+ Homicide

The Lundy Murders

WHAT THEJURY DIDN'T HEAR

In 2002, Mark Lundy was found guilty of murdering his wife Christine and seven-year-old daughter Amber by bludgeoning them with a tomahawk. But new evidence and expert opinion raise major questions about his conviction. Mike White investigates.

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ig fat bastard. How could he? Axed his wife to death in her bed, made her face unrecognisable, then turned round and smashed in his little daughter's skull.

Then he drove like a lunatic back to Wellington and hired a hooker to celebrate.

And remember him at the funeral? All that over-the-top distress and collapsing bullshit masked by dark glasses. All for an insurance payout.

Are there words that come close to describing Mark Lundy, how vile and despicable, human only in form?

When he insisted he was innocent, the Court of Appeal tossed it out and added three years to his sentence. Big fat filthy bastard.

That's pretty much what people remember about Lundy – the high-speed car trip, the prostitute, the funeral performance.

The case against him was circumstantial and scientific, the result of 24,000 police hours and thousands of interviews. Few argued with the verdict, virtually everyone abandoning him, repulsed by the mere thought they'd ever shaken the hand that

Remember him at the funeral? All that over-the-top distress and collapsing bullshit masked by dark glasses... How vile and despicable... big fat filthy bastard.

Above: The infamous funeral photograph.

hacked his wife and daughter to death.

But new evidence including undisclosed police information and expert opinion significantly undermines the case against him – to the point where "How could he?" arguably becomes "How could he have been convicted?"

Mark and Christine Lundy owned a small business supplying kitchen sinks and benches which they ran from their Palmerston North home. They'd met through Scouting, been married 17 years and had one child, seven-year-old Amber.

On Tuesday, August 29, 2000, Mark Lundy, 41, headed to Wellington on one of his fortnightly sales trips to visit kitchen suppliers. Around 5pm he checked into his usual Petone motel. At 5.30 he received a call from Christine, 38, and Amber back in Palmerston North, saying Amber's Pippins (Guides) group had been cancelled and they were going to have McDonald's for tea.

And it's the next three hours that are crucial, where police argue the suburban dad, well known for his community work and who'd never been in trouble before, became a murderous monster.

Lundy says he drove to Petone's foreshore, read his book for a bit, went back to the motel and drank half a bottle of rum while watching TV. Just before 11.30pm he rang

an escort agency, as he'd previously done on trips away, and spent the next hour with a prostitute at his motel.

But police say when Lundy spoke to Christine at 5.30pm he somehow convinced his wife to get herself and Amber into bed by 7pm, supposedly by saying he was coming home for sex.

He then drove 150km back to Palmerston North at high speeds, parked 500m from his home, ran to his house around 7pm, attacked his wife with a tomahawk, then, when Amber got out of bed to see what the disturbance was, he killed her also. Lundy then allegedly ran back to his car and sped back to Wellington, arriving just before 8.30pm.

The bodies were found by Christine's brother around nine the next morning.

A massive police investigation that stretched from Palmerston North's streets to a laboratory in Texas led to Lundy's arrest six months later. His six-week trial resulted in a guilty verdict which was upheld in the Court of Appeal and his life sentence increased from 17 to 20 years without parole.

The Crown suggested Lundy was in financial trouble over a vineyard venture and killing his wife was a way to get her life insurance payout. Killing Amber became necessary when she saw him attacking Christine.

While the case was complex and often complicated, it essentially came down to those critical three hours and whether Lundy could have done what he was accused of.

TIME OF DEATH I

Pinpointing when Christine and Amber Lundy were murdered was pivotal to the case, with the alibis of all suspects, particularly Mark Lundy, dependent on the time of death.

Palmerston North pathologist James Pang of Medlab Central was advised of the murders soon after the bodies were found on the morning of Wednesday, August 30. However, he didn't visit the murder scene until seven hours later, staying just over half an hour. According to police, most of this time was spent talking about the scene and getting into protective clothing.

Pang merely observed the scene and made no tests, saying he didn't want to disturb the bodies while forensic examinations were being carried out. This meant he didn't conduct crucial early tests, including body temperature and stiffening, to help ascertain time of death.

However, Pang claims it's standard practice



Christine Lundy had been married to Mark for 17 years when she and their only child, Amber (pictured above as a toddler), were hacked to death.

not to test bodies at a murder scene.

Amber's post-mortem examination was done on the evening of August 31 and Christine's on September 2.

Pang's most critical findings were that the stomachs of both victims were "full", with no observable food in the top of the small intestine, and that there was no "gastric smell" similar to vomit, which occurs when digestive juices are mixed with food.

Thus he estimated both died before digestion of their last meal began, within an hour of eating. In the stomach contents he identified potato chips and probable fragments of fish.

A receipt found in the Lundy home showed Christine and Amber had bought McDonald's takeaways at 5.43 on the Tuesday evening. The meal consisted of one chicken burger, one filet-o-fish burger, nine chicken McNuggets, one large fries, one medium fries and two apple pies. The wrappers for these and an empty ice cream sundae container

were found in the McDonald's bag in the kitchen tidy.

The Lundys lived about 10 minutes' drive from McDonald's and it was assumed they would have started eating around 6pm.

At trial, Pang said the stomach findings led him to believe the time of death was approximately 7pm – perhaps 7.10pm or 7.15pm at the outside, adding "it is within my expertise to say that".

His view was supported by Professor Gilbert Barbezat from Otago University who, after reviewing Pang's autopsy findings, estimated time of death to be "between 30 and 60 minutes" after eating but he also said he could push that out to 7.15pm. Barbezat said Pang's evidence of no gastric smell was a "very striking finding" which reinforced the conclusion digestion hadn't started and death followed shortly after eating.

It was known early on that Christine Lundy had taken a short phone call at 6.56 that night so was alive at least until then. Hence, if Pang's and Barbezat's evidence is accepted, the murders must have occurred within the next 20 minutes.

At trial, no expert evidence was called to challenge these very precise estimates.

However, even a basic reading of relevant literature shows estimating time of death is a notoriously uncertain science and using stomach contents/digestion as a guide is the most unreliable tool a pathologist has. Because there are so many variables, such as the amount and type of meal and a person's physiology, most experts advocate giving a very broad window when estimating time of death – at the very least several hours.

At trial, Pang referred to perhaps the world's leading expert in this field, Bernard Knight, emeritus professor at the University of Wales, who has written numerous papers and texts on the issue, including *The Estimation of the Time Since Death in the Early Postmortem Period*, the only book in the English language devoted to this subject.

In 2008, Pang's evidence was sent to Knight, who has conducted more than 25,000 post-mortems. (While Pang routinely did post-mortems in Palmerston North, Barbezat accepted at trial he'd never performed one, though he'd witnessed more than 100.)

Knight replied that estimating time of death based on stomach contents is "so unreliable as to be of little value".

Regarding the supposedly crucial fact that Pang could detect no gastric smell when he opened the stomach and that this was a guide to the interval between the last meal and death, Knight states: "I consider this to be utterly without foundation. I am conversant with virtually all of the literature about estimation of time of death... and I have never heard of such a contention. I have asked several of my former colleagues about this and the suggestion was met with derision... His contention that absence of smell on gastric contents means less than an hour since death is little short of ludicrous."

North & South also referred the case to Professor Derrick Pounder, head of the Centre for Forensic and Legal Medicine at Dundee University in Scotland, another recognised international expert in this field.

"In my view there would be a general consensus amongst forensic pathologists that estimating time of death from stomach contents with an accuracy of within half an hour, as is suggested in this case, is simply impossible. My personal opinion is that estimating time of death to an accuracy of within half an hour based upon stomach contents amounts to little more than quackery.

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There is to my knowledge no scientific literature with respect to stomach contents' smell and time of death, and the comment on this matter is incomprehensible to me.99

Professor Derrick Pounder, head of the Centre for Forensic and Legal Medicine at Dundee University



Christine and Amber shared a McDonald's meal similar to this one before they were murdered.

"There is to my knowledge no scientific literature with respect to stomach contents' smell and time of death, and the comment on this matter is incomprehensible to me."

Pang didn't weigh, measure or preserve the stomach contents. He kept only samples from Christine's stomach, including pieces of chips, which were photographed and sent for toxicological testing and have now been destroyed. Thus we only have his description as to the stomachs being "full".

But this description, like the stomach itself, is elastic. We all consider our stomachs full

after a normal meal. But when world eating champion Joey Chestnut devoured 93 hamburgers in eight minutes in September 2008 his stomach would no doubt have also been described as full.

The meal that Christine and Amber ate was sizeable (Christine weighed 112kg, Amber nearly 45kg) and there's no way of knowing what else they may have eaten or drunk that afternoon or evening. (Several snack food packets were also found in the kitchen tidy; a police officer records seeing a half-cut banana he thought was fresh on a kitchen board; and

a batch of muffins appeared to have been made recently.)

Pang admitted he opened only the top part of the small intestine, the duodenum, and observed no digested food in it.

But gastroenterologist Dr Nicholas Diamant from Toronto Western Hospital, who has studied stomach functions for more than 45 years, told *North & South*: "The meal eaten normally empties into the duodenum in small amounts as liquid, with solid particles less than 2mm in size. This content is moved rapidly out of the duodenum and further down the small bowel. Therefore solid gastric content is in fact not seen in the duodenum during the time of digestion in the stomach. Solid food can be recognised in the stomach for up to 10 hours after it is eaten.

"The stomach accommodates to the size of its contents, which also includes gastric secretions and would look 'full' as long as content was present. Furthermore, types of food markedly affect gastric emptying. For example, fat significantly delays emptying."

In 2007, Ontario's Court of Appeal quashed a murder conviction in a case with remarkable similarities to Lundy's.

Fourteen-year-old Stephen Truscott had been convicted of murdering 12-year-old Lynne Harper in June 1959. The charge rested on a pathologist's initial claim that Harper died between 7.15pm and 7.45pm based on her stomach contents – a period she was known to be with Truscott.

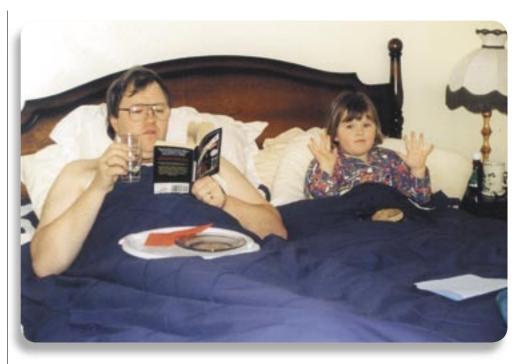
Sentenced to hang, Truscott eventually spent 10 years in prison and nearly 40 on parole before being acquitted.

At his 2007 appeal, numerous experts gave evidence that time of death based on stomach contents can't be pinpointed to such a specific timeframe. The appeal judges' decision was largely based on the fact the pathologist's estimate "had no scientific justification".

Pang acknowledged at trial that he didn't take notes during the post-mortem of everything he observed, relying on memory when making his full report later.

His initial post-mortem notes don't appear to refer to bladder contents but his final report records Christine's bladder having a "minimal amount" of urine and Amber's a "small amount" – suggestive perhaps that they'd only just gone to bed, as would fit with an unnaturally early hour of 7pm.

However, the officer in charge of Amber's body, Detective Constable Brett Calkin, who attended her post-mortem and made extensive notes throughout, recorded: "Mortuary attendant Matheson finds bladder is full



This photo from the Lundy family album is labelled "Father's Day 1997".

of urine." This notebook was available to Lundy's lawyers but the jury never heard its contents. Would Amber's bladder have been full if she'd just gone to bed?

(Interestingly, Pang also suggested during the post-mortem that the victims had eaten McDonald's and told *North & South* this was because he recognised "shoestring" chips. Calkin's notebook records: "It definitely appears that the potatoes were potato chip/fries thicker than shoestring." Photographs of chips from Christine's stomach appear much larger than shoestring, measuring about 1cm in width. Whether she also ate other chips at some stage, for which there is no record, is unlikely ever to be known.)

Pang, however, stands by his evidence of time of death, repeating it was an "educated estimate" and up to the jury and others to decide how much weight to put on his statements

But his reports and trial testimony are quite definite and leave little room for flexibility or jury interpretation – death was within an hour of eating, or around 7pm. At the very outside 7.15pm.

And when *North & South* asked whether, on reflection, a time of death of even 8pm or later could have been consistent with what he found, Pang stuck to his estimate, responding: "Probably not."

Crucially, 7pm was the exact midpoint of the less than three hour window Lundy had to commit the murders.

TIME OF DEATH II

Professor Derrick Pounder, in a paper on the subject, says estimating time of death should be based on three sources: evidence from the body, evidence around the body and evidence from the deceased's common habits.

"All three sources of evidence should be explored and assessed before offering an opinion on when death or a fatal injury occurred."

In this case the pathologist and police relied on a single aspect of just one source, stomach contents at the post-mortem.

Other factors suggesting a later time of death were known and some raised at trial – but obviously not considered as important as Pang's stomach-contents evidence.

Witnesses, including Christine's mother, said Christine usually went to bed after 11pm and Amber around 8pm.

Others stated Christine told them that when Mark was away she got more done and often read till late.

Julie Burnett, who rang Christine at 6.56pm that Tuesday, inquired whether Mark would be at wine club the following week. At trial, she merely said Christine told her Mark was out. But in a previously undisclosed notebook from an interview with Burnett, Detective Melinda Rix writes: "CL tells JB ML out and will be back in town Wed" – not that she was expecting him home any moment.

Christine was found in bed, with the glasses

she always wore put away in their case on the bedside cabinet. The TV in her bedroom was on standby, having been turned off with the remote control. Both these are as they would be if she'd gone to bed normally, much later than 7pm.

When switched on, the TV was on channel 4 – Prime.

Christine and Amber were *Shortland Street* fanatics. If Christine had been in bed at 7pm waiting for her husband to come home for a romantic evening, it's curious the TV wasn't set to TV2 for this.

Other witnesses described seeing lights on in the Lundy house after 11pm. The most specific was a next-door neighbour whose phone records show he was talking to his father between 10.59pm and 11.06pm. He described being outside at the time and clearly seeing lights on at the rear of the Lundy house. These were off the next morning.

The first three people on the scene the next morning – Christine's brother, a close friend and an ambulance officer – all said there were no lights on in the house when they arrived. So who switched them off if they were seen on after 7pm?

Trial judge Justice Tony Ellis realised how important time of death was when summing up to the jury.

"Plainly, for the prosecution to succeed the time of death of around 7pm is essential. If you are not satisfied on the evidence of this, or are left in a reasonable doubt about it, then it is fatal to the prosecution case."

THE COMPUTER SHUTDOWN

Perhaps the clearest proof Christine and Amber were alive well after 7pm was that the family's main computer in the office showed it was shut down at 10.52pm.

At trial, however, the national manager of the police Electronic Crime Laboratory, Maarten Kleintjes, raised the scenario that Lundy had manipulated the computer's time so it appeared it was shut down at 10.52pm but had actually been done much earlier.

Most people can change the time on their computer in normal operating mode – but it leaves a trace. Supposedly Mark Lundy, who witnesses said had no great computer ability, used a much more complicated method of doing this.

Kleintjes' theory was that Lundy had copied another computer's time/date control panel onto a floppy disk, opened this on his family's computer, changed the computer's time to 10.52pm and shut it down. Then he



Christine and Amber (pictured above in the nineties) were *Shortland Street* fanatics. If Christine had been in bed at 7pm waiting for her husband to come home for a romantic evening, it's curious the TV wasn't set to TV2 for her favourite programme.

restarted the computer but before it went into operating mode, he went into setup mode, changed the time back to normal again and then turned the computer off, leaving no trace of his actions or the second shutdown.

Kleintjes' evidence supporting this was that the computer's registry backup files, which hold essential computer data, were out of order. He said this showed the computer's clock had been altered up to five times in the past, presumably while someone practised the necessary manipulation.

Thus, police argued Lundy had gone into the office next door to where his wife was waiting for him at 7pm, altered the computer and closed it down so when it was restarted, it would show a shutdown of 10.52pm.

No evidence was ever produced that this actually happened, that anyone had taught Lundy how to do this technical procedure or where he copied the time/date control panel from.

Even at trial, Kleintjes was forced to admit the registry files would be out of order only if someone had practised changing the date – not the time. This raised the question why Lundy would have practised altering the date when that was never what he was likely to be trying to leave evidence of.

A copy of the computer's hard drive and Kleintjes' evidence was given to computer forensic expert and former police intelligence officer Allan Watt. He utterly dismisses the police theory, saying it's "so far-fetched and beyond reality it can't be comprehended". Watt says few people would know how to manipulate a computer as Kleintjes suggested, let alone realise other methods would be traceable.

Now living in Australia, Watt has spent more than 400 hours examining the computer's files.

He quickly discovered it was infected with what's known as a KAK virus, commonly spread through emails and the internet, which affected, among other things, registry files. Another computer forensic expert, the late Alan Peacock, also easily found this virus.

Kleintjes says he didn't detect any viruses and had never heard of the KAK virus.

Watt removed the virus and ran the computer for several days, switching it on and off at various times.

The registry backup files immediately returned to normal.

Mark Lundy also had a laptop that he used for work and Christine used it to do accounting work for her brother, Glenn Weggery, who had his own business.

On Monday, August 28, Weggery left his chequebook with Christine for her to do his GST return, which was due at the end of the month. The next morning he called again, but Christine hadn't finished the return.

But by the morning of Wednesday, August

30, when Christine and Amber were found dead, the work was done, with Weggery's chequebook found on the kitchen table together with his completed GST return and an ACC invoice.

In police photos taken inside the office after the murders, the laptop can clearly be seen in its case, sitting on a chair in front of a desk with a clear area where it appears the laptop has been. Just as the police knew the family's main computer could contain crucial clues, they must have realised the laptop was also important.

Weggery had told them Christine did his GST returns on the laptop as it had the necessary computer program. And some time between Tuesday and Wednesday morning she'd done his GST return – quite possibly after 7 that evening, after Amber went to bed. If it could be identified what time she did it, surely that would be crucial.

What happened with the laptop is, at best, confusing. At trial, Kleintjes said he received the laptop. But afterwards police claimed the laptop had never even left the house.

The officer in charge of the case, Detective Sergeant Ross Grantham (now a detective inspector), acknowledges he asked for the laptop to be cloned.

But Kleintjes denies being asked to do this or even looking at it.

When asked why Kleintjes would seemingly ignore his request and why the laptop was never investigated, given the vital information it might hold and how detailed the rest of the investigation had been, Grantham simply shrugs and says he doesn't know.

Curiously – given the police claim the laptop was never looked at – a previously undisclosed notebook from police forensic accountant Reg Murphy has an entry from October 4 relating to a discussion with another officer.

"Advise thoughts on Marchris [the Lundys' company] and that unable to look at laptop until made available by Maarten Kleintjes." By this time the laptop had been returned to Lundy, so it raises questions whether Kleintjes in fact had some information from it, or even a clone.

In material obtained from Lundy's defence team, there is also a CD labelled "Lundy Computer & Laptop Emails".

Kleintjes says he can't explain this given they had never examined the laptop.

When the laptop was returned to Lundy it crashed when a new operating system was loaded, making retrieving meaningful data from it virtually impossible.

MARGARET DANCE'S EVIDENCE

Despite his high-speed journey to and from Palmerston North and the bloody murders of his wife and daughter, police had no eyewitnesses who'd seen Mark Lundy.

Except Margaret Dance.

Dance, 60, lived in Hillcrest Drive, 500m from Lundy's home.

A week after the murders, she went to the police.

Only some of her first statement deals with a man she saw running near her house as she drove to her choir practice at 7.15pm. But over several days she added to this description as more "images" came to her.

At trial, Dance claimed she had psychic powers and a photographic memory.

Her account of the runner eventually evolved to be incredibly detailed, including a lengthy description of a tracksuit top that he wore over a business shirt and tie; the fact his tracksuit bottoms were slightly wrinkled around the ankles; that he was wearing a blonde curly wig that was slipping down over his forehead; and that he appeared to be trying to look like a woman.

She couldn't remember details of his

face other than he had a "desperate, frantic look".

It was dark when Dance turned out of Hillcrest Drive into Rhodes Drive and the runner went past in the opposite direction, on her left.

She admitted at the time there were one or two cars coming in the other direction and she was concentrating on making a right-hand turn into Karamea Cres just ahead.

However, as well as the detailed runner description, she was also able to describe seven people in and around the takeaway shop on the other side of the road, including, in some cases, their build, clothing, hair and ethnicity.

Dance claimed she didn't look closely at pictures or stories about the murders but when she saw Lundy on TV she immediately recognised him as the runner, based on "the shape of his face and upper body".

She had also described the person as "running fast". However, Mark Lundy, who weighed 130kg, wore an orthotic aid in one shoe after an accident that required ankle surgery and struggled to do anything vaguely athletic.

Eyewitness Margaret Dance described the person as "running fast". However, Mark Lundy, who weighed 130kg, wore an orthotic aid in one shoe after ankle surgery and struggled to do anything vaguely athletic.

Below: Mark and Amber in 1996.



Nobody else, including the seven people Dance described around the takeaway shop, saw anyone running in the area that night, let alone a 130kg, 190.5cm (6'3") man trying to disguise himself as a woman with a blonde wig.

Dance suggested the runner's trackpants were light blue. Mark Lundy's were green. Her description of a two-tone tracksuit top is hard to reconcile with the maroon nonzip sweatshirt found in Lundy's car.

At trial, she said: "I saw the toes of the shoes and they definitely weren't running shoes. I just thought they were probably leather."

However, the Crown conveniently translated this into the runner wearing "dress shoes" – the only shoes Lundy had with him.

In June 2007, long after Mark Lundy was convicted, Dance wrote to the *Manawatu Standard* regarding treatment at Palmerston North Hospital's eye clinic.

She thanked them "from the bottom of my heart for the vision I have not had for over 60 years – in spite of now being able to see my wrinkles and cobwebs in the house!"

Ross Grantham says he has no reason to doubt what Dance had to say. "She gave very good evidence."

Dance refused to talk to North & South.

Dance's evidence was crucial in another area. She described seeing a car parked outside her house as she headed to choir practice that night, saying it was dark blue, new, streamlined and rounded.

Thus the police case was that it was Lundy's car, parked well away from the murder scene, and when he ran past her on Rhodes Drive he was returning after murdering Christine and Amber.

It's worth mentioning that her first statement to police doesn't mention the car.

Her next-door neighbours were also interviewed by police and both clearly remembered a "dark-blue or black vehicle... just a little car, like a little Ford, something like a Laser from the early eighties", parked outside Dance's for several days around August 29. The jury never heard their evidence.

If it was Lundy's car outside Dance's property it was a strange place for an intending murderer to park, given it was virtually opposite a friend's house, near a streetlight and close to his brother's home.

Dance's estimate of the time she apparently saw Lundy is also open to challenge. She said she was preparing to go to her 7pm choir practice when two friends called by.

They stayed just a few minutes and as Dance was about to leave she saw it was

If it was Lundy's car parked outside Dance's property it was a strange place for an intending murderer to park,

given it was virtually opposite a friend's house, near a streetlight and close to his brother's home.

Below: The Lundys' home at 30 Karamea Cres, Palmerston North.



MIKEWIL

between 7.10pm and 7.15pm.

Her visitors told police they'd been to a nearby store, T-Market Fresh, around 6pm, spent about 20 minutes shopping there and then went to Dance's house, which was very close. They weren't wearing watches and the shop normally closed at 6pm. This suggests their visit to Dance was likely to have been well before 7pm.

North & South has seen security records from the T-Market Fresh store and it shows the owners, who usually spent some time in the shop after the last customers left, switched on their alarm at 6.37pm that day.

The owners were never contacted by police to help verify the times Dance gave in evidence.

THE CAR-TRIP TIME

That crucial sighting by Margaret Dance fitted the police scenario of Lundy's movements that night: that he'd driven rapidly back from Wellington to Palmerston North after 5.30pm, murdered Christine and Amber about 7pm, rushed back to his car by 7.15pm

and raced back to Petone, arriving there just before 8.30pm.

On top of driving 300km in this three-hour period, at a minimum Lundy also had to: run 500m to his house; manipulate the computer's clock; murder his wife and daughter in sustained attacks; take a large jewellery box from the bedroom to make it look like a burglary; remove the coveralls police believe he wore to commit the murders; fake a break-in via a rear window; and run 500m back to his car.

Since Dance said Lundy wasn't carrying anything when she saw him, we have to add in disposing of the murder weapon, the overalls, the jewellery box and possibly equipment he used to fake the break-in – all between his house and being seen by Dance. Despite extensive searches, none of the above has ever been found.

It's difficult to estimate how long all this may have taken – perhaps 20 minutes – but it needs to be subtracted from three hours when considering how fast Lundy would have had to drive to be back in Wellington at 8.29pm.

Cellphone records put Lundy at his motel at 5.30pm when he received a call from Christine's phone. The call lasted eight minutes. If he left immediately afterwards he had about 1 hour 20 minutes to get home – requiring an average speed of close to 117km/h.

His return trip had to be done in under 1 hour 15 minutes based on Dance's sighting, requiring an average speed of at least 120km/h.

There are numerous routes Lundy could have taken but the quickest is probably turning off SH1 near Levin, passing through Shannon and Opiki then turning onto what is known as the No. 1 Line that leads onto Tremaine Ave and Kelvin Grove on the north side of Palmerston North.

Whatever route is taken requires travelling through numerous built-up areas with 50km/h speed restrictions, many traffic lights, pedestrian crossings, stop signs and roundabouts.

Police tried to replicate Lundy's trip, using a similar car to his 1998 Ford Fairmont and driving at up to 140km/h.

Their best time travelling north was 1 hour 29 minutes, an average of just under 100km/h – but was done leaving Petone just before 9pm when the roads are relatively empty – not anything like Wellington's notorious rush-hour traffic when Lundy was supposedly driving.

Their job-sheets record the fastest trip south was 1 hour 33 minutes at an average speed of 91.4km/h. (However the police numbers don't add up. They claim the trip was 150.2km; if this is so, at 91.4km/h the trip would have actually taken nearly 1 hour 39 minutes.)

At trial, one of the officers involved said he believed he could have gone faster if he'd "thrown caution to the wind". Given their northward trip wasn't in rush hour and their average speed still wasn't even close to that supposedly done by Lundy, this has to be questioned. As must be their ability to do the trip much more quickly and not be noticed, as Lundy allegedly did.

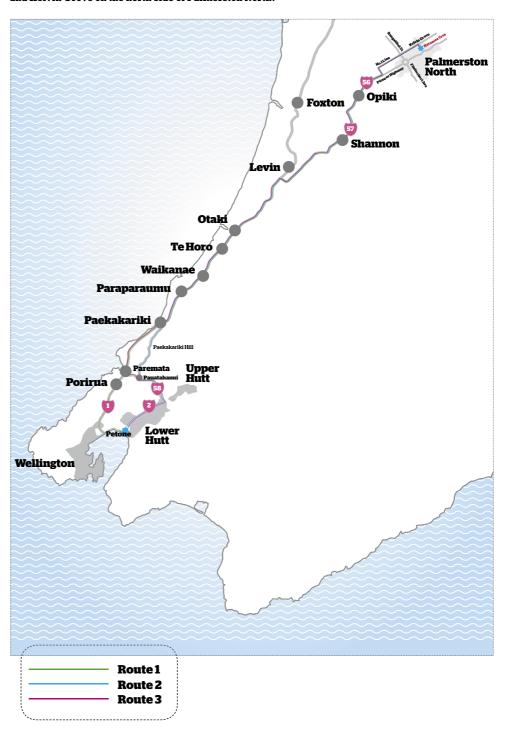
The defence employed former police detective and reconstruction expert Paul Bass, who made three trips north from Petone to near Lundy's home at the same time Lundy would have been travelling, through rush hour. Bass's quickest time was 1 hour 56 minutes, with an average speed of 77km/h.

However, his evidence was challenged by Crown claims he didn't use an identical car to Lundy's – although his Nissan Skyline GTS is arguably quicker and more agile than Lundy's Fairmont.

If you're held to an average of 80km/h for half the journey, as in our tests,

you must average a farcical 160km/h for the remainder of the journey to do what Lundy supposedly did.

Below: There are numerous routes Lundy could have taken for his alleged 150km dash each way but the quickest is probably turning off SH1 near Levin, passing through Shannon and Opiki then turning onto what is known as the No. 1 Line that leads onto Tremaine Ave and Kelvin Grove on the north side of Palmerston North.



In an attempt to gain a better idea of what would have been required and as a reference point for the required trip time, *North & South* made the trip on the first Tuesday after August 29 in 2008, leaving at 5.38pm, using a similar four-litre, six-cylinder automatic car. The drive was done as quickly as possible without endangering other traffic, with rapid acceleration, passing numerous vehicles and top speeds over 120km/h when possible.

The trip north took 1 hour 49 minutes at an average speed of 79.2km/h. The return trip from Palmerston North when roads were quieter took 1 hour 44 minutes, averaging 82.8km/h. Both trips' average speeds were nearly 40km/h slower than Lundy supposedly achieved.

Two other return trips were subsequently carried out, with average speeds between 72km/h and 76km/h.

It's impossible to recreate conditions, traffic flows, red lights etc, but it's undeniable that whatever route might have been driven there are considerable hindrances to high-speed travel.

For example, the final 7.5km to Lundy's house is all in a 50km/h zone. So are towns such as Paraparaumu, Waikanae, Otaki and Shannon. There are inevitable slow vehicles, trucks, tankers, horse floats and so on that cause a driver to slow down until it's possible to pass. The majority of the drive had to be done at night, when driving at speed is much harder.

You might think you could do the trip in the time required – most people have done 120km/h at some time. But to average 120km/h requires prolonged periods of driving far in excess of that to make up for all the times when forced to stop, slow down behind any traffic not doing 120km/h, take corners, go through towns and all the other things that don't allow you to drive to the car's limits.

If you're held to an average of 80km/h for half the journey, as in our tests, you must average a farcical 160km/h for the remainder of the journey to do what Lundy supposedly did.

As a reference, when a Porsche 996 Turbo broke a New Zealand endurance record at Manfeild racetrack in 2006, its best one-hour average speed was 125km/h. It could be argued Manfeild has some tight corners as well as fast straights. But it has no traffic lights, 50km/h zones, cops, hills, slow traffic or oncoming traffic. The Porsche was on the track by itself, had an experienced race driver behind the wheel, was race-prepared and hit top speeds of 200km/h. Lundy's Fairmont engine was speed-limited so it

Not one report from other motorists of a wildly speeding vehicle that night was produced at trial. Nobody *555ed him. No police noticed the frantic 300km drive.

Below: The Foreshore Motor Lodge in Petone, where Mark Lundy stayed on the night his wife and only child were murdered.



couldn't go faster than 180km/h and could manage this only on very long straights.

North & South consulted Phil Kerr, one of New Zealand's foremost motor-racing experts. Kerr helped create the McLaren motor racing team with great friend Bruce McLaren, was its joint managing director, Formula 1 race director, still heads the McLaren Group of companies in New Zealand and is an automotive engineering expert.

He has driven a race-prepared five-litre, V8 Holden Monaro at Pukekohe racetrack and averaged less than 130km/h.

"And I'd be a lot faster than Lundy and that car would be way, way quicker than a Fairmont."

Kerr has no doubt it would have been impossible to do the trip in the times alleged – physically and mechanically.

Not only is it impossible to maintain the required speeds with other traffic on the road and long periods in built-up areas, but the constant braking of such a heavy car from high speeds would have caused "brake fade". The pads and discs would get too hot to operate effectively and the brake fluid

would boil, Kerr says, meaning no matter how hard you braked, the car wouldn't stop as normal. (Racing cars have special hightemperature brake fluid and pads.)

Driving to the limit at every opportunity and cornering at high speed would also have seriously damaged the tyres.

Subsequent garage reports show no evidence of tyre or brake wear on Lundy's car.

Kerr insists Lundy would have failed to take a bend or caused others to crash if he'd driven at the speeds claimed.

Not one report from other motorists of a wildly speeding vehicle that night was produced at trial. Nobody *555ed him. No police noticed the frantic 300km drive.

Nobody has been able to get close to the trip times Lundy was required to do.

In the Court of Appeal, the Crown could merely submit that the drive from Petone was "made with some urgency but the return drive was undertaken in extremis which no one could replicate".

Which poses the obvious question: If nobody could replicate it, was it possible in the first place?

MISSING PETROL

When Mark Lundy was told shortly before midday on Wednesday, August 30, that there were police at his house, he drove at high speed back to Palmerston North. When his car was examined, there were only 10 litres of petrol left in the 68-litre tank.

Lundy had filled up in Wellington the previous afternoon, made numerous business calls around Wellington and driven home fast the following day.

Police claimed this wouldn't have used 58 litres of petrol and said this proved he'd indeed made the extra trip home to murder his wife and daughter then driven back to Wellington.

But the problem for the police theory is that the trips they claim Lundy did would require more than 58 litres – in fact, much more than the 68 litres the tank holds.

The same three trips police did to ascertain fuel consumption used more than 80 litres to cover the distance they allege Lundy did. Even at the lowest fuel consumption recorded by police (curiously, on their fastest trip) it would have required 12 more litres than Lundy used. And Lundy supposedly travelled much faster than they did.

However, there's no evidence Lundy ever bought any more petrol – no receipts, no camera footage from garages, nothing.

Perhaps he'd previously bought some petrol and filled his car from jerry cans en route. If so, this would further cut into the time he had to make the journeys. And where are the jerry cans?

Ross Grantham suggests Lundy could have paid cash for petrol after returning to Petone.

But surely police would have checked service-station security cameras for this if they believed it?

Grantham says they didn't, but adds there's no evidence Lundy didn't buy more petrol.

This is a worrying statement if our legal system is based on such an approach. As the jury was reminded by the trial judge: "You must come to your verdict solely upon the evidence put before you in this court," and "The burden of proof... is on the Crown."

No evidence was presented to show Lundy bought more petrol that would have allowed him to complete the highspeed trips the police allege.

Yet by the time the Court of Appeal gave its ruling, it was somehow accepted fact.

"...Mr Lundy's actual fuel consumption was broadly consistent [if some petrol had been bought en route] with the distance the Crown contended he had travelled, ie, three trips between Petone and Palmerston North."

From the outside, this assumption seems difficult to square with another directive Justice Ellis gave the jury: "And finally, and most important, you are not to speculate to fill in gaps in the prosecution case."

CELLPHONE CALLS

The cellphone calls Lundy received and made in Petone at either end of the three-hour window he had to commit the murders (the 5.30pm call from Christine's phone and a call to a friend at 8.29pm) were crucial to plotting his location and either substantiating or challenging his alibi.

Around Petone's Foreshore Motor Lodge where he was staying, three cellphone tower signals converge and to some extent overlap: WPET-1, WALI-2 and WPEX-3. Calls normally go through whichever tower has the strongest signal if it's not overloaded with other call traffic.

Records show calls Lundy made and received on August 29 went through all three towers.

But a Telecom engineer said when he made tests from inside Lundy's unit he could make calls only through WPET-1.

At appeal, the Crown said because the 5.30pm and 8.29pm calls weren't through the WPET-1 site it showed Lundy wasn't in his motel unit at these times and might have been on the move.

However, during testing, the Telecom engineer spent only eight minutes inside the motel unit, around 10.30 one morning, and there's no way of knowing what cellphone traffic was like when Lundy made his calls – an off-peak period when many cellphone users have free minutes.

His tests actually showed that in half the calls made in the unit, while they connected through WPET-1, they transferred to WPEX-3 during the call as signal strength fluctuated.

And it's obvious WPEX-3 can be accessed from the motel unit given that three calls between Lundy's phone and the escort agency went through it.

The engineer also said that in a previous

The cellphone calls Lundy received and made in Petone at either end of the three-hour window he had to commit the murders were crucial to plotting his location and either substantiating or challenging his alibi.

Below: The Petone foreshore, where Mark Lundy says he went shortly before 6pm and read a book. But police alleged he was in fact speeding home to kill Christine and Amber.



test he'd made a call on the WALI-2 cellsite, "which was not what I expected".

While he doesn't record exactly where he was when he made this informal test, his later report notes the WALI-2 cellsite is actually the strongest signal at one end of the motel.

And he accepted there was a signal from WALI-2 in the motel room, though during his tests it was weaker than WPET-1 or WPEX-3.

However, the engineer's evidence was used to portray Lundy as a liar and suggest he may have had a few minutes at either end to complete his high-speed journey.

There were several other people at the Petone motel the night Lundy was there. Two other guests recalled seeing a Ford Fairmont, Falcon or Fairlane (all identical shape) parked there. One even remembered the car had a Palmerston North number-plate surround – as Lundy's car did.

However, both witnesses gave times that didn't quite fit with Lundy's recollection of events, though Lundy wasn't wearing a watch and was guessing at times.

It seems rather a coincidence, however, that two of the only other people at the motel saw a car like Lundy's outside Lundy's unit between 6pm and 7pm that night, yet police maintain it wasn't Lundy's.

PAINT FLAKES

Several dozen light-blue, orange and darkblue paint flakes were taken from the murder scene and victims' bodies.

Police became interested in these because Lundy, who'd been a builder in the 1980s, had marked many tools in his garage with orange and blue paint to distinguish them when on site.

Police thought if the paint fragments matched those on Lundy's tools, it would implicate Lundy as only he knew which key opened the garage and could have taken a weapon from there.

Of 47 fragments examined by ESR, the environmental science and research institute, nine orange and nine light-blue flecks are described as "indistinguishable" from samples taken from three tools and two paint tins in the garage. This was defined as meaning the paint was the same colour and chemical composition.

But in 16 of these 18 samples, the scientist noted there was contamination and the chemical match wasn't described or provided to the defence.

Beyond the complicated chemistry of this

Police claimed Lundy lied about visiting Christine and Amber's grave in the months after the murders. They said he'd been followed and never went there.

However at trial, Detective Sergeant Steve Kelly, the officer in charge of suspects, couldn't provide details about who followed him, how often, when or how.



MIKE WHI

evidence rest some more basic questions.

Where did all the other paint fragments come from that didn't match the samples?

How would so many fragments come off a weapon? ESR tested Lundy's painted tools in normal use and by knocking them against a hard surface and no flakes came off.

Pathologist James Pang determined the weapon used to kill Christine and Amber was possibly a tomahawk, and this became accepted fact.

If so, though, how would paint flakes be so imbedded in the victims' wounds – who would paint their tomahawk's blade?

Police eventually recovered a tomahawk from among Lundy's possessions. It wasn't marked with paint, and nor did it test positive for blood.

But still a sinister pall was cast over this.

At a preliminary depositions hearing, Crown prosecutor Ben Vanderkolk said this tomahawk "was not in the locked garage on the morning of the 30th" of August and that, "of all the variety and range of tools found in the garage on the 30th, the Lundys did not by observation and inspection have a tomahawk".

Thus the assumption was that Lundy had used his own painted tomahawk for the murders, disposed of it, then replaced it with another one which police eventually seized.

But there's absolutely no evidence of Lundy buying or obtaining another tomahawk.

Furthermore, at trial, police insisted they actually didn't examine the garage until September 11 and when they did, made no mention about a missing tomahawk.

Thus, in fact, there's no evidence the tomahawk that police eventually took from Lundy hadn't been in the garage all along.

LUNDY THE LIAR

Ross Grantham remains in no doubt Lundy is utterly dishonest.

The Crown alleged numerous examples of this in an attempt to paint him as a liar whose evidence couldn't be relied on.

There isn't space to debunk all of these, but here are some examples of how this perception was shaped by police and the prosecution.

• Lundy said he checked out of his motel just after 8am on August 30, bought breakfast from a nearby store and began visiting customers.

At one place near Petone, Lundy estimated he arrived between 8.30am and 9am. However, two people there said Lundy didn't arrive until 11am or 11.15am. Lundy said no, he was in central Wellington at that time. However, the Crown insisted Lundy was lying about his movements on the morning after the murders. But police knew the two witnesses were not correct in their recollection and Lundy was telling the truth. A previously undisclosed police notebook shows a detective interviewed the two clients Lundy said he was visiting in central Wellington around 11am-11.30am and both agreed he'd been there at this time.

What's more, a track of Lundy's cellphone movements that police commissioned from the Telecom engineer stated calls showed he was around Lower Hutt from 8.54am and "this call activity then moved to the Wellington central city area from 11.04am through to 11.40am". The jury was not told of this.

• Two witnesses gave evidence that Lundy habitually called home at 8pm whenever he was away. Lundy denied this, and his denial was used as further evidence that he was a liar.

In fact, the police knew Lundy didn't tend to call home at 8pm when he was away. An officer was instructed to analyse all Lundy's cellphone calls to either his home or Christine's cellphone after 5.30pm on days he'd been out of town. His report says there were only seven dates (but lists only six) in the previous 17 months that such calls occurred and only one call was between 6.10pm and 9pm.

His report stated, "It appears that Lundy made few calls to his home address or Christine Lundy's cellphone after 17.30."

The fact Lundy didn't call later on the night of the murders was also portrayed by police as a sign he knew not to. But why would he call home at 8pm if he'd already talked to Christine and Amber at 5.30pm?

• Police claimed Lundy lied about visiting Christine and Amber's grave in the months after the murders. They said he'd been followed and never went there.

However at trial, Detective Sergeant Steve Kelly, the officer in charge of suspects, couldn't provide details about who followed him, how often, when or how.

No police notebooks or job-sheets have been found that record such surveillance.

Ross Grantham told *North & South* Lundy was followed for a period. But he also can't remember many details other than suggesting it would have been for a fortnight and for most of the day and sometimes in the evenings.

Without any evidence or details of this supposed surveillance, it was Lundy's word against that of the police, with the likelihood the jury would believe the police.



Amber's last birthday. In her parents' photo albums, all her birthdays are recorded.

THE BRAIN TISSUE

While everything detailed thus far may give grounds for doubt about Lundy's guilt, by far the most damning evidence against him were two minute specks of tissue found on one of his shirts.

This polo shirt was in an open suit carrier with other clothes and miscellaneous items on the back seat of his car when police intercepted him on Wednesday, August 30.

Nearly two months later, ESR scientist Björn Sutherland examined it with a bright light and found two faint stains, one on the left sleeve near the shoulder seam and another on the left-hand chest pocket, which he suggested had blood in them.

He wet the sleeve stain and pressed it against a slide to make a sample.

The two stains were then cut from the shirt and sent for DNA testing.

This involved rinsing the stains with water, and both tests showed high probability of Christine's DNA.

This on its own couldn't prove anything – her DNA might have got there if she gave him a hug or put away his shirt.

The slide taken by Sutherland was shown to a number of doctors and several suggested it might contain a few cells found only in brain or spinal-cord tissue.

However, because the material on the slide was "scanty" and "shrivelled up", as one expert put it, and "suboptimally preserved", as another described it, it wasn't definite it was brain tissue.

Grantham put out an international call to help identify the tissue, including approaches to the FBI and the UK Home Office, but nobody believed testing would be successful on the samples.

However, a Medlab Central pathologist mentioned Dr Rodney Miller, a partner at the private ProPath Laboratory in Dallas, Texas.

Miller had supposedly helped pioneer a technique that allowed samples to be lifted from slides, such as the one police had, and retested, and coincidentally had spoken at a Palmerston North conference just days before the Lundy murders.

Thus, in February 2001, Grantham went to Dallas with the polo shirt, the two samples cut from it that showed staining, and the ESR slide taken from the more distinct stain.

However, Miller never employed the new technique he'd suggested and didn't even open the ESR slide.

Instead, he conducted a standard scientific procedure called immunohistochemistry (IHC) to see if there was any brain tissue on the shirt samples.

IHC is commonly used as an adjunct test in cancer diagnosis, and in research laboratories, to help establish what cells are present.

What Miller did that was new was use IHC on a fabric sample and on tissue that hadn't been specifically prepared for IHC.

However, he'd satisfied himself the process could work. The week before Grantham arrived, Miller had been preparing a chicken for dinner and smeared material from its neck and kidney on an old shirt, then tested it with apparent success.

A brief science lesson: IHC relies on antibodies (which the body produces to fight off foreign objects such as bacteria and viruses) finding and attaching themselves to antigens (the molecules in cells that stimulate this immune response, usually proteins).

In IHC, antibodies that bind with specific parts of certain cells are introduced to a tissue sample, and if they bind with part of the tissue it can indicate what type of cell may be present.

In this case, Miller used antibodies designed to recognise proteins in brain and deep nerve tissue and introduced them to the two shirt samples Grantham brought from New Zealand.

His report concludes there was brain or spinal-cord tissue present on the shirt. Together with the fact the shirt samples tested positive for Christine's DNA, this was the killer blow for Lundy. How on earth could he explain Christine's brain tissue on one of his shirts unless he was the killer?

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At trial, his defence suggested accidental contamination and even police planting but failed to provide strong evidence for this.

At this point, however, it's useful to step back from the science and logically consider, if it is indeed brain tissue, how it got on Lundy's shirt.

You'll remember Crown witness Margaret Dance was clear the man she saw running was wearing a business shirt and tie – not a purple and navy striped polo shirt.

The murders were incredibly vicious, with blood and tissue covering walls around the victims. There was so much blood that a "shadow" was formed on the curtains behind where Christine's attacker stood.

Lundy's car, glasses, wedding ring, shoes and other clothes were all tested for blood or other tissue and absolutely nothing was found.

Police said Lundy wore coveralls that protected him from the blood, but remember, these were never found.

But if we accept Lundy was wearing coveralls, then how can a piece of brain tissue get inside them and onto the left sleeve of his shirt? Try it yourself with a jacket or something similar – unless the zip is undone close to halfway it seems impossible. Would the murderer have gone to the trouble of wearing coveralls only to leave them partially open? And if that was the case, would only two tiny flecks of tissue, 1-2mm across, and no other blood have got onto the shirt?

The other way brain tissue might have got on the shirt is if the killer perhaps brushed their hand or glove across their chest when removing their coveralls.

However, this would have had to be done almost instantly after the murders and still raises issues of how only two tiny stains, both with only brain tissue and no skin or blood, were found.

And if Lundy had been wearing the polo shirt, wouldn't he have disposed of it along with all other possibly incriminating evidence?

You might also expect the exertion of a 130kg man having to run 500m each way and carry out a frenzied murder with all the attendant stress during the high-speed drives may leave signs of perspiration. ESR noticed no obvious sign of sweat on the shirt.

But back to the science.

While immunohistochemistry is a potentially powerful tool, its limitations and fallibility mean it has to be used and inter-

preted with caution.

Numerous scientific papers outline its unreliability, and even the United States Food and Drug Administration repeatedly describes it as "subjective and variable".

For this reason very strict controls are necessary, particularly when the tissue being tested hasn't been prepared in anything like a laboratory or medical environment as normal IHC samples would be.

This supposed brain tissue had randomly flown or been smeared from Christine Lundy's skull onto a shirt; been discovered after 58 days by a scientist who wet it; been sent to another ESR lab which rinsed it with water to extract DNA; been taken by Ross Grantham and kept in his safe at Palmerston North's police station for two months; then, more than five months after it got on the shirt, it was finally preserved and tested.

Brain cells are perhaps the least robust in the body and start to break down immediately after death – within seconds. Therefore few expected the shirt to have any cells that could be identified after five months and non-laboratory care for much of that time.

That Miller was able to identify brain cells was little short of miraculous.

His evidence at trial appeared convincing and was largely unchallenged, the defence's only witness on this issue not having even seen many crucial parts of the prosecution's case.

Miller, Pang and Dr Cynric Temple-Camp, another pathologist from Medlab Central, all explain this incredibly fortunate preservation of the brain tissue by saying it got onto the shirt almost immediately from Christine's body, was smeared very thinly, dried virtually instantly and was thus preserved.

Now, it's important to consider how unlikely or indeed remarkable this would have been

There are several ways scientists preserve fresh brain tissue.

It can be fixed immediately using a preservative such as formalin; snap-frozen in liquid nitrogen and kept in a freezer; or sometimes, when doctors take biopsies, it can be air-dried – the method essentially being suggested in the Lundy case.

But even Temple-Camp admitted at trial this last method is very imprecise because the cells begin breaking down so quickly.

"It is very difficult to do. The air drying has to be done immediately after removal from the body... It is a difficult technique for surgeons, even trained surgeons, to do."

It tests credibility that this critical process, which is very difficult for even surgeons

using slides in a hospital to get right, was achieved utterly by random on a shirt in the midst of a frantic murder.

Temple-Camp also said that if the shirt was wet, the vital instant drying that supposedly occurred would be even more difficult. Supposedly the 130kg Lundy wasn't sweating around his armpits during or after the murders.

North & South referred Dr Miller's report – including his photos, court testimony and a medical journal article he wrote (along with Grantham, Pang and Temple-Camp) – to two leading scientists at Otago University who deal with immunohistochemistry for comment.

Both find aspects of his procedures highly questionable and his findings concerning.

Primary among them is the lack of adequate controls in Miller's testing.

Dr Philip Sheard from Otago Medical School's physiology department says because what Miller was attempting to do – testing tissue that had been on a shirt for more than five months rather than a normal, instantly preserved medical sample – it was impossible to know if the technique could still work and if the antibodies used could still reliably recognise the antigens.

"The tissue was treated in a way that was really so very, very far removed from the technique used reliably to treat tissue in my lab, for instance, I regarded the process as experimental.

"Somebody's life is on the line as a consequence of this so as I see it, it's important the process be done properly, and what's of interest to me in this case is the lack of scientific rigour in processing and judging of the tissue with regard to immunohistochemistry."

He describes most of Miller's controls – putting an unstained sample from the polo shirt through the IHC testing as well as another sample from an unassociated shirt – as virtually irrelevant.

Sheard doesn't question that routine aspects of the testing were done professionally, though he says final documentation of results and photography were poor. But what most concerns him was that Miller didn't use an appropriate positive control – fresh brain tissue smeared on a shirt and left for several months and treated in an identical way to the police sample before being tested by IHC.

Only by doing this would it be possible to know whether IHC could even be used reliably in this situation.

Sheard says validating the findings by hav-

ing stringent controls was doubly necessary because the tissue evident in Miller's report was poorly preserved, with no intact cells.

He says if cell contents aren't preserved in their normal form, the antigen proteins that the antibodies bind to can change their properties, easily giving false results – something he's frequently seen in the 20 years he's used IHC.

Sheard believes Miller's results are uninterpretable and if they'd been in a paper presented to him by a student he would have rejected it.

"If somebody came here and presented that as a seminar, the first thing anybody would say at question time is, 'Where are the controls?"

Miller's findings were published in the American Journal of Forensic Medicine and Pathology, which means they were peer-reviewed.

But Sheard points out this publication has a low rating in the scientific-journal ranking system and "just because it's published doesn't mean it's true", adding that scientific literature is littered with disproved or misinterpreted experiments.

When Dr Marilyn Duxson from Otago University's department of anatomy and structural biology was independently shown Miller's reports and evidence, she immediately echoed Sheard's concerns about lack of necessary controls.

Duxson, who has taught neuroanatomy for 25 years and done IHC for 16, also criticised the lack of serial photos (showing the same area of tissue tested in different ways, rather than random areas as Miller presents) – something she says is basic good science.

And she questions why all the tissue stained the same way when treated with IHC – normally each different antibody would stain in different patterns and in different areas as they attach to different parts of the tissue.

Moreover, she raises an issue noted by other experts who've viewed the photos: Why are there no blood cells evident?

She said it seemed "at the very limits of probability" that in such a gruesome murder the brain tissue would not have had any blood cells with it.

(James Pang, who gave evidence on the possibility of brain tissue being on the shirt, told *North & South* the brain doesn't have much blood in it – only in the scalp area – a suggestion met with incredulity by other doctors and scientists it was referred to.)

But above all Duxson finds it hard to believe any tissue could have been preserved on the polo shirt.



Amber was a Pippin, part of the Girl Guides movement. Her father had no way of knowing her Pippins meeting was going to be cancelled on the afternoon of the killings. He found out only when Christine and Amber rang him at 5.30pm – supposedly as he was about to dash back to Palmerston North to commit murder.

"That really blows the minds of anybody who's experienced in this area that I've mentioned it to – we just can't believe he could get anything surviving, any real tissue surviving, after what that shirt went through."

Even if tissue had been preserved, she says the fact it was dried for a long time at room temperature means, in her experience, it became "sticky" and in IHC testing would bind with things it normally wouldn't if it was in good condition, thus giving totally unreliable results.

"It's something I tell my students to be very careful not to do. That kind of drying is the last way I'd preserve tissue for immunohistochemistry."

Further complicating the reliability of Miller's tests is that even if the brain tissue had been miraculously preserved initially on the shirt by sheer fluke, it was then wet again (twice, in the case of the more important sample) during ESR tests.

Pang argues once the tissue was dried on the polo shirt it was preserved forever and

the cells wouldn't have been affected by being rehydrated.

Duxson's response: "Oh I completely disagree – utterly disagree. I don't think he's correct."

She says great lengths are gone to in laboratories when preparing IHC samples to prevent moisture getting on them before they're fixed with formalin or liquid nitrogen, as enzymes in the material will be reactivated, degrading the material.

Duxson says there's no way what Miller did would stand the scientific scrutiny necessary for a top scientific journal or one that routinely published about IHC.

"There are so many variables there – oh man, I wouldn't put a man in prison on that evidence. It's just a pity the defence didn't manage to get the right sort of expert witness who could stand up to [Miller] and say, 'But what about this – this isn't beyond doubt?"

Miller, however, maintains his work is above question.

He rejects suggestions his controls were

inadequate, insists the antibodies stained as expected and claims the tissue was well preserved.

"Those who are familiar with my work know that there are few immunohistochemists on the planet that go through the trouble that I do to ensure the accuracy of my results. That is one of the reasons I have been so successful as a consultant to other pathologists. For that reason I can say with 100 per cent certainty that the tissue on Mr Lundy's shirt was central nervous system tissue. Not 99.999 per cent certainty - 100 per cent... Any appropriately trained pathologist or other scientist who examined the evidence that I did and reviewed the immunostains that I performed would come to the same conclusion that I did. If they did not, they are either incompetent, hopelessly naive or unwilling to believe the truth."

None of this sways Sheard or Duxson, who describe Miller's responses to questions as "unbelievable", "astonishing" and showing a "worrying degree of over-confidence".

Sheard adds Miller's insistence on 100

ignorance of the uncertainty inherent in all biological investigations".

per cent certainty "reflects a remarkable

When ESR scientist Björn Sutherland examined the polo shirt, he also found red particles that he said were so small it was difficult to conduct tests for blood. Only one red particle he tested returned a positive result, and Sutherland stressed it was "a probable indication that blood is present, however it is not conclusive".

Subsequent DNA testing strongly suggested Amber's DNA in the sample but Sutherland said other cellular material from Amber could have been found in the same area.

This microscopic particle of "blood dust" is the basis for the common claim that Amber's blood was found on Lundy's shirt. Lundy supporters say if it was blood dust, it was just as likely to have come from an old scabbed-over leg wound found at the post-mortem and could have got on Lundy's shirt as the two cuddled up on the couch watching TV, as they often did.

The microscopic particle of "blood dust" is the basis for the common claim that Amber's blood was found on Lundy's shirt.

Lundy supporters say it could have come from an old scabbed-over leg wound found at post-mortem and could have got on Lundy's shirt as the two cuddled on the couch watching TV, as they often did.

Below: Amber with her father a few months before she was killed.



METICULOUS OR RIDICULOUS?

Judges, including the one in the Lundy case, often instruct juries to use their common sense when deciding guilt.

So it's worthwhile standing back and looking at the Lundy case from that perspective.

According to police and the Crown, Lundy had been planning the murders for weeks, his plan was "meticulous" and he believed he'd committed the perfect crime.

If that's to be believed, Mark Lundy left an incredible amount to chance.

- If his alibi was to have been out of town, but then drive home and back so fast nobody would believe he could have done it, his whole plan relied on not one single person in rush-hour Wellington, on SH1, or on the streets of Palmerston North seeing him drive at arguably impossible speeds. It would have taken just one person to notice this lunatic drive, to have *555ed him, to have been run off the road by his wild passing manoeuvres, just one cop or traffic camera to have seen him and he was toast.
- Lundy had no way of knowing Amber's Pippins group was going to be cancelled that night he found out only when Christine and Amber rang him at 5.30pm supposedly when he was about to set off to murder one or both of them. Until then, he would have expected them to be up when he stole home at 7pm. Wouldn't this have thrown his meticulous plan into disarray and caused him to reconsider or postpone the murders? Did he really instantly come up with the bizarre request for Christine and Amber to be in bed by 7pm because he was coming home for sex?

Wouldn't the practical Christine have said, "Don't be silly, Mark, there's no way I can get Amber asleep by 7pm/you'll never make it home by 7pm in that traffic/why don't you wait till later this evening if you really want sex tonight/but you've already booked into your motel/couldn't it wait till tomorrow night/make it after Shortland Street?"

Ross Grantham says, "It's plausible that Lundy convinced his wife that they should have a romantic evening and it's not uncommon for married couples."

Really? At 7pm when your kid's normally up and about; when the husband's already checked into a motel for the night; when it requires a 300km round-trip?

And did Lundy make Christine promise not to tell anyone she might talk to in the meantime – like Julie Burnett – that he was unexpectedly coming home? Because if she did, he was toast again.

• Why would Lundy have said a ludicrous

time of 7pm? Why not 9pm or 10pm? What made him think he could actually make it home by 7pm anyway?

- If Amber had been put to bed so early, there was every chance she wouldn't be asleep at 7pm and would get up when she heard her dad come home. If so, you have to accept Lundy planned to kill her all along.
- Meticulous? Why would he park opposite a friend's place and later run 500m through suburbia and past shops trying to disguise himself with only a curly blonde women's wig? If speed was essential, why would he park so far from the main route back to Petone?
- Meticulous? How could he have been so dumb to keep the shirt he wore during the murders?
- Meticulous? If he wanted to avert suspicion he wasn't the loving spouse and father virtually everyone described him as, why would he have done the one thing that would have confirmed he was a heartless husband and hired a prostitute?

If he wanted proof he was in Wellington around midnight, why wouldn't he have bought a burger, used an ATM, phoned for a pizza – anything that proved where he was without bringing suspicion and opprobrium?

- If he was such a lousy actor at the funeral and in the various times police construed his body language as false or unbelievable, why did the prostitute, the motel manager and his customers the next morning describe him as normal and cheerful? North & South has listened to the phone messages Lundy left for Christine on the Wednesday morning when he was trying to find a central Wellington address so he could chase up money owed to them. They sound so unlike a man who's murdered his wife and daughter hours earlier that he either truly doesn't know they're lying hacked to death or he's a superb actor.
- The suggested motive for the murders was an insurance payout. The Lundys were in the process of increasing their life cover (as part of a normal annual review of their policies and in light of a new vineyard venture) from \$200,000 to \$500,000 each, but this hadn't been completed.

Why then would Lundy murder his wife before the increased cover was in place?

IF NOT LUNDY THEN WHO?

Ross Grantham remains in no doubt police got the right man, despite Lundy's protesta-

tions, despite a small group of friends who still work to prove his innocence.

"I'm convinced that the evidence produced is irrefutable... I admire friends of Mark Lundy for sticking by him – that's admirable, but I think it's futile. I think because he has no remorse for what he did, because he's so dishonest, he appeals upon these people, and that's unfortunate."

Christine's brother, Glenn Weggery, also insists police got it right and says Lundy's supporters are very misguided and keep stirring up the case "so the rest of our family gets put through hell again".

Grantham says it's unfortunate that most of those who believe Lundy's innocent weren't present during the whole trial and didn't see all the evidence.

Campaigner Geoff Levick admits he wasn't at the trial but you'd struggle to find anyone who knows more about the case.

He used to own a chemical-importing company and would visit clients in Petone and Palmerston North, near the Lundy home. He drove that route dozens of times and it always took him about two hours. When he heard of the times Lundy was supposed to have managed, he simply didn't believe it.

Now a horse-breeder in Auckland, Levick has devoted more than five years, 5000 hours and many rooms of his house to investigating the murders, amassing expert evidence challenging the police case and helping establish the website www.lundytruth.com. He never knew Lundy before the murders and insists he's interested only in evidence and not emotion.

Despite obtaining many undisclosed documents, he estimates there are several hundred more the defence never received, as well as more than 20 police notebooks.

So what might really have happened that night? It's difficult to go into detail because of court suppression orders among other things. But it's possible to say this much:

- For several months police believed there was more than one person involved, saying someone else helped clean up the scene afterwards.
- At trial, it was revealed there were four uneliminated suspects, not counting Lundy. Grantham says these people had one alibi for the time of death but not the two police required. However, all alibis revolved around a time of death of 7pm, which must now be questioned. The original suspect list had more than 30 names.
- During the investigation, police actually accused one of those people of being

the murderer, but later said he wasn't involved.

- Grantham's notebook suggests he also offered immunity to a friend of Lundy if he admitted involvement. (Grantham now says he offered only the opportunity of immunity from prosecution, as only the Solicitor-General can grant immunity.)
- Seven unidentified fingerprints and a palm print were found around the house
 a fact not revealed to the jury.
- Lundy was a suspect from day one. In the arrest interview, Detective Sergeant Steve Kelly told him: "If you want to know what we've been doing for six months, we've been working on you, all right, for six months, from day one. The number-one suspect on my spreadsheet is you all right.

"Now that's the way it's been for all those man-hours, all of those going to work at six in the morning till nine at night, seven days a bloody week, with the cops thinking that you killed your wife and daughter."

It's impossible to say whether this resulted in any tunnel vision, but it clearly suggests Lundy was the investigation's main focus from very early on.

More than 24,000 police hours were invested in convicting Mark Lundy. In attempting to defend him, his lawyers had to haggle to get legal-aid funding for a few hundred hours to investigate the case, question witnesses and counter police claims in what was often an extraordinarily complex case.

The jurors heard six weeks of evidence and deliberated for seven hours before finding Lundy guilty. Nobody should challenge their decision based on the evidence they heard.

However, the police and Crown's common cry that only those who sat through the trial have a right to comment on a person's guilt is spurious. If not all the relevant evidence was produced at trial, if compelling expert evidence challenging the Crown case was never presented, how can this claim be sustained?

A thorough sifting of trial transcripts and evidence; much more background research into complex areas than was ever presented to the jury (it was exposed to the case for only about 200 hours); and studied reflection on this, away from the heat of the courtroom with its theatrics and tactics – is that not arguably an acceptable basis on which to question a conviction?

If it is, and if the benchmark for justice in New Zealand is "beyond reasonable doubt", it seems only fair Mark Lundy's case be viewed again dispassionately and with all the available evidence.