

# TRACING THE EVIDENCE: AN INTERVIEW WITH FORENSIC EXPERT DR HENRY C. LEE

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▲ Director CID and DSP Lim Seng Kim from CID received Dr Lee at the Changi Airport.

**The Singapore Police Force (SPF) welcomed Dr Henry C. Lee, one of the world's foremost forensic scientists, as guest speaker for the Commissioner of Police's Lecture organised by the Singapore Senior Police Officers' Association (SSPOA) on 17 May 2008.**

The lecture was held at the Homeground, Police Cantonment Complex. Dr Lee also conducted a half-day seminar on fire investigations on the same day, for investigators from the Singapore Civil Defence Force and the SPF, as well as foreign investigators from the ASEAN region.

Dr Henry C. Lee, an eminent and well-respected forensic scientist, has rendered forensic expertise to many law enforcement organisations in more than 6000 cases, over a career spanning 40 years. Some of the high profile cases he has handled include the famous OJ Simpson case in the United States of America (USA), the re-investigation of former American President, John F Kennedy's assassination, as well as war crimes in Bosnia and Croatia.

He is also professor and founder of the Forensic Sciences Programme at the University of New Haven, set up in 1975, and the Henry C. Lee Forensic Institute that was established

in later years. Today, Dr Lee gives lectures to the police, universities and other civic organisations throughout USA and across the globe. Dr Lee has published papers on DNA, trace evidence, crime scene investigation, among others, in numerous professional journals and textbooks. He presently holds the position of Chief Emeritus for Scientific Services for the State of Connecticut, Director of Forensic Research Training Centre and Chair Professor at the University of New Haven, USA.

Commissioner of Police, Mr Khoo Boon Hui, also took the opportunity to present to Dr Lee the distinguished Temasek Sword as a token of great appreciation for his service rendered to the Singapore Police Force in the areas of forensic training and consultation.

Police Life Monthly took the opportunity to speak to Dr Lee for his insights into forensic investigation.

**Q1: Dr Lee, could you share with us how you developed your interest in forensic science?**

A1: Almost 50 years ago, after I graduated from Taiwan's Police College, I was assigned to the Taipei's police department. At that time, investigations basically relied more on confessions, such as through an interview or an interrogation. There was very little emphasis on the physical evidence and the crime scene. After I read some related books, I became very interested in using physical evidence to solve cases, so I decided to go to the USA to further my studies.

In 1965, when I arrived in USA, there wasn't a PhD in forensic science. So I decided to enter as a college freshman, although I already had a police college degree. I finished four years of college, majoring in forensic science. I then went on to obtain my Master's degree and a PhD in Molecular Biology. At that time, I also worked at the New York University Medical Centre. After I finished my degree, I had an opportunity to use my scientific knowledge with my police background when I was approached by the Governor of Connecticut to be the first Chief of the Forensic Science Laboratory.

In the early 1960s, investigations in USA also relied on confessions and interrogations. There were a couple of major cases and decisions in USA Courts, which severely limited police's use of interrogation techniques. The volume of confessions also decreased and police were required to use a Miranda Warning to advise arrested persons of their rights – the right not to answer questions; and the right to hire a lawyer.

Today, police have come up with new technologies to solve crimes. So forensic science has become an important tool for law enforcement. Hence, in the 1970s, I was able to build forensic science (in Connecticut) from the ground level up, with other forensic scientists.

**Q2: We heard you solved a murder case without a body. Could you tell us more about that?**

A2: In the 1980s, there was an airline stewardess who was married to a man called Richard Craft. Richard worked for a CIA affiliate. After retiring, he flew airplanes for the Eastern Airline.

One night, the airline stewardess mysteriously disappeared. All her friends asked her husband and he said she either just ran away with her boyfriend, or went home to visit her mother. Her friends approached the police. Police put Richard Craft on polygraph and he passed. They searched his house and did not find many clues. Two and half months later, they came to see me and said, "Dr Lee, can you look into this case? She'd vanished into thin air!"

We went to her house, found the carpet gone and the furniture rearranged. We only found a couple of little blood stains on the mattress, and nothing else. There was no body! In the early days, the *corpus delicti* of a homicide was a body.

We re-interviewed the witnesses and found that on the night of her disappearance, there was a big snowstorm. A highway worker said they saw somebody towing a big commercial wood chipper towards the riverbank. We found out Richard Craft did rent a wood chipper that week. We went to the wood chipper rental store and repossessed the wood chipper – this huge machine that took us 14 hours to take apart – and looked for clues. Eighteen hours later, we were still trying to put it together and we did not find any clues.

The [staff at the] rental place said he never saw a rented wood chipper come back so clean. Obviously, he [Richard Craft] had cleaned the wood chipper.

Using logical analysis, we deduced that the direction of the wood chipper was towed, appeared to be the riverbank. So in the middle of winter, we melted the snow, looking for clues. We found 56 little bone chips, less than half an inch each. We found 2660 hairs, and half of a finger, a thumb and a toe. We knew something had happened.

We sent divers to the lake looking for the body, but couldn't find any. However they recovered a chain saw. We took the chain saw apart and we found the serial number had been filed



▲ Thirsting for more, a SPF officer engaged Dr Lee on a one-on-one after the fire forensic lecture.

away. We restored the serial number - E5921616. We called the manufacturer and traced it to the chain saw rental store. Richard Craft had used a credit card for the chain saw. And in the chain saw, there was grease, and all the trace evidence were stuck to the grease. Meticulously and with extreme hard work, we found human tissues and hair follicles. Richard Craft was found guilty primarily because we found enough evidence to show that the airline stewardess was murdered.

**Q3: Dr Lee, we understand you also have your own television show. Could you share with us more on this?**

A3: Yes, I've got my own television show called "Trace Evidence: The Case Files of Dr Henry Lee". At first, when they [the television producers] approached me, I did not like the idea. However, I found that "Crime-Scene Investigation" (CSI) was getting so popular, and the [American] jury and the public were misled by CSI.

People think that by the second commercial, we should be able to find some clues. In every case, we should find a fingerprint. When we shine a light, all the evidence pops up.

To them, you can literally put a hair in a machine and the other end prints out a picture, the name, address and telephone number! Of course, there's no such thing. Police cannot perform miracles. So that's why the producer talked to me and we decided to use real cases - even some cases which were not solved, to educate the public. In this way, we could let the public know what's reality and what's Hollywood.

**Q4: Could you share with us more on why these unsolved cases are featured on the show?**

A4: Not all cases are solvable. In some of the cases, there's a lack of evidence, a lack of witnesses, and some of them, a lack of luck. Some of [these] unsolved cases were used as training examples on how to secure the scene, how to preserve the evidence and how to look for clues. The more we learn from such history, the better we are as an investigator.

In the early days, the investigators only learned from their own mistakes. In other words, if you were assigned to the Criminal Investigation Department, you worked on a couple of cases and that's all you know.

Nowadays, we use case examples so investigators can learn from the world and other people's experiences on their cases. In particular, why a case was successfully solved and why a case could not be solved. With that, investigators can learn and improve. That's one of the purposes behind "Trace Evidence".

Of course, sometimes people ask if criminals are going to learn our tricks. I tell them that in solving cases, we don't use tricks. We use evidence, intelligence, logic and experience. The criminals probably learn from each other in the jail, more than from us, sharing information on how they got caught!

**Q5: Could you share with us more on the limitations of forensics?**

A5: Yes, definitely there are limitations, unlike what is presented on CSI, where you can find evidence in every case. As I have mentioned, by the second commercial, CSI have clues, and by the third commercial, they make an arrest. By the end of the episode, they're eating in a fancy restaurant! In real life, we don't have a second commercial and we don't have a third commercial. It's about team work, not about one hero.

However, even with the best team, you still have limitations. The [first] limitation is forensic officers are usually not the first ones to get to the scene. Sometimes we get called to the scene maybe two or five days later. Recently, a department contacted me on a 39-year-old case! That's a severe limitation. There's no crime scene anymore. Even with a crime scene, 39 years later, what do you think a tree at the scene is going to look like? 39 years ago, maybe there wasn't even a tree. Now there's a giant tree. So, time can change the crime scene. Weather can change the crime scene. The environment can alter the crime scene. Individuals and witnesses can alter and modify the crime scene. So, the one severe setback is that the crime scene is not actually controlled by forensic officers. We are usually the last ones to get called. By the time we get there, the crime scene may already be altered, modified and changed. So, that's a severe limitation.

The second key limitation is that crime scene evidence is not always obvious. Then you have to develop technology - chemical, physical, instrumental methods - to enhance and develop the latent prints. If you lack training, skill or if you use the wrong chemical, that evidence will never become a piece of evidence.

The third limitation is human factor. If you have people running around the crime scene, or the case happens outdoors where the traffic continue to move. That can affect the availability of evidence. That's why we don't always find evidence at the crime scene.

**Q6: I understand that you've read about the forensic examination conducted for the Mas Selamat case. What are some of your comments on the collection of evidence in the case?**





▲ As a token of SPF's deep appreciation, CP Khoo presented Dr Lee the Fourth Edition of the Temasek Sword – The Commissioner's Series, at the end of the lecture.

A6: Ideally, I've to look at the site and get there right away. Obviously, from the size of the window, we can tell if somebody was fit enough, who is in good physical shape, could go through. The height of the window is not really that high, so one can get over from the inside to the outside. You can get through without touching anything and leaving trace evidence. Hence, it looks like this case is not going to have abundant evidence, such as fingerprints or tyre tracks waiting for you (to uncover). So you have to look at other information, not necessarily from the physical evidence, not necessarily from the witness, and not necessarily from the crime scene.

**Q7: If a suspect is believed to have negotiated and climbed over the fencing, as in this case, would a DNA swab taken from the fence be expected to yield any DNA profiling?**

A7: It is very difficult to perform a general swab of an area [for DNA]. Usually, it is done as a last resort. Let's say this chair, if you swab the whole area looking for DNA, you will get a mixture of DNA and you never will be able to solve the case. There may be more chances indoors. But [with DNA], you're talking about a very small amount of a tissue, not somebody's semen or saliva or blood.

With a small amount of tissue, sometimes you don't even find DNA. Especially outside on a post or wire, the chance to find such DNA is almost zero. If you are lucky and hit the spot, maybe you can get a trace amount of DNA.

If you take a general swab, you may never find enough DNA because of the weather, humidity and rain. With the fence, because the contact is minimal, unless he cut himself, and if toilet paper is used to wrap around the fingers to climb – you're not going to find DNA.

In addition, with a small area of metal, and condensation during the night, it's very easy, in a couple of days, not to find anything. So I don't expect you to find a lot of DNA, unless he's bleeding or has cut himself.



▲ Officers from various CID units gathered for a group photograph with Dr Henry Lee.

As for fibre [from clothing], some fibre is resulted by what we call direct transfer or indirect transfer. In a single transfer, we have a little fibre from a correction officer or some people involved in the search, and the wind carries that fibre to the location, or is accidentally transferred there. So a single fibre, a white cotton or polyester fibre, has got very little forensic value. Unless you find multiple fibres, that becomes more valuable.

**Q8: People think forensics is scientific, but when you analyse, there's always a danger of examiner bias. In the Madrid train bombings, fingerprints were found on a plastic bag at the scene. Yet, when the prints were analysed, they were falsely matched to somebody else. Would you have any comments on this case?**

A8: Many times, our interpretation is subjective, but note that physical evidence is always objective. When a task involves humans – [for example] humans to examine the evidence. This is where a pre-set bias could set in. This pre-set bias depends on whether you are the defence expert or prosecution expert. You tend to link the evidence in favour of your theory. However, this (Madrid train bombings) case showed that physical evidence is objective – because it was subsequently confirmed that the fingerprint was not his. So the fingerprint evidence cleared him. With earlier serology, it involves subjective interpretation. That's why for the USA's "Innocent Project", 142 people were cleared. This is because DNA evidence is more objective now and it "cleared" them. For example in this fingerprint case, everybody agrees it's a fingerprint. That's very objective. Whether these two fingerprints match, now it becomes a subjective call. Elimination is easy, getting a match is more difficult.

**Q9: As a parting shot, do you have any advice for our officers who aspire to a career in forensics?**

A9: My entire career is in forensic work, that's my love – forensic work. I would advise forensic officers to treat their job like a profession, not a job. If you think it's a job, you're going to hate it. I love my profession; I can work 24 hours without sleep, without food and without drinks. As a forensic scientist, you have to have that devotion, to have curiosity and believe in continued learning.