

Business and Law THE FORENSIC Investigator

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From the Librarian

Some interesting titles recommended by our librarian Selios Pudias.

1. The future of forensic DNA testing : predictions of the Research and Development Working Group / [National Commission on the Future of DNA Evidence]. United States. National Commission on the Future of DNA Evidence. Research and Development Working Group
2. The MMPI, MMPI-2 & MMPI-A in court [electronic resource]: a practical guide for expert witnesses and attorneys / Kenneth S. Pope, James N. Butcher, and Joyce Seelen. Kenneth S Pope
3. Evaluating sexual harassment [electronic resource] : psychological, social, and legal considerations in forensic examinations / William E. Foote, Jane Goodman-Delahunty. William E. Foote
4. Experts in court [electronic resource]: reconciling law, science, and professional knowledge / Bruce D. Sales and Daniel W. Shuman. Bruce Dennis Sales
5. Bitemark evidence [electronic resource] Robert B.J. Dorion.

Police Commissioner

The recent and ongoing success of television programs like CSI has resulted in an increase in forensic science courses throughout Australia. While forensic science focuses on analysing the evidence collected from crime and accident scenes, in contrast, Edith Cowan University's Bachelor of Forensic Investigation focuses on the recognition, collection and preliminary analysis of collected evidence. It is the effective and reliable collection and recording of evidence that underpins subsequent criminal and civil legal actions. The investigation of crime and accident scenes has also evolved beyond traditional learning on the job.

Modern investigators need to be aware of the law and justice framework in which they operate. It is pleasing to see a course of study that embeds forensic skills in a framework of key science, law and justice units of study, thereby better equipping students for future employment.

Dr Karl O'Callaghan- Commissioner for Police, Western Australian Police.



Dr Peter Roberts



My name is Dr Peter Roberts and I am the coordinator of the scientific component of the Bachelor of Forensic Investigation degree. I have more than 20 years experience in teaching and research at the university level at UWA and ECU.

At present, as well as my work with the K09 degree I am the Postgraduate Course Coordinator for Human Biology and have just finished a stint as the Coordinator of the Biomedical Science degree. In addition to developing and lecturing in a number of the units within the K09 degree I also lecture in Microbiology, Pathophysiology, the Biology of Human Disease and Reproductive Biology. Another aspect to my role at ECU is the supervision of the research of a number of graduate students.



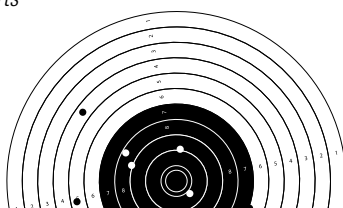
Lecturers Feed back

On the evening of Tuesday September 23rd, students and staff involved within the introductory unit Forensic Skills met at Harrison Rifle Range in Swanbourne for an introduction to firearm safety and ballistics. The evening began with a lecture on firearm safety. Safety was central to the night's activities. Students were also introduced to a variety of firearms.

We then moved to the event everybody was looking forward to, shooting on the rifle range. Each student was allocated an individual instructor who guided them through what was for many their first shooting experience. After an introduction to range safety the "hands on" part of the evening began with students shooting small-bore rifles using various protocols. Prior to the students finally seeing the results of their handiwork, further instruction was given on various types of ammunition, projectile velocities and weapons.

The group finally moved indoors for light refreshments and a public airing of their talent. The evening was both interesting and informative and was probably (according to feedback) one of the more interesting and enjoyable laboratory classes with which the students had been involved.

Dr Peter Roberts



Forensics at ECU

*Dr Magda Wajrak
Lecturer: Faculty of Computer,
Health and Science*

Gunshot residues contain a number of metals such as lead, antimony, barium and copper. When a firearm is fired, gunshot residue is expelled and in order to confirm the presence of gun residue on a person or item it is necessary to confirm the presence of these metals. Current standards require the presence of at least barium, lead and antimony.

Investigators may test a suspect's hands, arms and face for particles of gunshot residue as evidence of having recently handled or fired a gun. Current analytical methods that are used to detect for these metals in gun residues are: Neutron Activation Analysis (NAA), Atomic Absorption Spectrometry (AAS), Inductively Coupled Plasma-Atomic Emission Spectrometry and Scanning Electron Microscopy (SEM). However, these methods use sophisticated equipment and require complicated infra-structure and experienced scientist.

There is however an alternative technique which could be used for the detection of lead and antimony in gunshot residues (Woolever, C. A. and Dewald, H.D., Forensic Science International, 117, 2001, 185-190) Anodic stripping voltammetry is relatively simple, cheap and doesn't require complicated infrastructure. Voltammetry is an old technique, which with the recent

improvements in the electronics, can now complete with the more sophisticated methods such as AAS and ICP.

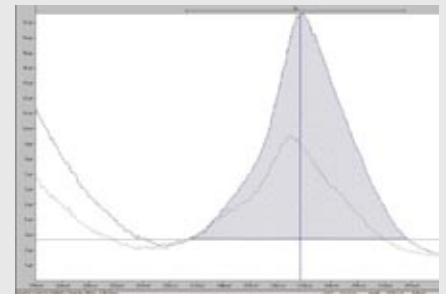


Fig 1: Voltammogram of 10ppb and 20ppb Ba standard with blank subtraction

Currently it is possible to detect lead and antimony using voltammetry, however, barium is difficult to detect, due to low negative deposition potential needed and production of large quantities of chlorine gas. Dr Magda Wajrak from the School of Natural Sciences is currently working in a project to development a voltammetric method for the detection of low concentrations (ppb) of barium using portable digital voltammeter, PDV6000+ and then implement of the method for the detection in gunshot residues.

So far Magda has been able to detect barium in 10ppb barium standard solution and the next two steps are to lower the detection limit and then implement the method for the detection in real gunshot residue samples.



Fig 2: Magda developing barium detection method



Building 1 at ECU Joondalup Campus

Case of Interest

The following extracts from *R v Nathan Green*, an unreported decision of the District Court of New South Wales alerts you to how sometimes it is the simplest things that can go wrong with forensic evidence. Here the issue is continuity, the link between the item found at or near the crime scene and the object that is to be linked to the accused in trial. Should you want to read the whole judgement please contact Michael Crowley.

R v NATHAN GREEN - [2008] NSWDC 245 - BC200840341 - Admissibility of evidence
NEW SOUTH WALES DISTRICT COURT

JUDGMENT OF: Knox SC DCJ

CATCHWORDS: Admissibility of evidence - Accused's DNA evidence – Continuity and chain of custody - Lack of certainty as to the item from which the DNA sample was taken

DECISION:

Evidence of the DNA material admitted.

JUDGMENT

1 The accused is charged with two counts, car stealing (count 1) and aggravated break and enter with special circumstances of aggravation (wounding) (count 2) on 17 November, 2006.

2 Counsel for the accused has objected to evidence being led as to the accused's DNA being found on sunglasses taken from one of the victims of the aggravated break and enter the basis of count 2 on the indictment.

3 The Crown proposes to lead that evidence from Ms Wedervang, who is an officer attached to the Division of Analytical Laboratories at Lidcombe. The basis of the objection is that Defence counsel submits that the Crown cannot establish that the sunglasses from which the swab was taken were the sunglasses which were taken from the victim at the robbery.

4 A short summary of the relevant evidence on which the Crown relies is that on 17 November, 2006, the La Fayette Hair Salon at Caringbah was broken into at about 8 pm. A masked offender burst through the glass door of the salon carrying a knife. He lunged at the proprietor of the salon (Ms Corcoran) and cut her arm and wrist with a knife. After attacking a customer in the salon, Ms Reid, he wrestled or pulled her to the floor. He took Ms Reid's handbag containing her purse and her Christian Dior sunglasses. The offender then fled the salon.

5 Ms Corcoran, Ms Reid and another staff member, Ms Burns, ran outside. They saw a car being driven in the adjoining street. Ms Corcoran and Ms Reid identified the driver as the same man who had broken into the salon. They called 000 and identified the registration number of the car. That car had been stolen at about 6:15 pm in Woonoona about 50 kilometres away. It was recovered at about 10 pm that night, totally burnt out. The

continued

number plates, bearing the same numbers as read out in the 000 call, were in the car.

6 The Defence case is that the accused was not in either the car or the premises which were broken into. Accordingly he does not contest the circumstances of the break and enter nor the car-stealing charge.

7 The morning after the break and enter, Ms Reid's handbag, her purse and the sunglasses were found by a Mr Tucker about a kilometre from the salon. The handbag, purse and the sunglasses were given to the police. They were entered as exhibits at the Miranda Police station and sent to the Division of Analytical Laboratories.

8 The sunglasses examined contained a smear from which a swab was taken and analysed. It contained DNA consistent with a sample of the accused's DNA taken later in 2007 following other matters. The DNA testing excluded the possibility of that contained in the swab being that of Ms Corcoran, Ms Reid or Mr Tucker.

9 DNA testing taken from a smear on the sunglasses was consistent with that of the accused - the report notes that the chances of the DNA being that of some other person are one to ten billion individuals in the general population.

10 DNA testing was carried out on Ms Reid's handbag, purse and sunglasses by another officer at the DAL laboratories. The DNA testing on the handbag and purse was unsuccessful and no was DNA recovered.

11 The principal issue in the trial is whether there is any evidence connecting the accused to the hair dressing salon in which the aggravated break and enter took place (count 2) and the stolen car

(count 1) was seen speeding away from an area in the immediate vicinity of the salon immediately after the break and enter.

12 There is no forensic or other evidence connecting the accused to the salon nor to the car...

17 The evidence of Ms Wedervang and Ms Robinson both from the Division of Analytical Laboratories on the voir dire is that there were some markings made with a permanent identifier on the sunglasses from which the swab was taken. That consisted of a forensic science number on the arms of the sunglasses. There were some other marks highlighting other areas on the sunglasses.

18 The aspect of Ms Robinson and Ms Wedervang's evidence and which forms the basis of the objection which has been taken is that the numbers and markings placed on the sunglasses had been erased.

19 In response to the specific question in cross-examination Ms Wedervang said there was no other unique identifying feature for those sunglasses. She said that the sunglasses were similar in appearance. They were brown Christian Dior sunglasses. In those circumstances Defence counsel submits that there is no other identifying evidence that the sunglasses examined were the sunglasses taken from Ms Reid during the break and enter.

20 The only direct evidence that the Crown has is the DNA evidence on the sunglasses and that is why the identification of these sunglasses as being the sunglasses on which the DNA testing was carried out is a particularly crucial matter. The remainder of the Crown case is based on circumstantial evidence...

23 ... Ms Reid... said that those were her sunglasses. It was not suggested to her that they were not her sunglasses.

24 It is agreed that there was a continuity in the chain of custody of the sunglasses between when they were found by Mr Tucker, retrieved by them from his home and given to the police and taken by the police to DAL. It is not conceded that those were the sunglasses returned to Ms Reid.

25 The issue is whether the Crown can be permitted to lead evidence as to the DNA samples taken from the sunglasses when the DAL Laboratories cannot establish that they were the sunglasses of Ms Reid.

26 Evidence was given by Ms Wedervang and Ms Sarah Robinson, also of the Division of Analytical Laboratories in relation to the procedures which have been followed.

27 Miss Robinson was the Team Leader of the Forensic Services Branch of the laboratory. In December 2006 she was a hospital scientist responsible for the examination, screening and confirmation testing of exhibits.

28 She produced notes in her handwriting of the examination of the Dior sunglasses carried out by her on 7 December 2006 (MFI 2). The worksheet notes indicated that the brown Dior sunglasses contained a scratch mark on the outside of the left lense. There was an area of smearing on the sunglasses which was swabbed by her and subject to DNA analysis.

29 It was that swab which produced the DNA consistent with that of the accused.

30 Ms Robinson was also able to identify the fact that she had written the forensic services



Forensic Job *Opportunities*

Janet Simmons - Workplace Opportunities Coordinator: Faculty of Business and Law

It is never too early to start preparing for your career. An extensive, structured resume will make you stand out from other applicants in the competitive field of forensics. Here at ECU we provide many ways to help you enhance your employability skills. Within the Faculty of Business & Law there is the blackboard site called 'Get that Job!' which provides information on career workshops, vacancies, graduate programs, and employer events. I recommend that you look at this site on a regular basis to maximise those opportunities.

Also within Student Recruitment and Careers, there are monthly resume and interview workshops that you can attend. If you are lacking relevant work experience, have you considered volunteering?

Some useful websites for you to start looking at are
www.asio.gov.au
www.ecoexpo.com.au
www.afp.gov.au

In future publications we will be focussing on opportunities in more detail.

(FS) number on the left arm of the sunglasses in a marker pen. She also took photographs of the sunglasses which were produced. Ms Robinson said that after her examination the sunglasses were returned to the police.

31 Ms Robinson said that the FS number had been written on the left arm of the sunglasses in a marker pen. This appears to have been rubbed off. Without that FS number there was no method of identifying the sunglasses as being the particular exhibit from which the DNA was taken.

32 Defence counsel submits that the Crown cannot disprove there may have been a switch or substitution of the sunglasses while in the DAL laboratory...

46 In my view, consistently with the decision in *Bergin and Burr* what is involved here is essentially a jury question. It is for the jury, and not for me, to determine whether there has been any relevant possession of the items taken during the break and enter - *R v Reynolds* (CCA (NSW) unrep, 25 August 1992) at 21.

47 Here, there is no direct evidence that the sunglasses on which the DNA was found were precisely the same sunglasses as taken from Ms Reid. However, in my view, there is material which is available to the jury from which they could conclude as a matter of overwhelming inference that the sunglasses were the sunglasses from which the swab was taken and on which the accused's DNA was located. Further, there is certainly sufficient evidence before the jury for them to be satisfied beyond reasonable doubt that the chain of possession had not been broken and the sunglasses were the sunglasses on which the DNA was located and analysed.

Library at ECU Joondalup Campus

48 In my view, the probative value of this evidence is extremely high in that, absent any explanation as to how the accused's DNA came to be found on the sunglasses, that DNA sample clearly links the accused with the handbag and its contents which were taken from Miss Reid during the course of the break and enter.

49 Absent any other evidence or explanation, and given the evidence of the police and the DAL analysts up to the time of the removal and analysis of the swab, there is no other evidence which could support an inference other than that the item examined were the sunglasses retrieved following the robbery... ons were taken either manipulatively or in any way to attempt to frustrate the defence.

55 The Division of Analytical Laboratories used a permanent marker pen for the application of the FS number. It did not take steps to ensure that such markings were permanent. However, the relevant analysing officer did photograph the items including the scratches which were the subject of evidence as well as recording her observations.

56 It is clear from the evidence of the OIC, Detective Senior Constable Bullock, that the sunglasses were returned to Ms Reid by a Constable Sullivan. The OIC agreed that there was no apparent pressing need for the return of the sunglasses to Miss Reid. However, it also appears that the accused had not been

apprehended at that stage – he was not arrested until the January of 2008, presumably after DNA analysis taken from him in connection with other matters matched the police records.

57 With the wisdom of hindsight, it was probably unwise to return a crucial item of identification evidence ahead of any possible trial. However, the police were clearly operating on the view that they had sufficient evidence certifying that the DNA sample was the sample taken from the sunglasses. Given that no person had been apprehended, there was no reason why a member of the public who had been robbed of items should not have those items returned to her. To require otherwise would require the police to store all exhibits for an indefinite time when those items are clearly owned by members of the public who are entitled to their return.

Ruling

58 I admit the evidence of the DNA material taken from the sunglasses...

Notation

60 The accused was acquitted on both counts by the jury on 7 November, 2008.



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- Camera barrier filter: Built-in filter module, filter selection via rotating knob, 14 filter values.
- Dimensions: Basic system (without monitor) 410 x 475 x 385 mm (WxDxH)
- Weight: Basic system 26 kg
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- Power consumption: 250 Watt max

Optional Accessories:

- New PIA-5 software
- PC control software
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- DC/AC- Inverter
- Transit case
- Monitor support
- Computer system

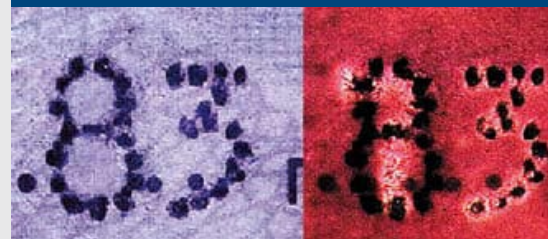
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Measuring of distances, angles, circle diameters



IR luminescence investigation to distinguish printing inks

Article of Interest

This article highlights the importance of following established procedures and ensuring appropriate, acceptable standards in collecting and testing evidence from crime and accident scenes are followed.

Industry Guidelines for the Forensic Investigation of Marine Incidents

James Angelo Ruggieri. Marine Technology and SNAME News. New York: Jan 2006. Vol. 43, Iss. 1; pg. M22, 5 pgs

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Abstract (Summary)

Landmark court decisions concerning admissibility of expert testimony indicate that industry guidelines and standards are an appropriate

source in the formulation and defense of expert opinions. When properly applied, such guidelines and standards provide experts with ample support in adversarial arenas. Review of the court's responsibility to determine scientific basis and expert opinions resulted in the Daubert decision (Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 [1993]).

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