opinion cannot be logically supported at all (my emphasis) that such opinion will not provide the bench-mark by reference to which the defendant's conduct falls to be assessed."

Having given careful consideration to the arguments advanced by Mr Moynihan in his submissions, I am not satisfied that Professor Walker's evidence "cannot be logically supported at all". Put another way, I am not satisfied that it has been demonstrated that Professor Walker's professional opinion is not capable of withstanding logical analysis so as to entitle me to hold that his opinion is not reasonable or responsible. I am also satisfied that the views he expressed were "views genuinely held by a competent medical expert", to adopt the wording of Lord Browne-Wilkinson in Bolitho at page 243 in the second paragraph. Indeed, I consider that Professor Walker's evidence, taken as a whole, was both logical and convincing.

Are there schools of thought?

Professor de Swiet gave evidence to the effect that in relation to Tuesday, 19 October 1999 some obstetricians would have decided on the basis of three +++ of proteinuria (on a dipstick) and blood pressure readings to commence delivery on that morning. He thought some obstetricians would have decided entirely on the basis of hypertension and proteinuria alone, and others would have wanted a bit more in the way of symptoms. He (in the first category) agreed that this demonstrated that there was a range of views from a spectrum of consultant obstetricians. He would have wanted Ms Weir at this time (the morning of Tuesday, 19 October 1999) to be delivered within 48 hours, from the start of priming which he agreed might start at about 6.00 pm that evening. The second category of consultant obstetrician would he thought be one who would also put some weight on previous symptoms. The third category would he thought be one who would continue to monitor and await results and seek to identify the optimum time for delivery based on the information being gathered in (I pause to observe that Professors Walker and Calder were clearly in this category). He said that he thought they would be "wrong" to be including efforts to rule out any form of urinary tract infection and to have any more definitive measurement of urine analysis on a 24-hour sample as his view was that three +++ of proteinuria on a dipstick was almost never due to urinary tract infection alone. However, he acknowledged that many would continue to do so. He went on to explain that it gave people "an excuse to delay". There is a natural reluctance to intervene. People like to let nature take its course. This might not be consciously expressed but they are in the obstetrician's sub-conscious. Professor de Swiet did not think that was a correct view. To wait purely for an additional 24-hour urine specimen result to come was "wasting time" and giving time for a crisis to

develop. Having said at one point in his evidence that he did not think that that was a correct view, I have to observe that at another point in his evidence, when he was explaining that he would be prepared to make the diagnosis of pre-eclampsia with three +++ of proteinuria even in the absence of a 24-hour urine/protein collection, he put matters somewhat differently. At this other point he said that if the patient was ill enough it would be perfectly reasonable to intervene on the basis of the three +++ of proteinuria but that it would be "reasonable" to wait at that stage pending a 24-hour urine/protein collection, the result of blood tests and some further observations on the clinical course. I also observe that Professor Stirrat from his perspective as a consultant obstetrician expressed the view that it was important to do a 24-hour urine analysis to rule out a urinary tract infection. Be that as it may, Professor de Swiet confirmed that he would advocate an "aggressive" policy (in that he would intervene in the pregnancy) but agreed that there were many consultant obstetricians who would not go along with that. He accepted that there was a not insignificant body of opinion that would be more "conservative". In paragraph 6.2 of his report he had said: -

"Had a consultant obstetrician been involved I believe earlier delivery would have been instigated either on the basis of hypertension and proteinuria alone or because of concern about the patient's symptoms."

In cross-examination to Mr Donald, Professor de Swiet agreed that even if a consultant had been involved there is a spectrum of views in any event and therefore that even if a consultant obstetrician had been involved it might not have made a difference to the process. Professor de Swiet also confirmed that an area in relation to which he differed from Professor Walker was in relation to what Professor de Swiet saw as being the adoption by Professor Walker of a "conservative" approach to the management of Ms Weir. Professor de Swiet was then asked: "...in so far as he is concerned he is clearly supporting what was done here, and I take it that you...are simply distancing yourself from it saying: "That is one approach, it is not my approach"? Professor de Swiet's reply to that was: "Correct". I mention this exchange because Professor de Swiet was not someone who agreed with something just because it had been put to him. If he had a view about something he would say so. If therefore he had been of the opinion that the approach adopted by Professor Walker had been beyond that of being just a different school of thought and approach, I would have expected him to say that.

At the end of cross-examination to Mr Donald in relation to the question of protocols or guidelines, Professor de Swiet gave evidence to the effect that having regard to the wide spectrum of management policies it would be difficult to write guidelines that were acceptable to everybody. His view was that there were advantages in guidelines because it helped in patient management if there was uniform policy. On the other hand there are disadvantages because people develop a "cook book" approach to practice and stop thinking.

Professor Walker indicated in relation to this topic that "spectrum of views" was probably an accurate description. He thought that if one talked to people in general terms they would largely agree, but the spectrum of exactly what point a decision was made would vary from person to person. That related partly to experience or lack of it. He thought there was an

"early delivery school" and a "late delivery school". The early delivery school were people who started seeing complications that they got frightened of and wanted to intervene, because if one delivers the baby, one was in theory getting them out of the environment that put them at risk. The later delivery people will assess the situation and feel "yes, they are getting worse but they are not bad enough yet to deliver and there is still benefit of maintaining the pregnancy for longer". He said that he obviously thought he was right but he agreed that there was a range of things and that there were people he respected very highly who would disagree with what he said. He went on to say that although people would say one thing or another, in clinical practice they often ended up doing very similar things so that they would have a philosophy that took them along certain lines and the decision-making often ended up very similar. He would say that Professor Redman and he agreed very similarly about prolonging pregnancy and that they both pushed pregnancies probably further in some ways than other people had traditionally done. He felt that Professor Redman and he led the ideas and the development of management protocols so that most people were following their delayed delivery approach. He said that Professor de Swiet was an early delivery person and he related that to some extent to Professor de Swiet's generation where early delivery was seen as the best option in previous times. He thought that Professor Greer would have been a delayed delivery person, although he had not worked with him clinically for at least 8 years. He said that Professor Baker had always been more of an early delivery person. He did not know what Professor Stirrat's decisions were, partly because he had not really discussed with him clinical management, as it was not an area that Professor Stirrat had been particularly involved with. Professor Walker went on to say that people who were putting a lot of emphasis on the visual disturbance at about 11.30 am on Tuesday 19 October 1999 were people who were coming from the thought that Ms Weir should have been delivered anyway, and therefore the sign they see on the Tuesday was confirmation of the belief they already have that this is a problem that needs to be intervened with. He explained that he was coming from the situation where he did not think this was a problem that required to be intervened with at that time. His position was that when an event occurred he did not just assume a "blanket response". He would want to find out "Why has this event occurred, and what does it mean; is there other signs such as high blood pressure requiring therapy?" He was not a believer that pre-eclampsia per se changed its risk because of a sign or even a biochemical test. He would want to try and analyse what it meant to the individual. For example, in relation to the visual disturbance on the Tuesday, it had not returned, she felt well, there was no change in her blood pressure and there was no change in the biochemical parameters. So far as he was concerned she was a stable pre-eclamptic. That did not mean she had no risk. It did not mean she would not progress, but at that point in time there was no evidence to change his opinion.

Professor Stirrat and Professor Calder were not specifically asked for their views on whether this is an area of practice in relation to which there are different schools of thought. They therefore did not give evidence on this issue one way or the other.

I am satisfied on the evidence I have heard that, in relation to the approach to management of pre-eclamptic pregnancies, including the question of timing and mode of delivery, this is an area of practice in relation to which there are different schools of thought represented by responsible, reasonable, respectable and competent experts in the form of both practising obstetricians and obstetric physicians.

Professor Redman:

In the context of "proper medical practice" and the timing of delivery, the Court was asked by Mr Moynihan to make a finding in relation to the following passage from Turnbull's Obstetrics (2nd Edition) by Professor Redman: "...There have to be compelling special reasons to leave women with proteinuric pre-eclampsia undelivered beyond 36 weeks". Mr Moynihan asked the Court to find that "the Redman guidance as to the principal of management at 36 weeks is correct medical practice". I do not consider that it is appropriate for the Court to make any such finding in the circumstances of this case. In my opinion, as I have just indicated, it is perfectly clear that there is a spectrum of opinions held by responsible, reasonable, respectable and competent experts in the form of both practising obstetricians and obstetric physicians in relation to the approach to management of pre-eclamptic pregnancies, including the question of timing and mode of delivery. No-one has suggested that this involves other than an exercise of clinical judgement. Professor Redman himself states at page 461 of his chapter in Turnbull's Obstetrics: "The timing of delivery is a matter of judgement, with few absolute guidelines to help the inexperienced clinician. The fact that the evidence at the Inquiry extended over 39 days (followed by 4 full days of written submissions) suggests to me that the matter is far from as straightforward as might be thought at first sight from the brief sentence in Turnbull's Obstetrics in relation to which I was asked to make a finding. The fact was that none of the expert witnesses expressed disagreement in principal with that passage, so far as it went. However, it is very clear that there are very real differences of view about just how that general guidance should be interpreted and applied as a matter of obstetric practice by obstetricians in the particular circumstances of a given case. If the correctness of medical practice in this area was so clear-cut, there would not be the problems inherent in the drafting of protocols and guidelines in this area, as was acknowledged by a number of the experts. These included Professor Walker, who has recently been asked by the Royal College of Obstetricians and Gynaecologists to draw up guidelines for the UK. He explained the problems with which he and his fellow drafters will be faced due to the spectrums of opinion existing, and the lack of evidence thus far available to enable other than only fairly general guidance to be given in relation to issues such as the timing of delivery.

I am also very conscious that the one person from the Court did not hear was Professor Redman himself as to just how he would interpret and apply his own guidance in the circumstances of the present case.

In addition, the passage upon which Mr Moynihan places such reliance does not appear to me to be the whole picture of what is involved. For example, there was evidence about the need to confirm a diagnosis with a view to deciding, if it was pre-eclampsia, when and in what manner delivery would be best achieved for both mother and child. Different views were expressed about how these steps should be best taken and in what sort of time-scales. An obvious example was the difference of views expressed about the reliability of the dipstick test for protein in the urine as against the longer 24-hour urine collection. Both points of view were explained by those arguing for the one or the other, and there was a clear and understandable rationale for both.

The experts also had different views about the question of symptoms and, in particular, when these amounted to something of significance in management terms, and why. For example, the experts did not agree on the definition of "symptomatic" in the context of pre-eclampsia. Professor Walker explained that he did not regard transient symptoms more than 12 hours apart of the same significance as those closer in time together. Although to him the episode of visual disturbance on the Tuesday was concerning, in view of the fact that the symptoms had settled, she was found to be well and her blood pressure (that being the potential problem about which to be concerned) was not at a level requiring anti-hypertensive therapy, he did not place the same significance on it as Professor de Swiet did (although Professor de Swiet did indicate at one point that "in all fairness" it would have been difficult for the doctors to have realised the severity of her condition "granted the variability of her condition"). Indeed, none of the other experts placed anything like the same significance on such symptoms. Professor Greer expressed the view that if the symptoms concerned were "significant" this would be symptomatic pre-eclampsia and the patient should be delivered urgently. However, there was no evidence about whether he would have regarded the symptoms in this particular case as "significant". Professor de Swiet in the light of his experience and expertise formed the view that the symptoms were of sufficient significance to warrant a decision for delivery to be completed within 24-hours, namely by midday on the Wednesday. Albeit that Professor Stirrat would, like Professor de Swiet, have been advocating a decision to commence priming that day, that would have been for different reasons, as I have summarised. He would have been putting in place a plan for commencement of priming on the Tuesday evening, envisaging a period of 48 hours as a period for completion of delivery. It was notable though that the visual disturbance later that morning would he thought not have swayed him to act more urgently at that point. He would have seen it as reinforcing his plan of management. Professor Calder's opinion was that the incident pointed to the need to continue closely monitoring her condition, but that it did not require immediate delivery.

Mr Moynihan acknowledged in his submissions that the Redman passage did not suggest that in every case there must be delivery. It was saying that for this gestation (36 weeks) clinicians should ask themselves whether they have good reason not to deliver. He then quoted a passage from Professor Walker's evidence where he had agreed that he accepted as a school of thought that the reason for the so-called "aggressive" school of thought was that by 36 weeks the balance of risk had fallen on the side of early delivery rather than prolongation for the health of the baby, particularly if one added in that the risk to the mother of prolonging the pregnancy was a 1 in 4000 risk of death. However, Professor Walker went on to explain that there was another aspect to the equation, namely that there had to be a decision on how to deliver. If the decision to deliver was by caesarean section the chance of the mother dying was far higher than 1 in 4000. At a later stage, Mr Moynihan submitted that Professor Walker's evidence about the risks associated with caesarean section were not material in the debate in this case. This was not put to Professor Walker in cross-examination. Be that as it may, I do not accept that submission. Professor Walker's position was that the 1 in 4000 risk of a mother dying as a result of prolonging a pre-eclamptic pregnancy had to be balanced against the risk of mortality from delivery by caesarean section when the chances of dying became far higher. There is also a higher risk of caesarean section if induction is carried out earlier. Caesarean section during a failed induction of labour carries a higher risk of mortality and the highest risk to the mother's life of any caesarean section. It therefore seems to me that it is a relevant and material consideration in the decision making process. I also noted that Professor de Swiet in his evidence referred to the fact that towards the end of a pregnancy there are "softer" risks to

be considered relating inter alia to the increasing risk of caesarean section associated with induction of labour.

In relation to the Redman guidance, Mr Moynihan submitted that Professor Calder had been "disparaging" about its relevance. In my opinion, that was not a fair characterisation of what Professor Calder said about it. He was it seems to me making a general and perfectly fair point that things are not as simple as A=B=C, which text books have to do, as there are several more factors than A and B in order to reach a balanced decision. Professor Calder said that he agreed with the theory underlying the 36 weeks approach in Professor Redman's text and that it would seem to be the logical conclusion that from 36 weeks practice should err on the side of delivery of the baby, but he went on to say that that would imply that they should put babies at increased risk of what was known to be a measurable incidence of neo-natal complications against uncertain and a really quite rare possibility that might affect the mother. He explained that "the obstetric challenge" was to make sure that they did not put either mother or baby at risk. He still felt that clinicians were inclined to be conservative until the point where it seemed clear that intervention was the better option. At another point, he mentioned the "classic challenge of obstetrics which is looking after two patients at once" and trying to make some balance involving all the risks involved. His point was that if every time there was one sign of trouble without "clear evidence" that allowed a balance of the benefits of intervention against conservative management, obstetricians would end up interfering with nearly every pregnancy because nearly all pregnancies had some deviation from normal at some stage. Obstetricians are he said already under tremendous pressure from patients' groups, politicians and others who are critical of the rising rates of intervention, especially induction of labour and caesarean section. His position was that interventions were the key to good obstetric care but that they must be applied with appropriate assessment of the benefits and risks of carrying them out.

Mr Moynihan submitted that it was evident that "the Redman approach" was "evidence based". In his submissions he had submitted that it was not the bare ipsi dixit of an expert that mattered but whether what they said could be substantiated. However, in submitting that the Redman approach was evidence based, reliance was placed on a passage from the evidence of Professor Baker where he said inter alia: "...there was little evidence to say that babies do better left within the uterus, and I would tend to suggest that babies would do better with delivery..." It does not appear to me that what Professor Baker was saying was evidence based. In the event, I found Professor Baker to be an impressive witness, and I see no reason not accept his evidence on this so far as it goes, but I do not consider that it has been established that the Redman guidance is "evidence based". In arriving at this view I also take into account evidence from Professor de Swiet and Professor Walker that in my opinion bears on this issue. Professor de Swiet told the Court that there are controlled trial data that look to a conservative approach to pre-eclampsia developing at 28 to 30 weeks but that there are no controlled trial data at the gestation concerned in this case. He believed that this was because it would be considered unethical to do this. Professor Walker explained that in relation to the guidance he has been asked by the Royal College to draft, his fear is that to some extent the guidelines will be based on the opinion of experts, apart from things like to use of anti-hypertensive drugs where there is good evidence. He went on to say:

"All the evidence available on prolongation of pregnancy or early induction of delivery is based on early gestation data, and it all favours prolongation of pregnancy. So the problem we have is if you are going to give policies of when to induce, that all the evidence available is supporting prolongation, whereas your feeling as a specialist is that you don't want to prolong pregnancies too long if there is no benefit from it. So you need to give some form of advice, as Chris Redman has done, but I couldn't write what he has done in his chapter, because that is not evidence-based. So I would have to give an opinion based on a range of opinions of what is acceptable practice. Now, the only way to improve that would then be to audit the results of the guidelines to see what the outcomes are. And that is what we try to do in Yorkshire, in monitoring our guidelines. But these guidelines in Yorkshire are based on the acute event, it is the planning of stabilisation of delivery, which Ms Weir would not have got on to till the Thursday afternoon. I also suspect that the guidelines will not really be very robust for the stage up to the event that occurred -- the acute event that occurred on the Thursday, because before that the evidence is very very woolly. What we will put down, I think, will be a range of opinion, and to some extent the 34/36 week guidelines which Chris Redman and myself have written before will be there, but you cannot say someone must be delivered immediately on admission. What we will say is "You should assess the pregnancy, you should assess the situation, you should stabilise the mother and deliver in the best way on the best day. And that is a clinical decision. There is no evidence that we have or guidelines we can give to tell any individual clinician whether any individual woman should be delivered on any particular day."

Mr Moynihan also submitted that Professor de Swiet had given a defence of the statistical underpinning of the Redman guidance at a passage in his evidence where, when asked if he could give any indicative range for the degree of risk associated with the general range of pre-eclampsia, Professor de Swiet had indicated that he could "give a feeling for it". Professor de Swiet went on to say:

"One of the problems of course is what you would like to know is the risk if you take somebody with proteinuric pre-eclampsia at nearly 37 weeks who has symptoms and you don't deliver them compared to the risk if you do deliver them. If you do deliver them, most of the risks are taken away by the process of delivery...the sorts of figures I would quote would be a 2 to 3 per cent risk of HELLP Syndrome in people with severe pre-eclampsia; risks of accidental haemorrhage, probably in the same order; risks of cerebral haemorrhage, it is difficult to define, because everything depends on the care and control of blood pressure; risks of uncontrolled or uncontrollable hypertension so that the woman has to be delivered urgently, because we can't control her blood pressure properly, and urgent delivery is not a good thing -- 5 to 10 per cent; the risks to the foetus, again acute foetal distress, previously unsuspected, the same order of magnitude. I think that covers it...I think the order of magnitude of a crisis in someone with proteinuric pre-eclampsia is 10 to 100-fold greater than the risks of the baby dying from respiratory distress syndrome caused by pre-term delivery".

Professor de Swiet was then asked if he could give an "indicative feel" for the degree of risk to the mother's health if pre-eclampsia is allowed to go unchecked. He replied:

"We have good figures for mortality, and that is the power of the confidential maternal mortality series. We are looking at a total number of deaths in the order of 30 in three years from hypertensive disease in pregnancy. So maybe 10 deaths per year. So the risk of a woman dying suffering from pre-eclampsia is I would say still pretty small, and on that basis I realise I don't want to quantify excessive maternal risk associated with allowing the pregnancy to run, because it would be wild guesswork".

I had no hesitation in accepting Professor de Swiet's evidence in these passages, but this is on the basis of his own characterisation that he was in giving these figures giving a "feeling" for the indicative range of degree of risk. This is in contrast it seems to me to being able to point, for example, to controlled trial data, which he had elsewhere explained was not available at the gestation involved in this case. I therefore still do not consider that it has been established that the Redman guidance is evidence based. I also note that when Professor de Swiet indicated that he thought that the order of magnitude of a "crisis" in someone with proteinuric pre-eclampsia was 10 to 100-fold greater than the risks of the baby "dying" from respiratory distress syndrome caused by pre-term delivery, the nature, degree and potential consequences of the "crisis" to the mother was not defined. It is therefore not clear to me the extent to which that the figure for that is really comparable to the figure relating to the risk of actual death of the baby.

There is no dispute that there is a significant risk of babies in pre-eclamptic pregnancies suffering from Intra-Uterine Growth Restriction ("IUGR"). In the event, however, it transpired that, fortunately, the baby in this case had only mild IUGR as judged by weight. Before this became evident, there had been some rather alarming evidence at a relatively early stage in the Inquiry from Dr Alan Howatson, consultant in paediatric and child health pathology at the Yorkhill NHS Trust, when he surmised on the basis of an examination of the placenta in this case that there had been a risk that if the pregnancy had gone on for much longer the baby might not have survived due to insufficiency of the placenta, of which a large infarct noted was an indicator.

However, there was a substantial body of evidence, which I preferred, which satisfied me that that was not in fact likely in the present case and, further, that there was in the event no evidence of foetal compromise in this case.

For example, Professor Walker, who was familiar with looking at the placenta following deliveries of pre-eclamptic patients, said that the findings in the report on the placenta in this case were consistent with IUGR but that it did not add any information about whether there was any cause for concern for the baby. He made the point, which I accepted, that it was not important what the placenta looked like. What was important was how the baby was finding the placental function as babies respond in different ways. What is important is an assessment of the well-being of the baby, such as by liquor volume, ultrasound, biophysical profile and CTG. That is why these tests are done.

In the present case, appropriate well-being tests were done to check that the baby was well in utero. The baby had high well-being scores, albeit that the lower end of the margin of error

for her foetal weight took the baby to a lower than average weight. However, it is a sign of poor foetal well-being that influences decision making, rather than the size of the baby. Here there was no evidence of poor foetal well-being up to delivery and the baby had coped with the acute event without significant distress.

Dr Turner, consultant paediatrician at the Queen Mother's Hospital, said that Dr Howatson's predictions had not been borne out by either the baby's condition at birth or by her condition since then so far as he was aware. She had had been in the mild category of IUGR as judged by weight at birth, but judged by her performance she had not been in the category of moderate or severe. After delivery, she had done well, responding quickly to minimal resuscitation and had none of the major complications of major placental failure. Low birth weight is not itself an indicator of such maturity or immaturity. He had seen the baby several times himself. There was no evidence of immaturity of the organs in this case. It is that which matters. Her head size had also been very normal, indicating that she had been growing well within the womb until a short period before delivery.

At the end of the day, it is clear that an obstetrician has to assess many competing risks to both mother and child of either continuing the pregnancy or of prolonging it. The obstetrician has, as Professor Calder put it, two clients. The interests of both are not always the same. He expressed the view that, ideally, one would continue to term where the risk of respiratory complications would be at the lowest point but the chances of the baby in this case getting severe respiratory problems from delivery at that stage were "really quite, quite small". He had had therefore thought that there would have been little to be gained for the baby from continuing beyond 37 weeks, once the proteinuria results were available. Professor Walker suggested that the balance might be better understood as seeing two lines on a graph. At some point the lines cross, not because the risk to the mother has increased but because the risk to the baby has reduced. He also included in the overall balancing exercise the risk of mortality from delivery by caesarean section, of which there is in turn a higher risk if induction is carried out earlier. At the end of the day, this is a clinical judgement. I have already mentioned Professor Walker's evidence about his understanding of the different approaches as between the "early delivery school" and the "late delivery school". It does not appear that there is any simple formula. If there was, Professor Walker would not be faced with the problem to which he referred as regards the drafting of parts of guidelines for the Royal College, including the question of when to deliver.

On the evidence I have heard I am therefore not satisfied that there can be said to be a "standard practice" in relation to timing of delivery in relation to pre-eclamptic pregnancies, including at the gestation involved in this case.

Dr Roberts and the other doctors involved in the care of Ms Weir:

Mr Moynihan submitted that the witnesses from the hospital tended to concentrate on only one side of the equation, the side relating to premature delivery, thereby he suggested seeking to justify prolongation of the pregnancy. The other side of the equation is that of the risk to (a) the mother and (b) the child of prolonging a pre-eclamptic pregnancy. He looked

particularly to Dr Roberts in support of this contention. Mr Moynihan placed particular emphasis on a reply from Dr Roberts indicating that she was unable to give a statistic relating to harm to the baby from pre-eclampsia. His submission was that she was the decision maker in Ms Weir's case "ostensibly (so she would have us believe) weighing up a balance and yet she did not have statistics for one half of the equation". It was not however clear to me the extent to which a practising obstetrician would, or should, really be expected to have at his or her fingertips actual statistics for such things. Certainly, I have no recollection of any of the experts giving evidence to the effect that there should be such an expectation. This may also be not unrelated to the evidence from Professors de Swiet and Walker to the effect that at the gestation involved in this case there are no controlled trial data. So far as Dr Roberts is concerned, at a number of points in the course of her evidence she indicated an awareness not only that pre-eclampsia poses a risk to the health of mother and baby, and therefore that there are risks if the pregnancy is allowed to continue, but also that there is a known risk that with proteinuric pre-eclampsia the life of both is in danger.

The fact is that the condition of both Ms Weir and the baby was being assessed and monitored. So far as risks to the baby were concerned, the tests indicated that it was doing well. There was nothing to indicate foetal compromise. So far as Ms Weir was concerned, her blood pressure although initially elevated did not reach levels requiring treatment until after the acute event on 21 October. Her blood tests were essentially normal up to and including the morning of 21 October. The proteinuria levels were confirmed to Dr Roberts on 21 October, confirming the diagnosis of pre-eclampsia by means of the 24 urine collection testing done. This is one major area of difference between Dr Roberts' approach and that taken by some such as Professor de Swiet, who would have been prepared to proceed on the basis of the dipstick results alone. There are clearly differing views on that, each of which in my opinion has a defensible and logical basis.

Another major area of difference of view is in relation to the question of the weight to be placed on the symptoms reported by a patient such as Ms Weir, such as the visual disturbance on 19 October. Dr Roberts' evidence was to the effect that she did not regard this episode as being particularly concerning. She explained that this was because Ms Weir's blood pressure was normal at the time (at another point in her evidence the way she described it was that the episode of flashing lights that morning was not associated with consistently raised blood pressure at that time, which I am satisfied was factually correct), the episode, which she had assumed from Dr Branchfield's note in the medical records to have lasted half an hour, had been transient and not lasting and that she was otherwise well. These things would she said have reassured her and would have made her question the relevance of the visual disturbance. She agreed that an episode of flashing lights could be consistent with being a symptom of pre-eclampsia. I am satisfied that she was not correct to describe Ms Weir's blood pressure at that time as having been "normal", as pointed out by Professor de Swiet. However, I am also satisfied that albeit that it was moderately elevated at that point, it was not at levels requiring anti-hypertensive treatment. This was the point made by Professor Walker. He explained that the visual disturbance itself is not dangerous but that it might be dangerous if it demonstrates evidence of hypertension requiring intervention. If it does not, it is one factor involved in the equation but is not a paramount factor. So what is important is that her blood pressure is checked. One is not treating the visual disturbance. One is treating the potential underlying clinical problem that might be causing the visual disturbance. Dr Hanretty and Dr Cameron indicated that they would have

taken the same view as Dr Roberts did in relation to the episode of visual disturbance on the Tuesday.

The evidence I have heard has satisfied me that there are clearly differing views about the interpretation of, and significance to be placed upon, such symptoms. Of the four expert witnesses who had given specific consideration to Ms Weir's case, only Professor de Swiet would have made a management decision to deliver on the basis of the episode of visual disturbance on the Tuesday. This was on the basis of that this in his view was now clear evidence of "symptomatic" proteinuric pre-eclampsia such that her condition was now severe enough to warrant delivery. His view clearly commands the greatest respect as an authority inter alia in the area of pre-eclampsia. However, I am also conscious that he himself agreed that there were some who would not have placed the same significance as he would have done on this episode and that there could be a spectrum of opinions on this. Professor Walker, also clearly an authority on pre-eclampsia, represented an example of another opinion in that spectrum. He agreed that he would interpret the visual disturbance on the Tuesday as being indicative of systemic disease and as having something to do with her disease process. He agreed that it was probably a symptom of her underlying condition. However, he did not agree that Ms Weir was manifesting "symptomatic" disease. This was because the symptoms were not persistent. They went away and had no associated parameters such as high blood pressure, which is what the clinicians would have been looking for. It is a factor you take into account but you would want confirmation of other things going on. He would want further information on biochemistry to see what sort of progression was actually happening so that he could make a decision on mode of delivery. He would view this as a potentially serious condition that needed to be closely monitored, rather than saying that she needed to be delivered immediately as an obstetric emergency. If the account had been of two episodes of visual disturbance within a 12 hour period a decision to commence priming on the Tuesday evening might have been taken on the Tuesday. He would have had less concern if they occurred within a 24-hour period than he would have done if they had occurred within a 12 hour period because they are more likely to be associated with a similar event if they occur within a short timescale. It is the same with blood pressure readings. The symptoms need to be close enough together to be linked to be persistent. If they are too far apart they are not necessarily persistent. Here they were more than 12 hours apart. In the light of the evidence led at the Inquiry in relation to how symptoms should be viewed, and defined, I can understand the argument from both points of view. I cannot say which view, if either, could be said to be the "correct" view. In any event, even if someone falls within the definition of "symptomatic", it is not clear to me that that necessarily means that the mother should be treated as an "obstetric emergency". For example, Professor Walker explained that if there was high blood pressure you would in the first instance lower that with an anti-hypertensive drug. In that event, there would be no need to deliver on an emergency basis. Urgent delivery in someone who is unstable was he said extremely dangerous. Delivery does not solve the maternal problem immediately. He said that one will generally increase morbidity for the mother by instigating delivery, and that instigating emergency caesarean section increased the risk of death for that mother over vaginal delivery. All these risks therefore had to be balanced.

The question of symptoms is related to a further criticism advanced against the doctors involved in the care of Ms Weir, namely that they did not correctly appreciate the severity of her condition. In the event, it is an inescapable fact that the catastrophic event at 1410 hours

on 21 October was not foreseen and was not avoided. It is not difficult to understand the thought that something must have been missed in the investigations and in the interpretation of the investigations. On the other hand, Professor de Swiet very fairly indicated that although he did not think that the doctors had realised the severity of Ms Weir's pre-eclampsia, "in all fairness, it was difficult granted the variability of her condition". At one point Professor de Swiet also remarked:

"There was also talk of severe pre-eclampsia, and it could be argued to what extent she did or did not have severe pre-eclampsia..."

At another point he reiterated that he thought the difficulty had been in assessing the severity of her pre-eclampsia. It was then put to him that he had said in the course of his evidence that he would not himself have needed to have defined her pre-eclampsia as severe for him to have proceeded to give advice for a decision for delivery. He replied:

"That is correct, based on her blood pressure and the degree of proteinuria, even without resource to the more tricky area which relates to symptoms".

At one point I asked Professor de Swiet whether he thought this had been "a severe case of pre-eclampsia". He replied:

"I thought it was severe enough to warrant delivery at this gestation".

In evidence in Chief he had been asked:

"Do you grade terms of pre-eclampsia when you are looking at pre-eclampsia, for instance, mild, moderate or severe? Is that a grading system you would use?"

He replied:

"No, it is not. I would be concerned with a definition of pre-eclampsia that is usually based on proteinuria and hypertension, although not always, because I accept you can have pre-eclampsia without proteinuria, and you should then assess each case individually in terms of a management plan. I don't find grading helpful to my practice".

However, in the way his evidence then developed it was clear that as a matter of fact he would have regarded her condition as being severe or, put another way, that her condition had been "severe enough" to warrant a decision on 19 October to proceed to delivery. That

said, in relation to what he regarded as being the significant episode of visual disturbance on 19 October he said:

"...paradoxically I think you would need to be rather experienced to realise the significance of this episode, and therefore to report it to superiors. So perhaps granted the relative inexperience of this SHO, then it was not unreasonable not to report it, because he just didn't appreciate what was going on".

Professor Walker agreed in cross-examination that a senior doctor should have been notified about this episode and should have come to see Ms Weir. However, in the event, for the reasons he gave about the lack of persistence of symptoms and the lack of association with blood pressure being at a level requiring anti-hypertensive treatment, he would not have made a decision to proceed to delivery that day. Neither would Professor Calder. Professor Walker said that he would still have wanted further information about her condition. It was clear from his evidence that his position was that even severe pre-eclampsia could be monitored and stabilised, and that it did not mean one had to deliver.

In connection with the question of "severity" of pre-eclampsia, Mr Moynihan correctly reminded me that Dr Roberts had given evidence to the effect that for Ms Weir to have had "severe" pre-eclampsia she would have been looking inter alia for protein in the urine at a figure greater than 5 grams per 24-hours. This was on the basis of a textbook by James & Steer, which is an American text. Professor Greer said that this text was not commonly used in UK practice. Dr Chitra also used it. Mr Moynihan also reminded me that proposition 2.5, with which none of the experts had taken issue, was that above the threshold of 0.5 grams per volume (in 24-hours) of proteinuria the degree of risk was not proportionate to the level of protein. That being so, a concept that there would require to be more than 5 grams in 24-hours would not appear to square with that proposition. However, Dr Roberts did also say that 3.32 grams per volume in 24-hours, which is what the position was in this case, is significant. In the event, as I have already indicated, I am satisfied that the level of proteinuria in this case was taken into account in Dr Roberts' decision to proceed to delivery (together with the element of maternal anxiety conveyed to her).

It became evident from the evidence of all the expert witnesses that there was a difference of view about the approach to be taken with or without signs and/or symptoms. At one end of the spectrum there was Professor Stirrat who thought it likely that he would have begun the process of priming on the Tuesday, even before any visual disturbance that morning. This was because, on the basis of his experience, he would have felt that he had a 48 hour window at that point. His approach was that, in general, he would have to have had very good reason not to have commenced delivery within 24-hours of admission of such a person, with or without symptoms. Also, in contrast to all the other expert witnesses, he would have been arranging priming in the labour ward. His own practice was designed for intervention in advance of symptoms arising. He gave the example of a fuse being lit without anyone knowing the length of the fuse or how quickly it might burn. At the other end of the spectrum there was Professor Walker who said that his concern was that he would not have known enough about Ms Weir to know what was going to happen. If he had had further biochemical and haematological information on her he would have had a better idea of what

the possibilities of her condition worsening during induction and labour would be. It may be that the signs would tell him that induction of labour was the wrong approach and that someone with an unfavourable cervix and worsening condition may be better off being delivered by caesarean section. He would not have had that information at that point to make that decision. To embark on induction of labour at that time without that information would mean that you would have really had no idea what problems you might encounter and what the risks of emergency caesarean section might be in the middle of the night.

Mr Moynihan correctly reminded me that on a number of occasions the staff, including doctors, at the hospital had failed to record the systolic blood pressure. Dr Roberts denied that anyone at the Queen Mother's Hospital "ignored" systolic readings. It was just that they were generally most concerned with the diastolic readings. This was she said the worrying factor in terms of morbidity. She confirmed that so far as she and her colleagues concerned they were taught that the concentration for assessment of hypertension and pre-eclampsia was mostly associated to the diastolic readings. All the experts were agreed that the systolic readings should have been recorded in addition to the diastolic, and attention therefore paid to the systolic readings also. The most significant occasion upon which the systolic was not recorded was when Dr Branchfield saw Ms Weir after the complaint of visual disturbance on the Tuesday. Staff Midwife Smith had recorded both the diastolic and the systolic blood pressures before sending for him. In the event, in the light particularly of the evidence of Professor Walker and Professor Calder to the effect that even although her blood pressure was not normal it was not elevated to the extent that anti-hypertensive treatment was required and, for the reasons they gave, they would not have made a decision for delivery that day, I am not persuaded that a different management decision (namely a decision for earlier delivery commencing that day) should have been taken. Nevertheless, it is clear that the systolic blood pressure reading is part of the whole picture to be considered in the context of pre-eclampsia. Doctors and midwives alike as should therefore record it, otherwise, it is difficult to avoid the impression that attention is not really being paid to it. That is relevant to my Determination under section 6(1)(e) in this case.

Mr Moynihan submitted that Dr Roberts and Dr Chitra had been lulled into a false sense of security by concentrating on the supposedly "normal" state of the condition. He reminded me that Dr Roberts had given evidence that pre-eclampsia was a progressive condition and that she had said:

"...usually the parameters become more abnormal or parameters which are normal become abnormal, and the decision to induce is based on an assessment of a number of parameters".

This he said was contrary to proposition 7.1, which was: "Pre-eclampsia as a syndrome is something that is known to present in atypical ways". It is not clear to me that in saying what she said at this point Dr Roberts was suggesting that she was unaware that pre-eclampsia was something which was known to present atypically. My impression was that she was saying much the same as Professor Walker, who gave evidence to the effect that he would normally expect to see signs of progression that can be picked up to allow intervention when necessary. It was not put to him in cross-examination that he was incorrect about that, or

that that was in some way contrary to proposition 7.1. At one point in examination in chief he said:

"People who say that by waiting for the crisis you are increasing the risk have an implication that the crisis will occur and obviously if the crisis will occur then why are you waiting for it. My argument is that in the vast majority of cases the crisis will not occur and also if it does occur then there are (prodromal) signs of that crisis going to occur such as changes in biochemistry, changes in blood pressure etc. The fact that someone has proteinuric hypertension does not mean that this disease is progressive. It means that she has got pre-eclampsia. Some of the women with proteinuric hypertension, the proteinuria goes away and so therefore although they have the diagnosis of pre-eclampsia not only is it not progressive but it actually settles and pregnancy (can) continue often until term. In another lot of women the disease will be slowly progressive or fairly static and you can watch and monitor and intervene in due course. In some women it is very progressive and will progress over a period of 24 or 48 hours, but again you can usually see signs of progression in all these situations. So, it is not a completely common normal pattern. You cannot say just because someone has proteinuric pre-eclampsia they will get a crisis".

Professor Stirrat also said that it was in his experience usual for abnormalities in blood results to pre-date onset of pain of such severity as the acute event in this case. Professor Calder also expressed the view that the majority of women who had this condition follow a fairly standard pattern.

However, that is not to say that pre-eclampsia cannot present in an atypical way, as indeed it did in the present case as all experts were agreed. For example, Professor de Swiet said that her condition had fluctuated in its severity. Her blood tests were normal. That was atypical. For a lady "to go off so quickly" following essentially normal results is "very, very uncommon".

On the basis an examination of passages of the evidence of Dr Roberts which had been put to him, Professor de Swiet he thought that she had not appreciated the fact that the symptoms of pre-eclampsia might be intermittent. That was the basic problem as he saw it. He thought that she had not appreciated the importance of the symptoms and that she had not appreciated the risk of crisis in a woman with proteinuric pre-eclampsia, having regard to the variability of the disease. He did not think that she really appreciated how variable and how dangerous pre-eclampsia might be. That was therefore why she had needed some further evidence of the deterioration in the condition before she was prepared to sanction delivery, such as symptoms that "she believed in". The same passages were put to Professor Stirrat. These included the following passages of evidence from her:

"I didn't feel on the Wednesday that I had compelling indication of the criteria there to make that decision on the Wednesday, and I wished to obtain the fresh blood results on the Thursday morning and look at the position about the situation then."

and

"I was waiting for any obvious signs of progression of her condition".

Despite these statements she had nevertheless then proceeded to make a decision on the Thursday to proceed to delivery in the absence of any such signs. In my opinion, it is not difficult to understand why Professor's de Swiet and Stirrat could not understand her approach in the light of (a) what she said was her approach as compared with (b) what she actually proceeded to do. I have already indicated that in my opinion it would not be fair to conclude that Dr Roberts was actually waiting for the catastrophic event that occurred on the Thursday. However, it is I think a fair conclusion from the expert evidence that if Dr Roberts does have a general approach, in the context of pre-eclamptic pregnancies at 36/37 weeks gestation, of actually "waiting for any obvious signs of progression of her condition" that would not appear to accord with the spectrum of views expressed by the expert witnesses in relation to decisions at this gestation in the context of a pre-eclamptic pregnancy. In the event, however, that was not what she did actually do in this case. That being so, it is not directly relevant to consideration of a Determination under section 6(1)(c) of the 1976 Act. It is however relevant to section 6(1)(e), about which I say more below.

As to what Dr Roberts actually did, passages from her evidence explaining her thought processes in that respect were put to Professor's Walker and Calder. She was asked inter alia what it was that had tipped the balance in favour of delivery. She replied:

"If I can try and explain it to you as best I can. I find it quite difficult to convey a sort of impression of the thought process. This is quite difficult, and even retrospectively it is difficult to try and convey to you exactly what was going through my head at the time. But essentially this was a lady in whom we had confirmed the diagnosis of pre-eclampsia with significant proteinuria. Having discussed with her and with Dr. Chitra on the Wednesday we had explained to her the situation that she was going to be delivered soon. To me that means that that decision is made and reviewed on a very short-term basis, so we had already done the initial discussion regarding induction of labour...it was very likely on the Wednesday that I was going to make that decision on the Thursday, and therefore when I received the additional information on the Thursday that the urine protein was of a significant level, that in addition to the information given to me by Dr. Chitra that the patient herself now had an element of anxiety and concern, which I had not been aware of the previous day, and she had expressed that she would prefer to be delivered sooner rather than later, then that, on balance, seemed to me a good time to proceed on that basis".

I have already indicated that I accepted Dr Roberts' evidence to the effect that the reason why she made the decision on the Thursday to commence induction of labour that evening was because of the combination of the 24-hour urine collection results, which confirmed the diagnosis of pre-eclampsia, and the element of maternal anxiety.

The actual management decisions taken by Dr Roberts were understandable and defensible so far as Professor's Walker and Calder were concerned. This included the decision on the Thursday to proceed to induction. For example, Professor Calder agreed that the induction of labour decision taken by her on 21 October was "perfectly reasonable" and that he would have taken a similar decision if he had been in her place. Put shortly, I am satisfied that the decision made by her on the Thursday was within the range of spectrum of views I have found there to be and was not outside that.

Quite apart from the difficulty Professor's de Swiet and Stirrat understandably had about what Dr Roberts had said was her approach as compared with what she had in the event done, clearly from their perspective they were in any event of the view that the decision should have been made earlier for the reasons they respectively gave. I put it that way as both Professor de Swiet and Professor Stirrat also had differing reasons for what they would each have done on the Tuesday.

Dr Cameron and Dr Hanretty did not take issue with the decision made by Dr Roberts on the Wednesday afternoon. Dr Cameron thought that he might have considered proceeding to induction of labour on the Wednesday evening as a matter of his own personal judgment, but not because he considered that there were any developing symptoms or obstetric emergency.

In Chapter 10 of his written submissions, Mr Moynihan submitted that Professor Stirrat could reasonably be concluded to have been pointing to the likelihood of delivery being completed by Wednesday evening, most probably by caesarean section. That would probably not be an unreasonable conclusion to reach from his evidence. However, Mr Moynihan also suggested that Professor de Swiet could be "twinned" with Professor Greer in order to produce a predicted completed delivery on the Tuesday by caesarean section "within hours" of the visual disturbance, with a "realistic prospect" of delivery being completed in the early afternoon of the Tuesday.

Mr Moynihan sought to do this in recognition of the fact that Professor de Swiet is not himself an obstetrician and would therefore be in the position of an advisory role with an obstetrician. I am not satisfied that it would be appropriate to adopt this "twinning" approach, particularly having regard to the fact the Professor Greer was giving evidence without the benefit of having full knowledge of Ms Weir's case. One basic example of a problem about the approach suggested is that Mr Moynihan's "twinning" included a passage to the effect that Professor de Swiet had viewed the visual disturbance on the Tuesday as an episode of "symptomatic" pre-eclampsia. What Professor Greer said was that "if symptoms are significant this is symptomatic pre-eclampsia, an obstetric emergency" and the patient should be delivered urgently, "within hours". However, I have no idea whether Professor Greer would have taken the view that the symptoms in this case were significant. Clearly, it is possible that he would have had that view, but I have no basis upon which I can conclude on the balance of probabilities that that would have been his view. In addition, Professor Greer said that if symptoms were "significant" he would view that as an "obstetric emergency" for urgent delivery. However, it did not appear to me from Professor de Swiet's evidence that he would have been viewing the circumstances as being an "obstetric

emergency", as he said that he would have been advising delivery to be completed in no more than 24 hours, namely no later than midday on the Wednesday as opposed to any earlier deadline. In all the circumstances I am therefore not satisfied that there was a sufficient match between the evidence of both Professor's to enable them to be taken together in the manner, and to the effect, suggested. In that connection also, Mr Donald reminded me that Professor Greer's evidence about delivering within hours of such symptoms had been dependant on the quality of information available and the severity of those symptoms.

It follows from the conclusions I have reached that I am not satisfied that it has been established that the protocols and practices followed by the Queen Mother's Hospital in relation to consultant involvement and delivery policy are out of line with standard practice. On the same basis, it follows that I am not satisfied that it has been established (1) that the doctors in the Queen Mother's Hospital had an insufficient understanding of the underlying balance of risks associated with pre-eclampsia or (2) that the doctors did not correctly appreciate the severity of Ms Weir's condition. The fact of the matter is that in my opinion there has been demonstrated to be a legitimate range of views. Depending on the point of view from which one comes, different conclusions are arrived at by responsible, reasonable, respectable and competent experts in this area of medical practice in relation inter alia to the question of assessment of (1) the balance of risks and (2) the severity of someone's condition.

At the end of the day, as I indicated earlier, in the light of the wording of section 6(1)(c) of the 1976 Act I ultimately have to ask myself two questions concerning the suggestion that earlier delivery would have been a reasonable precaution. Those questions are:

(a)Whether I am satisfied on a balance of probabilities that delivery at such an earlier stage would have been a reasonable precaution and, if so,

(b)Whether I am satisfied that such earlier delivery might have avoided Ms Weir's death.

Whether I am satisfied on a balance of probabilities that delivery at such an earlier stage would have been a reasonable precaution?

I am satisfied that there is a spectrum of views in relation to the issues involved in the management decisions in this case. This includes the position in relation to the decision ultimately made by Dr Roberts on the Thursday to proceed to delivery at that stage rather than earlier. Whilst it is evident that there is a substantial body of medical opinion that would have advocated earlier delivery, the fact is that she was supported by expert professional opinion that I have found to be responsible, reasonable and respectable. As Professor de Swiet put it at one point, Dr Roberts "is at the more conservative end of the spectrum". However, the fact remains that there is a spectrum and Dr Roberts was within it, albeit at the conservative end. That being so, and in the light of my conclusions in relation to the

evidence, I am not satisfied on a balance of probabilities that I can conclude that delivery at such an earlier stage would have been a reasonable precaution.

Whether I am satisfied that such earlier delivery might have avoided Ms Weir's death?

In the light of my conclusion in relation to the first question, this second question does not, strictly, arise for decision. However, in deference to the arguments presented, I propose to indicate my conclusions in relation to this aspect of the matter also.

Part of the difficulty in being able to conclude what the position might have been is that it is evident from the evidence of the expert witnesses (a) that the mechanisms of pre-eclampsia are not fully understood by anyone, including experts in the field, and (b) that what triggered (i) the sudden acute event at 1410 hours on 21 October and (ii) the sudden rise in blood pressure thereafter remain unknown.

Another complication is the evidence of Professor's de Swiet, Calder and Walker, which I accept, to the effect that delivery itself can trigger a deterioration of the pre-eclamptic condition. Professor's Walker and Calder said that labour was recognised as being a hypertensive stimulus. Professor Stirrat was alone in disagreeing with the proposition that delivery can trigger a deterioration in pre-eclampsia. I preferred the evidence of the majority. All of the experts who had considered Ms Weir's case also agreed that a further complication is that women with pre-eclampsia usually worsen for the first 24 to 48 hours after delivery. In particular, Professor Walker, whose evidence on this I accepted, explained that the risk of the 48-hour window was for all complications of pre-eclampsia, not just HELLP Syndrome. That therefore included hypertension. However, as Professor Calder said in cross-examination to Mr Donald, the fact that the risk was there did not always necessarily imply that the risk would be realised or that the event that was at risk would happen. There would therefore have been no absolute certainty (a) that delivery would have acted as such a trigger or (b) that there would have been such worsening.

In connection with the question of delivery being a potential stimulus, Mr Moynihan submitted that the stimulus that had caused the lability in the blood pressure productive of the cerebral haemorrhage was not triggered by delivery in this case and that, on the contrary, it had ended by the time of delivery. I have to say that I found this submission difficult to follow. This is because when, at Day 33 of the Inquiry Professor Walker responded to Mr Moynihan to the effect that to say that the trigger had gone because of delivery had occurred was wrong. The exchange between them at this point was as follows:

(Mr Moynihan): "It is the combination of these features that the condition was brought under control by the Labetalol by 10 past 6 or so, the point of delivery, and that whatever this trigger was seems to have abated by 10 past 6 also resulting in the lower blood pressures after delivery. It is a combination of these factors which leads me to ask you again...? - (Professor Walker): Can I come in there? I don't think you can say that. I think all the other factors, if you take HELLP syndrome for instance as another thing going on and I think it was

caused by the same trigger, the HELLP syndrome got hugely worse after that point. To say the trigger had gone because of delivery had occurred is wrong. You cannot say that because the HELLP syndrome if anything was extremely worse after the delivery, her enzymes were at huge levels after delivery so to say that the trigger was removed when the placenta was removed it is impossible because other factors demonstrate that she worsened in other ways. Her blood pressure was controlled but I think the most likely thing is it is a combination of Labetalol plus we know that immediately after delivery the blood pressure had settled. It is not because of the trigger going away. It is because of the haemodynamic changes that occur at the time of delivery. We also know these changes, haemodynamic factors, will affect blood pressure within 12 hours so the blood pressure will start to rise again so it is a false dawn in a way of reduction of blood pressure which can occur in many women within the first 12 hours and if you read articles I have written and others have written we often say that anti-hypertensive therapy, need often diminishes within the first 12 hours after delivery but will almost certainly rise within 24-hours so her blood pressure, the settling of it, will be a combination of delivery and the anti-hypertensive therapy but you cannot say the trigger has gone.

(Mr Moynihan): Okay, I accept that correction ..."

Mr Moynihan had then prefaced his next question with the words: "

"Now, what I'm coming back to, I take your point, there is a stimulus still present in some complication..."

In the light of Professor Walker's evidence, which appeared to be accepted, and which I accept, I am not satisfied that the stimulus had ended by the time of delivery.

Against such a background, Professor de Swiet explained his position in response to the following question from Mr Moynihan:

"Now, what I understand Professor Stirrat to be saying based on this material was that for a period of time, settling down to 6 p.m. that night, Labetalol was not controlling her blood pressure, but post-operatively, looking at sheet 203, Labetalol did at this stage bring the blood pressure under control. That does to some extent coincide with the consultant anaesthetist who has administered Labetalol and was dealing with Sharman Weir prior to the delivery, during the delivery and in the few hours immediately thereafter. One other point is that Professor Stirrat confessed an inability to explain what the process trigger was for the elevated blood pressure at 10 past 2 that day. He said it was one of these things that he is unable to explain in relation to this condition, so I cannot advance you his explanation for it: it was simply an unknown cause. His argument however was that if the severe hypertension was something that was ultimately brought under control by the drugs, then earlier intervention could have had a successful outcome, in other words avoiding the death, and I would suggest to you for one of two reasons: either because the stimulus, that is the presence of the placenta and the continuation of the pregnancy are absent, or because

earlier intervention could have brought the blood pressure sufficiently under control to have avoided the very elevated pressure we see at about 10 past 3 that afternoon that caused by this argument the cerebral haemorrhage. Now, first of all is my argument something that clinically you could at least follow?"

Professor de Swiet responded:

"I can follow it, and I would agree with it. The very high blood pressures between 3 o'clock and about 5 o'clock, when she was eventually delivered, are very worrying. It was not necessarily just the Labetalol that brought the blood pressure under control. She also had a spinal anaesthetic for delivery, and that could well lower the blood pressure. So it is certainly arguable -- and I would agree with this argument -- that if she had been delivered hours before that marked rise in blood pressure then that rise in blood pressure on the balance of probability would not have occurred and it might well have stopped her cerebral haemorrhage. Not necessarily, because one component of the cerebral haemorrhage was the increased liability to have a haemorrhagic state from the HELLP Syndrome, but hypertension was certainly...."

There were then the following two questions and answers:

"We are looking again at the window, whether on balance of probabilities -- and I appreciate this is a lawyer's concept -- on the balance of probabilities intervention could have avoided a fatal outcome. I understand your position in relation to that to be that anything is possible, but if you were asked to consider the balance of probabilities you would prefer to draw a line of 48 hours before 2.10 on the Thursday; is that according with your recollection? - Correct.

The reason I am putting Professor Stirrat's report to you is that on the last occasion you will recall that you were prepared on balance of probabilities to take the cut-off point to delivery achieved to the morning of Thursday, the 21st. Now, in light of the discussion we have had today about the impact of the blood pressure, hypertension, would you accept that on balance of probability had the hypertension been controlled or avoided by early delivery achieved at latest by the morning of Thursday, the 21st, on balance of probability Sharman Weir could have survived? - Yes."

This exchange took place after Professor de Swiet had considered the mechanism of death as explained in Professor Walker's report. I therefore consider it to be more appropriate to rely on Professor de Swiet's evidence bearing on this aspect of the matter after this report had been put to him as he had prior to that been thinking of causality in terms of the HELLP syndrome rather than in terms of hypertension. In my opinion, it is a reasonable conclusion from the exchange quoted above that Professor de Swiet is of the view that that even if Ms Weir had been delivered (by which I mean delivery completed) on the morning of 21 October, within hours before the acute event at 1410 hours, there would have been a realistic, as opposed to a fanciful or merely theoretical, possibility of survival. Mr Donald did ask some similar questions of Professor de Swiet at a later point, to which Professor de

Swiet gave a different response. However, I am satisfied that those questions were put on the quite different hypothesis of hypertension (and clotting abnormalities) occurring only after delivery rather than beforehand. I therefore consider it appropriate to proceed on the basis of his position as initially expressed to Mr Moynihan.

Professor Calder agreed with Mr Moynihan in cross-examination that it was possible that delivery completed at some stage before 1410 hours on the Thursday might have avoided a fatal outcome. However, he thought that this was "highly improbable" because the moment of delivery did not suddenly correct everything back to where it should have been. The condition generally settled after delivery, but a lot of the complications of this disorder took place in the post-natal period. So clearly if she had been delivered some time before the fatal event on the Thursday afternoon one might reasonably expect it would not have happened. The further back one went in time from 1410 hours on the Thursday the chances were perhaps increasing. When he said a day or two in his report in his conclusion, he said that he had had in mind 24 - 48 hours as being more likely. If delivery had been achieved by 1410 hours on the Wednesday it is quite possible that she might not have had these very serious manifestations, which led to her death. The further back one went from lunchtime on Thursday the more one could argue that the fatal complications might have been avoided. In cross-examination to Mr Donald, Professor Calder agreed that if the process had all been completed by Wednesday lunchtime, on the balance of possibilities a fatal event would (my emphasis) not have occurred, but he did not think there was any point in the run-up to that timescale in which he saw an indication to intervene in this way. He also agreed that it remained possible that delivery achieved as late as, say, 11.00 am on the Thursday could (my emphasis) have avoided a fatal outcome. However, he said that supposing she had been successfully delivered by 1100 hours on the Tuesday he would be speculating by saying that on the balance of possibilities the calamitous event would not have happened. In relation to the question of whether delivery within a few hours of 1410 on the Tuesday might have made a difference, Professor Calder agreed with Mr Donald in cross-examination that it was a very high level of speculation and added that although one could have a hunch that things might have been different, that is as much as one could have.

In my opinion, Professor Calder can reasonably be taken as accepting that if delivery had been completed by 1410 hours on the Wednesday, but no later than that, there would have been a real possibility of death being avoided.

In evidence in chief, Professor Stirrat confirmed that he continued to hold the view expressed in para 9.15.2 of his report that had delivery been achieved naturally by, at latest, the morning of 21 October 1999, Ms Weir would on balance have survived. It should be recalled however that at the time of writing his report he had not focussed on the significance of the high blood pressures in relation to cause of death. He later indicated that he believed that there was a time probably on 20 October 1999 that even if Ms Weir had been delivered she would have developed some elements of HELLP after delivery but that on the balance of probabilities this would not have been fatal. He thought that if she had been delivered 24-hours before 1410 hours on Thursday, 21 October she would have developed HELLP and been sick but on the balance of probabilities she would have survived. He then said even if Ms Weir had been delivered on the Thursday morning she probably would have avoided what he saw as being a third burst of activity (the first being that prior to admission, the

second being the visual disturbance on the Tuesday and the third being the acute event at 1410 hours on the Thursday) or at least have avoided HELLP syndrome. Still in examination in chief, he then gave evidence to the effect that, on a balance of probabilities, he felt that if Ms Weir had avoided the third burst of activity at 1410 hours on 21 October, because she had either been delivered earlier or was in the course of delivery he believed the outcome would have been different. He said that his "feeling" was that for the third burst of activity to have been avoided it might have been that Ms Weir would have to have been delivered by 10.00 am that morning.

However, in cross-examination to Mr Donald, Professor Stirrat indicated that if, even as late as 1410 hours on the Thursday, Ms Weir had been in the labour ward at that time and all the other tests had been done that should have been done, and the anaesthetists were aware of her, and everything could have been done quickly, there might have been a window of opportunity. He would put his balance of probabilities just over 50 per cent at that point. His view would therefore have been dependent on her being in the labour suite at that point in time, which no other expert had suggested.

Professor Stirrat's opinion therefore went further than any of the other experts, as his opinion was that delivery completed even apparently as late as 1410 hours on the Thursday would on a balance of probabilities have avoided death. As I understood him, his principal reason for this view was on the basis of his experience of women with more severe symptoms of HELLP syndrome. He said that his second reason for doubting whether the acute event would have been fatal even with the onset of epigastric pain was the part played by severe and uncontrolled hypertension. He said that he thought that this was probably one of the key issues that led to the cerebral haemorrhage. If that could have been avoided, her chances of survival from the syndrome would have been better. However, he did not go on to explain how or why delivery that morning, or as late as 1410 hours that day, might have led to their being a real possibility that the severe hypertension and death might have been avoided.

So far as Professor Walker is concerned, in evidence in chief, there was the following exchange with Mr Donald:

"We know this event arose at 1410 on the 21st. Your opinion is that we don't know what triggered it and why it actually occurred at that point. Do I understand that you cannot say with any degree of, even on a balance of probabilities, that unless you were in a situation of having to deliver that lady and complete the delivery 48 hours in advance of that episode -- on a balance of probabilities the only way that that would (my emphasis) have avoided the outcome of what happened here? - Yes, I think it is very difficult because we do not know what this trigger is and the timescale of this trigger. It is very difficult to know exactly what would happen. As I have already stated the problem with delivery is that you actually release into the maternal circulation a lot of the placental debris because of the delivery process itself and since the placenta is the trigger, the initial trigger, of pre-eclampsia what you get is a sudden influx of placental trigger that the mother then responds to. If she is prone to respond to it then delivery itself can actually aggravate the whole situation which is why 60 to 70 per cent of women with pre-eclampsia get worse after delivery because of that reason. So, it may be that even on the 18th, if you had carried out a caesarean section the process

of delivery would have given such a stimulus to Miss Weir that this same problem might have occurred. On a balance of probability I think that you can say that if you look at the timescale caesarean section on the 18th may well have allowed her to be delivered and recover before the serious event occurred. The problem is I cannot be sure (my emphasis) of that on delivery either by caesarean section or induction of labour from the 19th onwards".

Professor Walker then went on to say:

"I think that if she had been delivered on the morning (the Thursday) then I think with 100 per cent certainty the same events would have occurred. If she had been delivered the day before then I think all would have been completely almost the same. I would expect the same events to occur. Her response to them would be the same".

Shortly after that he went on to say:

"I have no evidence from my own experience or the literature to suggest if she had been delivered on the morning (the Thursday) that hypertensive problem that she experienced in the afternoon would not have occurred. Now, to deliver on the Thursday morning would have implied, even a caesarean section which would have had to have been set up the day before or an induction of vaginal delivery, had it been started at least two days prior...so even if that had occurred I do not believe that the outcome would have been different".

Ultimately, his opinion was that earlier delivery, other than outwith a 48 hour period prior to the acute event on the Thursday, would not have avoided the hypertensive crisis or controlled it and thus would not have avoided the fatal outcome.

However, as to possibilities, there was the following exchange in cross-examination to Mr Moynihan:

"...first of all you accept that delivery produces haemodynamic changes that reduce blood pressure, is that correct? - Yes.

And that in fact in Sharman Weir's case the intra-cranial haemorrhages were pre-delivery, not post? - Yes.

But it is the juxtaposition of those two, the fact that in this case the haemodynamic changes did produce a reduction in blood pressure for her and that the damaging bleeds occurred pre-delivery, that is leading me to suggest to you that if only delivery had occurred before 10 past 2, had been completed before 10 past 2, that there is first of all a possibility, a possibility, that these intra-cranial haemorrhages would not have occurred? - Well, it comes

back to this point of possibility. What I would say to you is that if she had been delivered prior to 10 past 2 she would not have been on anti-hypertensive therapy. That is the first thing. So therefore only the effect of delivery in reducing blood pressure would have been present. Now, the problem with someone who has labile blood pressure but not bad enough to treat is that often in that situation the delivery can make a rise in blood pressure even immediately afterwards but even if that is not the case, within 12 or 24-hours. If she is not on anti-hypertensive therapy then her blood pressure remains labile. It also remains able to respond to any stimulus or any haemodynamic change which is liable to produce a rise in blood pressure. So what I would say to you is that the probability, the major probability is if she was delivered earlier she would have had a hypertensive crisis after delivery at some point. Now, whether that would have been picked up and treated and managed or whether the blood pressure, the 100 diastolic (sic) may have been not reached is difficult to say. I think the probability is it would have still had. I agree with you that there is a possibility (my emphasis) that if she had been delivered earlier and someone had been with her at all times and had found her blood pressure rise sooner and acted fast and given anti-hypertensive therapy there is a possibility that the severe hypertensive crisis would have been brought under control sooner. I accept that but I still think she would have had a hypertensive crisis. All the evidence that I have from work I have done and others have done, the only way to reduce the prospect of hypertensive crisis is to have someone on an anti-hypertensive drug. The problem is you need a reason to start them on anti-hypertensive drugs in the first place. If you deliver her earlier she would not have been on them".

In connection with the question of a hypertensive crisis, there had been the following exchange between Mr Moynihan and Professor Walker:

"Added to that delivery before 10 past 2, delivery completed before 10 past 2 on the Thursday would mean that the placental stimulus to the pre-eclamptic condition and its complications would have been removed? - Delivery would have increased the placental stimulus at the time of delivery and it would have therefore increased the chances of both a hypertensive rise and the development of HELLP Syndrome compared with the steady state prior to delivery. It brings forward to some extent what might happen over the next few days more likely to happen within the next few hours. That is what delivery does. It concentrates down complications within that 24/48-hour period. So although it takes away the placental stimulus which is the initial drive, the complications that you are talking about like HELLP Syndrome and pre-eclampsia are not directly related to the placenta being present. The placenta could have been removed and these events still occur within 24/48 hours after delivery so the removal of the placenta does not mean that she would not have an acute rise within a few hours, within 24 or even 48 hours. It still may (my emphasis) occur and in fact in this lady's case if you ask me what I thought her post-partum complications would be I would have said hypertensive crisis. I would not have said HELLP Syndrome because her biochemistry was normal. It was her blood pressure which was labile so it is far more likely after delivery that she would have a hypertensive crisis post-delivery than any other complication of pre-eclampsia apart from maybe eclampsia itself which is related to the hypertension".

I have highlighted use of the word "may" in this answer. If the acute rise still "may" occur within 24 to 48 hours after delivery, it seems to me that it must follow that it must be possible that it might not occur.

In the light of Professor Walker's evidence, and bearing in mind that he was the expert who had done by far most in the way of explaining and analysing the actual cause of death, I accept that there would not have been a real possibility that death might have been avoided by delivery as late as the morning of the Thursday. In the light of all the evidence, I consider that there would only have been a "real possibility", as opposed to a theoretical one, that death might have been avoided had delivery been completed no later than 24-hours prior to the acute event at 1410 hours on the Wednesday.

As I have already indicated, I am not satisfied on a balance of probabilities that I can conclude that delivery prior to 1410 hours on the Wednesday would have been a reasonable precaution.

I should add that in his written submission Mr Moynihan submitted that Professor Walker had conceded that it was possible that "delivery" achieved even on the Thursday morning could have avoided the fatal outcome. However, the passage upon which he founded was all put on the basis, not that it was possible that delivery (my emphasis) might have avoided the death, but that administration of Labetalol at 1410 hours might have had this effect.

In that connection, Mr Moynihan reminded me that Professor Walker had accepted that Labetalol had first been administered at 1604 hours, after two systolic readings over 200. Mr Moynihan then reminded me verbally of Professor Stirrat's evidence that the sequence of events had occurred because Ms Weir's blood pressure had not been brought under control quickly enough.

This was one of the areas of evidence given by Professor Stirrat that I had found confusing. He was at some points critical of this as aspect of Ms Weir's management, but then in cross-examination to Mr Donald I had understood him to say that he was not critical of this. I also note that it was not suggested that a "reasonable precaution" in the present case would have been the earlier administration of Labetalol. Neither was any criticism to this effect put to anyone such as the consultant anaesthetist, Dr Stone, or Dr Catriona Bain, specialist registrar in obstetrics, both of whom had been involved with the administration of the severe hypertension protocol after the acute event at 1410 hours on the Thursday. Dr Bain had been the registrar on call in the labour ward on 21 October, and had therefore been involved with Ms Weir's care in the labour ward from Ms Weir's arrival there until her duty ended at 8pm that day. For the avoidance of any doubt, I would add that my opinion was that Dr Stone was a most impressive witness in whom I had complete confidence. Dr Bain also impressed me as being very competent. In any event, had that suggestion been made, I would have had no hesitation in preferring Professor Walker's evidence to the effect that the steps that were taken after the acute event were perfectly acceptable practice for very understandable reasons which he explained at some length. This consisted in a clinical decision to start therapy with magnesium sulphate rather than Labetalol. Both cannot be

given together at the same time. That had to be allowed to take effect before giving the Labetalol, which is what happened. No other expert was critical of this.

Section 6(1)(e):

Any other facts which are relevant to the circumstances of the death:

I have in the Introduction indicated that I have adopted the approach taken by Sheriff Kearney in the James McAlpine Determination. None of the parties took issue with this approach. I therefore proceed on the basis that I am entitled and indeed obliged to comment upon and, where appropriate make recommendations, in relation to any matter which has been legitimately examined in the course of the Inquiry as to a circumstance surrounding the death if it appears to be in the public interest to make such comment or recommendation.

In the light of the evidence, and my conclusions in relation to it, I take the view that there are a number of such matters in this case which appear to me in the public interest to require comment and recommendation.

I have therefore set out in my Determination under Section 6(1)(e) facts which I consider to be relevant to the circumstances of death together with what I consider to be appropriate recommendations to make in the public interest. These include (1) a recommendation in relation to the identification of a lead consultant to develop a system for the management of patients with pre-eclampsia and eclampsia, with that system to include appropriate staff training; (2) a recommendation about the admission of a patient with pre-eclampsia or suspected pre-eclampsia being brought to the attention of a senior doctor; and (3) a recommendation that a patient admitted to the ante-natal ward with pre-eclampsia or suspected pre-eclampsia should be seen by a consultant within the working day following her admission in order to determine the immediate and subsequent management of that patient in detail.

These recommendations are made in the light of my analysis of the position about consultant involvement and related matters in the section entitled "Whether there was inadequate consultant involvement such that the Queen Mother's Hospital was out of line with standard practice?" In that section, I made specific reference to the CEMD Reports and the evidence of various witnesses in relation to them. I have made Recommendations 3(a), (b), (c) and (d) for the reasons given there. In particular, in relation to Recommendations (3)(a) and (3)(d), I am making these recommendations not because I have answered Mr Moynihan's first question in the affirmative, which I have not. It is rather because I am not satisfied on the evidence available to me that the recommendations of the CEMD Reports founded upon by Mr Moynihan in his submissions are as yet "standard" practice (to use the wording of Question 1) in the medical profession. That being so, albeit that the Queen Mother's Hospital could not be said to be out of line in this respect with "standard" practice as it is at present, that does not in my opinion justify a continued failure on the part of any maternity hospital, including the Queen Mother's Hospital, to act upon and implement such

recommendations in the public interest, particularly having regard to the status of the Queen Mother's Hospital as a teaching hospital and as a tertiary centre taking referrals from other hospitals.

There is a further reason why I consider it to be in the public interest to recommend that a lead consultant should be appointed. I was not satisfied that earlier delivery would have been a reasonable precaution in this case on the view that the approach Dr Roberts' actually took was supported by reasonable, responsible and respectable opinion, albeit at the conservative end of the spectrum of views taken. However, I am conscious that although what Dr Roberts actually did was so supported, she had in her evidence described taking a different approach, apparently even in relation to a pre-eclamptic pregnancy at 37 weeks gestation, which was to wait for "any obvious signs of progression of her condition". If Dr Roberts does indeed have an approach, in the context of pre-eclamptic pregnancies at 36/37 weeks gestation, of actually "waiting for any obvious signs of progression of her condition", which were her own words, that would not in my opinion be in accord with the spectrum of views expressed by the expert witnesses in relation to decisions at this gestation in the context of a pre-eclamptic pregnancy. For example, Professor Walker confirmed that he did not subscribe to such a school of thought. I am also conscious that it is unlikely that Dr Hanretty, who was Ms Weir's named consultant, would have made a decision for delivery at any earlier stage either. Dr Cameron might have considered proceeding to induction of labour on the Wednesday evening as a matter of his own personal judgment, but not because he considered that there were any developing symptoms. In the light of the views expressed by both Dr Hanretty and Dr Cameron in their evidence, my clear impression was that they too take a "conservative" approach. I was told that there have not been any material changes in the system for the management of patients with pre-eclampsia at the Queen Mother's Hospital since the death of Ms Weir. I am well aware that Ms Weir's case was extremely unusual in almost every way. I also accept that it may well be that such a presentation is most unlikely to present again. Nevertheless, however unlikely this may be, it is difficult to avoid the conclusion that if a woman were to present again at the Queen Mother's Hospital as Ms Weir did, she would be unlikely to survive. By contrast, it is clear from the evidence of Professor de Swiet that had Ms Weir been in his care, there is a realistic possibility that she might have survived as he would have been advising delivery to be completed by midday on the Wednesday, which would have been over 24-hours before the acute event which occurred the next day. He also said that he believed that his opinion would be shared by his consultant obstetric colleagues in the three London Hospitals at which he is a consultant, namely by 20 to 30 consultants, and other consultants in the United Kingdom. In my opinion, it has to be for the obstetric profession, including obstetric physicians such as Professor de Swiet and Professor Redman, rather than the Courts, to decide on best obstetric practice, including that in relation to the significance to be placed on symptoms in the context of pre-eclampsia and the timing of deliveries at 36/37 weeks gestation. That in my opinion is therefore another good reason why it would be in the public interest to recommend that a lead consultant with the necessary experience and insight into the condition should be appointed at the Queen Mother's Hospital in order to consider the competing and problem areas with a view to developing an appropriate system of management of pre-eclamptic pregnancies, including those presenting atypically, such as happened in this case, which it is known can occur.

Mr Moynihan also invited me to make a recommendation to the effect that there should be a practice and policy review of the management of pre-eclampsia under the auspices of a city wide forum. Professor Stirrat had suggested this. What Professor Stirrat said about this was as follows:

"I would also have expected there to have been perhaps a cross-city group between the Royal Maternity Hospital and Queen Mother's Hospital and the Southern General, where those with these interests -- you know, they shared -- they met together, and there was some commonality. That is certainly what, if I were in Glasgow, I would have tried to achieve".

It seems to me that this was pretty vague. It was not something that was raised with any other expert witness for their views. It may well be that there is merit in the idea, but I do consider that that the evidence focussed this with sufficient clarity to persuade me that it would be appropriate to make a formal recommendation as suggested. If the hospitals to which Professor Stirrat referred wish to meet as such a cross-city group, that is I think a matter for them to think about and decide upon.

Mr Moynihan also invited me to specifically report the conclusions of this Inquiry to the Royal College, to be taken into account when Professor Walker is formulating his guidelines on pre-eclampsia. The procurator fiscal depute and Mrs Murray submitted that the Court had no power to do this. I was in particular referred to section 6(4) of the 1976 Act. Mr Moynihan was not able to point to any specific power in support of his invitation. I am not persuaded that I have the power to accede to this invitation, even if I had been persuaded of the appropriateness of so doing.

In the section entitled "Whether the Queen Mother's Hospital had a delivery policy?" I referred to the fact that the hospital's electronic information system was not checked on the Wednesday afternoon to see if the results of the 24 urine collection were available. In the event, I accepted Dr Roberts' evidence that she would in any event have wanted further blood tests the next morning. I therefore accept that the failure to check for the urine results that afternoon is unlikely to have made any difference to the management in relation to this case. However, as I indicated earlier, it is not entirely clear to me what the point is of having an electronic information system, possibly at no little cost, whereby such results are posted on the computer terminals unless these are checked, rather than simply the paper results awaited, in this case the following day, over 20 hours after they were posted on the system, this being the first time Ms Weir was being seen by a doctor again. In the event, it does not appear however that the paper results were being awaited as I note that when Dr Chitra was checking for the results on the Thursday, she went to the computer terminal for the results.

The fact therefore is that that there was a 20 hour gap in obtaining these results when there need not have been. Although it is unlikely to have made a difference to management in this case, in another case it could well do, particularly bearing in mind the variability of pre-eclampsia, including the rate at which it can potentially progress. Professor Calder said that as at 3.30pm on the Wednesday he would have wanted to know the results of the 24-hour

collection and that he would probably have asked someone to check whether the results were available. In my opinion, such an approach is to be commended. No reasons were advanced as why such an approach should not be adopted at the Queen Mother's. I did consider whether I should make a formal recommendation in this respect. However, it was not suggested by either the procurator fiscal depute or by Mr Moynihan that I should do so. I therefore have not made any formal recommendation about it. It might however be an aspect worthy of consideration by a lead consultant when looking at an appropriate system of management of pre-eclamptic pregnancies.

All were agreed that the blood tests instructed for the Wednesday should have been taken. It remains unknown why they were not. There was some speculation that this may have been because Ms Weir had agreed to take part in medical examinations for students that day. This certainly seems possible, but there was no evidence to provide a firmer indication than that. Whatever the reason may be, it is clearly unacceptable that such blood tests were not taken as instructed. In the event, because the blood results on the Thursday were essentially normal, it is most unlikely that the results for the Wednesday would have been any different. However, having regard to the fact that blood tests are one of the principal methods of monitoring to check for any signs of potential deterioration in what is such a potentially treacherous condition, it is in my opinion imperative that if such tests are instructed they be carried out. I have therefore reflected this in Recommendation 3(e).

The procurator fiscal depute invited me to make a recommendation to the effect that there should be an opportunity for all junior staff to de-brief after a fatal outcome as in this case. This arose because although there was evidence that the midwifery staff involved with the care of Ms Weir had had an opportunity to meet after the death of Ms Weir to discuss what had happened, it appeared that no specific opportunity had been given to the junior doctors involved to "de-brief" with a senior member of the medical staff. In particular, it became evident in the course of her evidence that Dr Hayes had felt that she had been under a lot of pressure on the evening of the Thursday, in what must have been a most taxing and difficult situation, and that she had felt that she could have done with more support. I am satisfied that this was not something which she had drawn to anyone's attention previously and, indeed, those who had been working with her that evening had felt that she had in fact coped well. I should make it clear that I agree with them. However, the fact is that it was very obvious that her evidence was in a number of material respects at variance with that of her colleagues. It was difficult to avoid the impression that her recollection of events was perhaps influenced by her knowledge of the fatal outcome, and possible concern about her own position. I am inclined to think that that her perception of events may well have been different had she had an opportunity to de-brief as suggested by procurator fiscal depute. Indeed, I would be surprised if such an opportunity would not have assisted. I am therefore persuaded, on balance, that it would be appropriate to make the recommendation suggested. This is reflected in Recommendation 3(f).

Mrs Murray submitted that on the evidence heard "it should be determined that the care which Ms Weir received within the Queen Mother's Hospital was not only in accordance with standard practice within the obstetric profession but was delivered to a high standard ...and ...was at the forefront of good practice". In my opinion, the public is entitled to expect all of these things from a hospital of the standing of the Queen Mother's Hospital.

However, I regret to say that I cannot agree that in the circumstances disclosed to me in evidence the care which she received in the ante-natal ward from the time of her admission there on Monday 18 October 1999 until the acute event on the Thursday 21 October 1999 was (a) in accordance with standard practice within the obstetric profession, (b) delivered to a high standard or (c) at the forefront of good practice. The plain fact is that there were a number of departures from good practice in the ante-natal ward during that period, as I have set out in my Determination under Section 6(1)(e) of the 1976 Act. In the event, these lapses probably did not make a difference to the outcome in this particular case. However, the fact is that every day from and including the Monday 18 October through to Thursday 21 October there were departures from good practice in the ward. With a condition as variable and potentially treacherous as pre-eclampsia, any single departure from good practice in another case could make the difference between life and death. That is not acceptable at any hospital, still less at a teaching hospital and tertiary centre such as the Queen Mother's Hospital. A recital of these lapses as narrated in my Determination under Section 6(1)(e) perhaps tells its own story, and in my opinion suggests that there is a degree of laxity in the current system for the management of such patients in the ante-natal ward. In my opinion, the situation was not assisted by the fact that Dr Roberts was being expected to continue with her usual duties, in a number of different hospitals and clinics, whilst supposedly having to cover for the consultant, Dr Hanretty, whilst he was on holiday. There was no suggestion in the evidence that the position would be any different in the event of the absence of any of the other consultant obstetricians on holiday, or for any other reason.

I have no doubt that Dr Turner was correct in saying that it would be a "resource solution". The recommendations I have made are inevitably "resource solutions", but there comes a time when the position is such that it is unacceptable in the public interest that "resources" such as Dr Roberts and others are spread too thinly for the best interests of the patients and their families. The recommendations I have made are made with a view to ensuring that the Queen Mother's Hospital does in future deliver care in the ante-natal ward to as a high standard as the public are entitled to expect, which should in my opinion include sufficient consultant involvement.

In saying all this, I should make it clear that at no time was it suggested that the midwifery care at the Queen Mother's Hospital was other than of the highest standard. Indeed, Professor Stirrat described the midwifery care given to Ms Weir at the Queen Mother's Hospital as "exemplary".

It is very much to be hoped that the guidelines to be produced by Professor Walker for the Royal College, and auditing of the results to see what the outcomes are, will provide greater certainty in the not too distant future in relation to what Professor Walker described as being the "grey area" in relation to which no guidelines currently exist. It is clear from the evidence I have heard that it will be no easy task.

Concluding remarks:

In the first place, I would like to particularly commend the dedication and dignity shown by members of Ms Weir's family at this Inquiry following her tragic death at what should, in the normal course of things, have been a time of joy on the birth of a child. I am thinking most particularly of Dr Alan Weir and Mr Malcolm Fletcher, from I was privileged to hear in evidence. It did not escape my notice that both somehow managed to spend substantial periods at this inquiry despite its length. As I recall it, Dr Weir, who lives and works in Belfast, only missed one day of the forty-three day Inquiry. That is dedication of a high order.

I would also like to thank all those who appeared at the Inquiry for the care that they took throughout, including in the preparation and presentation of their respective written submissions, which were of great assistance to the Court. It is clear that there was a lot of hard work involved for all concerned, and the care which each took was a reflection of that. I would therefore like to record my appreciation of that.

I would also particularly like to thank the procurator fiscal depute, Mrs Gillian Mawdsley, for all her hard work in arranging and presenting this Inquiry which was both large scale and of no little complexity. Mr Donald informed the Court that his understanding was that this Inquiry had been the longest running medical Fatal Accident Inquiry so far in Scotland, and with the highest number of professors attending to give expert evidence. The logistics alone of arranging all the witnesses, including those such as professors and doctors who no doubt had numerous other commitments, was hard enough work, but on top of that the subject matter was itself sometimes less than easy. That is leaving aside the sheer volume of it. So I would like to record publicly my sincere appreciation of all her undoubted hard work.

APPENDIX A: WITNESSES ADDUCED AT THE INQUIRY

FOR THE CROWN:

1.

MALCOLM FLETCHER

2.

DR CHITRA RAJAGOPALAN

3.

PROFESSOR PHILLIP BAKER

4.

DR IAN GIBSON

5.

DR JUDITH ROBERTS

6.

DR RICHARD LOCKE

7.

PROFESSOR IAN GREER

8.

DR ALAN CAMERON

9.

DR ORLA HAYES

10.

DR CATRIONA BAIN

11.

DR LORRAINE BELL

12.

DR KEVIN HANRETTY

13.

DR PAULINE STONE

14.

DR PATRICK BRANCHFIELD

15.

DR MOHAMMED ALLAM

16.

MRS MARGARET RAE

17.

SISTER ANNE DOOLEY

18.

DR JOHN LOUIE PLENDERLEITH

19.

PROFESSOR ANDREW CALDER

20.

SISTER DIANE ANDERSON

21.

DR BRIAN D STUART

22.

DR ALAN HOWATSON

23.

DR SANDRA SPILG

24.

DR THOMAS TURNER

25.

PROFESSOR MICHAEL DE SWIET

26.

CHRISTINA SMITH

FOR THE FAMILY:

1.

DR ALAN WEIR

2.

PROFESSOR GORDON STIRRAT

FOR THE DOCTORS:

1.

PROFESSOR JAMES WALKER

FOR YORKHILL NHS TRUST:

1.

SISTER MHAIRI BROWN