



McDONALD INSTITUTE CONVERSATIONS

Far from the Hearth

Essays in Honour of Martin K. Jones

Edited by Emma Lightfoot, Xinyi Liu & Dorian Q Fuller

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(Above) Martin Jones at West Stow, 1972 (with thanks to Ian Alister, Lucy Walker, Leonie Walker, and West Stow Environmental Archaeology Group); (Below) Martin Jones in a millet field, Inner Mongolia, 2010. (Photograph: X. Liu.)





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University of Cambridge
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Cover image: *Foxtail millet field near Xinglonggou, Chifeng, China, photographed by Xinyi Liu, September 2014.*

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CONTRIBUTORS

GRAEME BARKER

Department of Archaeology, University of
Cambridge, Cambridge CB2 3DZ, UK.

Email: gb314@cam.ac.uk

JAMES H. BARRETT

McDonald Institute for Archaeological Research,
University of Cambridge, Cambridge CB2 3ER, UK.

Email: jhb41@cam.ac.uk

TERRY BROWN

Manchester Institute of Biotechnology, School of
Earth and Environmental Sciences, University of
Manchester, Manchester M1 7DN, UK.

Email: Terry.Brown@manchester.ac.uk

GILLY CARR

Institute of Continuing Education, University of
Cambridge, Cambridge CB23 8AQ, UK.

Email: gcc20@hermes.cam.ac.uk

ANDREW C. CLARKE

McDonald Institute for Archaeological Research,
University of Cambridge, Cambridge CB2 3ER, UK.

Email: acc68@cam.ac.uk

MATTHEW J. COLLINS

Natural History Museum of Denmark, University of
Copenhagen, Copenhagen DK-1123, Denmark.

&

Department of Archaeology, University of
Cambridge, Cambridge CB2 3DZ, UK.

Email: matthew.collins@snm.ku.dk

GUANGHUI DONG

MOE Key Laboratory of West China's
Environmental System, Lanzhou University,
Lanzhou 730000, China.

Email: ghdong@lzu.edu.cn

RICHARD P. EVERSHERD

School of Chemistry, University of Bristol, Bristol
BS8 1TS, UK.

Email: R.P.Eversherd@bristol.ac.uk

DORIAN Q FULLER

Institute of Archaeology, University College
London, London WC1H 0PY, UK.

Email: d.fuller@ucl.ac.uk

CHRISTINE A. HASTORF

Department of Anthropology, University of
California-Berkeley, Berkeley, CA 94720, USA.

Email: hastorf@berkeley.edu

EVAN HILL

School of Natural and Built Environment,
Queen's University Belfast, Belfast BT7 1NN, UK.

Email: ehill08@qub.ac.uk

LEO AOI HOSOYA

Institute for Global Leadership,
Ochanomizu University, Tokyo 112-8610, Japan.

Email: hosoya.aoi@ocha.ac.jp

CHRISTOPHER O. HUNT

School of Natural Sciences and Psychology,
University of Liverpool, Liverpool L3 5UX, UK.

Email: c.o.hunt@ljmu.ac.uk

HARRIET V. HUNT

McDonald Institute for Archaeological Research,
University of Cambridge, Cambridge, CB2 3ER, UK.

Email: hvh22@cam.ac.uk

PENELOPE J. JONES

Menzies Institute for Medical Research, University
of Tasmania, Sandy Bay, TAS 7050, Australia.

Email: Penelope.Jones@utas.edu.au

SAMANTHA JONES

School of Geosciences, University of Aberdeen,
Aberdeen AB24 3FX, UK.

Email: samantha.jones@abdn.ac.uk

MASASHI KOBAYASHI

Hokuriku Gakuin University, I-11, Mitsukoji-machi,
Kanazawa, Ishikawa Prefecture 920-1396, Japan.

Email: masashi@hokurikugakuin.ac.jp

SHINJI KUBOTA

Kanazawa University, Kakuma-cho, Kanazawa,
Ishikawa Prefecture 920-1192, Japan.

Email: shinjikubota@hotmail.com

CARLA LANCELOTTI

CaSEs Research Group (Culture and Socio-
Ecological Dynamics), Department of Humanities,
Universitat Pompeu Fabra, Barcelona 08005, Spain.

Email: carla.lancelotti@upf.edu

CYNTHIA LARBAY

Department of Archaeology, University of
Cambridge, Cambridge CB2 3DZ, UK.

Email: cdal3@cam.ac.uk

HAIMING LI

MOE Key Laboratory of West China's
Environmental System, Lanzhou University,
Lanzhou 730000, China.

Email: lihaimingboy@126.com

EMMA LIGHTFOOT

McDonald Institute for Archaeological Research,
University of Cambridge, Cambridge CB2 3ER, UK.

Email: elfl2@cam.ac.uk

DIANE L. LISTER

McDonald Institute for Archaeological Research,
University of Cambridge, Cambridge CB2 3ER, UK.

Email: dll1000@cam.ac.uk

XINYI LIU

Department of Anthropology, Washington
University in St. Louis, St. Louis, MO 63130, USA.

Email: liuxinyi@wustl.edu

MARCO MADELLA

CaSEs Research Group (Culture and Socio-
Ecological Dynamics), Department of Humanities,
Universitat Pompeu Fabra, Barcelona 08005, Spain.

&

ICREA (Institució Catalana de Recerca i Estudis
Avançats), Barcelona 08010, Spain.

&

School of Geography, Archaeology and
Environmental Studies, The University of
Witwatersrand, Johannesburg 2000, South Africa.

Email: marco.madella@upf.edu

GIEDRE MOTUZAITE MATUZEVICIUTE

Department of City Research, Lithuanian Institute
of History, Vilnius 01108, Lithuania.

Email: giedre.motuzaitė@gmail.com

DACIA VIEJO ROSE

Department of Archaeology, University of
Cambridge, Cambridge CB2 3DZ, UK.

Email: dv230@cam.ac.uk

SHAWN O'DONNELL

School of Natural and Built Environment, Queen's
University Belfast, Belfast BT7 1NN, UK.

Email: S.O'Donnell@qub.ac.uk

HUGO R. OLIVEIRA

Manchester Institute of Biotechnology, School of
Earth and Environmental Sciences, University of
Manchester, Manchester M1 7DN, UK.

Email: hugo.oliveira@manchester.ac.uk

VICTOR PAZ

Archaeological Studies Program, University
of the Philippines, Diliman, Quezon City 1101,
Philippines.

Email: vjpaz@up.edu.ph

NATALIA A.S. PRZELOMSKA

Department of Anthropology, National Museum
of Natural History, Smithsonian Institution,
Washington, DC 20560, USA.

&

Smithsonian's National Zoo & Conservation Biology
Institute, National Zoological Park, Washington,
DC 20008, USA.

Email: PrzelomskaN@si.edu

MANON SAVARD

Laboratoire d'archéologie et de patrimoine,
département de biologie, chimie et géographie,
Université du Québec à Rimouski, Québec G5L 3A1,
Canada.

Email: Manon_Savard@uqar.ca

MARIE LOUISE STIG SØRENSEN

Department of Archaeology, University of
Cambridge, Cambridge CB2 3ER, UK.

Email: mlss@cam.ac.uk

CHRIS J. STEVENS

Institute of Archaeology, University College
London, London WC1H 0PY, UK.

Email: c.stevens@ucl.ac.uk

GUOPING SUN

Zhejiang Provincial Research Institute of Cultural
Relics and Archaeology, Hangzhou 310014, China.

Email: zjkgoffice@163.com

ZHIJUN ZHAO

Institute of Archaeology, Chinese Academy of Social
Sciences, Beijing 100710, China.

Email: zjzhao@cass.org.cn

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Acknowledgements

The initial idea of editing this volume grew out of a conversation between Xinyi Liu and Graeme Barker at St John's College, Cambridge in June 2016. The editors subsequently discussed the provisional layout of the volume. By April of the following year, our list of agreed contributors was complete. Abstracts followed, and the chapters themselves soon after. First of all, the editors would like to pay tribute to our 36 authors, whose excellent work and timely contributions made it all possible.

For the last two-and-a-half years, the volume has been known as 'Fantastic Beasts' in order to keep it a secret from Martin. As we enter the final stage, we wish to extend our thanks to all who have ensured Martin remains blissfully unaware, including Lucy Walker, and we offer her our sincere thanks. We are extremely grateful to Harriet Hunt, Diane Lister, Cynthia Larbey and Tamsin O'Connell, who are kindly

organizing the gatherings to mark Martin's retirement and the publication of this volume.

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*Xinyi Liu, Emma Lightfoot and Dorian Fuller
August 2018*

Foreword

The 28-year term of Martin Jones as the first George Pitt-Rivers Professor of Archaeological Science witnessed, and in part created, a transformation in the fields of environmental and biomolecular archaeology. In this volume, Martin's colleagues and students explore the intellectual rewards of this transformation, in terms of methodological developments in archaeobotany, the efflorescence of biomolecular archaeology, the integration of biological and social perspectives, and the exploration of archaeobotanical themes on a global scale. These advances are worldwide, and Martin's contributions can be traced through citation trails, the scholarly diaspora of the Pitt-Rivers Laboratory and (not least) the foundations laid by the Ancient Biomolecules Initiative of the Natural Environment Research Council (1989–1993), which he chaired and helped create. As outlined in Chapter 6, Martin's subsequent role in the bioarchaeology programme of the Wellcome Trust (1996–2006) further consolidated what is now a central and increasingly rewarding component of archaeological inquiry. Subsequently, he has engaged with the European Research Council, as Principal Investigator of the Food Globalisation in Prehistory project and a Panel Chair for the Advanced Grant programme. As both practitioner and indefatigable campaigner, he has promoted the field in immeasurable ways, at critical junctures in the past and in on-going capacities as a research leader.

The accolades for Martin's achievements are many, most recently Fellowship of the British Academy. Yet it is as a congenial, supportive—and demanding—force within the Pitt-Rivers Laboratory that the foundations of his intellectual influence were laid. Here, each Friday morning, the archaeological science community would draw sticks to decide who would deliver an impromptu research report or explore a topical theme. Martin is among the most laid-back colleagues I have worked with, yet simultaneously the most incisive in his constructive criticism. As a provider of internal peer-review he was fearless without being unkind. The themed Pitt-Rivers Christmas parties were equally impactful—on one occasion Alice Cooper appeared, looking ever so slightly like our professor of archaeological science.

Martin's roles as a research leader extended to several stints as head of the Department of Archaeology, chairing the Faculty of Archaeology and Anthropology and serving as a long-term member of the Managing Committee of the McDonald Institute for Archaeological Research. Having started his professional career as an excavation-unit archaeobotanist in Oxford, he was a long-standing proponent of the highly successful Cambridge Archaeological Unit. In the wider collegiate community, he is a Fellow (and was Vice-Master) of Darwin College and was the staff treasurer of the Student Labour Club. In all roles he fought valiantly and often successfully for the interests of his constituency. His capacity to fight for deeply held priorities while recognizing the value of diverse perspectives was of utmost importance. His nostalgic enthusiasm for the debate with archaeological science that was engendered by the post-processual critique is one signal of an underlying appreciation of plurality. His active support for the recent merger of the Divisions of Archaeology and Biological Anthropology, within our new Department of Archaeology, is another. As a scientist (Martin's first degree, at Cambridge, was in Natural Sciences) he values the peer-reviewed journal article above all scholarly outputs, yet has authored as many highly regarded books as a scholar in the humanities. His *Feast: Why humans share food* has been translated into several languages and won Food Book of the Year from the Guild of Food Writers. He views academia and society as a continuum, campaigning for archaeobotanical contributions to global food security (e.g. by promoting millet as a drought-resistant crop) and working with world players such as Unilever to encourage archaeologically informed decisions regarding food products.

That Martin's achievements and influence merit celebration is clear. That his colleagues and students wish to honour him is equally so. Yet does the McDonald Conversations series publish *Festschriften*? This is a semantic question. As series editor I am delighted to introduce a collection of important papers regarding the past, present and future of archaeobotany, representing its methodological diversity and maturity. That this collection concurrently pays respect to a treasured colleague is a very pleasant serendipity.

Dr James H. Barrett

Chapter 6

Martin Jones' Role in the Development of Biomolecular Archaeology

Terry Brown, Richard P. Evershed & Matthew Collins

Martin Jones's many research interests, in particular his contributions to our understanding of early agriculture, the changing role of food in prehistory and the development of agrarian societies, are well known, as documented by the various articles in this Festschrift. Those of us who have been around since the early years are also very much aware of the crucial role, arguably as important as his academic work, that Martin played in the establishment of biomolecular archaeology as a credible sub-discipline of science-based archaeology, both nationally and internationally. Many of us owe our careers to funding initiatives that Martin conceived, lobbied for and managed, and without his early guidance biomolecular archaeology today would be a much less vibrant area of research, and there would certainly be many fewer of us biomolecular archaeologists.

Archaeological scientists have studied preserved biomolecules since the early decades of the twentieth century, but during the late 1980s developments in analytical methods for the detection and identification of DNA, proteins and lipids gave a sudden impetus to the field. In the UK, the Science-Based Archaeology committee of the Science and Engineering Research Council (SERC), which Martin chaired, funded several projects using these new techniques, and the Bio-molecular Palaeontology initiative of the Natural Environment Research Council (NERC), which ran from 1989 to 1993, supported some of the earliest ancient DNA investigations. The researchers leading these projects came from varied backgrounds, including chemistry and genetics, as well as archaeology and palaeontology. What they shared was a common interest in ancient biomolecules and how these molecules could be used to enhance our understanding of the past.

In 1992, Martin met with Geoff Eglinton, the revered organic geochemist from Bristol University who was Chairman of the Biomolecular Palaeontology Steering Group, to discuss how this fledgling community of ancient biomolecules researchers could best

be supported. In *The Molecule Hunt*, Martin says, with masterly understatement, 'born out of that meeting was a programme that the UK's Natural Environment Research Council put in place ...'. That programme was the Ancient Biomolecules Initiative (ABI), to which NERC committed the massive, for those days, sum of £1.9 million (in comparison the Biomolecular Palaeontology programme was just £629,000). Getting NERC, or any funding body, to commit such a large amount of money was no easier in 1992 than it is now, and Martin's phrase 'born out of that meeting' refers to the delicate and protracted process by which concept notes, outline bids and a full bid were meticulously drafted, modified, presented to various NERC committees, defended, redrafted and resubmitted. Think normal grant application, but ten times more complex.

The ABI was a tremendous opportunity for UK research. It was also an opportunity that could have gone spectacularly wrong. The early 1990s were, in some respects, dark days for ancient biomolecules. This was most obviously true for ancient DNA, a series of impossible claims for million-year-old DNA culminating in a report concerning a 130-million-year-old weevil, whose liking for dinosaur blood was unknown, but which *Nature* published the day after the premiere of *Jurassic Park* in the USA. Ancient DNA was in danger of becoming a laughing stock (it was described in such terms to one of us by a very eminent British cell biologist at the time). Studies of ancient proteins and lipids were facing their own challenges, with high-profile papers reporting the use of unproven immunological methods to 'identify' proteins (often supposedly from human blood) on archaeological artefacts, and inappropriate low-resolution and insensitive chemical methods being employed to make equally unsupported 'identifications' of small molecules in archaeological residues.

It was essential that the ABI funded real science, and as such it needed strong leadership. This was provided by Martin Jones, who became Chairman of the Steering Committee, and Geoff Eglinton, who acted

as Programme Manager. They were unquestionably the best two people to lead the ABI, and looking back it might seem obvious that Martin and Geoff took on those roles. Together they possessed not only a vision for where the ancient biomolecules field might lead archaeologically and palaeontologically, but also a deep appreciation of the scientific rigour that was necessary to ensure that credibility was maintained. However, it is easy to forget that Martin and Geoff's roles involved a tremendous self-sacrifice: as the Chairman and Programme Manager, they were not allowed to apply for funding from the programme, and Martin in particular was forced to withdraw from the productive collaborations that he had previously set up, notably on ancient DNA from charred grain.

Many of us who were involved in the ABI look back on that period as among the most stimulating years of our research careers. Through judicious use of the money made available by NERC, the ABI funded 18 projects between 1993 and 1998 (Table 6.1a), involving 31 principal investigators and 21 postdoctoral and postgraduate researchers. The postdocs and postgrads included Robin Allaby, Martin Richards, Oliver Craig, Angela Gernaey, Colin Smith and others, who formed a new generation of young biomolecular archaeologists. The projects covered the full scope of ancient biomolecules research, and importantly included major studies into the processes responsible for decay of DNA, proteins, lipids and carbohydrates under different environmental conditions, thereby giving credibility to the field as a whole, and making major strides towards defining what was and was not possible in terms of biomolecular preservation and establishing the right and wrong techniques to use to investigate different classes of biomolecule. Annual Meetings of Principal Investigators and Research Associates were held every January in Cambridge and workshops devoted to specialized topics were organized at various other times (Table 6.1b). Throughout the programme, Martin was a continual source of energetic encouragement, guidance and stimulation, his insistence that everything that was presented should make sense to every person in the audience, regardless of their background and specialization, forcing all of us continually to evaluate the rationale and purpose to our projects.

As well as being a research success, the ABI had a major impact on NERC, which had acquired responsibility for science-based archaeology from SERC in the early 1990s but initially did not know what to do with it. The 200 delegates who attended the grand finale of the ABI—a one-day symposium at the Natural History Museum on 7 January 1998—included the Chief Executive of NERC, along with several Council members, who were genuinely enthused by what the

programme had achieved. By now Martin had joined NERC's Terrestrial and Freshwater Strategy Board, as well as the Science-Based Archaeology Strategy Group, and his influence, along with the success of the ABI, kept ancient biomolecules high in NERC's line of sight. Funding for science-based archaeology has never been easy to obtain in the UK, or anywhere else for that matter, but biomolecular archaeology consistently punched above its weight during the late 1990s and 2000s.

Through the ABI, Martin therefore helped to establish the careers and research groups of many of the now-senior members of the UK biomolecular archaeology community. But this is not the end of the story. As early as 1993, Martin had been exploring other sources of programme funding for science-based archaeology in general and biomolecular archaeology in particular. In 1994–5, as the NERC initiative was entering its final phase, Martin approached the Wellcome Trust (WT). The Trust was funding the History of Medicine, but Martin convinced Gavin Malloch, scientific programme officer at WT, and his colleagues to fund a 10 year programme in bioarchaeology, which ran from 1996–2006. Initially, many of us in the field thought that, taking account of the WT's interest in human disease, the bioarchaeology programme might be focused specifically on palaeopathology, which at that time was an important but not predominant part of biomolecular archaeology. Martin, however, successfully argued for a broad definition of human health, which encompassed areas as diverse as diet and domestication, and continued to promote this agenda during his period as Chairman of the Bioarchaeology funding panel. The WT programme therefore became happily structured so as to build upon the previous achievements of the Biomolecular Palaeontology and Ancient Biomolecules initiatives.

A key feature of the WT programme was a focus on individuals as well as projects. The programme funded a large number of PhD students, a smaller number of fellowships for postdoctoral researchers, and a select number of University Awards, which gave senior researchers five years of funding to be followed by a full-time position. Individuals who were supported by the programme included Alan Cooper, Mike Richards, Keith Dobney, Tamsin O'Connell, Jessica Pearson, Stephen Buckley, Hannah Koon and Kirsty Penkman, and through them biomolecular archaeology has benefitted from the emergence of a second group of research leaders including Eske Willerslev, Tom Gilbert, Ian Barnes, Greger Larson, Mike Bunce, Rhiannon Stevens and Beth Shapiro.

Martin was therefore directly responsible for both the initial establishment of biomolecular archaeology in the UK during the 1990s and the subsequent

development of the field during the 2000s when many of today's research stars were trained in UK laboratories. Those of us who began our careers way back in the 1980s never could have imagined how lucky we were that Martin Jones, Geoff Eglinton, Gordon Curry and others would together convince a range of

different funding agencies to support two decades of research into ancient biomolecules. The result has been a significant new community of academics, pioneers of different aspects of ancient biomolecule research, who promise to remain at the international forefront of the field for years to come.

Table 6.1. (a) Projects and (b) Workshops funded by the NERC Ancient Biomolecules Initiative (1993–1998).

(a) Projects	
D. Briggs & R. Evershed (University of Bristol)	Animal cuticles in the fossil record: organic preservation
T. Brown & G. Jones (UMIST, Manchester & University of Sheffield)	Using ancient DNA to distinguish between tetraploid and hexaploid wheats
T. Brown & G. Jones (UMIST, Manchester & University of Sheffield)	Using ancient DNA to distinguish between single grains of tetraploid and hexaploid wheats
M. Collins (University of Newcastle)	Understanding the causes behind the diagenetic stability of the bone protein osteocalcin
M. Collins, R. Hedges & M. Riley (University of Newcastle & University of Oxford)	Improving the analysis of ancient collagen, testing a mathematical model of collagen degradation
M. Collinson, P. Finch & A. Scott (Royal Holloway University of London)	Plant cuticles in the fossil record: diversity, evolution, and preservation of resistant biomacromolecules
G. Dover, G. Barker & A. Grant (University of Leicester)	Ancient and modern genetic signatures of animal breeding and management in Britain from prehistoric times
W. Grant & T. McGenity (University of Leicester & University of Reading)	Use of molecular techniques to investigate possible long-term dormancy of halobacteria in ancient salt deposits
E. Hagelberg (University of Cambridge)	The study of prehistoric migrations using DNA markers from archaeological bone
E. Hagelberg (University of Cambridge)	Improved methodologies for the analysis of DNA from human and animal bones
I. Head, K. Farrimond & R. Pickup (University of Newcastle & Institute of Freshwater Ecology, Windermere)	Molecular records of bacterial contributions to sedimentary organic matter
A. Lister & H. Stanley (University College London & Institute of Zoology, London)	Ancient and modern DNA from a variety of sources in a study of horse domestication
J Parkes, J Maxwell and R Evershed (University of Bristol)	Why do readily biodegradable organic compounds survive to be preserved as ancient biomolecules?
S. Rowland (University of Plymouth)	Quantitative composition of ancient sedimentary organic matter (OM) and relationship to bacterial necromass
C. Shaw & P. Rowley-Conwy (University of Durham)	The genetic differences underlying morphological divergence in early <i>Sorghum</i>
A. Smith, R. Thomas & R. Fortey (Natural History Museum, London)	The search for geologically ancient DNA from amber entombed insects
H. Stanley & J. Wheeler (Institute of Zoology, London & University of San Marcos, Peru)	New World camelid domestication and pre-Spanish llama and alpaca breeds
B. Sykes & R. Hedges (University of Oxford)	Investigating prehistoric human lineages
(b) Workshops	
Ancient DNA Workshop (organizer: B. Sykes)	Part of <i>Ancient DNA III</i> , Oxford, 22 July 1995
Ancient DNA in Cattle (organizer: G. Dover)	Leicester, 30 October 1995
Ancient Protein (organizer: M. Collins)	Newcastle, 18 December 1995
Biopolymers and Lipids (organizer: R. Evershed)	Bristol, 19–20 June 1996
Microbial Signatures in the Sedimentary Record (organizer: W. Grant)	University of Leicester, 2–3 September 1996
Ancient Seeds (organizer: T. Brown)	UMIST, 6 May 1997

