STATEMENT OF WITNESS

STATEMENT OF: Dr Brian Norman Harding (*Name*) MA DPhil BM BCh FRCPath (*Rank*)

AGE OF WITNESS *(If over 18 enter "over 18"):* Over 18

To be completed when the statement has been written

I declare that this statement consisting of 5 pages, each signed by me is true to the best of my knowledge and belief and I make it knowing that, if it is tendered in evidence at a preliminary enquiry or at the trial of any person, I shall be liable to prosecution if I have wilfully stated in it anything which I know to be false or do not believe to be true.

Dated this 22 day of August 2007

SIGNATURE OF MEMBER by whom statement was recorded or received

PRINT NAME IN CAPS

B Harding

SIGNATURE OF WITNESS

Qualifications and Experience

I have been Consultant Neuropathologist at Great Ormond Street Hospital since 1983, as the only full-time paediatric neuropathologist in the UK. My clinical workload involves the morphological diagnosis of neurosurgical biopsies for brain tumours, of brain resections for treatment of intractable epilepsies, of muscle biopsies, and the post-mortem diagnosis of brain diseases in children. Although my research interests lie mainly in the field of developmental and metabolic disease in childhood, my clinical practice includes many examples of pregnancy and birth related hypoxic-ischaemic injury, and both accidental and non-accidental traumatic injury. I also receive many referral-consultations from both national and international sources. I have given expert evidence in both the criminal and civil courts, and in the Appeals court, and have appeared for both prosecution and defence, Guardians ad litem, and local authorities. I have authored many peer reviewed papers, written many chapters in leading textbooks, and jointly edited an

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international textbook on Developmental Neuropathology, (for the International Society of Neuropathology).

Declaration

I understand that I owe an overriding duty to the Court to provide independent assistance, to the Court, by way of unbiased opinion in relation to the matters within my expertise and that such advice must be uninfluenced by the exigencies of the case. I have complied with, and will continue to comply with, my duty to the Court.

I confirm that I have read guidance contained in a booklet known as Disclosure: Expert's evidence and unused material which details my role and documents my responsibilities, in relation to revelation as an expert witness. I have followed the guidance and recognise the continuing nature of my responsibilities of revelation. In accordance with my duties of revelation, as documented in the guidance booklet, I:-

a. confirm that I have complied with my duties to record, retain and reveal material in accordance with the Criminal Procedure and Investigations Act 1996, as amended;

b. have compiled an Index of all material. I will ensure that the Index is updated in the event I am provided with or generate additional material;

c. that in the event my opinion changes on any material issue, I will inform the investigating officer, as soon as reasonably practicable and give reasons.

NEUROPATHOLOGY EXAMINATION re Claire Roberts (d.o.d. 23.10.96)

At the request of DS Cross for the Police Service of Northern Ireland.

Materials received:

1. Autopsy Report by Dr Herron.
2. A letter from Dr Walby, dated 16.12.04 giving further history.

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3. The inquest verdict.
4. 32 H&E stained sections, 23 immunostained slides, 4 semi-thin slides.
5. A further H&E stained sections, levels from one of the above blocks.
6. A letter from Mr Alan Roberts, Claire's father, to his solicitor.

Microscopic examination:

The sections are not anatomically identified, so that particular parts of the cerebral cortex cannot be identified with certainty. However there are numerous blocks taken from the cerebral hemispheres. In these sections, there is no evidence of meningitis or encephalitis (inflammation of brain and its coverings). There is no evidence of haemorrhage or infarction (stroke). Regarding the anatomy, there is no convincing evidence of malformation. Occasional neurons are present in the white matter; this is a normal finding. The only substantive abnormality is the presence of scattered neurons showing hypoxic change.

The basal ganglia and thalamus, as well as the hippocampus are similarly unremarkable. Sections from the brainstem and the cervical spinal cord are unremarkable. There is no evidence of inflammation, haemorrhage or malformation. In particular, there is no evidence of central pontine myelinolysis (a destructive lesion which may occur following hyponatraemia with rapid correction).

Cerebellar tissue is insufficient for meaningful comment.

Summary: Brain swelling (macroscopic description).

Acute hypoxic damage to nerve cells (probably terminal).

No evidence of acquired or inherited disease.

Opinion:

In answer to specific questions:

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a. There is no evidence of acquired infection (meningitis or encephalitis).

b. The cause of death as given on the death certificate and in the inquest verdict remains in my opinion not concordant with my observations.

1. The only relevant observation, albeit macroscopic (naked eye) is of brain swelling, as judged by the excessive brain weight (1606g, the normal at this age in girls is 1200g) "effacement of gyri" and "uncal prominence". However these are rather weak indicators, not supported by major downwards shift of the brain and cerebellum which is common in severely swollen brains and by the microscopy (lack of vacuolation of white matter). I can find no mention of the head circumference on the records which I have been given to indicate whether this child had a normal head circumference during her life, against which to judge the brain weight. During the terminal illness the CT scan was reported to show cerebral oedema (swelling).

2. We have no information regarding the other internal organs of the body, which might help us, for example to exclude a cardiac cause of sudden death.

3. If cerebral oedema is present (inquest cause of death 1a), then we require a cause of it. The inquest records 1b "meningo-encephalitis, hyponatraemia due to excess ADH production and status epilepticus".

4. I consider meningo-encephalitis excluded, both by microbiology and the post-mortem neuropathology.

5. Hyponatraemia has been identified from the chemical-pathology data. There is a history of vomiting which when severe may result in electrolyte

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disturbance. Hyponatraemia is known to cause brain swelling. But there is no other specific neuropathological indicator for hyponatraemia, that I am aware of.

6. The child was said to suffer from seizures. None were witnessed prior to hospital admission, and certainly not status epilepticus. Moreover the neuropathological sequelae of status were not present. Nor was there damage to the hippocampus which may be seen in children with chronic epilepsy.

Conclusion: Although the data are incomplete, in my opinion the evidence suggests that brain swelling was the immediate cause of death and hyponatraemia is the only causative factor that has been positively identified.