12TH ANNUAL FORENSIC RESEARCH & TEACHING (FORREST) CONFERENCE

5TH JULY – 7TH JULY 2016
THE LIGHTHOUSE, MITCHELL LANE
GLASGOW G1 3NU, SCOTLAND, UK
CONTENTS

5th July – 7th July 2016 .................................................................................................................. 1
The Lighthouse, Mitchell Lane ..................................................................................................... 1
Glasgow G1 3NU, Scotland, UK .................................................................................................. 1
Conference Schedule .................................................................................................................. 4
Oral presentations ....................................................................................................................... 6
PLENARY SPEAKER – The Right Hon. Lord Bracadale (Alastair P Campbell QC), Judge of the Supreme Courts & Member of the Inner House ................................................................. 6
“Judicial primers for scientific evidence, & Thomas Ross Young v HMA” ................................ 6
Ahmad Aurangzaib, Punjab Forensic Science Agency, Lahore-Pakistan ............................ 7
“Change of location of Firing Pin Impression of 7MM bolt action rifles” ............................. 7
Rachel Bolton-King, Staffordshire University ........................................................................... 7
“Peer-Mentoring to Improve Forensic Graduate Employability Skills” ................................... 7
Valentina Brenzini, Anglia Ruskin University ........................................................................... 9
“A comparison study of the detection of blood stains on painted surfaces with Luminol” .... 9
Debra Carr, Cranfield University ............................................................................................... 9
“Forensic textile science: a case study - gunshot damage” ..................................................... 9
Lorna Dawson, The James Hutton Institute .............................................................................. 10
“Soil in criminal investigations: intelligence and evaluation in current and cold cases” ......... 10
Norman Fenton, Queen Mary University London .................................................................... 12
“On the benefits and pitfalls of using the likelihood ratio to help understand the impact of forensic evidence” ..................................................................................................................... 12
Rick Graham, University of Leeds ............................................................................................ 13
“Rule 19 and Trust in the Expert” ............................................................................................ 13
Claire Gwinnett, Staffordshire University ................................................................................ 14
“Can Undergraduate Students Get Involved with Casework? The Use of Easylift to Link Burglary Scenes.” ..................................................................................................................... 14
Hilary Jane Hamnett & Ann-Sophie Korb, University of Glasgow .......................................... 15
“Teaching Research Skills to Forensic Science Students by Drinking Coffee” .................... 15
Ashleigh Hunt, University of Cumbria ....................................................................................... 17
“A Major Incident - Real World Lessons Outside The Classroom” ......................................... 17
Allan Jamieson, The Forensic Institute .................................................................................... 18
“T and Me; Soles, Science, and Statistics” ................................................................................ 18
Carole McCartney, Northumbria University ................................................................. 20
“Flushing out the Mavericks & Dogmatic”: Expert Evidence & Rule 19. ............................... 20
Ben M. de Rooij, Marileen J.E.M. Gosens, Henk F. Haarman, Avans University of Applied
Science .......................................................................................................................... 20
“International Classroom: Experiences with Exchange Programs in Forensic Science” .......... 20
Sonny van Seeters and Ellen Hofstede, Avans University of Applied Science ...................... 21
“Didactics in forensic science, an experienced based journey” ........................................... 21
Rory Simmons, Northumbria University .............................................................................. 24
“An Investigation into the Use of Multivariate Analysis for the Interpretation of Textile Fibre Evidence
in Criminal Cases” ....................................................................................................... 24
Keith Sturrock*, Wilfred Otten (Cranfield University), Jon Wilkin*, Luigi Tomas*, *University
of Abertay .......................................................................................................................... 25
“The application of X-ray Micro-Computed Tomography to forensic teaching and research” .... 25
Tim Thompson, Teeside University ...................................................................................... 26
“Publishing your forensic science research” ........................................................................ 26
Barry Turner, University of Lincoln, with the European Group for Legal Expertise ............... 27
“Regulating the Expert: Proposals for a Professional Expert Standard” ............................... 27
Graeme Walker, NHS Highland .......................................................................................... 28
“The (in)significance of genital injury in rape and sexual assault” ....................................... 28
Graham Williams, University of Huddersfield ..................................................................... 28
“Genetic based body fluid identification strategies” ............................................................. 28
Lesslie Young, Epilepsy Scotland ......................................................................................... 29
“Crime Seen? Inadvertent entry into the criminal justice system as a result of behaviour associated
with seizure activity” .................................................................................................... 29
Poster Presentations ........................................................................................................... 31
Other Resources .................................................................................................................. 33
Information About Glasgow ............................................................................................... 34
Getting to the city centre from Glasgow Airport .................................................................. 34
Hotels & Accommodation ................................................................................................. 34
Places to eat ....................................................................................................................... 35
Things to do ....................................................................................................................... 36
Contacts, & Map of Glasgow City Centre ........................................................................... 37
## CONFERENCE SCHEDULE

### Day 1

**Tuesday 5th July 2016**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:00</td>
<td><strong>Welcome: Allan Jamieson</strong> incl. Emergency Procedure announcement</td>
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<tr>
<td>14:00</td>
<td><strong>Norman Fenton (Queen Mary University, London)</strong> – The benefits &amp; pitfalls of using the likelihood ratio to help understand the impact of forensic evidence</td>
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<tr>
<td>14:30</td>
<td><strong>Claire Gwinnett (Staffordshire University)</strong> – Can undergraduate students get involved with casework? The use of Easylift to link burglary scenes</td>
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<tr>
<td>15:00</td>
<td><strong>COFFEE</strong></td>
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<tr>
<td>15:30</td>
<td><strong>Barry Turner (Lincoln University)</strong> – Regulating the Expert: Proposals for a Professional Expert Standard</td>
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<tr>
<td>16:00</td>
<td><strong>Valentina Brenzini (Anglia Ruskin University)</strong> – A comparison study of the detection of blood stains on painted surfaces with Luminol</td>
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<tr>
<td>16:30</td>
<td><strong>Ben de Rooij (Avans University)</strong> – International classroom: Experiences with exchange programs in Forensic Science</td>
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<tr>
<td>17:00</td>
<td><strong>Carole McCartney (Northumbria University)</strong> – Flushing out the Mavericks and Dogmatic: Expert Evidence and Rule 19</td>
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<tr>
<td>17:30</td>
<td><strong>FINISH</strong></td>
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<tr>
<td>17:45</td>
<td><strong>Civic Reception at Glasgow City Chambers</strong></td>
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### Day 2

**Wednesday 6th July 2016**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tr>
<td>09:00</td>
<td><strong>Debra Carr (Cranfield)</strong> – Forensic textile science: a case study - gunshot damage</td>
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<tr>
<td>09:30</td>
<td><strong>Ellen Hofstede &amp; Sonny van Seeters (Avans University)</strong> – Didactics in forensic science, an experience-based journey</td>
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<tr>
<td>10:00</td>
<td><strong>Rory Simmons (Northumbria University)</strong> – The use of multivariate analysis for interpreting textile fibre evidence in criminal cases</td>
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<tr>
<td>10:30</td>
<td><strong>Keith Sturrock (University of Abertay)</strong> – The application of X-ray Micro-Computed Tomography to forensic teaching and research</td>
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<td>11:00</td>
<td><strong>COFFEE</strong></td>
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<td>Time</td>
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| 11:30 | **Plenary Session: Right Hon. Lord Bracadale QC**  
Judicial primers for scientific evidence, and, Thomas Ross Young v HMA |
| 12:15 | **Lesslie Young (Epilepsy Scotland)** –  
Crime Seen? Inadvertent entry into the criminal justice system from behaviour associated with seizure activity |
| 12:45 | **Rachel Bolton-King (Staffordshire University)** –  
Peer-Mentoring to improve forensic graduate employability skills |
| 13:15 | LUNCH and Poster Session |
| 14:15 | **Ashleigh Hunt (University of Cumbria)** –  
A Major Incident - Real world lessons outside the classroom |
| 14:45 | **Graham Williams (University of Huddersfield)** –  
Genetic based body fluid identification strategies |
| 15:15 | **Ahmad Aurangzaib (Punjab Forensic Science Agency, Pakistan)** –  
Change of location of firing pin impression of 7MM bolt action rifles |
| 15:45 | COFFEE |
| 16:00 | **Rick Graham (University of Leeds)** –  
Rule 19 of the Criminal Procedure Rules and trust in the expert |
| 16:30 | **Hilary Hamnett (University of Glasgow)** –  
Teaching Research Skills to Forensic Science Students by Drinking Coffee |
| 17:00 | **Graeme Walker (NHS Inverness)** –  
The (in)significance of genital injury in rape and sexual assault |
| 17:30 | FINISH |
| 19:00 | Conference Dinner |

**Day 3**  
**Thursday 7th July 2016**

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<tr>
<th>Time</th>
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<tr>
<td>09:00</td>
<td>“Matters Arising” (Panel Session)</td>
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<tr>
<td>10:30</td>
<td>COFFEE</td>
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| 10:45 | **Lorna Dawson (The James Hutton Institute)** –  
Soil in criminal investigations: intelligence & evaluation in current & cold cases |
| 11:15 | **Tim Thompson (Teeside University & Science & Justice)** -  
Publishing your forensic research |
| 11:45 | **Allan Jamieson (The Forensic Institute)** -  
T and Me; Soles, Science, and Statistics |
| 12:45 | Closing remarks, announcement of Best Speaker & Best Poster Prizes                                                                         |
| 13:00 | END                                                                                                                                 |

[The Forensic Institute]
*Better science, better justice*
I am involved in a project which is a joint venture between the two Royal Societies to prepare judicial primers on various aspects of scientific evidence led in court. As the project is at an early stage of development, I will give only a brief overview of it. As to the second part of my talk, I was a member of the court in the case of *Thomas Ross Young v HMA* which rejected the use of “case linkage analysis” as a science suitable for application in court. As one purpose of the project with the Royal Societies is to identify flaws in approaches to scientific evidence, I hope it will be of interest to FORREST delegates if I were to explain the thinking of the court in *Young*. The case also has quite an interesting background.

A summary of the case and judgement may be found on the Judiciary of Scotland Website (linked here: http://www.scotland-judiciary.org.uk/9/1177/THOMAS-ROSS-YOUNG-v-HMA)

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Lord Bracadale was appointed a Judge of the Supreme Courts in 2003 and appointed to the Inner House in April 2013. He is a graduate of the University of Aberdeen (M.A.) and University of Strathclyde (LL.B). He was admitted to the Faculty of Advocates¹ in 1985 and served as an Advocate Depute² from 1990 to 1993. He was Standing Junior Counsel³ in Scotland to HM Customs and Excise in 1995. He was appointed Queen’s Counsel in 1995. He served as Home Advocate Depute from 1997 to 1998 (Principal Crown Counsel).

In 2000-2001 he was senior Crown Counsel at the trial and appeal at the Scottish Court at the Netherlands of Abdel Basset Al Megrahi for the Lockerbie bombing.

¹ The Scottish Bar.
² Counsel for the prosecution in criminal cases.
³ Standing Juniors are appointed by the Lord Advocate to advise and represent government departments.
During a case study of forensic firearms identification, it was observed after careful examination that firing pin of 7mm bolt action rifle may change its location on cartridge case because of its free movement in its housing. This thing may deceive the firearm examiner in making decision and case may lead towards false elimination. Actually firing pin of bolt action rifles is spring loaded, because of which its location on cartridge case may be different, but its shape and internal marking would always same. Although the firing pin impression changes its position, but identification can be made after careful examination of periphery of firing pin and its internal markings. This paper highlights the importance of internal markings of firing pin of 7mm bolt action rifle and change in location of firing pin impression on cartridge case which could be helpful for forensic firearm examiners/forensic scientists in making right decision.

**Aurangzaib Ahmad** has a B.Sc (Hons) in Physics from the Center For High Energy Physics, Punjab University, Lahore and is currently enrolled in MPhil Physics at the University of Lahore, Lahore-Pakistan. He worked as a Physics and Mathematics Lecturer in Peak Solutions College and University of Management and Technology, Lahore. He joined Punjab Forensic Science Agency in 2011. He has been working in the Punjab Forensic Science Agency, Lahore (second largest full service forensic science laboratory) as a Junior Forensic Scientist/Firearm and Toolmark Examiner since 2011. So far he has worked on hundreds of cases related to firearm identification, Serial number Restoration of vehicles and firearms, GSR detection, caliber determination. He also an expert in delivering lectures on forensic science to members of law enforcement agencies.

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**RACHEL BOLTON-KING, STAFFORDSHIRE UNIVERSITY**

“PEER-MENTORING TO IMPROVE FORENSIC GRADUATE EMPLOYABILITY SKILLS”

Over recent years, the transition from further to higher education has become more challenging for students studying and academics teaching forensic and crime science (FACS), with diversifying prior learning experiences and fierce competition for graduate employment.
This presentation discusses the evaluation of a voluntary peer-mentoring initiative piloted in the FACS Department at Staffordshire University over the last 3 years. The aim of this initiative was to further develop a variety of transferable employability skills for undergraduate students at Level 5 to Level 7, whilst simultaneously enhancing the learning and teaching environment for Level 4 students.

Following the peer-mentoring period each year, questionnaires were disseminated and voluntarily completed by both Level 4 students and peer-mentors. The survey data was independently coded and analysed to eliminate bias from the interpretation of the initiative outcomes. To assess the impact of this initiative on student performance, personal development assessment marks were tracked between levels, mapped and analysed for each individual FACS student.

Overall, the initiative was successful resulting in this andragogic approach being implemented more widely across FACS awards and good practice fed back for inclusion in university peer-mentoring policies. However, some important and potentially surprising insights were also attained from the analysis. Consequently, a new programme of additional learning and teaching events has been developed to annually inform teaching and learning practiced within the curriculum for individual student cohorts and an overview will be provided in this presentation.

Dr Rachel Bolton-King:
After completing the BSc (Hons) Sandwich degree in Forensic Science at Nottingham Trent University in 2008, I was awarded the Association of Firearm and Tool Mark Examiners (AFTE) Scholarship in 2010 and a PhD in Forensic Firearms Identification and Imaging in July 2012.
In 2011 I began a lectureship in Forensic Investigation at Staffordshire University and am now the Award Leader for Certificates of Competence, offered by Chartered Society of Forensic Sciences (CSFS) for forensic professionals. I am an approved CSFS Assessor for the Pre-Employment Assessment of Competence and Lead for both the Knowledge Bank Research Workstream within the Staffordshire Forensic Partnership and the Departmental Research, Enterprise and Scholarly Activity Working Group.
Current research focusses on andragogic practice as well as forensic firearms identification, ballistics and shooting incident reconstruction, leading and supervising national and international research projects. Professional memberships include CSFS, Royal Society of Chemistry and Higher Education Academy. In addition, I am a Technical Advisor for AFTE, Member of the Editorial Board for the E-Cronicon.
There seems to be a limited research about the detection of concealed bloodstains on painted surfaces. The bloodstains on the walls and floors are often removed and surfaces re-painted by the perpetrator after committing a violent crime. The study hereafter extends and deepens a previous research by investigating the detectability of horse bloodstains on painted ceramic tiles as a function of the number of layers of paint. The Luminol is used as a reagent to detect the bloodstains. The study focuses on two types of paints: water-based and solvent-based paint. This study also investigates the effectiveness in reducing the detectability of bloodstains on ceramic tiles using four different cleaning methods: pure water, soap with water, wet wipes, and bleach. In the experiment the bloodstains were cleaned at various time intervals after the deposit: two minutes, fifteen minutes and one hour. The analysis concluded that the bloodstains concealed by layers of solvent-based paint are less likely to be detected by Luminol as compared to water-based paint. The study also concluded that the tiles cleaned with bleach are recognisable from the other ones cleaned with other methods. In each study the duration of the reaction was timed, highlighting the differences in the cleaning methods.

Valentina Brenzini is currently doing her Master of Science in Forensic Science at the Anglia Ruskin University Cambridge (UK). She finished her BSc in Biological Science at Università del Piemonte Orientale Amedeo Avogadro in Alessandria Italy in May 2015. She did a two months internship in Bonaire at STCB (Sea Turtle Conservation Bonaire). The idea of performing this experiment come from an assignment during her Masters.

Forensic textile science is a relatively new discipline with forensic science. Different aspects have been developed to varying degrees of expertise e.g. fibre identification (particularly for man-made synthetic-polymer fibre is extremely well established; more difficulty exists with natural fibres). Textile damage is another sub-discipline
and this is relatively poorly represented in the scientific literature, particularly from a textile science perspective; expertise does exist within several organisations and it can be argued that the topic gained international significance during the dingo case in Australia. The work summarised in this presentation was conducted under the auspices of a Winston Churchill Fellowship in forensic textile science (2012) and considered the damage caused to typical apparel by handgun ammunition.

**Debra Carr** has a BSc(Hons) in Materials Science and a PhD in Engineering. Debra is a Senior Lecturer in Impact and Armour at Cranfield University at The Defence Academy of the UK. Debra has worked for the Ministry of Defence (Stores and Clothing Research and Development Establishment), Imperial College (Department of Mechanical Engineering) and The University of Otago (Clothing and Textile Sciences). Debra is a Chartered Engineer, a Fellow of The Institute of Materials, Minerals and Mining and a Professional Member of The Chartered Society of Forensic Science. In 2012, Debra was a Winston Churchill Travelling Fellow in Forensic Textile Science. Debra has published over 60 articles in peer-reviewed journals and over 50 conference papers. Debra currently supervises MSc and PhD students at Cranfield University, RMIT and the University of Otago. Debra’s current research interests include: forensic textile science, body armour and helmet optimisation, wound ballistics, forensic textile science and clothing and textile sciences.

**LORNA DAWSON, THE JAMES HUTTON INSTITUTE**

“SOIL IN CRIMINAL INVESTIGATIONS: INTELLIGENCE AND EVALUATION IN CURRENT AND COLD CASES”

Forensic soil science is an increasingly important discipline involving soils, minerals, dusts, plants and rock fragments to determine provenance i.e. to provide a chronology of their ownership, custody or location. Soil materials have been used as forensic trace evidence for many years, and are often highly distinctive from one region to another [1]. Such traces are extremely useful in a forensic context, because of their environmental specificity; their high levels of transferability; their ability to persist on items such as clothing, footwear, tools and vehicles; and their high levels of preservation after long periods of time. This resilience makes soil trace materials, frequently present at crime scenes and forensic exhibits, highly valuable forms of intelligence and evidence that can aid crime investigations and reconstructions.

Significant advances in forensic geoscience over the past decade, in the development of analytical approaches, miniaturisation and also in understanding the behaviour, transfer, persistence and preservation of sediments, soils and plant material have widened their applicability. Evidence samples can be analysed using a wide range of
complementary methods that address their physical, chemical and biological components with greater precision, speed and accuracy than ever before. This now permits samples of less than 10 milligrams to be accurately characterised, and permits forensic soil science to also contribute to cold case investigations, both in providing intelligence and evidence in court. Examples will be presented of case work where soil has played a pivotal role.

Sediments/soil on footwear and vehicles can indicate where a crime may have taken place, and may provide evidence of a person being at a particular place of interest. Improved analytical capabilities, coupled with the development and availability of relevant databases, allow forensic geoscientists to help police to search for unknown objects or people, prioritise areas for investigation or search, and provide robust and reliable evidence in court. Forensic geoscience has mainly been used in the past in the context of high-impact crimes such as murder, rape, aggravated burglary and terrorism investigations, where resources allow it. However, techniques are becoming cheaper and faster, and have the potential to become regularly used. With developments in analytical technology, and an increasing understanding of how soils and sediments are distributed within natural and anthropogenic environments, forensic soil science has more power to answer questions such as: “Where did the soil material come from?”, or “Where has this item been?”. Understanding the context of a specific case is crucial to help answer such questions. In addition, being able to explain the significance of the evidence that has been analysed, and demonstrating logically and transparently how a conclusion has been reached, remains important for forensic soil science specifically and trace evidence generally.


Lorna Dawson was brought up on a mixed farm in Angus, picked tatties from her dads fields and grew up loving soil, plants and the environment. She graduated with a BSc (Hons) in Geography from the University of Edinburgh, in 1979, then obtained a PhD from the University of Aberdeen in Soil Science, in 1984, where her thesis was awarded the best published work in the Journal of Soil Science. Her skills in soil science were further developed with a post at the Macaulay Institute for Soil Research in soil fertility where she continued to specialise in the study of soil science. She is now Head of Forensic Soil Science at the James Hutton Institute. She is also a visiting professor at Robert Gordon University, an Advisor to the Scottish Government’s Strategic Research Programme, a Chartered Scientist, a Fellow of the Institute of Professional Soil Scientists and a Fellow of the Royal Society.
of Arts. She saw the need for the development and application of quantitative ecological tools within the criminal justice system and initiated the design and integration of methods in soil forensic science. She continued to lead research on aspects of particular significance in this field; how to best deal with very small sample sizes, mixtures and the effective communication of evidence in court. She is now recognised as one of the few international experts in the field of forensic soil science, has worked on around 100 cases, produced over 70 forensic reports and statements, and is frequently invited to deliver keynote presentations at international conferences and regularly provides advice to forensic and legal practitioners worldwide. She is a council member (treasurer) of the International Union of Geological Sciences-Initiative in Forensic Geology (IUGS-IFG), a member of the European Network of Forensic Institutes, Working Group on Animals, Plants and Soil Traces (ENFS-WGAPST) and an advisor on the Chemical, Biological and Radio-nuclear(CBRN) GIFT research project. She gained a diploma in civil and criminal law and is a fully trained expert witness, regularly attending courts as an expert witness. She has developed a high profile in the area of science communication, currently sitting on the British Association of Science General Committee and promotes science, soil science, and in particular, forensic soil science. Lorna holds a diploma in Science Communication from Bristol University (2010) and has developed an international reputation in knowledge exchange. She has worked on sabbatical for the BBC, and has advised on programmes such as 'Countryfile', 'Vera' and 'Silent Witness' and contributed to a recent Massive Open Online Course (MOOC) on 'Identifying the dead', with Dundee University, reaching over 20,000 participants. She has also been effective in wider communication with media such as Radio, podcasts and novels, and she set up and won a national live communications prize for a Murder, Mystery & Microscopes series of events, based on forensic case histories. She has contributed to several books by leading UK authors (i.e. Ann Cleeves, Val McDermid, Mark Billingham, Stuart MacBride and Lin Anderson), thus effectively reaching audiences of 1,000s, and has performed at The Harrogate Crime Festival and Bloody Scotland.

NORMAN FENTON, QUEEN MARY UNIVERSITY LONDON
“ON THE BENEFITS AND PITFALLS OF USING THE LIKELIHOOD RATIO TO HELP UNDERSTAND THE IMPACT OF FORENSIC EVIDENCE”

In general the likelihood ratio (LR) is a very good and simple method for communicating the impact of evidence, but its correct use is based on strict assumptions that have been routinely ignored by forensic experts and statisticians, leading to the very kind of confusion and misunderstanding (e.g. when presented to lawyers and juries) that it was supposed to help avoid. This talk will highlight the
problems which invalidate the LR, and will show how they can be avoided by incorporating all relevant information in a Bayesian network.

**Norman Fenton** is Professor of Risk Information Management at Queen Mary London University and is also a Director of Agena Ltd, a company that specialises in risk management for critical systems. Norman’s works on quantitative risk assessment typically involves analysing and predicting the probabilities of unknown events using Bayesian statistical methods including especially causal, probabilistic models (Bayesian networks). This type of reasoning enables improved assessment by taking account of both statistical data and also expert judgment. In April 2014 Norman was awarded one of the prestigious European Research Council Advanced Grants to focus on these issues. Norman’s experience in risk assessment covers a wide range of application domains such as legal reasoning (he has been an expert witness in major criminal and civil cases), medical analytics, vehicle reliability, embedded software, transport systems, financial services, and football prediction. Norman has a special interest in raising public awareness of the importance of probability theory and Bayesian reasoning in everyday life (including how to present such reasoning in simple lay terms) and he maintains a website dedicated to this and also a blog focusing on probability and the law. In March 2015 Norman presented the BBC documentary Climate Change by Numbers. Norman has published 7 books and over 200 referred articles and has provided consulting to many major companies world-wide. Norman’s current projects are focused on using Bayesian methods for improved legal reasoning and improved medical decision making. Since June 2011 he has led an international consortium (Bayes and the Law) of statisticians, lawyers and forensic scientists working to improve the use of statistics in court. In July-December 2016 he will be leading a prestigious 6-month Programme on Probability and Statistics in Forensic Science at the Isaac Newton Institute for Mathematical Sciences, University of Cambridge.

**RICK GRAHAM, UNIVERSITY OF LEEDS**

“RULE 19 AND TRUST IN THE EXPERT”

Recent amendments to the Criminal Procedure Rules and associated Practice Directions were intended to implement recommendations of the Law Commission, regarding admission and management of expert evidence. It has been suggested that great trust has thereby been placed in the judiciary, if they are to take on the more ‘activist’ role that this recommends and requires. This paper argues that great trust has, equally, been placed in the experts whose role it is to provide the expert evidence. In a recent study involving interviews with 25
forensic scientists, with experience in testifying as to DNA evidence, concerns emerged regarding their ability and willingness to actively engage with the judicial process to ensure that the science was properly addressed. Whilst the expert is obliged to remain unbiased and in the service of the court, views expressed by prosecution- and defence-instructed witnesses were strikingly polarised. This paper presents and discusses these findings.

Rick Graham has degrees in Biological Sciences and in Law. He has just completed his doctoral thesis on the subject of the presentation and examination of DNA evidence in criminal trials. The particular perspective examined within the study was that of the forensic scientist themselves, a viewpoint largely unexplored. Rick’s particular interest is the practical interface between forensic DNA evidence and the criminal court of law. Several papers for publication are in the course of preparation, examining different aspects of this interface as identified within the study.

CLAIRE GWINNETT, STAFFORDSHIRE UNIVERSITY
“CAN UNDERGRADUATE STUDENTS GET INVOLVED WITH CASEWORK? THE USE OF EASYLIFT TO LINK BURGLARY SCENES.”

The development of specific skills for the analysis of evidence is crucial for the creation of a forensic science graduate. Employers are keen to see graduates that are capable of handling evidence appropriately and expect them to demonstrate experience in this, albeit this may be through mock cases. The Forensic and Crime Science Department at Staffordshire University have a longstanding project surrounding the optimisation of trace evidence from crime scenes. One such output of this project is a UK/US/European patented tape lifting system called Easylift™, which removes the need for evidence dissection, increasing analysis throughput and reducing the risk of contamination. This project also investigates the opportunity in obtaining information from fibres evidence for linking volume crime scenes to identify prolific offenders and gain fibre prevalence information from point-of-entries so as to understand the evidential value of finding such evidence. This project collaborates with a variety of Police forces and forensic science providers for the further development of Easylift™, and utilises this product at crime scenes to be screened at Staffordshire University to gain intelligence information. Final year students and interns have been trained in the analysis of these tapes and report findings for use by investigators. This presentation will outline the background to this project, the minimum requirements put in place for students to analyse crime scene samples, the students’ experience in analysing real crime scene samples and
the skills they develop due to their involvement. This presentation will also reflect upon the employability aspects of these types of project.

**Dr Claire Gwinnett** works at Staffordshire University as a Principal Lecturer and Researcher in the Forensic and Crime Science department and Student Experience Manager for the Faculty of Computing, Engineering and Sciences. She is actively involved in forensic science research and pedagogy with her main areas of expertise being hairs and fibres, glass and paint, proficiency testing and forensic databases production. Her key research areas include; the development of trace evidence databases; the development of new fibres analysis methods; textile damage; contamination prevention strategies; transfer and persistence studies; animal hair analysis and development of competency testing schemes.

Claire is a Teaching Excellence Fellow at Staffordshire University and is currently the UK project manager for the new ERASMUS+ Strategic Partnerships project in the development of a new European Forensic Education Network (EFEN) which brings together European HE institutions and forensic providers to share best practice and collaborate in forensic learning and teaching.

Currently, Claire is working with UK and European Police forces and forensic providers including the Netherlands Forensic Institute (NFI) in testing of a new tape lifting method (Easylift), developed and patented at Staffordshire University.

Claire is a professional member and sits on the Council of the Chartered Society of Forensic Sciences (CSFS). In this role she is chair of their CPD/CPC committee and is council lead for the development of their Certificates of Professional Competence (CoPCs). Other current consultancy and projects include; development of an ‘undersuit’ for SOCOs; consultant to forensic veterinarians in the UK and Kenya in species identification of animal hair from crime scenes; Northern Ireland Government funded project in the development of new methods for improving the identification of illegal dangerous dogs; US funded project on heat damage to animal hair; Natural History Museum project in the contamination prevention and analysis of micro plastics from deep sea sediment; and development of a proficiency testing scheme for fingerprint quality assessors with CAST.

**HILARY JANE HAMNETT & ANN-SOPHIE KORB, UNIVERSITY OF GLASGOW**

“TEACHING RESEARCH SKILLS TO FORENSIC SCIENCE STUDENTS BY DRINKING COFFEE”

This case study will describe an active, student-led method of teaching research skills to forensic science students.
Students taking the MSc in Forensic Toxicology at the University of Glasgow are required to complete a 20-credit module known as Research & Laboratory Management, which aims to prepare them for their summer projects and for future forensic science research. The aim of this educational research project was to re-design this module in response to feedback from both students and staff, and to evaluate its effectiveness. The newly designed module has moved away from memorization of content towards more active engagement. The key component of this is a hands-on, student-led experiment called the Coffee Project, where the effect of certain variables on the perceived taste of coffee is investigated by the students.

Over the course of 10 weeks, the students cover relevant research concepts (e.g. project management, method validation, health & safety, ethics etc.) and apply these to the planning of each element of the coffee experiment as a group. At the end of the course they carry out the experiment they have designed together, and use the results as the basis for an individually assessed journal article.

The implementation of this new module will be described, along with the results of the reflection of 15 students on their confidence and development of key research skills during the course. This work has implications for the teaching of research skills to forensic science students, particularly those undertaking taught programmes.

Dr Hilary Hamnett is a Forensic Toxicologist and Lecturer in the department of Forensic Medicine & Science at the University of Glasgow. After completing an MChem and DPhil at the University of Oxford she moved into forensic science via an MSc at the University of Strathclyde. She started her career as a Forensic Toxicologist specialising in drug driving offences with the Forensic Science Service in London, and took its demise as an opportunity to go overseas. During her three-and-a-half years working for ESR in New Zealand, she expanded her casework experience to include drink driving, post-mortem, and sexual assault cases.

Hilary returned to the UK in July 2015 and currently teaches both undergraduates and postgraduates forensic science, specialising in forensic toxicology. She also runs a course for PhD students and early-career staff on getting published in science. Her areas of research interest include driving under the influence of drugs, teaching forensic science, and contextual bias in forensic toxicology. She is proud to be one of the RSC’s 175 Faces of Chemistry.
ASHLEIGH HUNT, UNIVERSITY OF CUMBRIA
“A MAJOR INCIDENT - REAL WORLD LESSONS OUTSIDE THE CLASSROOM”

Due to the nature of the subject, the current provision for universities’ offering Forensic Science, relies heavily on a variety of teaching pedagogies. However, due to the inability to find placements for these students, traditional methods are limited and offer no sustainable development. With this in mind, an innovative assessment strategy, in the form of a “Major Incident” was designed using a collaborative and experiential approach to learning.

Current methodologies for assessment strategies were reviewed and the need for highlighting real life experience that meets employers’ needs and expectations was highly evident. Looking across all three year groups it was noticed that there was an opportunity for students to work together in a unique and challenging way where they could share their level of knowledge and understanding with each other. The fact that this could form an assessment for all concerned was an added incentive.

The Major incident remains a two day assessment where students are charged with working alongside seasoned professionals and across faculty with relevant disciplines such as Policing and Paramedic Science in a realistic setting. Activities were mapped to learning outcomes across modules to ensure the assessment opportunities were relevant to the particular year group. Engagement with the Constabulary was imperative and essential for accuracy during both planning and execution to ensure professional standards were maintained. Alumni and current students have also factored heavily in the evolution of the current approach, using their own experiences of education to inform teaching.

Results have shown notable changes within the student groups since the Major Incident. Students which have appeared disengaged in the past have reengaged, not only within their lectures but within their own cohort. They are also engaging with other year groups which serve to help them with future studies. Confidence levels have also increased, with those students once quiet within a classroom environment, putting themselves forward for tasks and questioning.

Ashleigh Hunt is a Lecturer in Forensic & Investigative Science in the department of Science, Natural Resources and Outdoor Studies. She has a breadth of experience in law enforcement and criminal investigation. Having served with Thames Valley Police, one of the largest forces in Britain, she has since narrowed her focus to forensic investigation and is a professional member of the Chartered Society of Forensic Sciences. She has recently been awarded the Vice Chancellor’s Excellence Award for Teaching and Support of Learning for creating an innovative and exciting
learning environment for students, transcending the conventions of classroom teaching by taking forensic science into the simulated environment of a major incident.

Ashleigh lectures full-time at the University, sharing her expertise in modules on crime scene investigation and forensic analysis. She aims to take a hands-on approach where possible, teaching important investigative techniques, such as photography and fingerprinting, and developing their use for the investigation of complex crime scenes.

Her current PhD research is in the area of preventive trauma management for public services and the military.

ALLAN JAMIESON, THE FORENSIC INSTITUTE
"T AND ME; SOLES, SCIENCE, AND STATISTICS"

The decision at the Court of Criminal Appeal for England & Wales in the case of R v T (2010) caused controversy for many reasons. The case eventually involved only the evaluation of a footwear mark. But there was more, and even in considering the footwear mark evaluation many important issues emerged. So many in fact that a whole journal issue was devoted to this single case.

This presentation will show the development of the case from my perspective as the expert for the defence. We will look at how the original challenges, including DNA, were whittled down to just a few – some of them not even apparent to me as I wrote my statements!

The Appeal highlighted many matters that still rightly attract attention today;

- Science versus skill
- Role of the Forensic Science Regulator
- Using databases
- Statistics without numbers
- The Likelihood Ratio
- Disclosure
- Evaluative opinion

It also shows how the interaction of lawyer and expert are essential components in the trial process; a fact perhaps not appreciated in another significant decisions which has had far-reaching repercussions (Nunn v Suffolk Constabulary).

The judgement in R v T also refers to two other important Appeals in which we have been involved; Reed & Reed, and Weller which have ramifications for scientific expert witnesses.

Together these represent significant developments in the understanding, or misunderstanding, of science by courts.
Professor Allan Jamieson, BSc, PhD, CBiol, FRSB
Is Director of the Forensic Institute, Glasgow. He is Visiting Professor at Staffordshire University and Honorary Professor at the University of the West of Scotland.
He has provided written evidence and advice in over 1000 criminal cases in England, Wales, Northern Ireland, Scotland, Republic of Ireland, Gibraltar, USA, New Zealand, Cyprus, and Australia, including the Court of Criminal Appeal, 4 days of evidence on LCN DNA in the Omagh Bomb trial of Sean Hoey, and at the inquest into the death of Diana, Princess of Wales.
He is a member of the Expert Roster for DNA for the New York State Assigned Counsel Plan. He was invited and adopted as, ‘a scientist and scholar’ to sign amicus briefs to the California Supreme Court on bitemarks, and also the United States Supreme Court on the use of statistics and DNA in Court. Also invited as amicus in submissions to Wisconsin Supreme Court.
Co-Editor in Chief of Wiley’s Encyclopaedia of Forensic Sciences.
Published (March 2016), with Dr Scott Bader of The Forensic Institute, by ‘A Guide to Forensic DNA Profiling’.
Member of the Royal Society of Biology Professional Recognition Panel (which is responsible for award of Chartered Scientist status)
Undertaken consultancy projects in Turkey (EU funded), Nigeria, Egypt (Government investigation), Pakistan (Education).

He had appointments on the Science, Engineering, and Manufacturing Technologies Alliance (SEMTA) UK Science Strategy Group and the Biotechnology and Bisoscience Steering Group and was a Board Member of the Centre for Forensic Statistics and Legal Reasoning (Edinburgh and Glasgow Caledonian Universities).
He was the external examiner at Kings College, London (Forensic Science), Hendon Police College (Crime scene examination and fingerprints), Heriot-Watt University, University of Kent at Canterbury and the University of Edinburgh and University of Dundee (Forensic Science). A member of the Editorial Board of Clarke’s Identification and Isolation of Drugs and Biologist. He was the keynote speaker on forensic education at the International Association of Forensic Sciences Conference in Hong Kong, and presented, along with Lord Justices Clark, Auld and Mustill, and Professor Sir Alan Craft, at the Expert Witness Institute’s Annual Conference on the subject of assessing the authority of expert witnesses.
He has appeared in numerous live and recorded TV and radio documentaries and news items.
The Criminal Procedure Rules 2014 contained new provisions for the testing of expert evidence before admission at trial. The tests included in Rule 19 (previously Rule 33A) are intended to implement changes that were called for by the Law Commission after their extensive work on expert evidence in the justice system. More recently the subject of a Criminal Practice Direction, as well as strongly worded exhortations from the highest judicial offices, the expectation is that with training rolled out nationally for advocates, Rule 19 should lead to far more stringent scrutiny of expert evidence prior to, and at trial. As the Law Commissioner has stated – the Rule is there to ‘flush out the mavericks and dogmatic’. This paper will look at the new Rule 19 and considers the impact the Rule and its strict application may have on experts and their evidence.

Dr Carole McCartney is a Reader in the School of Law, Northumbria University. Previously senior lecturer in criminal law and criminal justice at the University of Leeds, and Bond University, Queensland, Australia. Carole has written on Australian justice, Innocence Projects, miscarriages of justice, international policing cooperation, and DNA, forensic science and criminal justice more widely. She established an Innocence Project at the University of Leeds in 2005, and was project manager for the Nuffield Council on Bioethics report ‘The Forensic Uses of Bio-information: Ethical Issues’ and the Nuffield Foundation project ‘The Future of Forensic Bioinformation’. She has run projects on forensic science education and forensic regulation and completed an EU Marie Curie international research fellowship (2009-2012) on ‘Forensic Identification Frontiers’. She currently teaches and researches in the areas of criminal law, criminal evidence, and forensic science.

Forensic scientists may be involved in casework with an international dimension. For instance Disaster Victim Identification (DVI), wild life forensics, smuggling, air plane crash investigations and cases of sports doping. In such casework it is important to
realize that cross border communication and cooperation is needed and international, rather than national, regulations and standards must be followed.

For students it would be of benefit to experience cooperation with class mates with different cultural background to train capabilities to work on such cases. Therefore 3 semester programs are made available for exchange students, stimulating a multi-cultural and multi-lingual environment. The programs are: International Forensics, Forensic Biology and Forensic Chemistry and are taught in English, rather than Dutch. All the three programs have classes, practicals and project work combined, and the different aspects of the mentioned themes are incorporated in the subjects.

We like to share our experience in the development and teaching of the exchange programs in the last 4 years, and we invite other universities to participate in our international student exchange programs.

Ben de Rooij started as a lecturer in analytical and forensic chemistry at Avans University of Applied Sciences in 2006. Currently, he is coordinator of the major forensic laboratory science. This major is a bachelor program focused on chemical- and biological information from pieces of evidence. His research focus is on the development of analytical methodology for forensic-, and clinical sciences. Recent projects are steroid profiles in serum and saliva, colorants in textile and activity of renin by LC-MS/MS.

In the period 1998 – 2005 he took responsibility for projects and quality assurance in contract laboratories and pharmaceutical production facilities. Before that he was Ph.D.-student and post-doc at the Leiden-Amsterdam Center for Drug Research (LACDR).

SONNY VAN SEETERS AND ELLEN HOFSTEDE, AVANS UNIVERSITY OF APPLIED SCIENCE
“DIDACTICS IN FORENSIC SCIENCE, AN EXPERIENCED BASED JOURNEY”

Reading the title of this abstract, you may ask yourself: isn't this too general? Yes it is! This presentation will be about didactics in practical courses in chemistry and biology based laboratory activities. Specifically, our course, forensic spectroscopy.

Avans University (Breda, The Netherlands) is a university of applied sciences, that offers bachelor studies in chemistry and biology. Our school system is competence based. Students will study practical skills as well as theoretical and complex thinking
skills. The students have theoretical and practical courses that are quite traditional. However, students undergo projects where the practical and theoretical skills will be combined in a context based project. Some call this inquiry based, discovery based or experimental. All these types are pedagogic equivalent, they share complex skills.

Based on recent educational studies, students need a lot support to master complex skills such as reasoning, problem solving and other research skills. Only support is not enough. In one of our practical courses we use the 4C-ID model (4 component instructional design) to support the students in their development of complex skills. When students have to learn complex skills, they will perform learning tasks that are scaffolded. Difficult skills that professional chemists possess are impossible to practice directly in the laboratory, but need to be built up in complexity. So in a course, students perform exercises that are fully scaffolded, during the course the learning task will be repeated in different ways, but the amount of scaffolding and feedback will be reduced, and the student is left more independently in the learning task. Crucially, to the learning task and the guidance itself, procedural information is provided. For example, written step by step instructions. The way in which we offer this procedural information will differ in size during the course. Essential to the total learning tasks and courses there is supportive information. For example, the context or theory on what the experiments are based. Additionally, most of the students need additional practice of specific parts. All those components together are the 4C-ID with the aim to guide the students through the learning tasks to secure that they will reach their goals in a systematical way.

However, it is not as easy as it looks. There are some problems with the transfer of separate learning tasks to the total complex skills. This is a well-known problem, not only in the field of chemistry but also in other studies such as medical studies and architecture. This is known as transfer. Students learn skills in a context, but in another context it seems that they do not recall them anymore. The 4C-ID model should overcome this problem.

In the course forensic spectroscopy we use aspects of this model to reach the goals. Students will gather evidence from a crime scene, that they will analyze in the lab. The practical skill at this stage should be known and automated (however, it is not always the case). And students focus on the complex skill of combining information related to the context. We will offer students the procedural information and the context will give the students structural feedback during the sessions. And after all, the students will present their analyzed evidence in court. What is very important is that the environment where the student performs the learning task is as realistic as possible.
Further Reading

Sonny van Seeters
Since 2007 I have taught chemistry at Avans University of Applied Science, located in Breda, The Netherlands. I mainly teach practical techniques in organic chemistry and polymer chemistry, (particularly polymer synthesis and analysis). I teach analytical chemistry as well, mainly basic chromatography courses and spectroscopy. My involvement in our forensic science program arose because of my practical teaching in the field of chemistry. Through education and by experience, I'm very interested and involved with didactics (the theory and practical aspects of teaching) in chemistry education. In my work as a teacher I’m quite often involved with secondary school students and teachers, and try to make a good connection between secondary school and university studies in chemistry.

Ellen Hofstede
Ellen Hofstede has been an employee of Avans University of Applied Science since 2007. Before that time Ellen worked for twenty years in several biomedical laboratories, where she was always involved with supervising the trainees of the laboratories. In Avans, within the forensic team, Ellen teaches the student different kinds of practical analytical chemistry and biological techniques in the laboratory. Ellen is also a mentor for several first years students and supervises trainees in the third year.
Textile fibres are frequently encountered within forensic casework and are particularly prevalent in serious crimes such as homicide and sexual assault. Currently the interpretation of textile fibre evidence is a primarily subjective process, relying heavily on expert opinion. Although uncommon, this can lead to disagreement between experts as to whether or not a fibre(s) may have originated from a particular source. To date, limited work has been published regarding the use of multivariate analysis (MVA) to aid interpretation of textile fibres evidence; therefore this work aims to contribute to the increasing amount of information becoming available.

In this study, spectral data was obtained for 23 visually distinct cotton and acrylic sources using visible range microspectrophotometry. Linear discriminant analysis (LDA) was then performed with and without prior dimension reduction by principle components analysis (PCA). MVA was performed using the statistical software R. A blue cotton colour block study using 10 dark and 10 medium blue cotton sources was also performed. Additionally, the use of normalisation as a pre-processing method was investigated.

LDA used with and without PCA as dimension reduction demonstrated comparable results when classifying samples into their correct source; providing a suitable number of principle components were retained for subsequent analysis. Similar results were also observed when performing the colour block study using blue cotton. This suggests that the pre-processing stage of dimension reduction using PCA is not required prior to LDA when using R. Normalised and non-normalised data provided comparable results when a suitable number of principle components were included in subsequent analysis, again suggesting that this pre-process stage may not be required when performing MVA using R.

Rory Simmons is a second year PhD student based at Northumbria University, Newcastle where he is conducting his research under the supervision of Dr. Kelly Sheridan. His current research is investigating the potential application of multivariate statistical analysis to textile fibre evidence within forensic science. Rory received his BSc (Hons) degree in Forensic Sciences from Abertay University, Dundee where he obtained First Class Honours. As well as this, he was awarded the “Wright Health Group Prize” for best overall student in his final year and the “Chartered Society of Forensic Sciences Prize” for most meritorious forensic science honours project. Rory has also published work...
on the comparison of processing methods for the enhancement of fingermarks on wetted, porous surfaces and the effect of fingermark enhancement techniques on the subsequent detection of semen/spermatozoa.

KEITH STURROCK*, WILFRED OTTEN (CRANFIELD UNIVERSITY), JON WILKIN*, LUIGI TOMAS*, *UNIVERSITY OF ABERTAY
"THE APPLICATION OF X-RAY MICRO-COMPUTED TOMOGRAPHY TO FORENSIC TEACHING AND RESEARCH"

Computed Tomography (CT) was invented by Hounsfield and Cormack in 1972. It was originally used medically to scan a patient's head and later developments allowed whole bodies to be scanned. The original systems were slow and took many hours to obtain a single scan and days to reconstruct an image from scan data. MicroCT was introduced in the early 1980's in medical research. With advances in CT and computer technology, scans can be obtained in seconds and reconstructions take minutes.

Most forensic applications historically and recently have focused on post mortem examinations but there have been the beginnings of a diversity of applications. A recent review (Rutty 2013) gives a good overview of forensic work.

Our work has historically focussed on the microstructure of soils and their interactions with plant roots and the spatial arrangement of air and water pockets in soil masses.

As a teaching tool microCT allows items to be scanned then represented in a variety of formats; greyscale images, colour coded images and bespoke videos in which 3D representations of samples can viewed from any angle, rotated, zoomed in and out and seen as a ‘fly through’.

Forensic science projects carried out with our scanners include; the examination of surface etching of bullet casings, penetration of arrows through clothing and ballistic gel and the study of the decomposition of buried materials. Recently we have expanded the range of subjects for examination to include teeth, concretes, bones, food products such as bread and muffins and meat and fish. This versatile and non-destructive technique can be applied to almost any sample to give valuable information on internal structures and could prove to be an even greater aid to forensic research and investigations and as a useful teaching tool.

Keith Sturrock has been employed at Abertay University since 1984. He began his career as a Laboratory Technician with responsibility for the Chemistry / Forensic Science laboratory suite and took up an appointment as a lecture in Forensic Sciences in 2006. Keith has many years’ experience in analytical chemistry and completed his PhD in synthetic organic chemistry in 2005. He is currently Programme Leader for the BSc Policing and Security course and teaches general chemistry and chromatography and spectroscopy on the Forensic Science programme. His research interests include the synthesis and characterisation of novel pyridines and thienopyridines, fingerprint technologies and strategies, the application of spectroscopic, chromatographic and chemometric techniques to forensic investigations and food analysis particularly problems associated with food quality, adulteration and provenance. He has recently taken on the role of manager of the University’s X-ray Computed Tomography facility. Keith has been a member of the Forensic Institute Research Network (FIRN) Management Board since 2012.

TIM THOMPSON, TEESIDE UNIVERSITY
“PUBLISHING YOUR FORENSIC SCIENCE RESEARCH”

Climbing the first few steps up the career ladder after your degrees can seem intimidating. However, publishing your exciting and novel research can be a really effective way to helping this process. In this talk, I will discuss the current publication environment, discuss the process of submitting your work to journals like ‘Science & Justice’, the nature of the peer review process and how to use those bibliometrics to your advantage. The session will provide plenty of opportunity to ask questions and get some useful insider hints and tips.

Tim Thompson is a Professor of Applied Biological Anthropology in the School of Science & Engineering. In 2014, Tim was awarded a prestigious National Teaching Fellowship by the Higher Education Academy for excellence in teaching and support for learning in higher education. Before coming to Teesside, Tim studied for his PhD at the University of Sheffield (Faculty of Medicine) and was a Lecturer in Forensic Anthropology at the University of Dundee. Tim has published over 50 papers in peer-reviewed journals and books and is a renowned expert on bone diagenesis. He has recently published the book 'The Archaeology of Cremation: Burned Human Remains in Funerary Studies' and before that 'Human Identity and Identification' with Dr Rebecca Gowland (Durham
University) and was senior editor for the book 'Forensic Human Identification: An Introduction'.

Externally, he is on the editorial boards for the 'Journal of Forensic Sciences', 'Journal of Forensic and Legal Medicine' and 'Human Remains and Violence: an Interdisciplinary Journal'. He has recently been appointed as Editor-in-Chief of the journal 'Science & Justice'. Tim also runs the award-winning company ‘anthronomics ltd’ which develops digital learning tools. Tim is a Fellow of the Chartered Society of Forensic Sciences and the Royal Anthropological Institute, and is a practicing forensic anthropologist who has worked at home and abroad in a variety of forensic contexts.

**BARRY TURNER, UNIVERSITY OF LINCOLN, WITH THE EUROPEAN GROUP FOR LEGAL EXPERTISE**

“REGULATING THE EXPERT: PROPOSALS FOR A PROFESSIONAL EXPERT STANDARD”

The dismissal of the case against Prof. Jane Ireland on the 7th June focuses the attention yet again of the necessity of a system of accreditation of expert witnesses to operate in the courts of the European Union.

Prof. Ireland had raised the issue of incompetent, unqualified and inexperienced expert witnesses operating in the UK Courts and illustrated again the often lax attention paid to the capacity of experts and the validity of their reports and testimony.

In this paper Barry Turner will talk about the work of the European Group for Legal Expertise and its work on creating a register, code of practice and system of ethics for all experts operating in the legal systems of the European Union.

**Barry Turner** is a senior lecturer in Law, Pharmacy and Life Sciences at the University of Lincoln with a special interest in pharmaceutical law and regulation and psychiatry. He has taught for many years on the law of evidence, medical law and forensic science. He is a member of the Paris based European Expertise and Expert Institute and has worked for the last three and a half years on the European Group for Legal Expertise expert witness project.
GRAEME WALKER, NHS HIGHLAND

“THE (IN)SIGNIFICANCE OF GENITAL INJURY IN RAPE AND SEXUAL ASSAULT”

Evidence of genital injury has traditionally played a significant role in the prosecution of rape and sexual assault. This presentation, based on the author’s August 2015 publication in the Journal of Forensic and Legal Medicine (Volume 34, pages 173-178) takes a critical look at the research, in the context of modern understandings of what actually constitutes rape and sexual assault. He concludes that both consenting and non-consenting sexual contact may or may not result in genital injury, and that there is insufficient evidence to make robust conclusions associating presence, absence, nature or severity of genital injury with the issue of consent.

Dr Graeme Walker is a Forensic Physician and General Practitioner working in the north of Scotland. He provides forensic and medical care to complainers and suspects of sexual offences at the request of Police Scotland, on behalf of NHS Highland. His interest in clinical forensic medicine began in 2013 and he has since gained full Membership of the Faculty of Forensic & Legal Medicine of the Royal College of Physicians of London. In 2014, Dr Walker completed the prestigious and comprehensive training course "Forensic and Medical Examination for Rape & Sexual Assault" at St Mary’s Sexual Assault Referral Centre in Manchester, during which time he undertook the academic work which resulted in the publication of a paper on genital injury following rape, to be presented at this conference.

GRAHAM WILLIAMS, UNIVERSITY OF HUDDERSFIELD

“GENETIC BASED BODY FLUID IDENTIFICATION STRATEGIES”

Since 1985, following its conception, DNA profiling has improved in leaps and bounds, with increasing sensitivity and specificity. However, the field of body fluid identification has remained relatively unchanged since early 20th Century. Thus there are numerous instances where a DNA profile can be obtained, but its body fluid origin is unknown. In addition, a number of body fluids cannot be reliably identified. Efforts to address this include non-genetic based strategies and genetic-based strategies including forensic RNA analysis. Biomarkers such as messenger RNA and micro-RNA have been shown to be tissue specific and currently efforts are underway to explore the operational limitations of such tests. Here, the background to RNA analysis is covered along with an overview of current capability and potential future
directions. A brief discussion about potential stumbling blocks to implementation will be included.

**Dr Graham Williams** BSc (Hons), MSc, PhD, CBiol, FRSB, FHEA - Huddersfield

Dr Williams is a Senior Lecturer in Forensic Science at the University of Huddersfield, and Course Leader for the Postgraduate Forensic provisions. He is an expert witness in DNA profiling, body fluid examination, clothing damage analysis and bloodstain pattern analysis. He is research active in forensic genetics and has particular expertise in genetic based strategies for body fluid identification, and is exploring further exploitation of the crime scene stains, from DNA methylation analysis of identical twins, through to phenotypic analysis of external visible characteristics.

**LESSLIE YOUNG, EPILEPSY SCOTLAND**

“**CRIME SEEN? INADVERTENT ENTRY INTO THE CRIMINAL JUSTICE SYSTEM AS A RESULT OF BEHAVIOUR ASSOCIATED WITH SEIZURE ACTIVITY**”

Starting with a general introduction to epilepsy the condition, I show short video clips of seizure activity and behaviour that may be misinterpreted, and illustrate this with case studies. There is a section on learning difficulties and the impact on the individual and those (eg the police) who may be in first contact with the individual. This talk includes several exercises to demonstrate learning difficulties & sets out questions the police should ask; looking beyond what they have seen or what has been reported to them. This presentation finishes with a video clip and an audience verdict to decide if the person is experiencing a seizure or not.

**Lesslie Young** is a member of the Institute of Directors and the West of Scotland Vistage Group for CEOs. She also is a Non-executive director on the Executive Board of COPFS.

Her interest and passion for improving the life of people with epilepsy comes from personal experience. Her daughter has epilepsy and learning disabilities. Lesslie joined Epilepsy Scotland’s training department in 2006. She was appointed Chief Executive in 2009. During her tenure Lesslie introduced a new business model enabling the private, public and third sector to work together to provide a service for people with epilepsy in an area where none existed. This model is replicable geographically and in respect of other long term conditions. The introduction of this model resulted in her nomination for Third Sector Director of the Year by the IoD.
A particular interest of Lesslie’s is the inadvertent entry of people with epilepsy into the criminal justice system. Certain seizure activity can result in behaviour which can be perceived as criminal in nature; the repercussions of this can have a hugely detrimental impact on the individual. Lesslie has developed a close working relationship with the Judicial Studies Institute, COPFS and Police Scotland. She sits on the Criminal Justice Disability Advisory Group and presents annually at Dame Elish Angiolini’s LLM Advocacy course.

Lesslie qualified as a general nurse in 1976 and a midwife in 1978. She was a Charge Nurse for ten years. She then led the introduction of quality assurance systems and performance indicators to hospitals in the public sector in Scotland and the private sector in England. On returning to Scotland Lesslie set up a charity providing a home-based teaching system to children with learning disabilities and their families whilst also working as a partner in a home care business and an occupational health consultancy.
1. **Olivia Ball, Anglia Ruskin University**  
The Comparison of Cyanoacrylate Fuming and Aluminium Flake Powdering as Development Techniques for Latent Lip Prints in the Identification of Individuals

2. **Debra Carr, Karl Harrison, Cranfield University**  
Stability of typical forensic packaging

3. **Victoria Cooke, John Cassella, Caroline Newman, Staffordshire University**  
The effect of decomposition of Mammalian Tissue on the immediate aquatic environment- Forensic Considerations

4. **Adam Davidson, Robert Gordon University**  
An Analysis of the Range of Methods used to Disguise Handwriting

5. **Charis Griffith, Anglia Ruskin University**  
"Legal Highs" - Insight into these psychoactive alternatives

6. **Claire Gwinnett, Staffordshire University**  
Forensic Science Meets Freud: The Use of Forensic Science Approaches to Analyse Sigmund Freud’s Examination Room and Artefacts

7. **Robert Harrison, Anglia Ruskin University**  
Backwards propagation of glass when broken by a falling hammer dropped from a 90° angle and driven by gravitational energy.

8. **Rebecca Haythorne, Colette Fegan, Sheffield Hallam University**  
The Forensic Environment: service user perspectives into the pursuit of meaningful occupations

9. **Charlotte Henderson, Robert Gordon University**  
The Determination of Diazepam in Licit, Illicit & Redirected Diazepam Tablets using GC-MS

10. **Georgiou Kyprianos, Anglia Ruskin University**  
An Investigation into fingerprint development techniques from recycled and non-recycled plastic materials

11. **Samantha Lehan, John Cassella, Claire Gwinnett, Staffordshire University**
Bacterial Succession of The Aquatic Necrobiome As An Indicator of Post Mortem Submersion Interval

12. Holly Major, Anglia Ruskin University
Method development for the detection of Benzofury isomers using gas chromatography mass spectroscopy with reference to silylation and acylation derivatisation

13. Claire Morton, Anglia Ruskin University
Assessing the Reliability of Digital Photographs as a means of carrying out Age Related Morphology of the Pubic Symphysis and secondly, to Analysis the Inter-Observer Error between Experienced and Inexperienced Anthropologist when applying the Suchey-Brooks Method of Age Estimation to Digital Photographs

14. Fauzia Nurul Izzati & Shannon Smith, with Kirsty H Watson, Martha Ilett, Hilary J Hamnett, University of Glasgow

15. Jana Rupp, Robert Gordon University
Assessing the Evidential Value of Colour and Organic Markers when Interpreting Mixtures of Soils

16. Sonja Uerlings, Robert Gordon University
Dishwasher vs DNA, Can DNA really withstand a Dishwasher Cycle?

17. Chloe Waine, S Higgins, J Cassella, Staffordshire University
The Expert Eye: Testing the Observational Skills of Scene of Crime Officers using Eye Tracking Equipment

18. Laura Wilkinson, Claire Gwinnett, David Bailey, Bénédicte Amery, Danique Prinsen, Staffordshire University
The Investigation of Different Sources of Heat Damage to Animal Hair for the Interpretation of Abuse Cases

19. Laura Wilkinson, Claire Gwinnett, Staffordshire University
The Creation of a Fit-for-Purpose Animal Hair Reference Collection for Wildlife Crime Casework and Training

20. Kassie Williamson, Robert Gordon University
Physicochemical Characteristics of Counterfeit Medicines
A Guide to Forensic DNA Profiling
Allan Jamieson, Scott Bader (Editors)
ISBN: 978-1-118-75152-7
456 pages, March 2016

The increasingly arcane world of DNA profiling demands that those needing to understand at least some of it must find a source of reliable and understandable information. Combining material from the successful *Wiley Encyclopedia of Forensic Science* with newly commissioned and updated material, the Editors have used their own extensive experience in criminal casework across the world to compile an informative guide that will provide knowledge and thought-provoking articles of interest to anyone involved or interested in the use of DNA in the forensic context.

Following extensive introductory chapters covering forensic DNA profiling and forensic genetics, this comprehensive volume presents a substantial breadth of material covering:

- **Fundamental material** – including sources of DNA, validation, and accreditation
- **Analysis and interpretation** – including, extraction, quantification, amplification and interpretation of electropherograms (epgs)
- **Evaluation** – including mixtures, low template, and transfer
- **Applications** – databases, paternity and kinship, mitochondrial-DNA, wildlife DNA, single-nucleotide polymorphism, phenotyping and familial searching
- **Court** – report writing, discovery, cross examination, and current controversies

With contributions from leading experts across the whole gamut of forensic science, this volume is intended to be authoritative but not authoritarian, informative but comprehensible, and comprehensive but concise. It will prove to be a valuable addition, and useful resource, for scientists, lawyers, teachers, criminologists, and judges.
INFORMATION ABOUT GLASGOW

GETTING TO THE CITY CENTRE FROM GLASGOW AIRPORT

These are some of the most common connections. More information can be found at Scotland’s public transport information website: Traveline Scotland

**Airport buses** run from the airport to Glasgow city centre up to every 10 minutes, 24 hours a day, and take approximately 25 minutes.

**Glasgow Airport Taxis** are located immediately outside the terminal building or can also be booked by calling +44 (0) 141 889 1813. The airport also has an SPT Travel Desk, located at Domestic Arrivals (Check-in), where staff can provide you with details of buses and taxis.

**Addresses in the UK** are usually described by the Building Number, Street Name, Suburb and Postcode (eg 166 Buchanan Street, Glasgow, G1 2LW).

HOTELS & ACCOMMODATION

With over 18,000 bedrooms in the Greater Glasgow area, and almost 7,000 in the city centre alone, you’re guaranteed to find accommodation which suits your taste and budget. For even more choice of accommodation, including B&Bs, hotels, guest houses or student rooms, go to visitscotland.com
Glasgow’s eating and drinking scene is vibrant, with food and drink available to suit all tastes and pockets. Popular travel magazine, Wanderlust, recently highlighted the city’s “impressive gastronomic scene”. These days it’s firmly part of the city’s unique culture.

Glasgow’s lucky – our chefs are able to source some of the best local produce in the world, including outstanding game and beef; Scottish fruit and vegetables and award-winning cheeses. Combine this with confident, creative restaurateurs, and you’ll understand why Glasgow’s culinary offering is imaginative and cosmopolitan. You can taste traditional dishes, regional specialties and local produce, like haggis, shortbread and cullen skink. Modern Scottish cuisine embraces this but then adds a twist...

Glasgow has also embraced the flavours and cuisines of the many nationalities of those who’ve made their home here. You can literally “dine your way around the world”. From native Mexican, American, Asian, Indian, Italian, Spanish, Portuguese and African influences, to name just a few, the choice is truly international.
THINGS TO DO

Glasgow offers lots of exciting experiences. You could start with the city’s iconic buildings, first taking a walk through the city’s museums and galleries to find everything from Dinosaurs to Dali, and a tour of the historic City Chambers and magnificent Glasgow Cathedral.

Football fans will also undoubtedly want to take a look behind the scenes of Scotland’s national stadium at the Hampden Experience, taking in the iconic sporting venue.

Fans of Charles Rennie Mackintosh will find The Willow Tea Rooms, The Lighthouse, House for an Art Lover, and the Glasgow School of Art to be must-visits, with the Hard Rock Cafe nearby to provide a stop-off.

For something a little bit different, head over to Glasgow Science Centre or the Hunterian Museum and Art Gallery to find fascinating exhibitions and collections, or step aboard the Tall Ship, an icon of Glasgow’s ship-building heritage still afloat to this day.

All of our attractions are supported by a great network of tourist transport - so why not see it all on an open-topped tourist bus, hopping on and off as many times as you like.

For more information on all of the above, visit: https://peoplemakeglasgow.com/visiting
**Conference Venue –**

The Lighthouse  
11 Mitchell Lane,  
Glasgow, Glasgow City G1 3NU  
Web: thelighthouse.co.uk  
Phone: (0044) 0141 276 5365

**Conference Hosts –**

The Forensic Institute  
Prof Allan Jamieson  
Dr Rhonda Wheate  
Email: info@theforensicinstitute.com  
Phone (0044) 0141 890 1111

The Forensic Institute  
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