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BURNT HUMAN REMAINS

RECOVERY, ANALYSIS,
AND INTERPRETATION

Edited by

**Sarah Ellingham, Joe Adserias-Garriga,
Sara C. Zapico and Douglas H. Ubelaker**



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Burnt Human Remains

Recovery, Analysis, and Interpretation

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She has published extensively on forensic anthropology and skeletal biology. She has reported on about 500 forensic cases. To this date, 20 PhD. students have already completed their PhD. under her supervision. Her research interests include, among others, identification and age at death.

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Dennis C. Dirkmaat, PhD, D-ABFA, has been a board-certified forensic anthropologist since 1996. He was awarded the first (2020) Outstanding Mentor Award in the Anthropology Section of the AAFS. He is the 2021 winner of the AAFS' T. Dale Stewart Award for lifetime achievement in Forensic Anthropology. Dr. Dirkmaat is the Chair of the undergraduate program in Applied Forensic Sciences and the Master of Science in Anthropology graduate program at Mercyhurst University. Since 1986, Dr. Dirkmaat has conducted nearly 1000 forensic anthropology cases and has testified in court over 28 times as an expert witness. Chair of the Search and Recovery Committee of the Scientific Working Group-Disaster Victim Identification (SWG-DVI) group and co-chair of the Anthropology Committee of SWG-DVI (FBI, NIJ). Committee member of the Disaster Victim Identification Subcommittee OSAC. Dr. Dirkmaat has participated as a primary forensic anthropologist with the US Federal Government's Disaster Mortuary Operational Response Team (DMORT).

Peter Ellis, OAM, MB, FRCPA, is a forensic pathologist who has worked in Sydney and Queensland, Australia. He has extensive experience in all aspects of forensic pathology and is Adjunct Professor in Forensic Medicine and Pathology at Griffith University.

He has a special interest in identification science and has actively participated in numerous mass fatality incidents in Australia, New Zealand, and in SE Asia. He was the lead Australian pathologist for the Tsunami response in late 2004 and has also worked on forensic operations in Kosovo, East Timor, and Sri Lanka. He was the consulting forensic pathologist to the WWI Fromelles mass grave project based in northern France. He has worked as the Chair of the Interpol DVI Pathology / anthropology sub-working group and has lectured extensively in Australia and SE Asia.

David Errickson, PhD, is a senior lecturer in forensic archaeology and anthropology at Cranfield University, United Kingdom. He is a certified forensic anthropologist (Cert-III) with the Royal Anthropological Institute of Great Britain and Northern Ireland (RAI), an Associate of the Chartered Institute for Archaeologists (ACIfA), and a lead archaeologist for Cranfield's Recovery and Identification of Conflict Casualties Team (CRICC) who partner with the Defense Prisoner of War / Missing in Action Accounting Agency (DPAA). David gained his PhD. from Teesside University, UK, where he investigated the application of 3D imaging to forensic anthropological context, including the display of information within the court. He further holds an MSc in Forensic Archaeology and Crime Scene Investigation, a BSc in Archaeology, and a Diploma in Professional Archaeology Studies. David has a substantial number of publications relating to 3D documentation in both anthropological and archaeological contexts.

Maria Teresa Ferreira, PhD, holds a PhD. in Anthropology, branch of Forensic Anthropology, and is Assistant Professor in the Department of Life Sciences at the University of Coimbra. At present, she is Coordinator of the Master of Forensic Anthropology and Vice-Coordinator for the branch of Forensic Anthropology of the PhD. in Anthropology; Vice-coordinator of the Center for Functional Ecology – Science for People and the Planet; Co-curator of the 21st Century Identified Skeletal Collection, Laboratory of Forensic Anthropology, Department of Life Sciences, University of Coimbra. She investigates mainly in the areas of Forensic Anthropology (namely, Forensic Taphonomy) and Bioarchaeology (in particular, slavery in the early days of Portuguese maritime expansion).

Hanna Friedlander, MA, is the Human Remains Analyst and Unidentified Remains Coordinator for the Michigan State Police (MSP), Missing Persons Coordination Unit. Her duties as the in-house forensic anthropologist include aiding federal, state, and local law enforcement in the search, detection, recovery,

and identification of missing persons and unidentified remains within the State of Michigan. This includes cold case work, Native American (NAGPRA) repatriations, and the development and implementation of forensic anthropology trainings for law enforcement and other stakeholders. She is a responder for the Emergency Management Assistance Compact (EMAC) Program through the MSP Emergency Management Homeland Security Division and Forensic Anthropological Consultant for Kenyon International Emergency Services. She completed her MA in Biological Anthropology at the University of Alberta. Her interests include heat-related bone alteration, trauma analysis, 3D technology pertaining to trauma analysis, and skeletal marker assessment utilized for the identification of unidentified remains.

Alison Galloway, PhD, D-ABFA, is Professor Emerita, University of California, Santa Cruz and a board-certified forensic anthropologist. Her research focuses on time since death, effects of traumatic injury, and the consequences of thermal damage to human remains. She is co-editor of *The Evolving Female: A Life History Perspective*, *Broken Bones: Anthropological Analysis of Blunt Force Trauma*, and *Forensic Anthropology and the U.S. Judicial System*. She continues to practice forensic casework in central California.

David Gonçalves, PhD, is a biological anthropologist at the Portuguese Directorate-General for Cultural Heritage. At the Archaeosciences Laboratory, he currently undertakes research in human bioarchaeology and provides expertise on the management of archaeological activity involving human remains. He has dedicated most of his research career to the study of burnt human bones and teeth and is the co-developer of the first ever reference collection composed of experimentally burnt skeletons which is housed at the Laboratory of Forensic Anthropology of the University of Coimbra. By combining macroscopic with physical-chemical analyses, David has been attempting to find new and more reliable methods of retrieving relevant information from human bones and teeth subjected to heat.

Denice Higgins, PhD, is a researcher and forensic odontologist at the University of Adelaide. She received her doctorate in forensic biology on DNA identification from degraded human teeth. Dr. Higgins also holds a Bachelor of Dental Surgery and a Graduate Diploma in Forensic Odontology. She is the Director of the Forensic Odontology Unit in Adelaide, providing services to Australian Government and Policing Agencies. She worked on several large-scale DVI events and further coordinates and teaches a Graduate Diploma course in Forensic Odontology and supervises research students. She chairs the Medical Sciences Scientific Working Group for the National Institute of Forensic Science, Australia and New Zealand Policing Advisory Agency and is the President of both the Australian Society of Forensic Odontology and the South Australian Branch of the Australian and New Zealand Forensic Science Society. Dr. Higgins is a fellow of both the International

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Kalyna Horocholyn, MA, was born and raised in Winnipeg, MB. From a young age, she has always been fascinated with stories, the connections between people, and the different ways that life histories are shared. Kalyna completed her Bachelor of Science in Bioarchaeology at the University of Winnipeg in 2010. She completed her Master of Arts in Anthropology at the University of Alberta in 2013, with her research focus on examining cremated remains for the purpose of microscopically identifying human remains from other larger mammalian remains. She attended McMaster University in Hamilton, ON, and obtained the title of PhD. Candidate before seeking new ways of connecting with people, as her interest in the dead had waned and she yearned to work with the living once more. Kalyna lives in Kitchener, ON, with her wife, Erin Horocholyn, and their three cats and one dog. Kalyna is now pursuing a professional career in social work with ambitions to become a counselor.

Ashley Kendell, PhD, is an Associate Professor of Anthropology and the Coordinator for the Certificate in Forensic Science at California State University, Chico. Having worked as a death investigator for five years, she offers extensive experience in medicolegal death investigation and her research spans the sub-disciplines of bioarcheology and forensic anthropology. She is also a certified POST instructor, teaching homicide investigation courses to regional and state law enforcement. Currently, she is a co-editor of a volume focused on wildfire response and victim recovery, which is nearing completion.

Haley Khosrowshahi, MA, is a museum professional living in Washington, DC. Her work at the Smithsonian National Museum of Natural History in the Anthropology Department under forensic anthropologist Dr. Douglas H. Ubelaker fostered a passion for research and further exploring the forensic contributions to human rights. After finishing a BA in Archaeology at the George Washington University, Haley moved to California to pursue an MA in Museum Studies at the University of San Francisco. Her studies focused on cultural heritage, museum law, and different ways museums could engage visitors. Her thesis titled: "Transparency through Display: Using Orphaned Collections to Reconnect with Museum Audiences," focused on how museum objects with unclear ownership could still be informative and tell a compelling narrative that museums should explore with new curatorial models.

Alexandra R. Klales, PhD, D-ABFA, is an Associate Professor of Forensic Anthropology at Washburn University and is the founder / director of the Washburn University Forensic Anthropology Recovery Unit (WU-FARU), which conducts forensic anthropological casework in Kansas and Missouri. She earned

a BA in Anthropology from the University of Pittsburgh, MS in Forensic and Biological Anthropology from Mercyhurst University, and a PhD. in Anthropology from the University of Manitoba. Dr. Klales is a board-certified Diplomate (#123) of the American Board of Forensic Anthropology, a Member of the Anthropology Section of the American Academy of Forensic Sciences, and editor of the journal *Forensic Anthropology*. Her research focuses on improving biological profile methods, understanding skeletal sexual dimorphism, and developing protocols for the forensic archaeological recovery of human remains. She teaches courses in biological anthropology, forensic anthropology, human skeletal biology, and forensic archaeology at Washburn University and as continuing education forensic anthropology short courses.

Calil Makhoul, MSc, is PhD. student in Anthropology, branch of Forensic Anthropology, in the University of Coimbra. He is an invited lecturer in the Superior Institute for Social and Political Sciences at the University of Lisbon. Currently, he is a forensic autopsy technician and a member of the DVI Portuguese team in the National Institute of Legal Medicine and Forensic Sciences, Center Branch, in Coimbra. He is a level II certified forensic anthropologist of FASE-Forensic Anthropology Society of Europe. He investigates mainly in the areas of Forensic Anthropology (namely, commingled Human Burnt Remains) and Forensic Entomology (in particular, successional entomofauna).

Pamela Mayne Correia, MA, Pamela completed her MA at the University of Alberta. She is an academic at the University of Alberta, Anthropology Department. Her research interests are in the area of the analysis of cremated human skeletal material, trauma analysis, bone taphonomy and in human identification, problems related to cremation, taphonomy, and the identification of human remains using traditional histological methods. She is curator for the three museum collections managed by the Department of Anthropology. Pamela provides the core courses and instruction in forensic anthropology. She was the Chair of the Anthropology / Medical / Odontology Section of the Canadian Society of Forensic Sciences for ten years. She is a consulting forensic anthropologist for the Office of the Chief Medical Examiner and has contributed to numerous cases for the RCMP, Medical Examiner, and Archaeological Survey since 1989. As part of this work, Mayne Correia is involved in the Missing Children / Persons and Unidentified Human Remains Project in Alberta, as well as ongoing identification of human remains.

Alexandria McDaniel, MS, holds a BS in Anthropology with a minor in Criminal Justice and an MA in Bioarchaeology from the University of Indianapolis. She is a Medicolegal Investigator I at the Office of Chief Medical Examiner in New York City. She believes that investigating the death of an individual is important in providing crucial information that is essential for the criminal justice system

and public health, but also providing a voice for those who cannot speak for themselves. She has her ABMDI Board Certification. She studied low thermal alterations of pig bone at sub-ignition point.

Raymond Miller, DDS, is the forensic dental consultant to the Office of the Erie County Medical Examiner in Buffalo, NY, and a Clinical Associate Professor at the University at Buffalo School of Dental Medicine. He is a member of the Disaster Mortuary Operational Response Team and deployed to the World Trade Center, Hurricane Katrina, and the crash of Flight 3407. Dr. Miller is a retired Lieutenant Colonel and served as the Base Dental Surgeon for the 107th Attack Wing of the New York Air National Guard. He has served as the Odontology Section Chair of the American Academy of Forensic Sciences and is the Vice-chair of the American Dental Association's Standards Committee on Dental Informatics for Forensic Odontology. He has served as a forensic dental representative to the Disaster Victim Identification Subcommittee for the federal Organization of Scientific Area Committees and the American Academy of Forensic Sciences Standards Board.

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University in Erie, Pennsylvania and a master's and PhD. in Anthropology from Stony Brook University in Stony Brook, New York. Her work focuses on the evolutionary and developmental variation of the human skull, anatomy education in the health professions, and improving diversity and inclusion in biological anthropology and anatomy.

Pier Paolo Petrone, MSc, is head of the Laboratory of Forensic Anthropology at the University Federico II of Naples, Italy. He carried out several archaeological excavations of pre-protolithic and historical sites in Italy, North Africa, and Asia. His studies mainly focus on the effects and causes of death of the victims of the Vesuvius eruptions. Research on sites buried by the AD 79 and OBA Avellino Pumices events has provided useful information for the mitigation of the volcanic risk that affects three million people in metropolitan Naples. The results of these studies, published in prestigious journals (*Nature*, *PNAS*, *New England Journal of Medicine*, *PLoS ONE*), have been reported in the world press and are the subject of several scientific documentaries (Discovery Channel, BBC, History Channel, National Geographic, etc.). In 2019, his project: "Genetic Exploration of the Population of Herculaneum in AD 79" was funded by the National Geographic Society with a Research Grant.

Kassandra Pointer, BA, B.Ed, is a multidisciplinary educator and continuing-education specialist currently residing in Lethbridge, Alberta. Ms. Pointer completed her Bachelor of Arts in Biological Anthropology at the University of Alberta in 2015, having culminated her degree by partaking in a human osteological dig through the Slavia Foundation in Poland. During her Bachelor of Arts, Kassandra completed her undergraduate honor thesis on the histological analysis of cremated human bone, along with Pamela Mayne Correia. In 2019, she obtained her Bachelor of Education in Science Education from the University of Lethbridge, where her love of human anatomy melded with her adoration for teaching. She is now a substitute teacher in high school science and teaches adult courses at a continuing education center.

Elayne Pope, PhD, is a Forensic Anthropologist who researches how the human body burns, for application to fatal fire casework. She received her doctorate from the University of Arkansas in 2007 for: "The Effects of Fire on Human Remains." Dr. Pope has been a researcher and instructor for the San Luis Obispo Fire Investigation Strike Team (SLO FIST) Fatal Fire Death Investigation Course since 2008, where human cadavers are utilized to recreate fatal fire scenes (www.slofist.org). She worked as the Autopsy Supervisor and forensic anthropologist for six years at the Tidewater Office of the Chief Medical Examiner in Norfolk, Virginia. Dr. Pope is currently a forensic consultant and owner of Fatal Fire Forensics LLC.

(www.burnedbone.com) who specializes in legal / civil fatal fire case review and examinations, burn pattern analysis, skeletal trauma analysis, expert witness and testimony, training lectures and course instruction, and identification of fragmentary burnt bone (human vs. non-human / non-bone).

Julie Roberts, PhD, ChFA, is a Chartered Forensic Anthropologist (Cert FA-I) and archaeologist with over 20 years of practitioner experience in the excavation, analysis, and interpretation of burnt human remains. She received her PhD. from the University of Glasgow for her research into war crimes against children in Kosovo and Bosnia-Herzegovina in the 1990s. She is current Chair of the British Association for Forensic Anthropology, and the forensic anthropology coordinator for UK DVI, the national capability of the UK police service to respond to mass fatality incidents. She is company Scientific Advisor for Alecto Forensic Services, and a Visiting Research Fellow in the Faculty of Science at Liverpool John Moores University. Her research interests include analysis of factors which influence DNA success rates in mass fatality incidents, multidisciplinary approaches to improve identification rates in forensic and humanitarian contexts, and interpreting sequences of events in burnt and dismembered remains.

Christopher W. Schmidt, PhD, received his PhD. in Biological Anthropology from Purdue University in 1998. His research areas include the study of human teeth and the study of burnt human remains. His books include: *Long on the Tooth, Dental Wear in Evolutionary and Biocultural Contexts*, co-edited with Jim Watson, and two editions of *Analysis of Burned Human Remains*, co-edited with Steve Symes. His primary area of research is dental microwear texture analysis, although he has published on a wide range of topics including Neandertal diet, paleopathology, historic cemeteries, bone tools, and tissue rehydration. The journals in which he has published are, likewise, diverse and include *Paleoanthropology*, *American Journal of Physical Anthropology*, *North American Archaeologist*, *Physics Today*, *Surface Topography: Metrology and Properties*, and the *Journal of Forensic Sciences*.

Austin A. Shamlou, MSc, attended The George Washington University and graduated with a Bachelor of Science in Biological Anthropology. During her time in Washington, DC, she volunteered at the National Museum of Natural History, assisting Dr. Ubelaker on a few of his projects. In the summers of 2017 and 2018 she participated in three field schools in Austria, Romania, and Poland, emphasizing her passions for osteology and bioarchaeology. Shamlou then attended Boston University School of Medicine and received her MSc in Forensic Anthropology. Her thesis research focused on frontal sinus variations as seen on computed tomography scans. Her current research interests are around human osteology and variation, digital data and distribution, as well as diversity and inclusion within the field.

Christophe Snoeck, PhD, is a Research Professor at the Vrije Universiteit Brussel (VUB, Belgium), and the head of the Brussels Bioarchaeology Lab (BB-LAB – www.bb-lab.be). He combines his multidisciplinary expertise in bioarchaeology and isotope geochemistry to answer key archaeological questions, with a particular focus on populations that practiced cremation. Since January 2018, he has also been the Scientific Coordinator of the CRUMBEL project - Cremation, Urns and Mobility: population dynamics in BELgium (www.crumbel.org), funded by the Belgian Excellence of Science program (EoS). And since 2021, with the start of his ERC Starting Grant LUMIERE (www.erclumiere.be), he aims to develop new proxies for the study of charred and calcined bone to answer questions of mobility and landscape use at the European level.

Rebecca Stone-Gordon, MSc, holds a BA in History and Anthropology and an interdisciplinary MS in audio technology and visual media from American University, in Washington, DC. She is currently working on an MA in Public Anthropology (Biological Anthropology and Archaeology) at the same university. Her research areas include feminist theory, disability studies, the history of anatomy, archaeology, and horror film and literature. She specializes in representations of anthropology, archaeology, and mummies in Anglo-American feature films. She is also involved in interdisciplinary forensic projects at the Smithsonian Institution. She is the director of volunteer management for the Museum of Science Fiction.

Tim J.U. Thompson, PhD, is Dean of Health and Life Sciences and Professor of Applied Biological Anthropology at Teesside University. He has been practicing, researching, and teaching forensic anthropology for over 20 years, and has published over 70 peer-reviewed papers, chapters, and books. He is an expert in the effect of burning on the skeleton and previously published *The Archaeology of Cremation*. He was Editor-in-Chief of the journal *Science & Justice* and the *Journal of Forensic & Legal Medicine*, is a Fellow of five professional bodies, and holds a prestigious National Teaching Fellowship for excellence in teaching and the support for learning. In 2021 he was appointed President Elect of the Chartered Society of Forensic Sciences.

Yara Vieira Lemos, MSc, holds a BSc in Medicine and MSc in Health Sciences. She is a Certified Specialist in Legal Medicine. She is a Medical Examiner at the Civil Police of Minas Gerais, working mainly at the Laboratory of Forensic Anthropology and Applied Thanatology. She is also a roster member of JRR (Justice Rapid Response) and Assistant Professor at the Medical Sciences College of Minas Gerais. She was elected 2020–2022 President of the Brazilian Association of Forensic Anthropology (ABRAF) and is also an associated editor of the *Brazilian Journal of Forensic Anthropology and Legal Medicine*.

P. Willey, PhD, D-ABFA, is Professor Emeritus of Anthropology at Chico State University, California. He is a Diplomate of the American Board of Forensic Anthropology. In retirement, he remains actively involved in forensic anthropology, analyzing cases, participating in search and recoveries, and penning chapters. He authored *Prehistoric Warfare on the Great Plains: Skeletal Analysis of the Crow Creek Massacre Victims*, co-authored *They Died with Custer: Soldiers' Bones from the Battle of the Little Bighorn*, as well as *Mystery of the Bones: Syphilis, the Lewis and Clark Expedition, and the Arikara Indians*, and co-edited *Health of the Seventh Cavalry: A Medical History*. His final co-edited volume concerns a post-Civil War San Francisco anatomical waste deposit and it nears completion.

Amanda N. Williams, PhD, is an instructor with Truckee Meadows Community College Anthropology Department. She received her BA (2010) in Anthropology and Sociology from the University of Tennessee, Knoxville (2010), and her MA (2013) and PhD. (2020) in Biological Anthropology from the University of Montana. Dr. Williams primarily serves as an instructor, but also works in cultural resource management, where she actively engages in fieldwork, lab work, and serves as an osteological consultant for several firms and federal agencies within the northern Nevada and northern California area. Dr. Williams's research interests focus on forensic anthropology and the taphonomic processes affecting the human body after death. She is primarily interested in how these processes can be used to answer broader questions surrounding time since death estimates and used to reconstruct in situ conditions of death events. Her current research focuses on developing a broader scoring system for analyzing burnt human remains. Her primary research interests include forensic anthropology, taphonomy, and archaeology.

Lauren Zephro, PhD, is a forensic anthropologist based in central California. Lauren is currently the Forensic Services Director for the Santa Cruz County Sheriff's Office where she oversees crime scene investigation, the forensic laboratory, the property and evidence section, and the County's multidisciplinary sexual assault response team. Lauren earned her MA in Anthropology from the University of Tennessee, Knoxville, and her PhD. in Anthropology from the University of California, Santa Cruz. She is a certified latent print examiner and a Fellow of the American Academy of Sciences Anthropology Section. Her research interests and publications are primarily focused on skeletal trauma, secular change, method and theory in forensic anthropology, and burnt bone.

Preface

Thermally altered remains continue to pose a particular challenge to forensic practitioners tasked with their analysis and interpretation; consequently, it is a highly dynamic aspect of forensic science, with constant development and innovation, both in the field and in the lab.

The idea of this book originally arose from a workshop titled: “Some like it hot: A forensic analysis of burnt remains,” which we presented at the American Academy of Forensic Sciences’ 70th annual meeting in Seattle, 2018. Each of us having spent a significant portion of our careers working with and researching burnt remains from the angle of our respective disciplines (forensic anthropology, forensic odontology, molecular biology, and analytical chemistry), our aim was to gather forensic specialists at the forefront of their métiers in the study of burnt human remains, to provide a fresh look at the complexities involved in their recovery, analysis, and interpretation, as well as to present the most cutting edge research trends to tackle these forensic puzzles.

The overwhelming interest and feedback we received after the workshop highlighted the potential relevance of an updated textbook on the subject matter. This volume does not aim to replace, but rather build on and complement the existing excellent books covering the topic of burnt remains, such as Schmidt and Symes’ 2008/2015 *The Analysis of Burned Human Remains*, Thompson’s 2015 *The Archaeology of Cremation: Burned Human Remains in Funerary Studies*, Symes and Dirkmaat’s 2012 *Recovery and Interpretation of Human Remains*, and Fairgrieve’s 2007 *Forensic Cremation: Recovery and Analysis*.

Understanding the changes undergone by bodies when subjected to fire is of paramount importance for not only the determination of identity, but also the reconstruction of the events leading up to incineration and the determination of cause and manner of death. Therefore this book takes a novel and multidisciplinary approach to tackle the subject of burnt human remains. It is divided into four main sections. After a review of the History of the Study of Burnt Remains (Chapter 1), the first section focuses on the Search and Recovery of Burnt Human Remains from the Fire Scene (Chapters 2–4), delving into aspects such as scene analysis and interpretation for crime scene and death investigators, as well as search and recovery techniques to preserve forensic anthropologically and odontologically relevant material, context, and information. The second section looks at the Examination and Identification of Burnt Human Remains (Chapters 5–10). This includes detailing traditional and new approaches to classifying the degree of burn trauma, discussing the application of forensic medicine to determining the cause and manner of death in burnt remains, skeletal alterations though thermal exposure and the resulting challenges for biological profile estimation. It further

tackles the role of forensic odontology in the identification process of burn victims, as well as a review of novel and established approaches to trauma analysis on burnt skeletal remains. Section three looks at Analytical Approaches to the Analysis of Burnt Bone (Chapters 11–17). It covers the biochemical and structural alterations of bone subjected to fire and analytical techniques to observe and quantify them and correlating changes to temperature and exposure time, followed by a chapter on molecular changes and DNA profiling techniques from burnt bone, pointing out challenges, methods, and case examples. Further in this section, the classical approach of calorimetry to determine the degree of heat exposure is re-examined, as is the use of histology in order to distinguish human from non-human burnt bone fragments with a discussion on limitations to the technique. It elaborates how isotopic and elemental analysis on burnt bone can be used to reconstruct a person's mobility *in vivo*, as well as in some instances shed light on the burning conditions. A further chapter discusses the application of different imaging techniques, both 2D and 3D, which can be used for the analysis of heat-induced bone. The section closes with a presentation on the first reference collection of burnt remains, highlighting the availability of this skeletal assemblage for researchers, aiming to inspire more research in the field. The book finally concludes with a section on Case Studies (Chapters 18–22); following a statistical review of 44 years of forensic anthropology casework brought to the Smithsonian Institution in the Washington, DC area, four further chapters discuss the experience of their respective authors during casework in Brazil, the USA, and Afghanistan, giving not only practical, but furthermore international insights into the type of scenarios that law enforcement, medical examiners, and forensic anthropologists may find themselves confronted with regarding burned human remains. The final chapter constitutes an archaeological “cold case” – the analysis of the victims of the AD 79 eruption of Mount Vesuvius.

This book is intended to bridge the gap between research and practice. It is designed to be a “one-stop-shop” on the topic of burnt remains, and we are hoping it will become a valuable new resource for practitioners, academics, students, and the interested layperson alike. It is our aim to promote a multi- and interdisciplinary approach when facing burnt remains in case work and to inspire an increase in research in this ever-evolving field.

We would like to thank all contributing authors for agreeing to be part of this project and sharing their valuable insights and experiences. Thanks also to our editors at Wiley for their support and patience in the process of turning this project from an idea to a reality. And finally, thanks to you, our reader, for considering this book for your library. We hope it fulfills your expectations.

Sarah Ellingham
Joe Adserias-Garriga
Sara C. Zapico
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Series Preface

The forensic sciences represent diverse, dynamic fields that seek to utilize the very best techniques available to address legal issues. Fueled by advances in technology, research and methodology, as well as new case applications, the forensic sciences continue to evolve. Forensic scientists strive to improve their analyses and interpretations of evidence and to remain cognizant of the latest advancements. This series results from a collaborative effort between the American Academy of Forensic Sciences (AAFS) and Wiley to publish a select number of books that relate closely to the activities and Objectives of the AAFS. The book series reflects the goals of the AAFS to encourage quality scholarship and publication in the forensic sciences. Proposals for publication in the series are reviewed by a committee established for that purpose by the AAFS and also reviewed by Wiley.

The AAFS was founded in 1948 and represents a multidisciplinary professional organization that provides leadership to advance science and its application to the legal system. The 11 sections of the AAFS consist of Criminalistics, Digital and Multimedia Sciences, Engineering Sciences, General, Pathology/Biology, Questioned Documents, Jurisprudence, Anthropology, Toxicology, Odontology, and Psychiatry and Behavioral Science. There are over 7000 members of the AAFS, originating from all 50 States of the United States and many countries beyond. This series reflects global AAFS membership interest in new research, scholarship, and publication in the forensic sciences.

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