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BAHID 2017 Team

BAHID Honorary President: Dr Dick Shepherd

BAHID Officers: Leigh Evans (Hon. Secretary), Ray Evans (Hon. Treasurer)

BAHID Conference Organising Committee: Leigh Evans, Ray Evans, Carole Davenport (Membership Secretary), Kathryn Sloper, Steven Walden, Rose Drew, Benedict Rodbourne, Esther Poulus, Dave Ridgewell, Mike Conway and Roos Eisma (Web Editor).

BAHID Student volunteers: Kirstie Bransfield-Garth, Simon Cooper and Varohtini Maharja.

Programme cover design: Emma Price - www.formingfaces.com

BAFA 2017 Team

BAFA Steering Committee: Julie Roberts, Linda Ainscough, Catriona Davies, Heather Bonney, Jan Bikker

BAFA Organising Committee: Julie Roberts, Linda Ainscough, Heather Bonney, Patrick Randolph Quinney, Catriona Davies

BAFA Student volunteers: Claire Fitton and Varohtini Maharaja

BAHID President's Welcome

'I would like to extend a warm welcome to you, on behalf of BAHID, and thank you for making the journey to Manchester to attend our conference on "Search, Recovery and Identification", a topic that is particularly relevant at the moment and will no doubt continue to be so in the years to come.

At this conference we hope to gain an understanding of the multiple and increasingly complex modalities involved in planning and searching for human remains and the many challenges that still remain in determining the identities of the remains that are discovered. We are indeed fortunate that at this conference our speakers will bring an eclectic mix of papers from Europe and from around the world, papers that look back at the past but also into the future and so provide us with a new and broader understanding of progress in this fascinating and essential field of forensic practice.

Human Identification is still a developing and progressing science which is needed now more than ever in an increasingly complex, violent and litigious world and the presentations at the Conference will help prepare, and hopefully also inspire, the attendees for their work in these areas. Please enjoy, engage and exchange with your colleagues and the many fascinating lectures and talks but also remember to make time to look at and discuss the posters.

One of the bonuses of attending a BAHID conference is the great diversity, knowledge and wide experience of our delegates and their willingness to chat, share ideas and talk about general experiences and opportunities. Therefore, I would encourage all those attending to use this rare opportunity to mix freely, enjoy the learning, have fun at the social events, but please stay safe, and if you are not yet a member of BAHID - now is a good time to join!

I will be around throughout the conference, so please feel free to come and introduce yourself and chat, as I am always interested in feedback and new ideas for future meetings and how we can improve BAHID for our members.'

Dr Dick Shepherd

BAHID Honorary President Elect



Timetable of Events

Friday 1st December

- 19:00 – late** Evening drop-in in the main lounge at the Chancellors Hotel. All delegates are welcome to attend.
- 20:00 – 22:00** Buffet served in the lounge. Attendees are asked to purchase a ticket in advance.

Saturday 2nd December

- 08:45 - 09:15** **Registration and Coffee**
The registration desk will be placed outside the Flowers theatre; coffee will be available in the main lounge.
- Session 1** **Chair: Esther Poulus**
- 09:15 - 09:20 Welcome to the Spring Conference by Leigh Evans, BAHID Secretary
- 09:20 - 09:30 Introduction to the Spring Conference by Dr Dick Shepherd, BAHID President
- 09:30 - 10:00 Lorna Irish – Victim Recovery Dogs: Changing Current Dogma
- 10:00 - 10:30 Alastair Vannan and Peter Schofield – Forensic Remote Sensing
- 10:30 – 11:00 Mike Groen - The Amsterdam Research Initiative for Subsurface Taphonomy and Anthropology (ARISTA): The making of a human taphonomy facility in the Netherlands.
- 11:00 - 11.15** **Coffee in the main lounge**
Please take this time to view the Poster presentations in the Flowers Theatre
- Session 2** **Chair: Dave Ridgewell**
- 11.15 - 11.35 Keith Silika* - The confluence of politics and forensics in the exhumation of remains in Zimbabwe
- 11.35 - 11.55 Megan Quick* - Searching for Murder Victims: A Computational Model Approach
- 11:55 – 12:15 Charles Ritchie* - Use of a Structured Light 3D Face Scanner in CCTV Image Comparison
- 12:15 – 12:35 Kirstie Bransfield-Garth* - Digital vs Physical: Estimating sex and age from 3D scans, 3D prints, and real bone.

12.35 -13.30	Buffet Lunch in the restaurant Please take this time to view the Poster presentations in the Flowers Theatre
Session 3	Chair: Carole Davenport
13:30 – 15:00	Matteo Borrini and Simone Montaldo - Searching for Missing People: a multidisciplinary strategy combining Forensic Archaeology, Psychology and Canine Units
15:00 – 15:15	Coffee in the main lounge Please take this time to view the Poster presentations in the Flowers Theatre
Session 4	Chair – Rose Drew
15.15 – 15:55	Turi King – King Richard III – the resolution of a 500 year old cold case
15:55 – 16:25	Samantha De Simone – The role of Computed Tomography (CT) in resolving commingled remains – a 3-Dimensional analysis of different techniques
16:25 – 16:55	Stephen Gregory – DVI: The Challenges – Why “we” have to improve professionally and ethically
16:55 – 17:15	Closing remarks with Honorary President, Dick Shepherd, followed by the announcement of the student presentation prize winners
Approx. 17:15	BAHID Annual General Meeting – N.B. would all those present who are not BAHID members please excuse themselves from the Flowers Theatre at this stage during Association business BAHID Council Meeting – Council members only
19:00 - 20:00	Wine and drinks reception in the main lounge
20:00 - late	Dinner in the Chancellors main restaurant, followed by drinks in the lounge

* Student presentation entries

Speaker Abstracts

Dr Lorna Irish

Victim Recovery Dogs: Changing Current Dogma

ABSTRACT: Dogs have historically been used as biological detectors in a number of different areas including law enforcement, search and rescue and even conservation. Dogs as detectors currently exceed scientific instrumentation in their sensitivity and specificity to the odours they are trained to detect. Victim recovery dogs (VRD) are dogs trained to locate human remains. These dogs are expected to be able to detect human remains in a variety of different states of decomposition and in a variety of different scenarios. This encompasses a huge array of different odours, constantly changing over time, which the dogs must recognise and respond to. This arguably makes it the most difficult detection discipline dogs may be trained for. This presentation aims to:

- introduce the audience to Victim Recovery dogs including the current training practices of VRDs in the UK
- inform the audience of VRD capabilities and limitations related to body recovery
- discuss the future of VRDs in the UK, ensuring their training meets high standards in an international arena based on emerging research in decomposition odour

KEY WORDS: Victim Recovery Dogs, Human Tissue, Decomposition, Search and Recovery

BIOGRAPHY: Lorna graduated in 2012 from Sheffield Hallam University with a 1st Class degree in Forensic and Analytical Science. She went on to complete her PhD “Comparison of Volatile Organic Compounds Identified from Cadaver Decomposition and Olfactory Performance of Trained Victim Recovery Dogs” at the University of Huddersfield in 2016. Her research encompassed both the chemical analysis of decomposing animal remains alongside field experiments to ascertain which chemical odours Victim Recovery (VR) dogs respond to. Lorna has visited and liaised with a number of police forces and civilian organisations training VR dogs in the UK, and other countries, to review training methods used. She has given numerous presentations on these subjects nationally and internationally. Lorna is currently employed as a Canine and Biosystems Scientist at DSTL where she continues to work with detection dogs.

Dr Lorna Irish, Defence Science and Technology Laboratory

Alastair Vannan and Peter Schofield

Forensic Remote Sensing

ABSTRACT: Remote sensing is a key element in forensic archaeological landscape analysis both for the provision of general understandings of landscape character and development, and in the identification of features and anomalies in the landscape that may be significant to a criminal investigation. This presentation will examine the use of some of the different types of remote sensing data and spatial analysis using GIS, and the ways in which they can be used to inform searches for people who are missing presumed murdered. It will also detail

some of the recent research and development being undertaken at Cellmark Forensic Services into the capture of LiDAR data using UAVs and subsequent GIS analyses appropriate to forensic archaeological applications.

KEY WORDS: Remote sensing, forensic investigation, Search, GIS

BIOGRAPHY: Alastair is a Forensic Archaeologist at Cellmark Forensic Services. He has over 10 years' experience in professional archaeology, including the excavation and recovery of human remains from a variety of burial types and environments. Since joining Cellmark Forensic Services, he has undertaken search and recovery investigations for human remains at numerous scenes including landfill, allotment, and construction sites, as well as industrial and agricultural landscapes. He has also attended mortuaries to assist in the identification of human remains.

Alastair has a first class honours degree in archaeology and professional experience in a wide range of archaeological techniques. He is a specialist in landscape search and survey, and the use of Geographic Information Systems (GIS) in spatial analyses to define prioritised search areas and to undertake forensic remote searches for clandestine burials. He is also regularly responsible for training archaeologists and professionals from other disciplines in techniques for search and excavation

Alastair Vannan and Peter Schofield, Forensic Archaeologist, Cellmark Forensic Services

Dr Mike Groen

The Amsterdam Research Initiative for Subsurface Taphonomy and Anthropology (ARISTA): The making of a human taphonomy facility in the Netherlands

ABSTRACT: The Amsterdam Research Initiative for Subsurface Taphonomy and Anthropology (ARISTA) is the first European facility dedicated to the study of human taphonomy under natural conditions. The ARISTA project is coordinated by Professor Roelof-Jan Oostra (Amsterdam Medical Center) and combines expertise from the AMC, the University of Amsterdam (UvA), the Netherlands Forensic Institute (NFI) and the Dutch police. ARISTA's main aim is to help forensic scientists and scene of crime officers to understand the below ground human decomposition in a Dutch context, by interring bodies up to one meter deep along with instruments that can carry out chemical analyses without disturbing the site. It is hoped that the knowledge obtained will aid police in searches for missing and presumably buried bodies and that it will contribute to a reliable determination of the postmortem interval, to mention examples. This paper will focus on the history of ARISTA, the research performed and the possibilities this unique facility offers for studying human below ground taphonomy.

BIOGRAPHY:

Mike Groen is a forensic archaeologist employed by the Netherlands Forensic Institute (NFI) and a staff member at the Leiden University, Faculty of Archaeology. His past academic and professional experience relates to GIS modelling, field archaeology, human taphonomy and physical anthropology. He is responsible for the introduction of forensic archaeology in the Netherlands in 2005 and for the creation of the Forensic Archaeology group within the European Network of Forensic Science Institutes (ENFSI) in 2013. Since 2014 he has chaired

the Dutch Association of Physical Anthropologists (NVFA). His current research interest include forensic archaeology, GIS predictive modelling forensic taphonomy and scene of crime science.

Dr Mike Groen, Netherlands Forensic Institute

Dr Turi King

King Richard III – the resolution of a 500 year old cold case

ABSTRACT: When the University of Leicester Archaeology Service undertook the Grey Friars project, it was thought that the chances of finding the remains of Richard III were slim to none. Nevertheless, Turi King, with her background both in archaeology and genetics, was approached in the very early stages - should the skeletal remains of a 'good candidate' to be Richard III be found, would she be interested in overseeing the DNA analysis. Turi King will speak about the Grey Friars project, from the early stages of planning the dig, through to the excavation and the results of the various strands of analysis carried out on the remains.

BIOGRAPHY: Turi King is an Anglo-Canadian geneticist who started her academic career reading Archaeology and Anthropology at the University of Cambridge. It was here that she became interested in how genetics could be used to answer archaeological and historical questions and gained a scholarship to study for an MSc in Molecular Genetics at the University of Leicester, gaining a distinction. Turi went on write an award-winning PhD in molecular genetic examining the link between British hereditary surnames and the Y chromosome. Since then, all of her work has combined genetics with history, archaeology, geography, forensics and epidemiology. She is perhaps now best known for having carried out the genetic analysis which led to the identification of King Richard III.

Dr Turi King, University of Leicester

Samantha De Simone

The role of Computed Tomography (CT) in resolving commingled remains: a 3-Dimensional analysis of different techniques.

ABSTRACT: This study was developed from the growing need, in the forensic anthropological field, for techniques able to satisfy the standards of reliability, validity and objectivity required for experts to conduct their work in a scientific way.

The pursuit of these principles can be even more challenging when faced with scenarios which involve commingling, a high level of fragmentation of the remains and no easily visible way to compare relationships between the elements. Therefore, this study explores the applicability of techniques, originally developed for the resolution of commingled scenarios both for dry skeletal elements such as osteometric sorting or for 3-Dimensional models such as the Mesh-to-Mesh value comparison. To bones acquired through an extraction and rendering process of whole-body Computed Tomography (CT) pre-existent scans, from a cadaveric population.

Several factors were taken into account during the study and the evaluation of the results, including the sample utilised, the slice thickness of the scans and the advantages and disadvantages of 3-D software (e.g. Amira 5.3.0, Viewbox and MeshLab).

KEY WORDS: Computed Tomography (CT); Commingled remains; 3-Dimensional techniques.

BIOGRAPHY:

Samantha De Simone has been a trainee field archaeologist at Border Archaeology since 2017. She has received her master's degree in Forensic Archaeology and Anthropology from the University of Dundee, in 2017 and her bachelor degree with honours in Cultural Heritage from the University of Bologna in 2016. She has participated in several workshops (e.g. Gifted and Talented, in 2017 and Fullbright scholars, in 2017) and internship (General Forensic Anthropology), held by the University of Dundee, during the past academic year. She is currently living in England and developing practical experience in the archaeological field.

Samantha De Simone, University of Dundee

Stephen Gregory

DVI - The Challenges – Why “we” have to improve professionally and ethically

ABSTRACT: The presentation will examine Disaster Victim Identification and why the DVI family, in the widest sense of the word, has to adapt and improve the process throughout the whole activity from incident scene (or scenes), through Search, Recovery, Mortuary, Family Liaison, Casualty Bureau, Identification, Personal Effects, Repatriation, Inquests and Inquires, Memorials and Anniversaries.

All whilst respecting local cultural, religious, social and legal customs, complying with agreed standards and recognising international differences and priorities.

Why are they different to normal incidents; particularly with reference to incidents of Mass Fatality, and the additional pressures placed on those responsible for conducting and administering the DVI process.

Importantly to examine, from a practitioners perspective, the challenges posed in mass fatality incidents, linking to the much wider implications including identification of the deceased and the DVI benchmarks now set.

What are the Key Concepts and learning points from previous experience – What has been learnt, how has that been implemented and what is there still to learn?

KEY WORDS: Disaster Victim Identification Recovery

BIOGRAPHY: Stephen retired from the London Metropolitan Police after 30 years' service, where he gained a vast experience of Major Incident and Disaster Victim Identification (DVI) management, response and recovery. Trained as a specialist and Team Leader with the Body Recovery and Identification Team, Stephen was the first UK BRIT trained UK police officer deployed to Kosovo in 1999, dealing with the exhumation and investigation of mass graves on behalf of the United Nations. Since then, Stephen went on to deal with, manage and advise at the Paddington, Hatfield, Selby, Potters Bar and Ufton Nerve Rail Crashes, Aircraft and Helicopter crashes, Major fires at the Yarls Wood Immigration Detention Centre and

Buncefield Oil Depot, the Stockline plastics factory collapse in Glasgow and the Boscastle Floods.

A member and co-ordinator of the Association of Chief Police Officers (ACPO) Major Disaster Advisory Team Steve was seconded via the Home Office to the National Centre for Policing Excellence as the UK major incident and disaster management specialist, where he designed, developed and delivered the first UK national police Victim Recovery and DVI training. Steve also designed and delivered the multi-agency Management of Major Incidents Course.

Following the 2004 Asian Tsunami Steve was deployed as an advisor to Interpol in Lyon dealing with the co-ordination of the multi-national DVI response. Steve was then deployed to Thailand and then Sri Lanka where he worked as the DVI and Incident Management specialist on behalf of Interpol and the UK policing response.

In July 2005 Steve was an advisor to ACPO and was the Tactical Advisor in the emergency mortuary built in London following the terrorist bombings. In addition he advised the Police Gold Commander and the Senior Identification Manager following the 2005 bombings in Sharm El Sheikh, Egypt.

Steve acted as an advisor to the Home Office on major incident emergency response and mass fatality issues, including response and Disaster Victim Recovery and Identification in a CBRN environment, and was a member of the Home Office team that developed the "Humanitarian Assistance in Emergencies" guidance. Steve is an Associate at the UK Cabinet Office Emergency Planning College working with major public and private sector organisations.

Since 2007 Steve has utilised his experience and expertise at numerous overseas incidents including acting as a DVI Responder, Manager and Advisor at incidents in Libya, Algeria, Namibia, Mozambique & Angola, Spain, France, Russia and Egypt. Steve has delivered Major Incident Response and DVI training to Security Services and Police in Egypt and key stakeholders in East Africa. Additionally Steve has conducted time critical DVI response assessments in the UAE and has given lectures in the UK, USE, Holland, France and Australia.

Steve holds an MSc Degree in Disaster Management and Emergency Planning, is a Fellow of the Institute of Civil Protection and Emergency Management and an Associate Member of the UK Emergency Planning Society. In his spare time Steve enjoys watching Sport, and has been involved in crowd safety at events for over 30 years and holds a Level 4 Diploma in Spectator Safety Management. In 2012 Steve was a Safety Officer for the London Olympics and Paralympics and in 2015 Steve was the Chief Crowd Safety Marshal for the F1 British Grand Prix at Silverstone.

Stephen Gregory

BAHID Workshop Abstract

Simone Montaldo and Dr Matteo Borrini

ABSTRACT: The workshop will present a challenging case on the search for missing people that was solved using a disciplinary approach involving the cooperation of different disciplines. A case report will be presented to demonstrate the potential of the cooperation between Psychology, Canine Units and Forensic Archaeology during different stages of a search.

Missing person's cases show several levels of criticality, however police have limited resources; if the person (or the body) is not recovered in a short period of time, protracted searches are not sustainable. These cases pose complex challenges that need to take into consideration the background of the disappearance, the physical and psychosocial conditions of the missing and the environment in which the event occurred. Therefore, a multidisciplinary approach is crucial to improve existing methodologies and develop operative protocols to both optimize investigation time and cost and to increase the number of successful recoveries.

In addition to several scenarios, the authors will present an exemplar case that involved two associations, Ophir Criminology and N.E.M.E.S.I., that been remotely coordinated by Matteo Borrini, a forensic anthropologist from Liverpool John Moores University. The final discovery of the corpse represents not only a resolution of the case, but also demonstrates the potential of a multidisciplinary and planned search strategy that involved Psychology, Forensic Archaeology and Canine Units.

BIOGRAPHIES:

Simone Montaldo MSc is a contract professor of Testimony psychology and investigative interview techniques in the Department of Neurology and Psychiatry at the Sapienza University of Rome. He has worked as a consultant in a large number of cases for the Italian criminal justice system. He has dealt with vital issues in the field of witness reliability and eyewitness testimony with under-age and adult victims of different types of offence. He has also worked as consultant in research projects promoted by UNICRI (United Nations Interregional Crime and Justice Research Institute). Furthermore, he works in multidisciplinary teams in the field of missing person's research, managing the preliminary data collection through the application of structured interview techniques. From 2015, he has been the president of Ophir Criminology, a scientific non-profit association devoted to the development of forensic sciences and the dissemination of good practices for investigation

Matteo Borrini, PhD, holds a doctorate in Evolutionary Biology and Ecology from the University of Rome "Tor Vergata", Italy. He is a Principal Lecturer and Programme Manager for the MSc in Forensic Anthropology at Liverpool John Moores University, UK. Currently he is the only expert witness in Forensic Archaeology and Forensic Anthropology for the Italian State Prosecutor Office (registered at Criminal Court of La Spezia). He has led dozens of archaeological and bio-archaeological excavations, and was a scientific consultant for the National Geographic Society. He is involved in the search, recovery and identification of missing people and murder victims and is also devoted to WWII investigation. For his contribution to the identification and location of missing army soldiers, Dr Borrini was designated as an honorary member of the Commonwealth-Italian Joint Committee of the Commonwealth War Graves Commission.

Student Oral Presentation Abstracts

Keith. K Silika*

The confluence of politics and forensics in the exhumation of remains in Zimbabwe

ABSTRACT: Zimbabwe is a former British colony that attained its Independence in 1980 and in the last 50 years has gone through 4 pogroms that has resulted in the death of over 50,000 people. These are, the liberation war, (1966-1980), Matabeleland democides, (1982-1987), political violence during every election cycle, (1980-), and blood diamond deaths, (2006-). These deaths have produced various body deposition sites that vary from mine shafts, caves, burnt huts and mass graves at hospitals and schools. The excavation, recovery and identification of human remains is often done sporadically by family members, political party aligned groups and occasionally by Non-Governmental organisations. The political party aligned associations recover remains in locations that contain remains from other conflicts and assign identification based on advice of 'spirit mediums' and assumed *non-de guerre*. The timing of the recovery and the associated media frenzy accompanying it is then used to full effect in demonising opposition groups. The search, recovery and identification of human remains in Zimbabwean contexts is fraught with political nuisances which will make future truth and reconciliation efforts under the new Zimbabwe Constitution (2013) problematic.

KEY WORDS: Politics, Forensic Archaeology, exhumation, and identification.

BIOGRAPHY: Keith K Silika is a former police officer in Zimbabwe and PCSO for Greater Manchester Police. He holds a BSc in Criminology and Forensics from Manchester Metropolitan University, a MSc in Forensic Archaeology and Crime Scene Investigation from Bradford University and currently pursuing a PhD in Forensic Archaeology at Staffordshire University.

Keith Silika, Staffordshire University

Megan Ivy Quick*

Searching for Murder Victims: A Computational Model Approach

ABSTRACT: Remote sensing and near-surface detection methods are increasingly used in criminal investigations, but are not always successful in locating buried bodies of murder victims. Currently poor choices of detection methods are sometimes made due to personal preference, what instruments are available, or through unguided trial and error, which results in poor outcomes and wasted time.

The research aims to improve the detection of buried forensic targets by creating a semi-empirical algorithm implemented using a Geographic Information System (GIS), to rank detection methods for suitability by considering the properties of the target and its environment. The semi-empirical algorithm will combine experience of what works with computation models of why things can be detected by comparing our understanding of the physical properties of soils and the targets being sought with reality.

In systems as complex as soil, useable models must be great simplifications of reality. Thus, there is a risk that a model that is too simple will only give obvious or wrong conclusions, though many appropriate models can be wrong in ways, which are useful. Computation models can be used to show whether a detection method is suitable in a given soil type, and to define the most efficient approach, before real surveys are executed in the field. Computational modelling would be a useful tool to evaluate the practicality, cost and likelihood of success of surveys prior to an investigation and to reduce the chances of poor data acquisition.

Megan Quick, Liverpool John Moores University

Charles Ritchie*

Use of a Structured Light 3D Face Scanner in CCTV Image Comparison

ABSTRACT: CCTV imaging analysis routinely compares stills extracted from CCTV footage with standardised photographs of the suspected individuals. However, these standardised photographs are usually captured from frontal and profile views only, with the CCTV images used for comparison taken at oblique angles from above. The complexity of the human face presents a challenge when comparing images, facial parameters used in the analytical process can become hidden or distorted under different lighting conditions and if the angle or distance of the image is modified, which can often result in inadequate image analysis.

A pilot study was carried out by Lynnerup et al. (2009), where it was shown that surface scans of the face using a surface laser scanner could circumvent the limitations to CCTV image analysis. The resulting facial scan can be processed into a 3D model, and as such can be rotated in order to be compared with the angle of the CCTV image. However, there has been little progress in the adaptation of this technology within a forensic facial identification context.

The purpose of this research was to examine how this growing technology could be used within a facial identification setting. Primarily examining whether CCTV image analysis can be conducted accurately using a structured light 3D scanner (Artec Eva). Twenty-four participants were included in the study, sixteen females and eight males. Standardised photographs, CCTV imaging and 3D facial scans were produced. These were then compared by three Forensic Art and Medical Art.

KEY WORDS: CCTV, Face, 3D, Scan, Identification

BIOGRAPHY: Charles Ritchie graduated in 2016 with a BSc (Hons) Forensic Anthropology from the University of Dundee. In 2017, he completed the MSc Forensic Art and Facial Identification course at the same institution. He will be presenting the research conducted for his final semester masters dissertation.

Charles Ritchie, University of Dundee

Kirstie Bransfield-Garth*

Digital vs Physical: Estimating sex and age from 3D scans, 3D prints, and real bone

ABSTRACT: The application of 3-Dimensional (3D) technologies to forensic anthropological work is an emerging field of interest with far-reaching potential for both medicolegal practice and academic research. This presentation explores the usefulness of 3D technologies in sex and age estimation from the pubic bone, providing the first comparison of these aspects of the biological profile across three modalities: 3D computerised images of white light scans of dry bone, 3D printed replicas of dry bone, and dry bone itself. This research tests the consistency of results between observers between these three presentations to investigate whether methods developed on dry bone collections may be directly applied to 3D computerised images and 3D printed replicas. This study used observers of equal experience (n= 21) to provide sex estimations following the Phenice (1969) method and age estimations following the Suchey-Brooks (1990) method to 174 specimens each. Statistically significant differences were found between results of sex estimation using the 3D scans compared with both 3D prints ($p < .0005$) and dry bone ($p < .0005$), and no statistically significant differences between 3D prints and dry bone ($p = .313$). This indicates that sex estimation may successfully achieve the same consistency amongst observers as when used on dry bone and 3D prints, but that 3D scans produce different results. Age estimation was significantly more variable than sex estimation, with no statistical differences identified between the modalities. This research could impact forensic anthropology in teaching, practical casework, and global resource sharing to further the research potential of the field exponentially.

KEY WORDS: 3-dimensional, technology, anthropology, biological profile

BIOGRAPHY: Kirstie's research interests focus on improving the use of technology in forensic anthropology and human identification, specifically exploring the potential of 3D printing in all aspects of the field. Kirstie Bransfield-Garth holds an MSc in Forensic Anthropology from the Centre for Anatomy and Human Identification at the University of Dundee.

Kirstie Bransfield-Garth, University of Dundee

***Presentations are student prize eligible.**

Poster Presentation Abstracts

Kent Adamson*, Paul Norris, Tim Thompson and Meez Islam – Teeside University

“Digital Stringing” – The Practicality and Legitimacy of Determining the Area of Origin of an Impact Event From Three-Dimensional Scans Recorded Via Structured Light Scanning.

ABSTRACT: This presentation will impact the forensic science community by providing an investigation of the possibility and capabilities of determining the area(s) of origin (AO) of impact events using digitally captured, three-dimensional scans. Such a technique may prove useful in reconstructing impact events by providing a three-dimensional representation of the AO, re-evaluating/verifying AO calculations, and/or providing the possibility of calculating the AO of a previously recorded BPA event which may not have been performed *in situ* during initial scene processing.

Multiple impact events were created by a third party using laboratory materials including animal blood and various blunt instruments, in an enclosed space with white walls. The purpose of using such instruments was to simulate the blood spatter that may occur as a result of blunt force trauma, as opposed to sharp force trauma, high velocity blood spatter (i.e. gunshots), and/or arterial spurts. After the impact events were simulated, PhD candidate, Paul Norris, performed a full three-dimensional scan of the area using a “4D Dynamics Real 3D Scanning Solutions PicoScan,” structured light scanner, with a Canon EOS 1000 D / Rebel XS camera equipped with a 18-55 mm Zoom lens and 800 x 600 resolution Pico Projector, to record the spatter. Following the scan, *in situ* stringing was performed and photographed by PhD candidate, Kent Adamson, to record each impact event. Additionally, each individual impact spatter used for AO determination during the *in situ* stringing was documented. This was done in order to insure that the same spatter droplets were used while ‘digitally stringing’ the AO of each event.

Inspired by the ‘digital stringing’ capabilities of the FARO® “SCENE” software (<http://www.faro.com/en-us/products/faro-software/scene/overview>), using only the three-dimensional images captured via the PicoScanner, PhD candidate Paul Norris and Kent Adamson attempted to string the events digitally. Upon completion, the AO of the three-dimensional scans of the impact events that were strung digitally were compared with the images taken of the AO that were strung *in situ*. Additionally, all impact angles calculated during the *in situ* stringing and ‘digital stringing’ were compared.

The results were compared in order to determine the legitimacy and efficacy of using digital scans in order to accurately determine and represent the angle of origin of a series of impact events. While determining the AO of impact spatter is in itself an estimation, it is hypothesized that with accurate, highly detailed, three-dimensional digital scans of a series of impact events, the AO of each event can be estimated digitally to the same standards as if it were done *in situ*. Furthermore, it is hypothesized that by providing a three-dimensional representation of the AO to a jury, a better understanding of the impact events and the overall scene will be achieved.

KEYWORDS: digital stringing, blood spatter, 3D scan

Sarah Ashbridge*, Robert Janaway and Andrew Wilson – University of Bradford

Military Identification: Assessing the effectivity of identification discs of World War I

ABSTRACT: The ‘Great War’ introduced new methods of warfare including tanks, trench warfare and gas attacks. Industrial warfare had a devastating impact on not only the landscape, but on the bodies of men. The German Army introduced their world’s first mass system of military identification in the form of identity discs in 1878, with the idea spreading swiftly around the globe.

This poster presentation will discuss development of the British and German identity disc systems, and their role in the identification of the deceased. Despite the use of identity discs, in March 2009, the Commonwealth War Graves Commission estimated that 526,816 British soldiers still had no known graves. We will assess the efforts of governments and armed forces in the processed of peri- and post-war clearing of the battlefields, identification and administration of the War Dead between 1914-1925. Despite their undeniable value in the process of identification of the War Dead today, there has been little research into the durability of these important examples of material culture. This presentation will highlight a range of considerations for archaeologists engaged with the exhumation or identification of those who fell during the Great War, including an ethical discussion on the transitioning legal status of human remains as they exceed one hundred years of age.

KEYWORDS: identity discs, identification of the War Dead, taphonomy, modern conflict archaeology

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Dominik Bankler, Alexander Stagl and Cyrill von Planta – AFA: Forensische Archäologie Österreich

SFM (Structure From Motion): The Future of Documentation in Forensic Archaeology?’

ABSTRACT: Starting from a short look at the situation of forensic archaeology in Austria we outline how AFA came about and why and how using “Structure From Motion” [SFM] influenced our work. The main part of the presentation will focus in the *documentation method* of SFM as a very efficient means of documentation in forensic archaeology. Concerning the recovery, we will highlight the advantages in relation to other methods used in the field. Likewise, the disadvantages or weak spots will be named to open room for a broader discussion on this method.

KEYWORDS: SFM (Structure From Motion), methodology, cost (efficiency), precision, digital documentation

Dr Macher Nassim Chakib* – University Hospital Center Mohamed Lamine
Debaghine Ex Maillot Algier Algeria

The place of imaging in section in firearm trauma (using an autopsy case)

ABSTRACT: The introduction of the new imaging techniques is a necessary procedure in thanatological exploration of ballistic trauma. Accessibility to this technology remains limited in Algeria. The authors of this work present a practical illustration on a case of death by firearm, thus highlighting the contributions of imaging techniques to solve a major forensic issue.

KEYWORDS: Ballistics, trauma, radiology

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Ting Ting Chu, **Simon Cooper***, Alison Davidson and John Cassella – Staffordshire
University

*Visual observation of decomposition stages may be a less reliable indicator of Post
Mortem Submersion Interval than chemical data*

ABSTRACT: When a victim of crime has been discovered in a clandestine grave a key requirement is estimating the post mortem interval (PMI). In aquatic-taphonomy this is recognised as the Post Mortem Submersion Interval (PMSI) and is determined by observing the decomposition stages of the cadaver and assigning a 'body score'.

Human cadaver decomposition stage descriptions have remained largely unchanged for cadavers discovered in shallow graves and these observed stages have become adopted for cadavers in watercourses, however some authors suggest that PMI and PMSI stages can be difficult to identify and that stage sequences can vary, for example if adipocere is present.

This research used mice cadavers in 2.5 Litre tanks filled separately with deionised water or natural water and stored in incubators at 20°C. Each system was set up in duplicate. Water samples were taken from the tank at regular intervals to measure conductivity, phosphate and other chemical properties. Gross decomposition and total body scores showed differences with each water source. These chemical measurements demonstrate a predictable and consistent trend over time and as a result suggest that observation of the physical stages of decomposition is *not* (on its own) a reliable marker for PMSI.

The chemistry of decomposition is therefore suggested as a more reliable predictor of 'time since death' than gross decomposition observations alone. Henceforth, this research indicates that further development of chemical techniques is required to support the visual techniques in estimating PMI and PMSI.

Larissa Kennel* – University of Dundee

*Skeletal non-metric traits and their contribution to forensic human identification:
Investigation of trait prevalence in a Scottish population by dissection of Thiel-
embalmed cadavers*

ABSTRACT: Skeletal non-metric traits are morphological abnormalities in the anatomy of skeletal elements which are not measured, but commonly scored or categorised as absent or present. Investigation of non-metric trait prevalence in different populations, including ancestry, sex, age and side dependency, is necessary before their observation can contribute reliable intelligence to human identification. This study investigated the prevalence of traits (sternal foramen, sternoxiphoidal fusion, xiphoid process morphology, bifidity of cervical spinous processes, third trochanter, suprascapular foramen), including differences in sex and side prevalence. Non-metric traits were assessed in 38 Thiel embalmed cadavers (17 male, 21 female, mean age 82.0 ± 10.8 years) from a Scottish dissecting room population. Additionally, the inter-observer error associated with the identification of the listed traits was investigated. A sternal foramen was present in 0%, sternoxiphoidal fusion in 100%, a suprascapular foramen in 5.3% and a third trochanter in 17.1% of individuals. Xiphoid process morphology appeared most frequently single ended without a foramen (40.6%). The spinous processes of C2-C5 were bifid in 100%, C6 in 71.6%, and C7 in 0% of individuals. No statistically significant differences in side prevalence were found, and sex prevalence only differed significantly for the third trochanter, which was observed more frequently in females (p -value < 0.05). No significant inter-observer differences were found, except for sternoxiphoidal fusion (p -value < 0.05). Although this pilot study contributed new data to a scarce literature pool on skeletal non-metric trait prevalence, further research in larger populations is necessary to evaluate the trends established in the present study.

KEYWORDS: forensic human identification, skeletal non-metric traits, anatomical variation, cadaveric dissection, Thiel embalming

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Lalwani Sanjeev, Bhalla Ashu S, Logani Ajay, Madan Nirupam – All India Institute of Medical Sciences, New Delhi

Evidentiary Value of Age Estimation in Living: Current Status

ABSTRACT: Age is one of the primary characteristics of identification of a human being. It is one of the most important issues regarding the eligibility of the person to enjoy certain rights; however it is of forensic importance in judicial proceedings of a criminal case when the person in conflict with law claims leniency and plead for the same before the honourable court on the ground of being juvenile. biography

In India, as per Juvenile Justice (care and Protection of Children) act 2000, a child below 18 years of age is considered as juvenile. Juvenile Justice Rules 2009 prescribes the procedure to be followed in determining the age includes use of documents like date of birth certificate from the school first attended, birth certificate given by a corporation or a municipal authority or a panchayat and the matriculation or equivalent certificates. Only in the absence of either

of the above said documents the medical opinion will be sought from a duly constituted Medical Board, which will declare the age of the juvenile or child. Therefore, medico-legal cases requiring age estimation are not uncommon in forensic practice, particularly for those who are devoid of the above mentioned documents which could be used as age proof.

While estimating the age of an individual multiple criteria's such as physical development, dental examination and radiological examination of appearance and fusion of epiphysis of long bones are commonly used. However, while framing opinion on age, utmost care is required regarding the variation of ages at which epiphyseal union as reported in literature and variation due to factors like sex, health, hereditary, socioeconomic, nutritional, endocrine and environmental factors.

In this presentation, we shall be sharing our experiences of formulating medical opinion on estimation of age using various parameters, citing discrepancies in the available literature and the legal point of view of Indian courts in relation to the cases dealt at All India Institute of Medical Sciences, New Delhi

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Elizabeth Parrott* – Liverpool John Moores University

Drones and Bones: Reviewing the use of unmanned aerial vehicles (UAV's) for Search, Recovery and Identification in Law Enforcement and Forensics.

ABSTRACT: This poster presents a review of the untapped operational resource which is drone technology. Highlighting its potential applications within policing and forensics including; search and rescue, terrain mapping, operational planning, monitoring of sites, scene recording and scene reconstruction to name a few. With the use of specialized sensor technology, and well-chosen consumer devices as well as custom systems, this poster examines how drone technology could quickly become a valuable piece of equipment for every operating institution. The benefits of drone technology can already be seen in the case studies included in this poster. However, there is no doubt that this technology is still considered controversial and this poster outlines some issues of the technology both as a piece of equipment and what has been highlighted in the media. Yet ultimately this poster explains how the correct use of the technology alongside well-chosen devices, proper education and knowledge is beneficial to investigations often outweighing the cost and relevant drawbacks outlined beforehand. This poster concludes with operational demands which need to be considered for many investigations so that every drone mission can be conducted efficiently and safely to meet government regulations promote good practice and obtain the correct data for every type of investigation.

KEYWORDS: Drone, UAV, Search, Rescue, Forensic

***Presentations are student prize eligible.**



BAFA CONFERENCE – Sunday



Timetable of Events

Sunday 3rd December

08.30 - 09:30 BAFA Steering Committee Meeting

09.30 – 10:30 BAFA Members Meeting – AGM

10.30 – 10:45 Registration and Coffee

Ancestry Workshop

10.45 – 11.45 Dr Patrick S. Randolph-Quinney - Ancestry assessment from craniometrics: when and when not to use morphometric data

11.45 – 12.15 Dr Samuel R. Rennie - Considerations for using Ancestry Estimation Software: Examples from California.

12.15 – 12.30 Discussion

12.30 – 13.30 Lunch

13.30 – 14.00 Paul Elsmore - Ancestry Inference using DNA testing

14.00 – 15.30 Practical Workshop - A practical session where you will be asked to assign ancestry to images of crania, using morphoscopic traits and FORDISC outputs. Results for the entire group will be looked at and discussed in the context of the known origin of each individual.

15.30 – 15.45 Coffee in the main lounge

15.45 – 16.30 Discussion – Topics covered include:

- Ethical Considerations
- The problems and issues around ancestry estimation
- Managing Police / Coroner / Procurator Fiscal expectations

16.30 Close of Workshop

Presentation of Certificates of Attendance

Speaker Abstracts

Dr Patrick S. Randolph-Quinney

Ancestry assessment from craniometrics: when and when not to use morphometric data

ABSTRACT: This presentation will cover:

- Introduction to the collection of metric data in ancestry estimation
- Statistical principles in the assessment of biological affinity
- The FORDISC problem
- Forensic case applications: resolving metric and morphoscopic approaches

BIOGRAPHY: Patrick Randolph-Quinney is Reader in Biological and Forensic Anthropology, in the School of Forensic and Applied Sciences, University of Central Lancashire. He is programme lead for the MSc in Forensic Anthropology, and heads the Taphonomy Research Group. He has extensive human identification and archaeological casework experience in the UK and southern Africa, including work with the Mission Chambres Africaines Extraordinaires under the African Union. His broad interests concern the application of multi-disciplinary forensic sciences (anthropology, archaeology and taphonomy) into current medico-legal practice and the Evolutionary Anthropology of the deep past.

His interest in ancestry estimation has focussed on the integration of metric and morphoscopic techniques - applying methods of statistical shape analysis to understand the evolutionary basis of modern human cranial form. His current research programme primarily focus on taphonomic modelling from an actualistic basis, including advanced 3D imaging, system analysis of burial ecologies, and spatial modelling of taphonomy processes (especially in karstic cave systems). Most recently he has been applying forensic taphonomic analyses (trauma and spatial modelling) to fossil assemblages of the early hominins Australopithecus sediba and Homo naledi to understand patterns of bone breakage and trauma in natural death traps versus deliberate body disposal, and the evolution of hominin mortuary practices.

Dr Patrick S. Randolph-Quinney, University of Central Lancashire

Dr Samuel R. Rennie

Considerations for using Ancestry Estimation Software: Examples from California.

ABSTRACT: This presentation will cover:

- Utilisation of CranID and FORDISC and how they differ.
- Case Examples: Results from CranID, FORDISC (using FDB), and FORDISC (using Howells Database) for a small collection of skulls with known origin.

BIOGRAPHY: Sam Rennie has recently finished a PhD in Biological Anthropology at the Research Centre in Evolutionary Anthropology and Palaeoecology at Liverpool John Moores University (LJMU). His PhD research focused on human postcranial skeletal anatomy with a speciality in pelvic morphology and looked at the current methodologies surrounding sex determination. The other side of his research is biostatistics, or more precisely, the application of multivariate analyses and how they can be used within biological anthropology. His current interests include craniomorphology and the use of 2D and 3D geometric morphometrics.

He is currently part of collaborative palaeomigration project where he is researching craniomorphology, working alongside institutions in Mexico, USA, and the UK. This multidisciplinary study will try and describe the skeletal remains from the Pacific Coast and how this affects the current paradigms in the peopling of the Americas.

He is a consulting Forensic Anthropologist, Search and Recovery Specialist, and I.T Specialist for Kenyon International. During his time as a team member he has had two deployments, one as a Forensic Anthropologist and the other as a Search and Recovery Specialist. In 2015, whilst researching in South Africa, he assisted on several forensic cases at the Forensic Anthropology Research Centre housed at the University of Pretoria.

Dr Samuel R Rennie, Liverpool John Moores University

Paul Elsmore

Ancestry Inference using DNA testing

ABSTRACT: This presentation will cover:

- The use of Y-STR profiling to provide an indication of male ancestry and STR ancestry testing to assist in ethnic inference
- Ancestry Informative Single Nucleotide Polymorphisms (aiSNPs/aSNPs) using Next Generation Sequencing techniques
- Mitochondrial DNA Sequencing

BIOGRAPHY: Paul Elsmore has been with the Cellmark since 1990 after obtaining a B.Sc. (Hons) in Molecular Biology / Biotechnology, he has undertaken many technical roles within the company as it has grown; initially starting with relationship testing using multi locus methods (DNA finger-printing), and being involved in development in-vitro medical diagnostic kits and services. Since 2000 he has worked in the crime stain DNA Operations Department processing many diverse sample types, initially as a scientist and more recently as a development scientist involved in validating and implementing new methods and technology. He has set-up and developed the DNA sequencing services for Cellmark Forensic Services, including ISO accreditation for the identification of samples by HVI and HVII sequencing and species identification using ribosomal 12S gene sequencing. In his time he has processed over 100 crime and reference samples for mitochondrial DNA sequencing analysis. Current casework involvement includes familial searches of the National DNA Database (NDNAD) and canine STR testing.

Paul Elsmore, Cellmark Forensic Services

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BAHID would like to say a special thanks to the companies listed below, along with Leigh Evans (Honorary Secretary) and Carole Davenport (Membership Secretary) who have provided support towards this year's conference.

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6-7 MARCH 2018 | OLYMPIA LONDON

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As an exclusive offer available to BAHID members only, Forensics Europe Expo offers a 20% discount on all conference passes, with details available closer to the event date.



Blake Emergency Services are an International Emergency Response company based in the UK with offices near Manchester and in Watford. Our Managers and Team Members are located across the globe including Europe, Canada and North America, South America, Africa, Australia and New Zealand, the Far East, India. On behalf of our clients, we provide support to individuals and their families who have been involved in a major incident. Our services revolve around providing a Humanitarian Response in the event of an incident including care; counselling and mental health support; victim identification and repatriation; property and personal effects processing.

We are looking for individuals who feel they can contribute as a member of our Incident Response Team when one of our clients is involved in a major incident. Whether this contribution is by helping relatives and friends while they wait for news of their loved one; as a forensic specialist in one of our technical teams; by dealing with personal effects that need to be returned; or by providing logistic and administrative support to our teams either in the UK or abroad. If you think you have what it takes to become part of the Blake International Response Team alongside your normal work, or if you would like to find out more, please contact us at Team@blakeemergency.com for more information.



At Cellmark, we provide the police with a wide-ranging, multi-disciplinary forensic casework service to support the investigation of criminal offences. From our state-of-the-art forensic laboratories in Abingdon, Oxfordshire and Chorley, Lancashire, we deliver a comprehensive forensic service from crime scene to court.

At the forefront of forensic analysis, we provide both high throughput, highly automated analytical services, as well as targeted, high sensitivity specialist testing for the most challenging of forensic samples, all delivered within Cellmark's extensive ISO17025 scope of accreditation.

Cellmark's scene scientists are highly experienced and attend a wide range of crime scenes, including murders and serious assaults, suicides and suspicious deaths, rapes and sexual offences, fires, mass disasters and investigations to locate and recover human remains.

Innovative investigative work in a range of high profile cases has established our reputation for quality and analytical excellence. This is matched by our commitment to deliver a swift, responsive service to assist police in the rapid resolution of criminal cases.



Kenyon International Emergency Services is a crisis and disaster management company, recognized as the world's leader in providing crisis management services. Kenyon is the only private disaster management company with dedicated, full-time resources spread across four regional offices. Kenyon's client base exceeds all our competitors combined and all Kenyon equipment is owned and maintained in preparation for immediate deployment. With over 100 years of experience responding to 340+ incidents, Kenyon guarantees first class resources, services and software to meet the demands of any incident.

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ODYSSEY FIELDSCHOOL

Odyssey field school offers a practical experience in the excavation and post-excavation analysis of skeletons from contemporary settings. The project aims in the recovery, repatriation or reburial of skeletal remains excavated during the recycling process of old graves in two fully operating cemeteries. The field school is fully supervised by experienced staff and it aims in the training of students or professionals who seek to learn how to work and handle human skeletal remains, or further advance their knowledge in doing so. The knowledge gained here has direct application in Forensic Anthropology, Forensic Archaeology and Bioarchaeology. We encourage an interactive and easy-going process where the team of supervisors actively engage with the participants in order to mediate and communicate general and specific learning objectives. As a team we collectively work together to teach, train, tutor and guide each step of the process. Through teaching and participation in real professional scenarios the students learn how to preserve and act ethically with all that concerns the study and identification of human skeletal remains.

Odyssey Field school is offering a discount to BAFA and BAHID members booking onto next year's field school, for more information visit the website at <https://odysseyfieldschool.weebly.com/fieldschool-2018.html>

Amenities

Car Parking

Car parking is free to all delegates of the workshops and conference

Dress Code

Smart casual will be the recommended dress code for all BAHID conference sessions and events. Be comfortable!

Location of Meeting

All workshops and the conference will take place at The Chancellors Hotel and Conference Centre.

Telephone: +44 (0) 161 907 7414

Email: chancellorsbooking@manchester.ac.uk

Address:

Chancellors Hotel,
Chancellors Way,
Moseley Road,
Fallowfield,
Manchester
M14 6NN

For Satnav, please use M14 6ZT

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The hotel is 3-Star AA establishment with 70 en-suite bedrooms, each featuring a flat screen television, hair dryer, telephone, and complimentary tea and coffee. Chancellors Hotel also offers FREE high speed broadband and Wi-Fi in public areas.

Please call +44 (0) 161 907 7414 to book, quote **BAHID** and reference number **kv208992** to get the preferred rate for the room. Room rates include full breakfast and VAT.

Identification Badges

Upon registration, each delegate will receive a BAHID conference identification badge. Delegates should wear this badge at all times during the conference period.

Smoking Policy

No smoking is permitted inside The Chancellors Hotel and Conference Centre but there are designated smoking areas outside the buildings. It should be noted that this includes the use of electronic cigarettes.

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