This year’s event will discuss new research and case studies from a range of academic and discipline professionals. Focusing on forensic location and identification, this event will encourage the sharing of ideas and best practice among the delegates and presenters and will include an informal discussion session.

This event has CPD accreditation

This abstract book will be finalised two weeks before the event.
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Oral Presentation Abstracts

WHAT HAS FORENSICS GOT TO DO WITH ARCHAEOLOGY: A HUMAN SKELETAL REMAINS FROM THE EARLY BRONZE AGE SITE VuČEDOL (VUKOVAR, CROATIA)

Poster Presentation Abstracts

BIOARCHAEOLOGY IN FORENSIC LABORATORY: THE SKELETON OF A MEDIEVAL MAN WITH ARROWHEADS (LOBOR, CROATIA)
Lives worth knowing: political aspects of mass grave location and investigation
Ms Caroline Bennett, University of Kent, School of Anthropology and Conservation, University of Kent, UK
The location and investigation of mass graves, and the identification of bodies within them, are highly politicised practices, influenced by various pressures, political will, economics and the endeavour for political and social capital. Based on fieldwork in Iraq and Cambodia, this talk will explore when and why graves are searched for, and what influences their investigation (or not), and the identification of remains, after they are located.

DVI in Action: the Response to 7/7
Mr Gary Silver MSc PGCE (QTLS) FICPEM FEPS MifL, Independent Pracademic
This session will explore the operational response to the terrorist bombings of London in July 2005. It will examine how it was necessary to both implement and adapt existing plans and long-standing, well-versed Disaster Victim Identification (DVI) procedures in order to meet the exceptional demands of the event.

Forensic Mycology: A new weapon against crime
Dr Patricia E.J. Wiltshire, Forensic Ecology, Botany, Palynology, & Mycology Milford House, The Mead, University of Aberdeen, Ashtead, Surrey, UK
Professor David Hawksworth, Forensic Ecology, Botany, Palynology, & Mycology Milford House, The Mead, University of Aberdeen, Ashtead, Surrey, UK
Mycology (study of fungi) has proved to be a powerful forensic tool, especially when combined with forensic palynology. The identification of fungal spores, knowledge of fungal distribution, ecology, and biology has been invaluable in providing intelligence and probative evidence in cases of serious crime. We describe cases where mycology has been used to (a) ascertain post mortem interval, (b) time other events such as deposition of corpses, (c) demonstrate contact between objects and places (trace evidence), and (d) demonstrate the ingestion of toxins, and hallucinogenic drugs. A knowledge of mycology can also help to detect terrorist activity, and to provenance materials from various parts of the world.

Fashion-conscious burglars? Using footwear impressions to predict the characteristics of burglars
Dr Matthew Tonkin, CPsychol, Lecturer in Forensic Psychology, Birmingham City University, Birmingham, United Kingdom
Offender profiling seeks to use crime scene information to predict personal characteristics of an unknown offender (e.g. employment history). Most research in this area, however, has focused specifically on offender behaviour (e.g. level and type of violence) as the means of predicting offender characteristics, which ignores the many other types of crime scene information that might be used to facilitate offender profiling. This talk presents research that investigated the potential for using footwear impressions to predict offender characteristics. Statistically significant relationships were found between the cost of footwear worn to a burglary crime scene and a number of offender characteristics.
Dr John William Bond, University of Leicester, Leicester, United Kingdom

The development of bare footprint research in forensic identification
Dr Sarah Reel, Consultant Forensic Podiatrist, Sheffield Teaching Hospitals NHS Foundation Trust
Bare footprints found at a crime scene can be used as forensic evidence to link a person to the incident using comparison methods. Science underpinning such measurement in this field had not been fully explored, resulting in challenges within courts of law and law-driven policy. Various approaches used in the practice of footprint evaluation demonstrated either little or no scientific measurement rigour. Therefore a reliable and valid method for measuring two-dimensional bare foot impressions was developed by the presenter providing the necessary baseline tool for use in this field.
In 2015 forensic gait analysis will have been presented in court as a contributor to identification for 15 years. During that time experience has been gained, lessons have been learnt and professional practice has been honed. However, the discipline is still young, and further work needs to be undertaken to consolidate the evidence base for many areas of practice. The presentation will consider the development of forensic gait analysis and its acceptance as a forensic science discipline, what it can contribute to the process of identification, and the potential for its development as an objective methodology.

### Oral Presentation Abstracts

### Poster Presentation Abstracts

**BITE MARK ANALYSIS IN FORENSIC PRACTICE- MEDICO-LEGAL ISSUES IN INDIA**

**Karthik Krishna; Adarsh Kumar; SK Gupta**

Dr Karthik Krishna, Senior Resident, Department of Forensic Medicine, All India Institute of Medical Sciences, New Delhi, India 110029 Email: karthis86@yahoo.com

The forensic examination of teeth is valuable as it provides vital clues for identification. This is not only true in living individuals but also in dead bodies, even when found at an advanced stage of decomposition. The impression of the tooth on living human beings or non-living objects caused by bites can also help in connecting the crime to its perpetrator by forensic analysis of bite marks. In living individuals, bite marks can fade with time due to the healing changes in tissues, whereas the same in dead bodies do not show any changes. Bite marks can be caused during an assault as well as defence, on rape victim or on the perpetrator. Tooth impression of a person may be present on non-living objects like cheese, fruits or any other food material that serve as an evidence to prove or disprove an alibi in a crime scene. The bite marks in all these cases serve as an important tool of forensic investigation provided it is subjected to comparative analysis.

In a developing country like India, the analysis of bite marks for medico-legal purposes is a challenging task. The main reason is due to lack of dental records for comparison. Apart from that, there are other medico-legal hurdles that curtail its evidentiary value like delay in examination, poor method of evidence collection, lack of scaling and photographic techniques, inadequate training of forensic doctors, etc which will be briefly discussed in the presentation. The suggested remedial measures feasible in routine practice will also be highlighted in the poster as we are in stages of development of full-fledged forensic anthropology unit encompassing forensic dentistry as well.

**Key words:** Bite marks; Crime; Identification; Forensic tool; Challenges; India

### Day 2:

**Invited Speakers Abstracts**

**TBC**

Mark Oliver, Director, The Old Woollen Mill Associates Ltd, UK

**Global Cooperation in Disaster Victim Identification**

Detective Inspector Howard Way, Association of Chief Police Officers, London, United Kingdom

Mass fatality incidents will sadly occur somewhere in our world in the near future, whether the circumstances are natural disasters, accidental incidents, or deliberate criminal acts.

The response to such incidents has moved towards a multi-national response. The South East Asian Tsunami and more recently the MH17 Disaster are strong examples of operations that have been dealt with as multi-national collaborations.

Disaster Victim Identification (DVI) is an area of police investigation and forensic science which is increasingly driven by global standards, with guidelines agreed and published under the badge of Interpol.
Drawing from experience of high profile international disasters, this presentation will discuss existing methods of conducting large scale DVI operations, the challenges facing operatives and how we can overcome them.

**Domestic Homicide Reviews. Family Involvement and Key Findings**

**Mr. Frank Mullane**, visiting lecturer at Gloucestershire University, Swindon, SN3 9BG, UK

is credited with being the driving force behind Domestic Homicide Reviews becoming law in April 2011 and that families are given the opportunity to be integral to these reviews. Frank argues that participation of families and friends in the review process not only helps professionals to experience the reality of domestic abuse and homicide but provides a source of empirical evidence unavailable from elsewhere. This has helped Domestic Homicide Reviews to record the victim’s voice and detail of violence against women so often missing from other processes, for example the trial.

**Helping the police to catch criminals using facial composites**

**Dr Charlie Frowd**, CPsychol CSci AFBPsS, Reader in Forensic Psychology, Faculty of Humanities and Social Sciences, University of Winchester, UK

Witnesses and victims of crime are asked to create a face of a person they have seen to commit a crime. These pictures are known as facial composites and are used by the police to help catch criminals. In this talk, I will show how ineffective are traditional methods to construct a face. I will also describe ways in which the effectiveness of composites has been improved, and how it is now possible to create an identifiable face using a software program called EvoFIT, a system that is in regular use with the police.

**Is the Practice of Forensic Pathology being Confounded by Too Much Technology?**

**Associate Professor Gilbert Lau**, Director of Professional Practice, Forensic Medicine Division, Health Sciences Authority, Singapore, Republic of Singapore

Metals exposed to explosions undergo macro- and micro- variations, such as slip bands or mechanical twins. Twinning or slip occurrence depends on metal stacking fault energy, blast wave pressure and deformation rate. An experimental campaign was performed on different FCC metals. Results from austenitic stainless steels, gold alloys, copper and α-brass (30% Zn), and aluminum alloys specimens exposed to small charge explosion (50g and 100 g of plastic explosive) are presented. Optical and Electron Microscopy, Electron Back-Scattered Diffraction (EBSD) imaging, and X-ray diffraction allowed to establish the target-to-charge distance detectability limit, and hence the bomb unknown position in real cases.

**TBC**

Miss Maria M. Maclennan, Duncan of Jordanstone College of Art and Design (DJCAD), The University of Dundee, Glasgow South Side, United Kingdom

**Dowry death - south India's woes**

**Dr Sachidananda Mohanty**, Professor & HOD, PG Dept. Of Forensic Medicine & Toxicology, M.K.C.G. Medical College, Orissa, India

Dowry deaths in the newly married brides are a burning problem of southern India. The objective of the study was to identify the risk groups. This study was carried out on 140 established cases of dowry deaths. Results revealed that majority of the victims (83%) were young aged between 18 to 26 years, childless (65.7%) and died mostly within 4 years of marriage (77.2%). Iliterate housewives hailing from middle socioeconomic group(81%) are the major sufferers. Husband alone or along with in laws (75%) mainly responsible for this heinous crime.

The common causes of death are hanging, burning and poisoning. Homicidal deaths constitute in 43% of cases.

**Allegations of self-infliction- assessment of a fanciful possibility?**

**Dr Juliet Cohen**, MA MBBS DipRACOG MRCGP FFFLM, Head of Doctors, Freedom from Torture, University Oxford, London, UK

The caselaw KV states where self-infliction or self-infliction by proxy is ‘more than a fanciful possibility’ doctors examining victims alleging torture must consider the evidence in this light. The same principles apply to best practice in forensic medicine for other jurisdictions, where injury alleged to be due to assault may have been self-inflicted for secondary gain, but how was the evidence in the new caselaw KV assessed, and how do we determine when there is more than a fanciful possibility?

**C-LINK: a model of academic-practitioner collaboration**

**Dr Amy Burrell**, Lecturer in Forensic Psychology, Birmingham City University, UK

The Crime Linkage International Network (C-LINK) is an international network of academics and practitioners with a professional interest in crime linkage. Crime linkage – also known as comparative case analysis, linkage analysis, and case linkage – focuses on identifying crimes committed by the same offender using crime scene behaviour. Funded by a grant from the Leverhulme Trust, C-LINK brings together partners from across the world.
including the UK, Finland, the Netherlands, South Africa, Canada, and the United States, with the aim of establishing a coherent, evidence-based approach to the detection of serial offenders using crime linkage techniques. This talk will discuss the progress of C-LINK, the challenges encountered & how these have been overcome. A update as to the outcome of the research & the future of the network will also be discussed. For more information about the network please see www.crimelinkage.org

Finding the small charge explosion center by analyzing occurrence of mechanical twins in FCC metals
Dr. Donato Firrao, Politecnico di Torino, Corso Duca degli Abruzzi, Torino, Italy
Metals exposed to explosions undergo macro- and micro- variations, such as, slip bands or mechanical twins. Twinning or slip occurrence depends on metal stacking fault energy, blast wave pressure and deformation rate. An experimental campaign was performed on different FCC metals. Results from austenitic stainless steels, gold alloys, copper an d α-brass (30% Zn), and aluminum alloys specimens exposed to small charge explosion (50g and 100 g of plastic explosive) are presented. Optical and Electron Microscopy, Electron Back-Scattered Diffraction (EBSD) imaging, and X-ray diffraction allowed to establish the target-to-charge distance detectability limit, and hence the bomb unknown position in real cases.

Maximising the utility of familial DNA searching in major crime investigation
Dr Adam Gregory, National Crime Agency, London, United Kingdom
Full abstract to follow. The talk will explain what familial DNA searching is, how it works, how it has evolved, and how it is now used in UK Police investigation today. The focus of the talk will then move to the work that NCA BIA have undertaken in enhancing the standard familial DNA search product offered by forensic service providers in order to maximise its utility within major crime investigations. Challenges to the process will also be outlined.

Oral Presentation Abstracts

APPLIED SPECTROSCOPY FOR FINGER MARK VISUALISATION WITH TWO USUAL REAGENTS.
I. Mekkaoui Alaoui
Physics Department, Faculty of Sciences Semlalia, Cadi Ayyad University.
BP 2390, Marrakech 40000, Morocco

Abstract
To obtain the best results on finger mark visualisation and imaging using luminescence, we need to know how. The UV-visible spectroscopic properties and the luminescence characterization of a fingerprint reagent and its reaction product with the finger residue are necessary for the excitation choice. Absorption, excitation and fluorescence characterizations of the reaction of amino acids (present in the fingerprints’ residue) with the reagent will decide of the type of laser and excitation to be used. In case we need to weaken or eliminate the surface background disturbance, time resolved luminescence imaging is used. For this technique, we need to know the luminescence life time of the formed luminescent compounds, and the appropriate laser excitation must have the appropriate repetition rates or should be modulated to the appropriate luminescence life time scale.

This presentation will be about the applications of optical spectroscopy in forensic identification. In particular, we will concentrate on how to choose the laser excitation and power needed in laser fingerprinting. The UV-visible spectroscopic properties and the luminescence characterization of two fingerprint reagents and their reaction products with the finger residue will be presented. Some visualized latent fingerprint samples on paper and on aluminium cans will be also presented and discussed.

Keywords: laser excitation, emission, finger mark, visualisation, forensic, ninhydrin, 1,2- indanedione.

DEVELOPING FORENSIC ANTHROPOLOGY IN INDIA – NEED OF HOUR
Adarsh Kumar, Sudhir K Gupta
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Corresponding Author: Dr. Adarsh Kumar
Addl Professor, Forensic Medicine & Faculty In-charge, Forensic Anthropology Unit #315, New Forensic Wing, All India Institute of Medical Sciences, New Delhi- INDIA 110029 dradarshk@yahoo.com
In India in recent past, cases have made headlines not only when there is recovery of huge number of dismembered body parts like Nithari killings, Godhara massacre, Uttarakhand tragedy but also of the political nature like Shopian case. In India, medico-legal autopsies are usually done by basic MBBS doctors and in case of skeletonised body mostly examined by the Forensic Medicine doctors or the Forensic Scientists/Anatomists where such cases are referred. Main purpose of autopsy is centred on whether the remains are human or animal origin or inorganic material. If human then establishment of identity, followed by knowing cause of death if possible by skeletal trauma analysis. Age determination in living is frequently required since almost 3/4th of population still don’t have an authentic birth record.

In India we lack expertise in this branch; the reason albeit are multifactorial. Now with progression of society a dire need has been felt to develop this underutilised branch in India which being a multicultural, multi-ethnic and multiracial country becomes further complicated. AIIMS, New Delhi being apex referral centre for all type of cases (which includes medicolegal investigations also) and top most medical research institute of the country the efforts are being made to place state-of-art forensic anthropology services where it can cater to all such cases. Similarly Cadaver Dissection Laboratory for providing hands on training to various medical & surgical disciplines needs be developed as an important sub-branch of forensic anthropology. The aim of the presentation is to discuss the present status of functioning with a view to improve it in due course of time by way of interaction with international faculties and simultaneously paving the way for future collaboration opportunities.

Key Words: Forensic, Anthropology, cadaver, skeleton, age

Poster Presentation Abstracts
Poster abstracts will be finalised weeks before the event

THE ROLE OF THE FORENSIC INVESTIGATION IN A CASE OF CONCEALMENT OF A CORPSE IN A DEEP-FREEZER: MURDER OR NATURAL DEATH?
Ausania F., Chiarelli M., De Bartolo D., De Luca E., Cittadini F., Ricci P.
Presenting Author: Ausania Francesco, Chair of Legal Medicine, University “Magna Graecia” of Catanzaro, Viale Europa, 88100, Catanzaro, Italy

Corresponding Author: debora.debartolo@yahoo.it

We report a rare case of missing 93-year-old woman found dead in a home freezer. Homicide cases in which the victim’s bodies have been hidden in deep-freezes or similar devices have been reported in literature. The neighbors had no more news of the elderly woman, for at least one year. Although the son who lived in the house was suspected to have hidden his elder mother, it was not known whether she was murdered or died by natural causes and after hidden. The body showed neither signs of violent attack nor of severe disease. Therefore a careful postmortem investigation to determine the circumstances surrounding the death in these circumstances was required.

Postmortem changes due to freezing and thawing hamper investigations, but thawing is necessary to allow thorough examination, including autopsy and histological investigation. Certainly, the case presents the elements of interpretive difficulties related to the exceptional finding of the permanence of the body at low temperatures for a long period. Although the woman had been dead for at least 1 year and thawing would have been expected to rapidly accelerate postmortem changes, the body was preserved sufficiently for thorough postmortem examination including an autopsy and histological investigation.

Post-mortem examination revealed signs of initial decomposition, autolysis and putrefaction were evident. We have highlighted “facies negroid” with brownish-blackish appearance; putrefactive venous network and putrefactive blister in the lumbar region. During internal examination a displaced fracture of T12 was detected. Histologic finding of the thoracic vertebra showed a diffused hemorrhagic infiltration of perispinal fibrous connective tissue, fragmentation of trabecular bone, hemorrhagic areas and diffused bone marrow edema; these elements confirm the hypothesis of a vital injury. In addition an extensive thrombosis, atrium, ventricle and common trunk of the pulmonary artery, was evident. Toxicology tests were negative.

By the analysis of the data collected in the inspection, autopsy, histo-pathological and chemical-toxicological investigations, we can confirm that the death of the lady has been determined from an acute cardio-respiratory failure resulting from massive pulmonary thromboembolism (TEP) consequence of vertebral fracture which had occurred during her life. With regard to putrefactive phenomena observed, we concluded that the elderly
woman was frozen after the son (however, convicted of concealment of a corpse and fraud) and the reconstruction of the events that led to the about 7 days from death. In this case, the forensic evidence helped to compensate for the declared innocence of the son (however, convicted of concealment of a corpse and fraud) and the reconstruction of the events that led to the death of the woman.

Keywords: Forensic pathology, Autopsy, Police Investigation

IDENTIFICATION OF THE REMAINS OF SAINT CANDIDUS: A MULTIDISCIPLINARY APPROACH
Ausania F., Cittadini F., De Bartolo D., Pelli E., De Luca E., Polacco M., Gratteri S., Ricci P.
Presenting Author: Ausania Francesco, Chair of Legal Medicine, University “Magna Graecia” of Catanzaro, Viale Europa, 88100, Catanzaro, Italy
Corresponding Author: debora.debartolo@yahoo.it

To present the process of identification of skeletal remains preserved in a reliquary at the Roman Catholic Abbaye (in Italy), which allegedly contained the remains of Saint Candidus (d. 287 AD). He was a commander of the Theban Legion that, according to the Martyrologium Romanum, he lived under the Emperor Diocletian; is said to have been martyred, probably by beheading, at the Swiss town of Saint Maurice-en-Valais, where he was about 30 years old. A skull and many skeletal remains, retained in two reliquaries, whose have been delivered to the Institute of Forensic Medicine UCSC in Rome. The bone who remains were submitted to anthropological investigations. Before, we have studied the bones with the Multislice Computed Tomography (MSCT); the scanning and reconstruction parameters were the following: ultrahigh resolution, beam collimation 0.75 mm, all images were reconstructed at 1mm and 3mm slice applying the smoothing kernel and subsequent re-engineering techniques 3D Surface Rendering and Volume Rendering and Shaded Surface Display (SSD). Afterwards, for genetic analysis, the protocol for DNA extraction from ancient bone and teeth was based on silica method (Rohland & Hofreiter 2007). The genetic material has been amplified through the PCR. Genetic markers are: Amelogenin and SRY (locus for sex determination); HERC2 (locus for human eye colouration); SLC24A5 (locus for skin color) and the hypervariable region (HVR1) of mitochondrial (mt)DNA. Based on the results of anthropological analysis it can be assumed that the skeletal who remains belong to a male subject, but not from the same individual. The wear of upper teeth is, probably, indicative of a diet based mainly on the consumption of coarsely ground cereals, allowing to backdate the era of the skull in the late-Roman period. From the CT study, it may be concluded that there are bones with different ages: the skull and pelvic bones show a radiological appearance compatible with a single individual of a young age (20-30 years old); the vertebrae, clavicles and ribs, show signs of significant osteoarthritic degeneration, suggesting an older man (older than 40 years).

Genetic analysis was performed on an upper molar (skull), a lower molar (mandible) and a femoral fragment; it was possible to detect that the upper molar and the lower molar derived from two individuals with different eye color. All the samples have the same allele associate to the "light-skinned" phenotype and different mitochondrial profile.

The data obtained by a multidisciplinary approach allow to assert different skeletal remains belong to different men. In this study it was not possible to compare between the extracted DNA and that of known relatives. We calculate likelihood ratios for the non-genetic and genetic data separately, and combined.

In conclusion, according to the data and the place of discovery we can assume that our results suggest that some remains, skull and pelvic bones, belong to thirty year old man. We can assume that these remains could belong to San Candido.

Keywords: Forensic Anthropology, Identification, Computed Tomography, DNA, Age Estimation

HUMAN ODOUR AS BIOLOGICAL EVIDENCE – LIMITATIONS AND POSSIBILITIES
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In Hungary, scent identification line-up was performed since the seventies. This type of personal identification is conducted by a specialized police canine, with the cooperation of the dog-handler. According to the current national legislation, scent identification line-up is a judicial procedure, while the scent collected from the crime scene is trace evidence.

At the crime scene, the first step is to locate and collect scent trace. After locating it, cotton textile is used to collect the scent at the crime scene. These have to be covered with aluminium foil at least for half an hour and put into a glass jar. During the investigation, if law enforcement has a potential suspect in the crime case, their scent has to be collected also. For 10 minutes, he has to hold in his washed hands 2-2 cotton textiles during the collection method. Theses textiles are also put into glass jars such as used in the scent trace method. The glass
jars are stored at the County Department Police in a scent bank. Storage time of glass jars is 3 years in general cases, while in cases of crime against life by unknown perpetrators it is 10 years.

In the scent identification line-up there are 4 decoys and the suspects’ sample scents in a row. The requirement of similarity must be present (similar time-frame, same sex and race etc.). The 4 decoys and suspects’ scent are 80-90 centimetres apart from each other. Before the real trial, the control trial is performed. In cases of negative matches where the scent identification dog does not sign any identity between the suspects’ sample scent and scent trace pattern, the procedure is finished. With positive matches, the trial is repeated for 5 times. The dogs have to signal the result definitely.

The object of identification is the unique human scent. Some recent publications show that the quality of human body odour is influenced by numerous factors (like living conditions, alimentation, diseases and washing customs etc.). The unique scent is composed of the following:

1) primary odours: stabile and is determined genetically
2) secondary odours: influences by alimentation and diseases and
3) tertiary odours: which depend on exterior circumstances.

Dog’s sense of smell is generally 44 times better than humans. The anatomy and physiology of a dog, plays a large part in proving that canines are the ultimate living tools in distinguishing and identifying human scents.

Limitations of the method
- The method of identification of the scent identification dog is not well understood.
- How long do glass jars store scent evidence? What is the decomposition time of human scent in a glass jar?
- How valid are these identifications?

Possibilities for the future
- Defining the exact chemical compounds of human scent, using GC-MS
- Creating a body scent map similar to the DNA-map.
- Defining the validity of scent identification line-ups.
- Contributions for other fields of science and using their results (chemistry, biology etc.)

HEAVY VERSUS LIGHT: SPATIOTEMPORAL ISOSCAPES USEFUL FOR THE PROVENANCING OF HUMAN REMAINS
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3Department of Geology, University of Illinois, Urbana, IL 61801, USA

Isoscapes plot the geographic variation in isotope ratios. Isoscapes of oxygen and carbon ($^{18}$O/$^{16}$O and $^{13}$C/$^{12}$C) are useful for forensic provenancing of foodstuffs, ascertaining cultural differences in diet, and determining movements of an individual over time. Light element isotopes are fractionated biogeochemically while those of lead (Pb) are fractionated by radiogenic processes. Pb also differs from O and C in the number of isotopes of use (4 vs 2), the mechanisms of human uptake, and in its spatiotemporal distribution. Thus, Pb isoscapes should add discrimination when provenancing human remains. Using data from environmental proxies and humans with known life trajectories we compare the forensic efficacy of Pb isoscapes to those for $\delta^{18}$O and $\delta^{13}$C, applying them to case studies of current and historic interest.

Key Words: Forensic, Anthropology, $^{206}$Pb, isotope, skeleton, provenance

IDENTIFICATION OF THE REMAINS OF SAINT CANDIDUS: A MULTIDISCIPLINARY APPROACH
 Presenting Author: Ausania Francesco, Chair of Legal Medicine, University “Magna Graecia” of Catanzaro, Viale Europa, 88100, Catanzaro, Italy, Corresponding Author: ausania@gmail.com

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scanning and reconstruction parameters were the following: ultrahigh resolution, beam collimation 0.75 mm, all images were reconstructed at 1mm and 3mm slice applying the smoothing kernel and subsequent re-engineering techniques 3D Surface Rendering and Volume Rendering and Shaded Surface Display (SSD). Afterwards, for genetic analysis, the protocol for DNA extraction from ancient bone and teeth was based on silica method (Rohland & Hofreiter 2007). The genetic material has been amplified through the PCR. Genetic markers are: Amelogenin and SRY (locus for sex determination); HERC2 (locus for human eye colouration); SLC24A5 (locus for skin color) and the hypervariable region (HVRI) of mitochondrial (mt)DNA. Based on the results of anthropological analysis it can be assumed that the skeletal who remains belong to a male subject, but not from the same individual. The wear of upper teeth is, probably, indicative of a diet based mainly on the consumption of coarsely ground cereals, allowing to backdate the era of the skull in the late-Roman period. From the CT study, it may be concluded that there are bones with different ages: the skull and pelvic bones show a radiological appearance compatible with a single individual of a young age (20-30 years old); the vertebrae, clavicles and ribs, show signs of significant osteoarthritic degeneration, suggesting an older man (older than 40 years).

Genetic analysis was performed on an upper molar (skull), a lower molar (mandible) and a femoral fragment; it was possible to detect that the upper molar and the lower molar derived from two individuals with different eye color. All the samples have the same allele associate to the "light-skinned" phenotype and different mitochondrial profile.

The data obtained by a multidisciplinary approach allow to assert different skeletal remains belong to different men. In this study it was not possible to compare between the extracted DNA and that of known relatives. We calculate likelihood ratios for the non-genetic and genetic data separately, and combined. In conclusion, according to the data and the place of discovery we can assume that our results suggest that some remains, skull and pelvic bones, belong to thirty year old man. We can assume that these remains could belong to San Candido.

Keywords: Forensic Anthropology, Identification, Computed Tomography, DNA, Age Estimation

Day 3:

Invited Speakers Abstracts

Forensic Genetics in 2015: new markers, new platforms, new capabilities
Dr Chris Phillips, Forensic Genetics, University of Santiago de Compostela, Spain

In 2015, forensic genetic analysis has moved beyond DNA profiling to now encompass: characterisation of externally visible characteristics such as pigmentation traits; ancestry inference; body fluid identification using RNA; SNP-based facial reconstruction; the beginnings of biological age estimation using methylation markers; new rapidly mutating Y-chromosome markers; and expansion of STR variation to include SNPs sited on amplified DNA alongside the tandem-repeat polymorphisms. This talk reviews how next-generation sequencing systems such as MiSeq and Ion PGM have enabled the expansion of genetic markers detectable from contact traces and how this new data can help progress criminal investigations without a lead.

What has forensics got to do with archaeology: a human skeletal remains from the early bronze age site Vučedol (vukovar, croatia)
Dr Z. Hincak, Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb, I. Lucica 3, 10000 Zagreb, Croatia

The aim of this research is to present two archaeometrical cases. The use of red pigments linked to burial practice is the first one. The samples of pigment traces for this research were recovered from the skeletons from seven highly significant Early Bronze Age graves from the location Vineyard Streim on the site Vučedol. The preliminary results embraced the elemental and structural physicochemical analyses (SEM–EDX, EDXRF, RAMAN spectrometry) of the pigment trace samples on the skeletal remains. The second case presents a possibility, but also some problems of age at death determination as a part of biological profile, with the help of histomorphometric techniques on high fragmented bone samples. The histomorphometric analysis was performed with a polarizing microscope and SEM.

Your Vision Our Future
Dr Michael Brennan, School of Nursing & Midwifery, Trinity College Dublin, Dublin, Ireland

The aim of the Irish newly constructed mental health system is to deliver a range of activities to promote positive mental health in the community. It should interrve early when problems develop and it should enhance the inclusion and optimal functioning of people who have severe mental health problems (DoH&C,
Dental Autopsy for the Identification of Missing Persons
Dr. Emilio Nuzzolese, University of Magna Graecia, Catanzaro, Italy

Unidentified human remains require an accurate collection of post mortem data in order to achieve a positive identification. Forensic odontologists gather both dental and radiological data, as well as information from the missing persons families, in order to acquire more data for the completion of the Missing Persons Report. The generic identification, even in the absence of antemortem dental data, narrows down the investigative frame by defining sex, age, dental biography, socio-economic status and geographical origin. Human rights, Interpol dictates and more specific odontological analysis, make a complete dental autopsy a fundamental resource for the identification of unidentified persons.

Odontobiography - when teeth speak
Dr Marin Vodanovic, University of Zagreb School of Dental Medicine, School of Dental Medicine, Zagreb, Croatia

Teeth and mouth are a rich source of information about an individual. An average dentist is able to notice this information but usually is not trained to put them in appropriate context and they stay useless. Someone’s biography based on analysis of the teeth and mouths is called odontobiography.

It can be made for living or dead people including skeletons of archaeological origin. The aim of making odontobiography is to reconstruct the life of an individual and to provide as many details as possible from her/his life by analysis of the oral environment. Use your knowledge and learn how to understand when teeth speak.

Ahead by a Nose: Detection of Decomposing Remains by ‘Cadaver Dogs’
Dr Anna Williams, Senior Lecturer in Forensic Anthropology, University of Huddersfield Queensgate, Huddersfield, UK

This talk will show how cutting edge research at the University of Huddersfield is helping to understand how specially trained ‘cadaver dogs’ or human remains detection dogs detect human remains. The Forensic Anthropology Research Group is currently leading the UK in examination of the volatile organic compounds that are given off by a decomposing cadaver as a function of time, and using this information to test the proficiency of specially trained dogs. It will detail the research into the variation in training aids and training practices around the UK, and how this impacts on their successful location of operational finds.

Oral Presentation Abstracts

WHAT HAS FORENSICS GOT TO DO WITH ARCHAEOLOGY: A HUMAN SKELETAL REMAINS FROM THE EARLY BRONZE AGE SITE VUČEDOL (VUKOVAR, CROATIA)
Z. Hincak1, I. Špoljarić2, I. Bačić2, G. Mršić2, D. Mihelić3, M. Popović3, A. Durman1, M. Hutinec4, D. Roksandić1, J. Crnjac5
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In the last few decades the application of forensic methods to archaeology increases the criteria providing reliable and very precise results of material analysis, even in the case of a very small sample size as traces, or a small fragments. The aim of this research is to present two archaeometrical cases. The use of red pigments linked to burial practice is widely documented, primarily as the Near Eastern tradition in prehistory and also as a part of the later European practice. The samples of pigment traces for this research were recovered from the skeletons from seven highly significant Early Bronze Age graves from the location Vineyard Streim on the site Vučedol. Only few confirm the use of cinnabar (HgS), the most beautiful red pigment in the prehistory. Following the pattern of its appearance on distinct skeletal elements, with the help of anthropological analysis, it was possible not only to give a new insight into the burial practice, but also to confirm the presence of cinnabar as allochthonous element. The preliminary results embraced the elemental and structural physicochemical analyses (SEM–EDX, EDXRF, RAMAN spectrometry) of the pigment trace samples on the skeletal remains. The second case presents a possibility, but also some problems of age at death determination as a part of biological profile, with the help of histomorphometric techniques on high fragmented bone samples. Although this method does not meet high forensic standards yet, with introduction of new protocols in analysis it is coming nearer. The method was obtain for all well preserved skeletons whose preservation degree exceeded 80%. The histomorphometric analysis was performed with a polarizing microscope and SEM.
Poster Presentation Abstracts
Poster abstracts will be finalised weeks before the event

BIOARCHAEOLOGY IN FORENSIC LABORATORY: THE SKELETON OF A MEDIEVAL MAN WITH ARROWHEADS (LOBOR, CROATIA)
Z. Hincak¹, D. Mihelić², K. Filipec³, I. Špoljarić², G. Mršić², I. Bačić², A. Mikulka¹
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Abstract
During the summer archaeological excavation in 2002, on the archaeological site Our Lady of the Mountain Church in Lobor, the grave number 149 was revealed, with skeletal remains of a young male person. It was dated to the first half of the 10th century. The very position of the grave in the first raw beside a Pre-Romanesque church, accentuate the status of this person in the society. According to the grave pit contour it is possible to conclude that the body was placed inside a coffin and buried. It was a primary burial with the position of the grave West-East (the head toward West). During the excavation of the skeleton, it was noticed that the tip of a broad arrowhead penetrated shallow into the body of the right scapular bone. Other, completely preserved arrowhead was placed beneath the fragments of the same bone. The arrowheads were not grave objects or gifts, but a part of a weapon thrust into the region of the right upper part of the body (around the right arm). An anthropological analysis was performed: determination of sex and age at death, of body height, of musculo-skeletal stress markers, and description of trauma and other pathological conditions. With the application of a scanning electron microscopy (SEM) and a X-ray fluorescence spectroscopy (µXRF) an elemental chemical analysis, together with a morphological 2D and 3D characterization of the arrowhead were obtained.