

The Scarlet Thread

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There are references to “the scarlet thread” in both Christian and Jewish theology. “The scarlet thread” which is the title of my talk does not refer to any aspect of any theology. It does not refer to either the scarlet cord Rahab, the harlot, who lived in the city of Jericho, let down from her window to save her and those of her household from the Israelites (to find out more about her salvation and the aftermath see Joshua Chapter 2: verses 18-19 are the starting point) or the blood of Jesus. The theme of my talk is secular rather than sacred. So, you may wonder, what is “the scarlet thread” of my talk? I have taken it from the novel “A Study in Scarlet” by Sir Arthur Conan Doyle. It was published in 1887 and was the first of his novels to feature Sherlock Holmes. In a speech to his companion, Dr Watson, Holmes states:

“There’s the scarlet thread of murder running through the colourless skein of life, and our duty is to unravel it, and isolate it, and expose every inch of it.”

In many ways that has been a job description for a coroner since 1194 when the office of coroner was founded to the present day. When an unnatural death is reported to the coroner, he has a duty to investigate and establish certain facts and that investigative role is part of his inquisitorial function. To a greater or lesser extent the investigation of each death reported becomes a study in scarlet. Many deaths investigated by a coroner are not the result of murder, but each has a thread that needs to be unravelled to elicit the true facts behind the death. The colour of that thread is not always scarlet – that colour is reserved for murder - but when it is it may not always be apparent to the coroner that the same single scarlet thread links a series of deaths.

In her crime novel “Sister” Rosamund Lupton said this of the colour red:

“...the colour of cardinals and harlots; of passion and pomp; cochineal dye from the crushed bodies of insects; crimson; scarlet; the colour of life; the colour of blood.”

She put it rather well. Incidentally, it is a novel I would commend for bedtime reading.

My predecessor in office, the late James Elliot, held inquests into the deaths of the victims of the Shankill Butchers unaware that each was linked. The police officers investigating did not tell him – no doubt to protect sensitive lines of inquiry – and I remember him telling me how shocked he was to learn the truth. The murders carried out by the Shankill Butchers gang illustrate so well that unravelling, isolating and exposing the scarlet thread can be a most exacting task for a single human being and one that only a modern day Sherlock Holmes may

be able to accomplish. If you require proof of this have a look at the “Shankill Butchers” entry in “Lost Lives” and follow the labyrinthine journey of the scarlet thread as it snaked its way through so many brutal murders.

I held inquests into the deaths of five Catholics who were murdered at Sean Graham Bookies on 5th February 1992. The youngest was only 15. The two gunmen believed to be responsible were Raymond Elder and Joe Bratty, both members of the UFF. Whilst there was no forensic evidence at that time linking them to the deaths, the dogs on the street knew who was responsible and Elder had been visually identified as having been there. Both were shot dead by IRA gunmen on 31st July 1994. Sometime before the massacre one of the guns used, a 9mm Browning pistol, had been in the custody of a UDA Quartermaster, William Stobie, who was also a Special Branch informant. He gave it to his Special Branch handler for deactivation. It was then deactivated and handed back to Stobie. However, it was then reactivated and used in the Sean Graham Bookie’s massacre. The gunman who used it there was cool enough to reload it in the course of the shooting. (A total of 44 shots were fired.) Stobie was himself shot dead by a UDA gunman on 12th December 2001 and I held an inquest into his death. The history of weapons used in the troubles and paramilitary personalities can be fascinating. The 9mm Browning pistol had been stolen from the UDR barracks on the Malone Road by a UDA gunman, Kenneth Barrett, on 31st January 1989 and used by an unidentified UDA gunman to murder Aiden Wallace at the Devenish Arms on 22nd December 1991. I held that inquest too. It was then used at Sean Graham Bookies and eventually recovered by Police on 6th May 1992. Kenneth Barrett, also a Special Branch informant, was later convicted of the 1989 murder of the solicitor, Patrick Finucane in 2004. I also held that inquest.

Sometimes the scarlet thread has to be very long indeed and the colour of blood seems to be an appropriate one when the investigation relates to murder.

I have alluded to the quotation from “A Study in Scarlet” being a modern-day job description for a coroner. When I was appointed a deputy coroner in 1984 the scope of an inquest was much more restricted than it is now. The police provided the coroner with a selection of statements and a police inspector presented the evidence at the inquest. The late James

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Elliot, had a target of holding the inquest within 10 weeks of receiving the post-mortem report. Legal representation for bereaved families was unusual and families would be in ignorance of what evidence would be introduced until they heard it in the course of the inquest hearing. Usually the police investigation was ongoing. By and large that highly unsatisfactory state of affairs – “unsatisfactory” by the standards of today – was accepted by bereaved families. Now, the coroner expects to receive all documentation generated by the police investigation and so too does the family. Moreover, inquests tend to be held only when the investigation has concluded. There may be a series of criminal investigations – PSNI, Police Ombudsman, Historical Enquiries Team. Not surprisingly these may delay the holding of inquests for many years but families now appear to prefer that the inquest is held after the conclusion of all criminal investigations.

The statute *De Officio Coronatoris* of 1276 is generally considered to constitute the basis of modern coronial law in Ireland as well as England and Wales. Its provisions underline the paramount duty of the coroner to investigate.

“That the coroner, upon information, shall go to the place where any be slain, or suddenly dead or wounded; and shall forthwith command four of the next towns, or five or six, to appear before him in such place, and when they are come thither, the coroner, upon the oath of them, shall inquire in this manner, that is, to wit, if it concerns a man slain, whether they know where the person was slain, whether it were in any house, field, bed, tavern or company, and if any who were there.

...And also all wounds ought to be viewed, the length, breadth, and deepness, and with what weapons, and in what part of the body the wound or hurt is, and how many may be culpable, and how many wounds there be, and who gave the wounds; all which things must be inrolled in the roll of the Coroners...

If any be suspected of the death of any man, being in danger of life, he shall be taken and imprisoned as before is said.”

Interestingly, the mediaeval coroner was expected to make and record some form of medical assessment of what caused death and, clearly, his external examination of the body was not intended to be perfunctory as each wound found had to be described in some detail. Possibly, the mediaeval coroner was a forerunner of the forensic pathologist. Seven centuries would pass before this part of Ireland had a forensic pathologist, namely, Professor TK Marshall who was appointed as State Pathologist for Northern Ireland in 1958.²

Coroners were elected, the job was for life and during good behaviour. The coroner had to reside in the county and to be a “wise and discreet” knight and to be of substantial means. The rationale for the last requirement was that persons of wealth and status were less likely to succumb to corruption, but if they did their lands and goods would be forfeit to make good any resultant loss – an early form of indemnity insurance. Coroners were originally of such substance and station that, in the words of Blackstone, they would not “condescend to be paid for serving their country” in accordance with the common law “that none having any office concerning the

administration of justice should take any fee or reward of any subject for the doing of his office”. According to one commentator such lofty sentiments had been forgotten by the fifteenth century:

“...with the waiving of the knighthood qualification, it was open to more, on some of whom it undoubtedly conferred a status to which they aspired and might otherwise not have attained. Also, by this time extortion had become firmly established, was consistently practiced and only rarely punished. The office therefore appealed increasingly to families which were struggling to rise and to the unscrupulous.”

But there always have been a few good, honourable men.

As I have said the colour of the thread is not always scarlet and I will now give examples of that. Frustratingly, following extensive investigations I have held inquests into two deaths where my attempts to unravel the thread – the colour of which is undetermined at present - were thwarted by the present state of medical knowledge. Each inquest was concerned with the same issue, although the medical backgrounds were different, the post-mortem redistribution of morphine. How does a healthy human body and a dying human body metabolise morphine? Does a post-mortem analysis accurately reflect the ante-mortem position?

The first concerned a healthy body. Mrs A was admitted to hospital following the spontaneous onset of labour at 38 weeks gestation. It was her third pregnancy. Her previous two children had been born by vaginal delivery in April 2000 and February 2003 and are alive and well. She had no significant personal medical history. She had no history of allergies and she did not smoke or consume alcohol during her third pregnancy. The onset of fetal distress at full dilatation led to her third child being delivered by caesarean section. The baby was normal and healthy. Post-operatively pain relief was provided by morphine sulphate delivered by a patient-controlled pump. Eight hours after surgery she was found lying in bed in an unresponsive state and in spite of prompt resuscitative measures she failed to respond and was pronounced dead.

The Pathologist who performed the subsequent post-mortem examination found no evidence of significant natural disease to account for her death and there was nothing to suggest that any serious complication had arisen as a direct result of the pregnancy or the caesarian section. An examination of her heart by a specialist cardiac pathologist failed to reveal any evidence of underlying heart disease which might have explained the death. A toxicological analysis by Forensic Science Northern Ireland revealed the presence of morphine, a potent opiate painkiller, at a level significantly higher than the dose recorded in the medical records. The total level of morphine in the blood was 0.38 micrograms and the level of free morphine was 0.23 micrograms per ml. This contrasted with the clinical records which recorded that 12 mg was administered via the patient-controlled pump. (A leading forensic toxicologist who prepared a report for me cast doubt on the accuracy of that record.) The pathologist concluded that the cause of death was Morphine Intoxication.

However, not everyone who gave evidence agreed that this

is how the cause of death should be formulated and I had to consider alternative formulations, including that the cause of death was “unascertained” and should be recorded as such. The standard of proof in the coroner’s court (with the exception of cases of suicide) is the civil standard of the balance of probabilities. I concluded that on the basis of the evidence before me, which included the broader clinical picture, the cause of death should be formulated as follows:

1(a) Opioid induced central nervous system depression and Upper Airway Obstruction due to 1(b) Morphine administration following general anaesthesia for caesarean section and epidural fentanyl administration in labour.

There was evidence, which I accepted, that Mrs A had been snoring heavily and I accepted the opinion of a consultant anaesthetist who prepared a report for me that this was indicative of an evolving upper airway obstruction rather than being merely indicative of her fatigue following childbirth. It should have resulted in the midwifery staff seeking advice from the duty anaesthetist, if for no other reason than reassurance, but that did not happen. An anaesthetic referral may have culminated in a reassessment of her condition and a fatal outcome may have been avoided.

My formulation of the cause of death made it clear that I concluded that, on the balance of probabilities, one of the underlying causes of this lady’s death was morphine intoxication. However, I felt unable to discount the central nervous system depressant effects of fentanyl as the concentration of it in the epidural infusion and the additional dose for the caesarean section were in the upper range of acceptable dosage. I decided that “epidural fentanyl administration in labour” should be included as another underlying cause as I have noted that the central nervous system depressant effects of morphine and fentanyl are known to be additive.

I then went on to consider if I could reach a conclusion, again based on the balance of probabilities, which would explain the level of morphine found following the toxicological analysis. There was a divergence of views in the expert opinions I obtained and other possibilities were canvassed. These were:

- a. She did not die from the effects of morphine intoxication but from some other cause of death, though what that was could not be ascertained;
- b. the procedure used by the Pathologist to take a sample of blood from the body was flawed;
- c. some unidentified error or mishap occurred in the course of the toxicological analysis;
- d. a leakage from the sample bottle which occurred between the mortuary and the laboratory meant that the result of the subsequent toxicological analysis could not be relied on;
- e. the level of morphine found was explainable by reference to the theory of post-mortem redistribution of morphine; (Whilst none of the experts discounted this theory the majority took the view that it could not account for the high level of morphine found.)
- f. there had been a malfunction of the morphine PCA

(Baxter-Half Day infusor) device which had been used for pain relief resulting in the infusion of an overdose of morphine;

- g. the midwives who disposed of the residue of the morphine solution that remained in the syringe (which had been pre-filled with 60 mls of morphine solution), made an error in reading the amount remaining; (Their evidence was to the effect that only 6 mls had been used but a doctor involved in the attempts to resuscitate who saw the syringe stated that it looked half empty. To complicate matters further the medical records indicated she had not been in pain thereby obviating the need for any pain relief.)
- h. some manufacturing error had been made by the pharmaceutical firm that made up the solution; and
- i. the level of morphine found was due to some unidentified human intervention. (In relation to this the PSNI investigated, with negative results, whether she had any history of drug abuse or whether someone might have supplied her with drugs whilst she was a patient in hospital.)

I considered some of these possibilities less likely than others and I was conscious of the understandable desire of all concerned, particularly Mrs A’s family and the hospital staff, for an explanation for the level of morphine found. The need for an explanation assumed even greater importance as I concluded that morphine intoxication was one of the underlying causes of her death. I was satisfied that there was no evidential basis to allow me to hold that any of these suggested possibilities, whether singly or in combination, met the required standard of proof of the balance of probabilities. I had considered whether I should rank the possibilities I have mentioned to reflect my view of likelihood but I decided it would be wrong to do so as the evidential threshold of the balance of probabilities could not be met. I stated that I was satisfied on the balance of probabilities that death was due to the effects of morphine intoxication that occurred in circumstances which could not be ascertained coupled with the additive effects of the fentanyl.

The second inquest concerned a dying body. Mrs B, who was 56 years of age, suffered from severe chronic obstructive pulmonary disease, cerebral vasculitis and systemic lupus erythematosus. On admission to the hospital she was critically ill with acute respiratory failure due to the pulmonary disease. She expressed the wish that she did not wish for any active intervention to prolong her life. She was placed on the palliative care pathway and she died some six hours after being connected to a morphine infusion pump and this infusion continued for some 36 minutes after her death. Her death was reported to me only because of a suggestion that she may have received unspecified medical treatment from a family friend some months previously though the individual concerned denied that. However, a post-mortem was ordered to rule out any possibility that some form of treatment may have been given which may have contributed to her death.

The post-mortem examination failed to identify any connection between that medical treatment and her death but a toxicological analysis of a post-mortem sample of blood revealed a very high level of morphine that was well in excess

of the normal treatment range and at a level sufficient to cause death. It was found to contain 1.18 micrograms free morphine per ml and 1.26 micrograms total morphine (free morphine plus conjugates) per ml. The Pathologist ascribed death to "poisoning by morphine". He stated that her underlying medical conditions played no part in her death and that the morphine level detected was within the range where death in other cases had been attributed to morphine poisoning. No explanation for that level of morphine could be discovered. There was no evidence of untoward human intervention.

However, the Pathologist's formulation of the cause of death was not accepted by the hospital clinicians. One put forward an alternative formulation as 1(a) Chronic Obstructive Pulmonary Disease with Systemic Lupus Erythematosus as a contributory factor.

I obtained an independent expert report from a Biochemist and Senior Research Fellow in England. He stated:

"One must be very cautious in interpreting postmortem opiod drug concentrations in blood from chronic pain or other patients being treated with opiods as meaning the same as similar levels in overdose deaths of persons not being treated for pain."

He concluded:

"The concentrations of morphine found need not be the cause of death. What is confusing is the high percentage of free morphine to total morphine. On balance, it seems more likely that continued infusion of morphine (at concentrations 1,000-fold higher than found in blood) after the heart stopped beating, contributed to contamination of the post-mortem blood sample, producing a spuriously high free morphine figure.

Animal experiments, where drugs have been infused after death, support this conclusion. For example pigs infused intravenously with amitriptyline after death demonstrated high drug levels in blood samples from central vessels, heart, lungs as well as cerebrospinal fluid and vitreous humour. This implies that the presence of a lethal concentration of a drug in just one sample of heart blood can prove misleading in a case where agonal drug infusion may have occurred."

I sought advice also from Professor Dennis Johnston, Whitla Professor of Therapeutics and Pharmacology at Queen's University Belfast. In a letter to me dated 27th April 2010 he stated:

"... if the infusion continued for a period of 36 minutes after death, it is impossible to make any judgement about the blood morphine levels. Free concentrations of morphine will clearly be higher since metabolism would have ceased and the distribution volume would have been dramatically decreased. Overall, this would result in much higher blood morphine concentrations than those occurring during life if we could rely on uniform distribution. This assumption cannot be relied upon and the normal variations at different sites within the body would be subject to even greater variation. Very high levels would be obtained near the infusion site and much lower concentrations would be obtained elsewhere."

Essentially he is making two points. First, as the morphine infusion continued for 36 minutes after death it is not possible to reach any meaningful conclusion based on the post-mortem blood morphine level found following a toxicological analysis. Second, an analysis of a single, isolated blood sample cannot be relied upon to give an accurate analysis of morphine concentration in the blood.

The Pathologist considered both views but, having done so he remained of the view that his original conclusions were correct. In a letter to me dated 13th May 2010 he stated:

"It would be unwise to consider that the level detected was in some way a spurious result as I believe it has been rechecked and that the analysis would have been performed under strict laboratory conditions and guidelines. The accuracy of the level of morphine detected therefore seems unquestionable.

Furthermore given the high level of morphine detected I feel unable, and that it would be foolish, to incriminate the conditions, namely chronic bronchitis and emphysema, from which she was suffering as having played a direct part in her death. That is not to say however that the decision to prescribe morphine to this terminally ill woman, who had serious irreversible chronic lung disease, was in any way unreasonable in an attempt to alleviate her anxiety, stress and suffering.

In summary this is the case of a woman terminally ill with chronic lung disease with an as yet unexplained fatal level of morphine, most of which was free morphine, in the bloodstream. However despite our best efforts and seeking advice from elsewhere no robust, satisfactory explanation for the toxicology findings have been proffered. Whilst it may be that there is some as yet unidentified plausible natural/physiological explanation for the toxicological finding it may well be that there is not. Therefore one would caution against drawing any such conclusion lest some further evidence comes to light at some point in the future."

I felt his caution was understandable. Also, I accepted the accuracy of the toxicological analysis which was carried out by a Senior Scientific Officer attached to Forensic Science Northern Ireland.

In my verdict I stated that having considered all the available evidence and the competing opinions I was satisfied that present scientific knowledge is not capable of providing an answer to the conundrum posed by the circumstances of Mrs B's death. Despite the opinion of the Pathologist that her underlying condition played no part in her death and that she died from morphine poisoning, I concluded that the terminal condition for which she was being treated should not be ignored as it was the cause of her admission to hospital and the reason why she was on the palliative care pathway. On the balance of probabilities, I concluded that her terminal condition in combination with morphine toxicity caused her death. That being so I decided that the cause of death should be formulated as follows:

I(a) Chronic Obstructive Pulmonary Disease and Morphine Toxicity

II Systemic Lupus Erythematosus.

Did I fudge it? You will note that I used the term “morphine toxicity” rather than the more emotive term of “morphine poisoning” which is associated more with a homicidal death. What I found perplexing were submissions on behalf of each hospital trust that I should ignore the toxicology results. It was put to me in relation to Mrs B that if I formulated the cause of death to include morphine toxicity the consequence would be that medical staff would become fearful of administering morphine – particularly to those patients on the palliative care pathway. But why would I ignore any toxicological analysis that showed the presence of morphine far in excess of any therapeutic level? Why should I and how could I possibly justify it? What about the families and their expectation that an inquest would provide an explanation for such a level? What about the aspersions that would be cast on the Toxicologist who carried out each analysis? What about the Pathologist whose formulation of the cause of each death was based on those analyses? Surely their professional reputations must count for something? For me the bottom line was that the toxicology could not be explained away by any proven scientific alternative thesis. Rightly or wrongly I took the view that the elephant in the room – the toxicology – could not be ignored.

Subsequently, I decided that it would be wrong not to initiate some action to see if the toxicological impasse could be resolved. I must confess I was unhappy with the unsatisfactory outcome to both inquests. I wrote to our Chief Medical Officer, Dr Michael McBride, giving chapter and verse in relation to each death and I provided him with a copy of all the expert reports. I copied that correspondence to the Presidents of the Royal College of Anaesthetists and the Royal College of Physicians and Professor Patrick Johnston, the Dean of the School of Medicine at Queen’s University. Dr McBride has in turn referred the correspondence to the President of the Royal College of Pathologists. What I think Pathologists will say is that they rely on the results of the toxicological analysis and, in any event, the blood sample taken at autopsy is from a peripheral vein that is not proximate to the infusion site. That was the *modus operandi* in relation to these two women. Typically the blood sample is from a leg vein but not from the leg used for the infusion.

I am awaiting with bated breath the outcome of my referrals. Of course, if any of you have the answer please tell me.

What has surprised me is the absence of any research into how the human body metabolises morphine. I have already quoted from one of the expert reports submitted to me which referred to research involving pigs infused intravenously with amitriptyline. But is what may be true of the effects of amitriptyline true of morphine? Both the Pathologist and the Toxicologist who carried out the analysis took the view that like is not being compared with like. So far as I can ascertain there has been no research on human beings. Surely such research must be possible if it is properly consented to? For instance terminally ill persons on the palliative care pathway who are in receipt of morphine could be asked to consent to a series of both ante-mortem samples and post-mortem samples. What would the Ethics Committee say to such a proposal? I have been told by members of the medical profession who know about these things that almost certainly the Ethics

Committee would not approve such research. However, even if approval was given such research at best might only indicate how metabolisation in the dying body takes place. A Palliative Care Consultant I have spoken to informed me that by and large it is not known how the dying body deals with drugs and that it is likely metabolisation would be different to that in the healthy body.

Very few deaths of persons on the palliative care pathway are referred to the coroner (asbestos-related deaths excepted) as the vast majority of such deaths are from natural causes with a death certificate being issued. Post-mortems are rare and so the reservoir of knowledge, particularly in relation to the dying body and morphine is shallow indeed. The healthy individual in receipt of morphine as a short-term measure for pain relief invariably recovers without the opportunity or need for any morphine analysis. Thus, if Mrs A had, as expected, made a full recovery from the rigours of childbirth following a caesarean section, the morphine issue would never have arisen.

In summary are the issues these?

1. Is the theory of post-mortem redistribution of morphine scientifically valid?
2. Does metabolisation in the healthy body differ from metabolisation in the dying body?
3. Is what is true of a single healthy body true for all healthy bodies and, conversely, is what is true of a single dying body true for all dying bodies?
4. If the answer to that is No where does that leave us?

Two further points must be considered. First, criminal prosecutions take place – Dr Harold Shipman is one example – on the basis of a post-mortem blood analysis that shows a morphine level and which may culminate in someone being convicted of an offence and imprisoned. Is there not a problem in relation to this if medical science does not know how the human body metabolises morphine and the accuracy of any post-mortem level cannot therefore be relied upon? Second, if reliance cannot be placed on the post-mortem morphine analyses in relation to Mrs A and Mrs B does that now mean that all past analyses must be questioned? The consequences of the answer to that question being “Yes” are almost too dire to contemplate.

All of us have unfinished business and, I must confess, being able to solve the conundrum of the post-mortem redistribution of morphine is one of mine.

I hope this paper will provide you with food for thought and if you have the solution remember I am just a telephone call away. Unravelling the thread – scarlet or otherwise - can be as elusive as finding the crock of gold at the end of the rainbow. It is an exacting task and those involved would do well to remember the old adage that in any investigation what starts out as central may become peripheral and what starts out as peripheral may become central. All of us know the truth of that.

As an abuser of both morphine and cocaine Sherlock Holmes would have revelled in the challenge. You may remember the famous opening passage of “The Sign of Four”:

“Sherlock Holmes took his bottle from the corner of the mantelpiece, and his hypodermic syringe from its neat morocco case. With his long, white, nervous fingers he adjusted the delicate needle and rolled back his left shirtcuff. For some little time his eyes rested thoughtfully upon the sinewy forearm and wrist, all dotted and scarred with innumerable puncture marks. Finally, he thrust the sharp point home, pressed down the tiny piston, and sank back into the velvet-lined armchair with a long sigh of satisfaction.”

The story ends with an exchange between Holmes and Watson with Holmes saying “For me there still remains the cocaine-bottle” and Sir Arthur Conan Doyle adds “And he stretched his long white hand up for it”. (Some query whether Holmes had Marfan’s Syndrome.)

POSTSCRIPT

To date I have heard nothing on the “science” from the

Chief Medical Officer, the School of Medicine or the Royal Colleges which perhaps suggests it is much easier to pose questions than supply answers.

I have raised this issue with coroners in England and Wales and I now know of three who are investigating deaths where the post-mortem level of opiates bears no relation to the ante-mortem history. If you throw a pebble in a pond you do not know how far the ripples will extend.

This paper was given by the author at the combined meeting of the Ulster Medical Society and The Ulster Obstetrical and Gynaecological Society, on the 18th of November, 2010.

REFERENCES

- 1 © John L Leckey LL.M., Senior Coroner for Northern Ireland, November 2010.
- 2 See TK Marshall: “A National Forensic Pathology Service—the Northern Ireland Solution”, (April 1968) *Medicine, Science and the Law* 73.