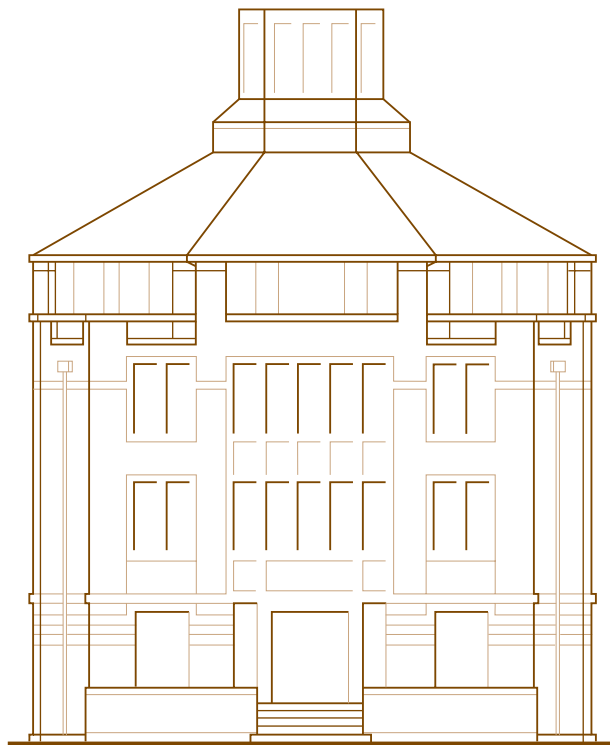




McDonald Institute for Archaeological Research

# *Annual Report 2002–2003*



*The McDonald Institute continued its successful series of projects, publications and seminars in 2002–2003, and also developed forward plans for the next three years. The Institute faces a period of change and challenge, in part imposed by changing arrangements within the University as a whole. It remains to be seen how fully-endowed institutions such as this will operate within the new structures of administration and finance. For this reason the Institute decided to suspend its customary triennial allocation of space and restrict allocations of space to a provisional period of one year in the first instance. Future research directions must also be considered, and in this perspective the Institute during the course of the year commissioned an independent academic review of its two major projects, the Illicit Antiquities Research Centre and the Human Population Genetics projects. Both were given strong approval and encouragement in the report of the Review Panel and were confirmed as key elements of the Institute's research agenda for a further period.*

*The Institute was also successful in winning additional research awards during the year, notably a large grant from the Alfred P. Sloan Foundation for the modelling of prehistoric demographics. The new major AHRB project on the study of early horse husbandry has also been established at the McDonald Institute and builds on the Institute's existing research strengths in this field. Excavation reports and conference proceedings (from meetings held at the McDonald Institute) continue to flow from the Institute's publication office along with the twice-yearly issues of the Cambridge Archaeological Journal and the newsletter Culture Without Context. Major conferences held during the year on materiality and archaeology, art and archaeology, and archaeoacoustics confirm the Institute's leading role in the development of new areas of research within the broad and exciting field of cognitive archaeology.*

# Events

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The key public event in the Institute's year was as usual the annual McDonald Lecture. The fourteenth in the series was delivered on 20 November 2002 by Professor Richard Bradley under the title 'A Life Less Ordinary: the Ritualization of the Domestic Sphere in Later Prehistoric Europe'. Professor Bradley, who lectures on European Prehistory at the University of Reading, specializes primarily in the study and interpretation of prehistoric settlements, landscapes and monuments and has excavated in England, Scotland, Scandinavia, Spain and Portugal. He has provided the following summary of his lecture.

## *The Fourteenth McDonald Lecture*

'A Life Less Ordinary' considered two tensions in contemporary archaeology. One was between specific structures, monuments and deposits as the result of either 'ritual' or 'practical' activities in the past, and the other was between an archaeology that focuses on subsistence and adaptation and one that emphasizes cognition, meaning and agency. It suggested that these tensions arise because of an inadequate conception of ritual itself. Drawing on recent studies of ritualization, it suggested that it might be helpful to consider how aspects of domestic life took on special qualities in prehistory. The discussion was based on Neolithic enclosures and other monuments, Bronze Age and Iron Age settlements and a series of earthworks that have been interpreted as late prehistoric sanctuaries. The case studies reviewed evidence from Western, Northern and Central Europe. The lecture concluded by suggesting that a greater emphasis on the process of ritualization would have implications both for social archaeology and for those scholars who study the formation of the archaeological record. The lecture was published in full in April 2003 in the *Cambridge Archaeological Journal* 13(1), 5-23.

The Vote of Thanks was moved by the Vice-Chancellor, Professor Alec Broers, and the lecture was followed by a reception at the McDonald Institute and by the annual McDonald Dinner at Queens' College.



*Professor Richard Bradley (centre) with Anthony Pitt-Rivers, Dr Jane Renfrew, Valerie Pitt-Rivers and Professor Renfrew at the reception following the Fourteenth McDonald Lecture.*

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## *Seminars*

The McDonald Institute Seminar Room was once again the venue for lectures, seminars and conferences throughout the year. These included the regular series of McDonald Institute Lunchtime Seminars, every second Wednesday in term-time, by researchers connected with or supported by the Institute, and the Thursday afternoon Garrod Research Seminars organized by the Department of Archaeology. In addition the Institute was host to seminars held by the American Archaeology Group, the Bronze and Iron Age Group, as well as an Aegean seminar series organized by Professor Renfrew and Dr Laura Preston, and a lecture on metallurgy and trade in metals by Dr J.G. Dercksen.

On 16th November 2002 the 5th Cambridge Heritage Seminar, 'Making the Means Transparent: Exploring Research Methodologies in Heritage Studies', was held at the Institute. Organized by John Carman, Mary-Catherine Garden, Yumiko Nakanishi, Hilary Soderland, and Marie-Louise Sørensen, this one-day event was part of their ongoing project of developing heritage studies as an explicit and critical field of academic investigation. The seminar took as its opening proposition that the crucial link between data and theory has been rather neglected in this field, and that consequently research methodology has become assumed rather than assessed. Twelve short papers from a range of disciplines were delivered in four sessions, each serving as an impetus for extensive discussion among the sixty participants. Diverse perspectives emerged from the analysis of different kinds of data sources, and a range of research methods was considered including interviews, questionnaires, participant observation, text analysis and 'people watching'. Discussions ranged from practical to ethical concerns.

On 22 January 2003 Jerome C. Rose of the University of Arkansas gave an account of excavations that he has been conducting in collaboration with Yarmouk University (Jordan) at late antique sites in the Decapolis region of north Jordan. Small rural sites with low-status tombs were selected for analysis because these sites best reflect the consequences of economic change, tax burdens, centralized administrative control and ecological factors such as weather. The construction of churches with elaborate mosaic floors testifies to the wealth available in these rural communities and large complex wine presses indicate the source. A new dimension for the socio-economic ranking of tombs is introduced by adding the quality of workmanship to size and complexity. Even individuals in the poorest tombs were buried with personal jewellery. Chemical analysis shows that much of the copper-alloy jewellery was made to resemble gold or silver, indicating that the wearers were trying to create an image of greater wealth than they possessed. This might suggest that some of the rural wealth filtered down to the lowest economic levels. The presence of 36–45 per cent of children in the tombs suggests that everyone who died was being placed in these tombs, and stable carbon and nitrogen analysis reveals a diet of grains and other agricultural products, along with some meat. There was no difference in diet between those buried in the largest and smallest tombs and comparisons over time show no meaningful difference in diet from the Late Bronze Age.

In a lunch-time seminar on 7 May 2003, Joan Oates presented the latest information then available on the situation in the Iraq Museum (based on the Paris UNESCO meeting, 17 April, and discussions with Dr Donny George in the British Museum on 29–30 April). It was known that the Museum offices had been ransacked and some 45 major objects had been stolen from the galleries, a few of which, including the famous Warka vase, have been returned. The storerooms, from which it is now clear that a large number of small objects are missing, had not then been examined owing to the absence of electricity. Regrettably, major



## ***McDonald Institute Lunchtime Seminars 2002–2003***

HARRIET CRAWFORD	<i>H3 Kuwait: gateway to the Arabian Gulf?</i>
JOHN MACGINNIS	<i>Excavations at the Assyrian site of Ziyaret in southeast Turkey</i>
CHRIS SCARRE	<i>Cumulative architecture: excavations at Prissé-la-Charrière in western France</i>
NICOLE BOIVIN	<i>Neolithic and megalithic landscapes of South India: the Bellary District Archaeological Project</i>
JEROME ROSE	<i>The tombs and people of north Jordan during Late Antiquity</i>
LOUIS DOUGHTY	<i>The Temper Project: training, education, management and prehistory in the Mediterranean</i>
LILIANA JANIK	<i>Cognition, art and the rock surface: prehistoric carvings from Russian Karelia</i>
COLIN RENFREW	<i>From land art to landscape archaeology</i>
JOAN OATES	<i>The looting of Iraq's heritage</i>
CORINNA ROSSI	<i>Caravan routes, water sources and Roman military installations: surveying the Kharga Oasis</i>
IAN HODDER	<i>Daily practice and social memory at Çatalhöyük</i>

objects such as the lifesize Akkadian copper statue and the Hatra heads have not as yet been returned. We currently know (information from Colonel Bogdanos, July 2003) that over 15,000 small objects had been stolen from the storerooms, including the whole of the cylinder-seal collection up to 1991 and numerous items of jewellery. Of these, many have been recovered, but an estimated 10,500 were still missing in July.

On 3 May 2003, Dr David Robinson and Dr Christopher Chippindale organized a seminar on rock art at the McDonald Institute which was followed by the opening of a special rock-art exhibit at the Cambridge University Museum of Archaeology and Anthropology, 'ROCK-ART – image – people – land – knowledge' (see p. 40).

## ***Conferences***

### ***Cultivating Archaeology: Innovations in Archaeology Conference (23–24 November 2002)***

Reflecting its vital role in human society, agriculture continues to be a central theme of contemporary research. The current emphasis on specialist and regional studies, however, has often precluded the opportunity to re-consider the agriculture as a subject in its own right. This conference, organized by Dr Melissa Goodman and Dr Helen Lewis, accordingly aimed to bring together specialists concerned with the cultivation of food from a wide range of research approaches and geographical settings in order to discover inter-connections and differences. The response from those interested to participate overwhelmed the capacity of the initial one-day conference, expanding it to two. Speaking to a full lecture room, the presenters can be said to have represented a global perspective on current research approaches, which ranged from assessment of historic records to microscopic analysis of soil. Interpretations of hydraulic technologies were explored by Charles Frederick on chinampa fields in the Basin of Mexico, and in Papua New Guinea by Tim

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Bayliss-Smith. Historical approaches were developed in a British context by Sue Oosthuisen and Rebecca Roseff, and in Iceland by Amanda Thompson. New perspectives on prehistoric landscape models were offered by Helen Lewis for Wessex and Melissa Goodman for the Peruvian Andes. Liliana Janik considered agricultural origins in the context of non-equilibrium ecosystems. Regional trajectories in the intensification of prehistoric Indian agriculture were developed by Dorian Fuller, and recent research in the Kala-Balge region of Nigeria was presented by Paul Adderly. Mim Bower related her research on ancient DNA to investigations of both plants and animals in agriculture. Geoarchaeological approaches were developed in many presentations. Soil as a limiting factor to Icelandic agriculture was explored by Ian Simpson; Roger Langhor reflected on his long experience with Belgian plaggen soils; and Manuel Arroyo-Kalin considered Amazonian dark earths. Comparative archaeo-pedological perspectives of European soils were presented by research teams from Ghent, Brussels and Sterling Universities. Poster presentations ranged from agriculture in South China, archaeobotanic work in Hellenistic Greece, the use of biogenetic silica to study irrigation, exploitation of the *Prosopis* tree in Peru, and the characterization of fishbone. Discussants Charles French, Donald Davidson, Christine Hastorf and Tjeerd van Andel shared their extensive expertise and helped illuminate common trajectories through these many themes. The organizers are grateful to the McDonald Institute for supporting this conference, and they wish to extend their warmest thanks to the speakers, discussants, poster presenters and participants. Finally, the efforts of all who helped make the Cultivating Agriculture Conference a success, in particular members of the Charles McBurney Laboratory and the McDonald Institute, are gratefully appreciated.

***Rethinking Materiality: the Engagement of Mind with the Material World (28–29 March 2003)***

‘Rethinking Materiality’ was the subject of the first part of a four-day international gathering focused upon new theoretical currents in archaeology, funded by the British Academy and the McDonald Institute and organized by Chris Gosden, Elizabeth DeMarrais, Colin Renfrew with Katie Boyle. Discussions centred upon two recent contributions to archaeological thought, namely the material basis of cognitive archaeology (Renfrew 2001) and the concept of ‘materialization’ seen as ‘the transformation of ideas, values, stories, myths, and the like into a physical reality that can take the form of ceremonial events, symbolic objects, monuments, and writing’ (DeMarrais *et al.* 1996, 16). The aim was to consider constitutive and instrumental aspects of material culture, as well as the strategic manipulation of resources seen in the process of materialization.

Conference participants included Elizabeth DeMarrais, Colin Renfrew, Chris Gosden, Lambros Malafouris, Carl Knappet, Nicole Boivin, Richard Bradley, Andrew Jones, Robin Osborne, Mike Rowlands, David Wengrow, and Clive Gamble from the UK; Kristian Kristiansen from Sweden; and Tim Earle, Mary Helms, John Clark, Liz Brumfiel, Susan Kus, Lynn Meskell, and George Cowgill from the United States. Discussions focused upon key thresholds in the human past, including sedentism, domestication, and the emergence of institutionalized social inequality. Contributors examined the impacts of transformations in the material conditions of life upon cognitive processes and symbolic behaviour, the making of cosmologies, and notions of the sacred. Through case studies, participants evaluated the nature and significance of each of the ‘key transformations’, with most agreeing that sedentism was more far-reaching in its implications than domestication. Contributors focusing upon the dynamics of power and inequality considered how studies of objects — from iconography to monuments — might deal more creatively with emotions, cognitive processes, and other ‘non-rational’ aspects of human experience. At the end of the conference, despite divergent theoretical perspectives, contributors agreed that materiality approaches hold rich potential for documenting and explaining the construction of new social realities in the ancient world. [REFERENCES: DeMarrais, E.,

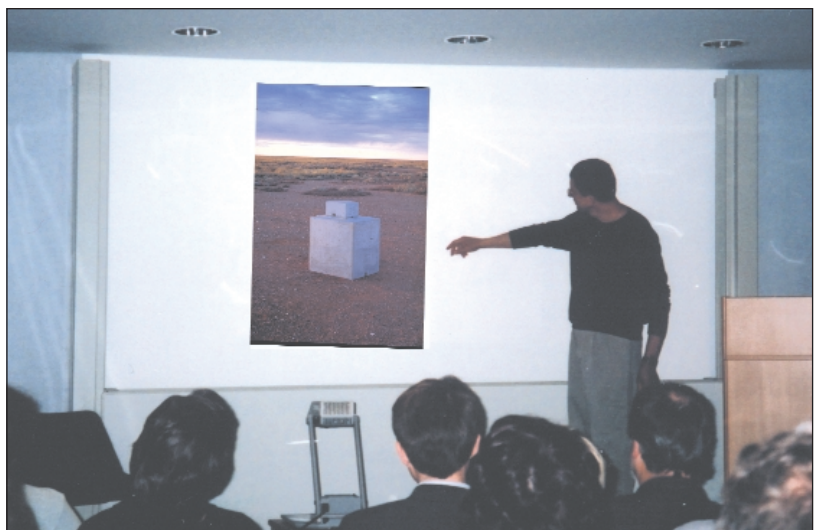


*'Rethinking Materiality' and 'Art as Archaeology' symposia participants (left to right). Back row: Lambros Malafouris, Simon Callery, Laura Basel, Clive Gamble, Marie-Louise Sørensen, Katie Boyle, Aaron Watson, Carl Knappett, Kristian Kristiansen, Fraser Sturt, Duncan Garrow, Nicole Boivin, Christopher Evans, Niels Johannsen, Sheila Kohring, George Cowgill, John Clark, Manuel Arroyo-Kalin, Antony Gormley, David Wengrow, Robin Osborne, Tim Earle, Colin Renfrew, Steven Mithen, Jacke Phillips, Lynn Meskell, Richard Bradley, Chris Gosden, Andrew Jones, Nicholas Saunders; Middle row: Joshua Pollard, Chris Scarre, Liz Brumfiel; Front row: Lotte Hedeager, Liliana Janik, Mary Helms, Susan Kus, Elizabeth DeMarrais.*

L. Castillo & T. Earle, 1996. Ideology, materialization and power strategies. *Current Anthropology* 37, 15–32; Renfrew, C., 2001. Symbol before concept: material engagement and the early development of society, in *Archaeological Theory Today*, ed. I. Hodder. Oxford: Polity Press, 122–40.]

### ***Art as Archaeology Symposium (30–31 March 2003)***

The Symposium 'Art as Archaeology and Archaeology as Art' was the second part of the four-day meeting organized by Chris Gosden, Elizabeth DeMarrais and Colin Renfrew which also included the 'Rethinking Materiality' Symposium. The entire meeting was attended by the speakers at both Symposia, which allowed for some lively discussion. The archaeologist contributors to the 'Art as Archaeology' Symposium were Chris Gosden, Chris Evans, Joshua Pollard, Nicholas Saunders, Colin Renfrew, Chris Scarre and Aaron Watson, and a



*Antony Gormley speaking at the Art as Archaeology Symposium.*



particularly welcome feature was the contribution by the artist Simon Callery, who showed slides of work from his current exhibition at Dover Castle. The sculptor Antony Gormley talked about his recent work, illustrated by slides, and the text of this talk and of the discussion will also be incorporated in the final publication.

### ***Identifying Intention in Ancient Uses of Acoustic Space and Structure (28–29 June 2003)***

From June 27 to 29, as part of its ongoing involvement in the developing archaeology of sound and music, the McDonald Institute sponsored and hosted a first international, multi-disciplinary meeting of researchers interested in the acoustics of archaeological sites. Organized by Chris Scarre and Graeme Lawson with the support of Liz Farmar and Katie Boyle, its purpose was to address, very specifically, the question of intention: whether — and if so, how — we can show that observed sound-properties of ancient landscapes and resonant spaces were deliberately selected or engineered. Some remarkable phenomena have been much in the news recently, but the purposes claimed for them remain, in our view, insufficiently established. The meeting therefore set out to bring together investigators from different fields to discuss common problems and to share insights afforded by different epistemological approaches across a range of cultural milieux. It sought in particular to explore interpretive strategies current in the now well-established archaeology of sound-related tool-use, such as music and sound-signalling behaviours, which might be applied to site and landscape studies. The role of ethnographical analogies and the interpretive potential of ethno-historical studies were also both high on the agenda.

Amongst the invited participants, Aaron Watson and Paul Devereux reviewed progress in understanding later prehistoric, and especially megalithic, monuments. Steven Waller (San Diego) and Joakim Goldhahn (Gothenburg) described correlations between rock-art locations and acoustical effects in the context of landscape. Theoretical aspects were reviewed and explored by Iain Cross, Ezra Zubrow (Buffalo) and Iain Morley. Graeme Lawson, Francesco d'Errico (Bordeaux) and Peter Holmes considered the nature and purposefulness of musical instruments of different archaeological periods, from the Upper Palaeolithic to the Late Bronze Age of Europe. Eleonora Rocconi (Cremona) detailed research on Ancient Greek theatres and their environs — one of the few classes of site for which an acoustical purpose cannot be doubted. Iégor Reznikoff (Paris) and Graeme Lawson described relationships between voices, instruments, liturgy and

architecture in churches and cathedrals of the European Middle Ages. The meeting was also attended, and sessions chaired, by distinguished colleagues from Cambridge and London Universities; publication is currently in preparation.



*Archaeoacoustics Conference participants (left to right). Back row: Richard Widdess, Paul Devereux, Joakim Goldhahn, Ezra Zubrow, Aaron Watson, Stuart Colam, Iain Morley, Jim Woodhouse; Middle row: Eleonora Rocconi, Iégor Reznikoff, Chris Scarre, Peter Holmes, Steven Waller; On stairs: Iain Cross, Graeme Lawson, Francesco d'Errico, Claire Barlow.*

# People

## McDonald Institute Committees

Membership of the two principal McDonald Institute committees was renewed at the beginning of the calendar year 2003. Professor Caroline Humphrey (Social Anthropology) was appointed a member of the Managing Committee, and Professor Paul Mellars (Archaeology) and Professor Nicholas Postgate (Oriental Studies) were reappointed, all for a period of three years (to 31st December 2005). They join Professor Lord Renfrew and Professor Martin Jones, who are *ex officio* members of the committee, and Dr Kate Pretty who is the nominee of the D M C McDonald Foundation. The Managing Committee reappointed Professor Postgate as its Chairman and in June 2003 the Committee decided to expand its membership and to co-opt Professor Martin Millett (Classics), bringing the number of committee members to seven.

The second McDonald Institute committee is the Advisory Committee of the D M McDonald Grants and Awards Fund. Dr Leslie Knapp, Dr Elizabeth DeMarrais and Dr April McMahon were appointed for a three-year term from 1 January 2003, joining Professor Lord Renfrew, Professor Jones and Dr Pretty.

We should like to thank those departing members of the two committees who have served us so well over the previous three years: Dr Robert Foley (Managing Committee), and Professor Caroline Humphrey, Professor Nicholas Postgate and Dr Preston Miracle (Advisory Committee).

## Institute Staff

The core staff of the Institute has remained as in previous years, with Mrs Deborah Parr as Chief Secretary and Secretary to the Director; Mrs Elizabeth Farmar, Secretary to the Deputy Director and Secretary to the *Cambridge Archaeological Journal*; and Mr Colin Lomas, Assistant to the Deputy Director with special responsibility for accounts and for the Institute buildings. The publication programme was ably handled by Miss Dora Kemp (whose job title was changed from Assistant Editor to Production Editor to reflect more accurately the nature of her duties), with assistance from Mrs Farmar and under the overall responsibility of the Deputy Director. Conference arrangements were managed by Dr Katie Boyle whose role has expanded to including the editing of some of the proceedings. Dr Boyle has

## PUBLICATIONS

### Colin Renfrew

- 2003 (ed. with K. Boyle & M. Levine). *Ancient Interactions: East and West in Eurasia*. (McDonald Institute Monographs.) Cambridge: McDonald Institute for Archaeological Research.
- 2003 Art and the artefact. *Museums Journal* 103(8) (August), 20–23.
- 2003 (with P. Forster). The DNA chronology of prehistoric human dispersals, in *Examining the Farming/Language Dispersal Hypothesis*, eds. P. Bellwood & C. Renfrew. (McDonald Institute Monographs.) Cambridge: McDonald Institute, 89–97.
- 2003 The emerging synthesis: the archaeogenetics of farming/language dispersals and other spread zones, in *Examining the Farming/Language Dispersal Hypothesis*, eds. P. Bellwood & C. Renfrew. Cambridge: McDonald Institute, 3–16.
- 2003 (ed. with P. Bellwood). *Examining the Farming/Language Dispersal Hypothesis*. Cambridge: McDonald Institute.
- 2003 *Figuring it Out: Parallel Visions of Artists and Archaeologists*. London: Thames & Hudson.
- 2003 (ed. with E.S. Elster). *Prehistoric Sitagroi: the Final Report*, vol. 2. Los Angeles (CA): UCLA Cotsen Institute.

### Chris Scarre

- 2002 (with L. Laporte & R. Jousaume). Le tumulus C de Péré à Prissé-la-Charrière (79). Etat des recherches après 6 années d'intervention. *Gallia Préhistoire* 44, 167–214.
- 2002 (with J.P. Mohen). *Les Tumulus de Bougon (Deux-Sèvres): complexe mégalithique du Ve et IVe millénaire*. Paris: Errance.
- 2003 Pioneer farmers? The Neolithic transition in western Europe, in *Examining the Farming/Language Dispersal Hypothesis*, eds. P. Bellwood & C. Renfrew. Cambridge: McDonald Institute, 395–407.



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### Harriet Crawford

- 2002 (with R. Carter). The Kuwait–British Archaeological Expedition to as-Sabiyah: report on the third season’s work. *Iraq* 64, 1–13.
- 2003 *The Archaeology of Bahrain: the British Contribution. Proceedings of Seminar held at the Brunei Gallery in July 2000.* (British Archaeology Reports International Series.) Oxford: BAR.

### Graeme Lawson

- 2003 (with F. d’Errico.) Microscopic, experimental and theoretical re-assessment of Upper Palaeolithic bird-bone pipes from Isturitz, France: ergonomics of design, systems of notation and the origins of musical traditions, in *Studien zur Musikarchäologie III: Archäologie früher Klangerzeugung und Tonordnungen*, eds. E. Hickmann, A.D. Kilmer & R. Eichmann. (Orient-Archäologie 10.) Berlin: Orient-Abteilung des Deutschen Archäologischen Instituts. Rahden Westphalia: Verlag Marie Leidorf.
- 2003 (with F. d’Errico, C. Henshilwood, M. Vanhaeren, A.-M. Tillier, M. Soressi, F. Bresson, B. Maureille, A. Nowell, J.A. Lakarra, L. Backwell & M. Julien). Archaeological evidence for the emergence of language, symbolism and music: an alternative multidisciplinary perspective. *Journal of World Prehistory* 17(1), 1–70.

### John MacGinnis

- 2002 (with T. Matney, M. Roaf & H. McDonald). Archaeological excavations at Ziyaret Tepe, 2000 and 2001. *Anatolica* 28, 47–89.
- 2002 The use of writing boards in the Neo-Babylonian administration at Sippar. *Iraq* 64, 217–36.
- 2002 Working in Elam, in *Mining the Archives, Festschrift Christopher Walker*, ed. C. Wunsch. Dresden: ISLET, 177–82.
- 2003 A corvée gang from the time of Cyprus. *Zeitschrift für Assyriologie* 93, 88–115.

also been acting as a research facilitator within the Institute, identifying potential sources of funding and disseminating information about them.

Researchers employed on individual projects are referred to in the reports which follow. The Illicit Antiquities Research Centre and the Human Population Genetics Projects remain the two core Institute research projects, employing Dr Neil Brodie and Ms Jenny Doole (IARC) and Dr Peter Forster (Human Population Genetics). The McDonald Institute also houses research and administrative staff supported by externally-funded projects: notably the Çatalhöyük team (Mr Craig Cessford, Ms Louise Doughty, Ms Shahina Farid and Mrs Katerina Smith), the Amarna project (Dr Pamela Rose) and the Tell Brak project (Ms Helen McDonald). Special mention must be made of Helen McDonald’s secondment to Iraq during the summer of 2003 to assist with antiquities and museum work in the aftermath of the war.

The Director, Professor Colin Renfrew, lectured at the British School of Archaeology in Rome in October 2002, in connection with the opening of the new lecture theatre there. He continued as a member of the Ministerial Illicit Traffic in Antiquities Panel under the chairmanship of Professor Norman Palmer, which worked on the wording of the Dealing in Cultural Objects (Offences) Bill, introduced as a Private Member’s Bill in the House of Commons by Richard Allen MP. He spoke in the Second Reading of the Bill in the House of Lords in September 2003. He participated in a public discussion with Antony Gormley at the British Museum in 2002, in connection with the exhibition at the British Museum of Gormley’s ‘Field for the British Isles’. He participated also in the public discussion with the sculptor Cornelia Parker at the Tate Britain in April 2003.

Professor Renfrew was co-organizer with Elizabeth DeMarrais and Chris Gosden of the symposium ‘Rethinking Materiality: the Engagement of Mind with the Material World’ in March 2003 (see p. 6). He attended the World Archaeological Congress in Washington DC in June 2003, presenting a lecture on the ethics of museum acquisitions, and a meeting of the Berlin Museums in May 2003 on the same topic.

Professor Renfrew spent the Easter Term on sabbatical, mainly in Greece, as Visiting Fellow at the British School at Athens,

delivering a lecture on the site Dhaskaleio-Kavos on Keros, and taking part in a seminar on Neolithic Greece. He was able to visit a number of archaeological sites in the Cyclades where significant excavations have recently taken place including Strophilas on Andros, and Akrotiri on Thera and to revisit sites at Naxos and Melos. He also delivered a lecture at the University of Ioannina. During the Long Vacation, he was Visiting Professor at the Institute of Anthropological Investigations at the National Autonomous University of Mexico (UNAM), delivering a series of lectures and chairing seminars on the archaeology of Mexico. It was possible to visit sites in Oaxaca, including Monte Alban and Mitla, and the excavations at the Pyramid of the Moon at Teotihuacan.

The Deputy Director, Dr Chris Scarre, continued his research on Neolithic monumentalism in Atlantic Europe, with a ninth season of excavations at Prissé-la-Charrière and a number of publications about landscape, colour and the Neolithic transition. In October 2002 he was joint organizer of the conference 'Origine et développement du mégalithisme néolithique de l'ouest de l'Europe' held at Bougon in western France. The conference coincided with the publication of the Bougon excavation report (Mohen & Scarre 2002) and drew together specialists from a range of European countries. The proceedings of the conference will shortly be published in dual-column English and French format. Dr Scarre delivered papers entitled 'Geology and landscape in the Neolithic monuments of northwestern Europe' at Evora in January 2003, 'Displaying the stones: the materiality of "megalithic" monuments' at Cambridge in March and 'Colour and stone in the megalithic monuments of western Europe' at Tomar in April. He also gave seminars at Reading and Oxford. In April 2003 he delivered the annual Taft Lecture at the University of Cincinnati on the subject 'Cumulative architecture: the megalithic monuments of western Europe'.

In June 2003 the Deputy Director was co-organizer along with Dr Graeme Lawson of a small but significant conference on archaeoacoustics (see p. 8). Sound should be one of the most significant themes in the study of the human past, yet archaeological remains are by definition mute, and the interpretation of prehistoric structures and spaces in terms of soundscape and acoustic design presents a considerable challenge, yet not one which is entirely beyond our reach. The conference sought to

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### Marco Madella

- 2002 (with D. Fuller). Issues in Harappan archaeobotany: retrospect and prospect, in *Indian Archaeology in Retrospect*, vol. II: *Protohistory*, eds. S. Settar & R. Korisettar. (Publications of the Indian Council for Historical Research.) New Delhi: Oxford and IBH, 317–90.
- 2003 (with M. Osterrieth & G. Ayala). The Late Pleistocene–Holocene environment and early human occupation of the Pampean coastal area, the Mar del Plata Project (Argentina), in *Second International Conference on Soil and Archaeology*, ed. G. Boschian. Pisa: Felici Editore, 167–70.
- 2003 (with A. Alexandre & T. Ball). International code for phytolith nomenclature 1.0. *The Phytolitharien* 15(1), 7–16.
- 2003 *Phytolith Analysis from the Iron Age Braehead Enclosure*. Report submitted to AOC Archaeology Group.

### Joan Oates

- 2003 Editorial note reporting on first UNESCO meeting (April 17) convened to consider the assistance that could be given to the Iraq Museum and other cultural institutions in the aftermath of the war. *Antiquity* 77, 224–5.
- 2003 A note on the early evidence for horse in western Asia, in *Prehistoric Steppe Adaptation and the Horse*, eds. M. Levine, C. Renfrew & K. Boyle. Cambridge: McDonald Institute, 115–25.

### Jacke Phillips

- 2002 (with A. Desie, C. Cain, N. Finneran & M. Harlow). Combating the destruction of Ethiopia's archaeological heritage. *Antiquity* 76, 955–6.
- 2002 (ed.) *El-Sheikh Mahmoud El-Tayeb, Genesis of the Makurian Culture in the Light of Archaeological Sources*. (Cahier de Recherches de l'Institut de Papyrologie et d'Égyptologie de Lille Supplément 6.) Lille: Université

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### Jacke Phillips (cont.)

- Charles-de-Gaulle Lille III.  
2002 (ed.) Review of E.M. Yamauchi ed., *Africa and Africans in Antiquity* (Ann Arbor: Michigan State University Press, 2001). *Journal of African History* 43, 313–14.
- 2003 Egypt, Nubia and Ethiopia, in *Egypt at the Dawn of the Twenty-First Century*, ed. Z. Hawass. (Proceedings of the Eighth International Congress of Egyptology, Cairo, 2000 II: History and Religion.) Cairo: American University in Cairo Press, 434–42.
- 2003 *Southern Dongola Reach Survey 1998: a Review of the Ceramics and Other Finds, in the Proceedings of the Ninth International Conference of Nubian Studies*. (Boston; on-line: www.nubianstudies98.com).
- 2003 An unconsidered trifle, in *The Synchronisation of Civilisations in the Eastern Mediterranean in the Second Millennium BC II. Proceedings of the SCIAM 2000-Euroconference, Haindorf, 2nd May –7th May 2001*, ed. M. Bietak. Vienna: Verlag der Österreichischen Akademie der Wissenschaften, 545–50.

### Laurence Smith

- 2002 Trading contacts between medieval Nubia and Egypt: two lines of evidence, in *The Archaeology of Contact: Processes and Consequences*, eds. K. Lesick, B. Kulle, C. Cluney & M. Peuramaki-Brown. (Proceedings of the 25th annual conference of the Archaeological Association, University of Calgary.) Calgary: Archaeological Association of the University of Calgary, 84–90.
- 2003 (with M. Serpico, J. Bourriau, Y. Goren, B. Stern & C. Heron). Commodities and containers: a project to study Canaanite amphorae imported into Egypt during the New Kingdom, in *The Synchronisation of Civilisations in the Eastern Mediterranean in the Second Millennium BC II*.

develop methodologies for identifying ways in which sound may have influenced the experience of early human societies, especially in the design of buildings and enclosed structures. The proceedings of the meeting are currently in preparation and will be published as a McDonald Institute Monograph.

## Arrivals

Two new research personnel were appointed by the McDonald Institute during the course of the year. The first, Philip Mills, joined the McDonald Institute on 9 June 2003 as a Research Assistant to Professor Martin Millett. The twelve-month project is funded by English Heritage and is intended to provide training in the skills of processing and publishing Romano-British pottery (see p. 37). The development of a standardized data base which can be used more generally for the classification and recording of Romano-British pottery is an integral part of this project. Philip Mills has extensive experience of work on Roman period small finds (including roof tile), not only from Britain but also from the Balkans.

The second new appointment was of a researcher who is already well known at McDonald Institute, Dr Marsha Levine. From 1 July 2003 she became Senior Research Associate on the project 'Palaeopathology and the origins and evolution of horse husbandry' (see p. 36). This three-year project is funded by a Major Research Grant from the Arts and Humanities Research Board, and by an additional grant from the Isaac Newton Trust. Dr Levine is already an acknowledged expert in this field and will be studying modern and ancient horse material from Central Asia, China and Lithuania, under the project director Professor Leo Jeffcott.

## Departures

It is with regret that we report the resignation in summer 2003 of Dr Matthew Hurles, who left the McDonald Institute to take up a new position at the Wellcome Trust Sanger Institute on 1 September. Dr Hurles joined the McDonald Institute in October 1999 and over the past four years has played a key role (alongside Dr Peter Forster) in developing the work of the Institute's Human Population Genetics Project. He will be succeeded in that laboratory by Dr Mim Bower, who will take up her post in early 2004.

## Shorter Appointments

There have also been a number of shorter-term research positions during the year. Mr Giorgos Gavalas returned to Cambridge in December 2002 and remained for five months working on preparation of the report on the excavations directed by Professor Lord Renfrew, Professor Christos Doumas and Professor Lila Marangou at Markiani, in the Cyclades. The report will shortly be published in the British School at Athens monograph series.

A second shorter research position (July to December 2003) is currently held by Dr Marco Madella who is carrying out research on oxygen isotopes and phytoliths, under the direction of Professor Martin Jones.

## Research Fellows

Dr Nicole Boivin was appointed a Post-Doctoral Research Fellow of the McDonald Institute for a period of 22 months from 1 October 2002. The Fellowship is one of those jointly funded by the Isaac Newton Trust and the McDonald Institute. She joins Dr Kate Spence who is now approaching the end of her second year as Research Fellow (see an account of her project on p. 31). Dr Boivin completed her PhD at Cambridge in 2001, combining ethnographic and geoarchaeological techniques to the study of building materials and domestic space in rural Rajasthan, India. She is currently co-directing a major research project on the Neolithic of South India, an account of which is included below (p. 30). Dr Boivin is also writing a book on material culture and co-editing a volume of papers on cultural perceptions of the mineral world.

A further Post-Doctoral Research Fellowship was advertised in March 2003. Interviews were held in May, but after discussion it was decided to readvertise the position in September, with a view to an appointment beginning early in the New Year.

## Fellows and Visiting Fellows

In addition to Research Fellows who are salaried employees, the Institute also has a category of non-stipendiary Fellowships for Cambridge-based researchers of post-doctoral status. In February 2003 the Managing Committee appointed Professor Robert Dewar to be a Fellow of the McDonald Institute for a period of three years from 1 October, followed in June by Dr Laurence Smith who was offered Fellowship of the McDonald Institute for a period of three years from 1 June 2003. Four existing Fellowships were extended during the course of the year: Dr Marco Madella for a further twelve months from 1 October 2002; Dr Jacke Phillips for two years from 1 April 2003, and Ms Janine Bourriau for three years from 1 June 2003. The full list of Fellows of the McDonald Institute during the academic year 2002–2003 is as follows:

### PUBLICATIONS

#### Laurence Smith (cont.)

*Proceedings of the SCIEM 2000-Euroconference, Haindorf, 2nd May–7th May 2001*, ed. M. Bietak. Vienna: Verlag der Österreichischen Akademie der Wissenschaften, 365–75.

2003 The SARS Survey along the Omdurman-Gabolab Road 1997: interim report on the pottery and small finds. *Kush* 18, 131–56.

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Ms Janine Bourriau (to 31 May 2006)  
Dr Harriet Crawford (to 31 May 2005)  
Professor Robert Dewar (to 30 September 2006)  
Dr Graeme Lawson (to 31 May 2005)  
Dr John MacGinnis (to 30 September 2003)  
Dr Marco Madella (to 30 September 2003)

Professor David Oates (to 30 November 2003)  
Dr Joan Oates (to 31 July 2003)  
Dr Jacke Phillips (to 31 March 2005)  
Dr Laurence Smith (to 31 May 2006)  
Professor Anthony Snodgrass (to 31 January 2005)

The McDonald Institute also welcomed Professor Charles Higham as Visiting Fellow in June 2003. He will be based in Cambridge for the next two years as a James Cook Fellow of the Royal Society of New Zealand, working on the origins of the civilization of Angkor.

### *Review of McDonald Institute Projects*

In June 2002 the Managing Committee agreed that both of the major McDonald Institute projects — the Illicit Antiquities Research Centre (IARC) and the Human Population Genetics Project — should be subject to external academic review. The IARC had been established in October 1997, and was hence entering its fifth year of operation. The Human Population Genetics project had been founded the following year. Both projects had already made a significant impact in their respective fields, but as major projects of the Institute, each operating within a specialized area, it was agreed that regular external review might identify new opportunities and directions of research. The specific objectives of the review were:

- to evaluate the productivity and scientific quality of those projects, and their standing in, and contribution to, their respective fields;
- to identify possible future directions that the projects might aim to develop; and
- to assess the structuring of the projects in terms of size, duration and organization.

The Review Panel had a membership of four: Professor Peter Addyman (York), Dr Mark Jobling (Leicester), Professor Martin Millett (Cambridge) and Professor Sir Tony Wrigley (Cambridge). Under Professor Wrigley's chairmanship the panel received documents and interviewed the research personnel of the two projects. They also discussed the Institute's research strategy with the Chairman, Director and Deputy Director.

The Review Panel delivered their report in January 2003 and it was considered by the Managing Committee at their meeting the following month. The Managing Committee welcomed the principal recommendations and in particular the favourable assessment of the work of the two projects. On the basis of these recommendations it was agreed that the future of both projects should be secured for a minimum of a further three years, and the research staff confirmed in post for that period. The Institute is extremely grateful to the Review Panel for the care and thoroughness with which they had prepared their Report, and the recommendations provide an excellent basis for the discussion and development of Institute research policy.



# Illicit Antiquities

The year 2003 was dominated by the tragic events in Iraq. The sack of the Baghdad museums and continuing pillage of archaeological sites throughout the country brought home to a wide audience the seriousness of the threats posed to the world's archaeological heritage by an unbridled market in antiquities. Staff of the Illicit Antiquities Research Centre (IARC) were kept busy throughout the summer answering media enquiries, and made numerous appearances on radio and television programmes to address issues raised by the events in Iraq.

Otherwise it was business as usual. Two more issues of the IARC's newsletter *Culture Without Context* were published, and as part of their mission to raise professional and public awareness of the trade, staff of the IARC continued to travel up and down the country. Jenny Doole lectured at Derby Museum and Durham Museum, as well as at Leicester and Sheffield Universities. She also lectured to students of the American University in Cambridge. Neil Brodie gave a lecture at Leicester University. The IARC also inaugurated a module on the Department of Archaeology's MPhil Archaeological Heritage and Museums course.

The travelling display 'Stealing History' continues to be in demand and this year was loaned to Derby Museum, Durham Museum, and Liverpool Museum of Customs and Excise.

IARC staff attended a number of conferences, including the ninth annual meeting of the European Association of Archaeologists in St Petersburg and the fifth World Archaeological Congress in Washington



DC. They also presented papers at an EC/DCMS Workshop on Illegal Trafficking in Works of Art, and at the conference Global Perspectives which was convened by Resource. The most important conference of the year, however, was undoubtedly *Illegale Archäologie*, organized by Professor Wolf-Dieter Heilmeyer of the Staatliche Museen zu Berlin with some financial support from the McDonald Institute. Sessions and workshops ran from the 23–25 May and enjoyed the support of a distinguished international participation. The success of the conference was assured by a timely statement from the German government that it would accede to the 1970 UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property.

Finally, in addition to their work at the IARC, Jenny Doole and Neil Brodie also participated in field projects in Greece and lectured on Aegean Prehistory for the University's Institute of Continuing Education at Madingley Hall.

## PUBLICATIONS

### Neil Brodie

- 2002 An archaeologist's view of the trade in illicit antiquities, in *Legal and Other Issues in Protecting Cultural Heritage: the Latin American and Caribbean Experience in Context*, ed. B. Hoffman. International Bar Association: <http://www.ibaculturalheritage.com/>.
- 2003 Lessons from the trade in illicit antiquities, in *The Trade in Wildlife*, ed. S. Oldfield. London: Earthscan, 184–95.
- 2003 (with D.W. Gill). Looting: an international view, in *Ethical Issues in Archaeology*, eds. L. Zimmerman, J. Zimmer & K. Vitelli. Walnut Creek (CA): AltaMira, 31–44.
- 2003 Spoils of war. *Archaeology* (July/August), 16–19.

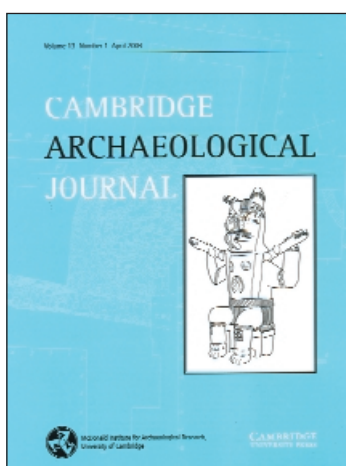
# Publications Office

This past year was one of the busiest yet for the Publications Office, which is a sign of things to come. Four major volumes in the Monograph Series were printed. *Ancient Interactions: East and West in Eurasia* and *Prehistoric Steppe Adaptation and the Horse* (both edited by Katie Boyle, Marsha Levine and Colin Renfrew) are the two volumes arising from an international conference on the Eurasian steppe held by the Institute at New Hall in 2000. Both volumes demanded considerable time and preparation from the editors, in particular Katie Boyle, as many of the papers were written by non-English-speaking authors from Eastern Europe and Russia. The Production Editor, Dora Kemp, worked extensively on redrawing and creative typesetting to get the papers into their final published format. A new development this year was the inclusion of indexes compiled by the Production Editor. It remains to be decided whether indexes will be a standard feature of the McDonald Monograph Series given the time and cost that they demand.

A ground-breaking monograph arising from another Institute conference was completed in July 2003. In *Examining the Farming/Language Dispersal Hypothesis* (edited by Peter Bellwood & Colin Renfrew) international experts in historical linguistics, prehistoric archaeology, molecular genetics and human ecology brought their specialisms to bear upon the question of whether linguistic diversity is connected to the spread of farming. Interdisciplinary research of this kind is a major part of the McDonald Institute's programme.

The fourth volume to be published this year was *Excavations at Tell Brak, vol. 4: Exploring an Upper Mesopotamian Regional Centre, 1994–1996* edited by Roger Matthews. This monograph, on the site of Tell Brak in Syria, provides an account of the architecture, artefacts and environmental evidence which is supported by a program of radiocarbon dating. The results emphasize the indigenous nature of cultural development in Upper Mesopotamia during the fourth to second millennium BC. *Excavations at Tell Brak, vol. 3* is due into the Publications Office in the middle of next year.

Printing technology is changing rapidly so that camera-ready copy is now a thing of the past as far as the Institute's Publications Office is concerned. With the upgrading of the Office's equipment and the development of scanning technology much if not all of the illustration work is now created in-house. Future editors and authors will be encouraged to forego the traditional large-format inked drawings in favour of electronic formats.



The *Cambridge Archaeological Journal* continues to be a central focus of the Publications Office and the year 2003 saw the redesign and modernization of its cover. The journal is still in the early stages of on-line production and the benefits of this are yet to be quantified; a number of technical issues remain to be resolved but it is hoped that the year to come will see these ironed out. Subscription rates have not continued to rise as rapidly as had been anticipated and a number of initiatives are being taken in order to address this situation. A new student subscription rate was introduced and it is hoped that this will be beneficial both for students and the journal as a whole. Major articles in the journal this past year discuss the evolution of the physiological and neurological capacities for music (Iain Morley), ritual and ideology in the Pre-Pottery Neolithic B of the Levant (Marc Verhoeven), Tairona anthropomorphic imagery and ceremonial architecture in Colombia (Matthew Looper), and implicit per-

ception, visual memory and Palaeolithic art (Derek Hodgson). The journal continues to have a distinguished reputation in the archaeological community and has a steady submission rate.

Other publications currently in press range widely from results of the Stage 3 project (Tjeerd van Andel *et al.*), to British prehistoric monuments (Colin Richards), and art as archaeology (Colin Renfrew *et al.*). There is also the twice-yearly newsletter *Culture Without Context* (see p. 15). This diversity underlines the continued vitality of the Institute's publication programme.

## CURRENT PUBLICATIONS

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*Star Carr in Context: New Archaeological and Palaeoecological Investigations at the Early Mesolithic Site of Star Carr, North Yorkshire*, by PAUL MELLARS & PETRA DARK

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*Excavations at Tell Brak, vol. 1: The Mitanni and Old Babylonian Periods*, by DAVID OATES, JOAN OATES & HELEN McDONALD

£45/US\$80 plus p&p; ISBN 0-9519420-5-0 hardback, xxii+296 pp., 239 ills., 14 tables

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*Late Prehistoric Exploitation of the Eurasian Steppe*, by MARSHA LEVINE, YURI RASSAMAKIN, ALEXANDR KISLENKO & NATALIYA TARTARINSEVA

£40/US\$70 plus p&p; ISBN 1-902937-03-1 hardback, viii+216 pp., 132 ills., 23 tables

*Towards Reflexive Method in Archaeology: the Example at Çatalhöyük*, by MEMBERS OF THE ÇATALHÖYÜK TEAMS, edited by IAN HODDER

£25/US\$45 plus p&p; ISBN 1-902937-02-3 hardback, xvi+238 pp., 71 ills., 10 tables

*Archaeogenetics: DNA and the Population Prehistory of Europe*, edited by COLIN RENFREW & KATIE BOYLE

£38/US\$60 plus p&p; ISBN 1-902937-08-2 hardback, xxiv+342 pp., 103 ills. (reprinted in 2002)

*Neolithic Orkney in its European Context*, edited by ANNA RITCHIE

£45/US\$70 plus p&p; ISBN 1-902937-04-X hardback, xiv+342 pp., 193 ills., 12 tables

*Hunter-gatherer Landscape Archaeology: the Southern Hebrides Mesolithic Project 1988–98*, edited by STEVEN MITHEN

£88/US\$150 plus p&p; ISBN 1-902937-12-0 hardback, 2 vols.; vol. 1 - xviii+345 pp., 293 ills., 177 tables; vol. 2 - xiv+305 pp., 273 ills., 65 tables

*Trade in Illicit Antiquities: the Destruction of the World's Archaeological Heritage*, edited by NEIL BRODIE, JENNY DOOLE & COLIN RENFREW

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*Excavations at Tell Brak, vol. 2: Nagar in the Third Millennium BC*, by DAVID OATES, JOAN OATES & HELEN McDONALD

£95/US\$150 plus p&p; ISBN 0-9519420-9-3 hardback, xxxii+643 pp., 493 ills., 60 tables

*Consuming Passions and Patterns of Consumption*, edited by PRESTON MIRACLE & NICKY MILNER

£20/US\$35 plus p&p; ISBN 0-9519420-8-5 hardback, vi+136 pp., 48 ills., 16 tables

*Excavations at Tell Brak, vol. 4: Exploring an Upper Mesopotamian Regional Centre, 1994–1996*, edited by ROGER MATTHEWS

£75/US\$135 plus p&p; ISBN 1-902937-16-3 hardback, xviii+446 pp., 333 ills., 70 tables

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*Prehistoric Steppe Adaptation and the Horse*, edited by MARSHA LEVINE, COLIN RENFREW & KATIE BOYLE

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# Laboratories

## *Charles McBurney Geoarchaeology Laboratory*

### **People and events**

It has been a year of change, new faces, and project consolidation in the Charles McBurney Laboratory. A number of people are to be congratulated: first, Julie Miller, the laboratory technician has deservedly been promoted; Gianna Ayala has been appointed by English Heritage as Geoarchaeologist for the south of England; and Melissa Goodman has now received her doctorate and moved on to a research position at Berkeley, California.

Several new members have joined the laboratory this year who are engaged in research towards their PhDs. Gabriella Kovacs from Hungary is conducting research on the micromorphological signatures of buildings and occupation deposits at the Szazhalombatta Bronze Age tell site in Hungary as part of the European Network Training Programme, 'The Emergence of Bronze Age Communities in Europe'. Ann-Maria Hart has returned from Australia to investigate the processes of oxidation and iron formation and their effects on soils and archaeological preservation conditions. Miranda Semple from Canada has begun her micromorphological study of communal spaces in tell sites in Syria.

Almost all members of the laboratory attended the annual soil micromorphological workshop at the Department of Geology, University of Pisa, in May, followed by the Second International Archaeological Soils Conference. Karen Milek, Gianna Ayala and Dr Charles French gave papers at this conference; Karen on the geoarchaeology of Viking structures in Iceland, Gianna on modelling landscape erosion in northern Sicily, and Charles on the early Holocene soil development of the chalk downlands of southern England.



**Figure 1.** *The main Rio Puerco (New Mexico) section showing the Archaic period double ditch associated with a slowly aggrading floodplain soil, sandwiched by multiple alluvial phases of sedimentation and incipient soil growth.*

### **New laboratory**

The most exciting development of the year has been the expansion of the laboratory's thin-sectioning facilities. This involves a new agreement with the Quaternary Science Research Unit of the Department of Geography, with the aim of doubling its capacity to produce large-format thin sections. This new collaborative facility acknowledges a long-standing sharing of facilities and expertise between these two Departments. The new laboratory will be a pan-University facility, with additional equipment being bought through the University's SRIF2 initiative. It has just become operational, and the hard graft of Julie Miller, Dr Steve Boreham (Geography) and Chris Dixon (EMBS) in making this happen is gratefully acknowledged.

### **Projects**

All of last year's projects have continued into this year, in particular, the laboratory's collaborative project with Dr Richard Periman of the United States Department of Agriculture Forest Service in New Mexico, which has now undertaken two seasons of fieldwork. This has discovered a series of major standstill phases in the last 5000





**Figure 2.** Anthropogenic dark earth sites in the Amazon Basin, Brazil, are often located on high river bluffs that overlook the main water courses. This photograph shows the Solimoes river as seen from the Hatahara site.

years of the Holocene erosion record, including a very well-developed phase of the Archaic period (c. 2000–3000 years ago) associated with ditch features (Fig. 1) which suggests floodplain management, possibly for maize agriculture. Immediately before this phase, there appear to have been frequent, short-lived and limited-extent fires in the tributary valleys, associated with alternating stable/unstable valley erosion and infilling deposits. The driver for these events is as yet unknown, but the massive erosion and incision that has revealed these deep stratigraphic exposures in the past 120 years or so is a consequence of over-exploitation for grazing associated with a large-scale ranching economy.

Funded by the Wenner Gren Foundation, Manuel Arroyo-Kalin continues his research into the archaeology of tropical lowland South America. Through micromorphological and geo-chemical studies of anthropogenic dark earth (Fig. 2) from a number of different sites excavated by the Central Amazon Project (CAP), he is investigating pre-Columbian anthropogenic landscape transformations.

Miranda Semple has begun a micromorphological study of domestic space on tell sites in northeastern Syria. Her research is targeted on roofed and unroofed space to examine how the space was organized, allocated and used (Fig. 3). A sampling

## PUBLICATIONS

### Charles French

- 2002 Micromorphological analysis, in *A Great Circle: investigations at Arbury Camp, Cambridge*, by C. Evans & M. Knight. *Proceedings of the Cambridgeshire Antiquarian Society* XCI, 39–40.
- 2003 *Geoarchaeology in Action: Studies in Soil Micromorphology and Landscape Evolution*. London: Routledge.
- 2003 *Wandlebury Ringwork, Cambridgeshire, 1994–7: Evaluation Survey and Excavation*. (Cambridge Archaeological Unit Report No. 553.)
- 2003 Soil micromorphological analysis, in *Power and Island Communities: Excavation at the Wardy Hill Ringwork*, by C. Evans. (East Anglian Archaeology 103.) Cambridge: Cambridge Archaeological Unit, 69–71.
- 2003 (with M. Kousoulakou). Geomorphological and micromorphological investigations of palaeosols, valley sediments and a sunken-floored dwelling at Botai, Kazakhstan, in *Prehistoric Steppe Adaptation and the Horse*, eds. M. Levine, C. Renfrew & K. Boyle. Cambridge: McDonald Institute, 105–14.
- 2003 (with J. Rackham). Palaeoenvironmental research design for the Witham valley, in *Time and Place*, eds. S. Catney & D. Start. Lincoln: Witham Valley Archaeological Research Committee, 33–42.

### Charles French & Karen Milek

- 2002 *Kaupang 2002: Preliminary Micromorphology Assessment of the Floor, Occupation and Midden Deposits*. Report submitted to Dr Dagfinn Skre, Department of Archaeology, History of Art and Conservation, University of Oslo.
- 2002 Sediment micromorphology, in *Deeply Stratified Medieval and Post-medieval Remains at Market Mews, Wisbech*, ed. M. Hinman. Cambridgeshire County Council Archaeological Field Unit Report No. 156, 38–48.



## PUBLICATIONS

### Helen Lewis

2002 An investigation of ancient cultivation at Hengistbury Head Site 6, Christchurch, Dorset. *Proceedings of the Prehistoric Society* 68, 83–102.

### Karen Milek

2002 Geoarchaeological sampling report, in *Hofstadir 2001: Interim Report*, ed. G. Lucas. Reykjavik: Fornleifastofnun Islands, 58–64.

2002 (with H. Roberts). Life in the house, in *Archaeological Investigations in Adalstræti 2001*, ed. H. Roberts. Reykjavik: Fornleifastofnun Islands, 77–80.

2002 Micromorphology results: pre-LNL soils; Micromorphology results: following the abandonment of the longhouse; Appendix 13: results of chemical analysis of floors in the longhouse, in *Archaeological Investigations in Adalstræti 2001*, ed. H. Roberts. Reykjavik: Fornleifastofnun Islands, 39–40, 92, 279–90.

2002 Sveigakot 2001, Area S – long house, in *Archaeological Investigations at Sveigakot 2001*, ed. O. Vésteinsson. Reykjavik: Fornleifastofnun Islands, 8–28.

2003 *Bornish, South Uist: Electron Probe Microanalysis of Slag Observed in Micromorphology Samples from the Cereal Barn on Mound 3*. Report submitted to Dr Niall Sharples, School of History and Archaeology, Cardiff University.

2003 *Sveigakot 2002: Area S Interim Report*. Report submitted to Dr Orri Vésteinsson, Icelandic Institute of Archaeology, Reykjavik.

programme has been implemented at three urban centres (Chagar Bazar, Tell Leilan and Hamoukar) where current excavations have exposed well-defined domestic and public architecture.

Ann-Maria Hart is investigating the effects of oxidation and iron-oxide formation on the preservation of organic material within British archaeological contexts. Each site has a different soil type and environment, and forest, pastoral and agricultural sites are included. Oxidation experiments will form the comparative data base and will be used to predict the levels of preservation of organic material under different preservation environments and soil types.

Karen Milek completed her third field season as excavation supervisor at the Viking Age site of Sveigakot, northeast Iceland, where she uncovered a tenth-century turf house. She also continued analyzing micromorphology and bulk sediment samples from Viking Age houses at Kaupang (Norway), Kilpheder, Bornish (South Uist), Sveigakot, and Adalstræti (Iceland), as part of her research on the use of space in Viking Age Scandinavian houses in the North Atlantic region.

Other continuing projects include the micromorphological studies of Neolithic and Bronze Age agricultural soils of highland Yemen for Tony Wilkinson, now of the University of Edinburgh, the geoarchaeological study of Cranborne Chase with Drs Helen Lewis (Oxford), Mike Allen (Wessex Archaeology) and Rob Scaife (Southampton), and a variety of small contracts for English Heritage, the Cambridge Archaeological Unit, and regional contracting units.

### STAFF

**Laboratory director:** Dr Charles French

**Laboratory manager:** Julie Miller

#### PhD students:

Manuel Arroyo-Kalin  
Gianna Ayala  
Ann-Maria Hart  
Gabriella Kovacs  
Karen Milek  
Miranda Semple

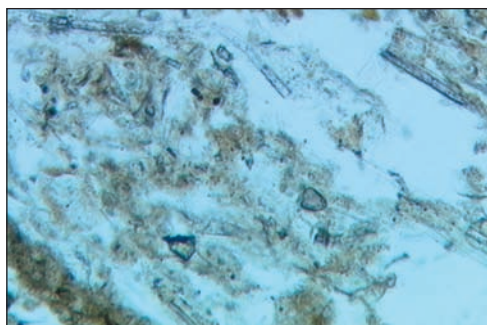
#### Affiliated researchers:

Dr Nicole Boivin  
Henry Kenny  
Dr Helen Lewis (Oxford University)  
Anna Nelson (Scott Polar Research Institute)  
Dr Richard Periman (USDA Forest Service)  
Dr Laurence Smith

**Figure 3.** Layers of interbedded organic material from a domestic structure at Chagar Bazar (plane-polarized light).

#### MPhil students:

Claudia Cyganowski  
Tracey Pierre



## *Glyn Daniel Molecular Genetics Laboratory*

The Glyn Daniel Laboratory hosts the Human Population Genetics Project which endeavours to reconstruct prehistory from DNA, and to compare the resulting genetic picture with the available archaeological, palaeoclimatic and historical linguistic framework. In previous years, the Laboratory's projects focused on world prehistory (initial settlement of the continents and oceans by modern humans, postglacial recolonization), whereas this year's clutch of publications deal with events in the more recent past: slave trade in the Caribbean and in the Pacific, admixture between Europeans and Eskimos in Greenland, and the effects of Mongol expansions in the era of Genghis Khan. A novel project is the application of a genetic data-analysis approach to resolve the tree of Celtic languages. Among the technical publications are a brief commentary (reported in *Nature* by Carina Dennis), which warns geneticists and editors that over 50 per cent of published DNA studies contain flawed DNA data.

After four years of pioneering work in the McDonald Institute, post-doctoral researcher Matthew Hurles has left us in a flurry of publications, accepting a prestigious research position at The Wellcome Trust Sanger Institute. His successful bid for a \$200,000 Sloan Foundation grant will fund a computational post-doctoral researcher for the Molecular Genetics Laboratory. Mim Bower has been appointed as the new genetics post-doctoral researcher and expects to take up the position in early 2004, after maternity leave.

### ***Slave trade in the Caribbean***

On Valentine's Day 2003, the BBC broadcasted the documentary *Motherland: a Genetic Journey*, which traces the African roots of today's descendants of the Afro-Caribbean slave trade. Maternal ancestry (i.e. mtDNA) was examined and interpreted in the laboratory (Lucy Forster, Matthew Hurles, Peter Forster), while paternal ancestry (i.e. the Y chromosome) was analyzed by Mark Jobling in Leicester. Two American laboratories were involved in further analyses. The most striking result in the sample of 230 individuals was that more than 95 per cent of Caribbean mtDNA is African, whereas more than 25 per cent of Caribbean Y chromosomes are European, the latter presumably derived from the slave owners. Amerind DNA comprised only 1 per cent, confirming the large-scale extinction of the indigenous population.

## **PUBLICATIONS**

### **Peter Forster**

- 2003 (with A. Toth). Toward a phylogenetic chronology of ancient Gaulish, Celtic, and Indo-European. *Proceedings of the National Academy of Sciences of the USA* 100, 9079–84.
- 2003 To err is human. *Annals of Human Genetics* 67, 2–4.
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- 2003 Book Review on Jan Klein and Naoyuki Takahata's *Where do We Come From? The Molecular Evidence for Human Descent*. *Spektrum der Wissenschaft* [German edition of *Scientific American*] June, 97–9.
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### **Matthew Hurles**

- 2002 Are 100,000 'SNPs' useless? *Science* 298, 1509.
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- 2003 (with E. Bosch, F. Calafell, Z.H. Rosser, S. Nørby, N. Lynnerup & M.A. Jobling). High level of male-biased Scandinavian admixture in Greenlandic Inuit shown by Y-chromosomal analysis. *Human Genetics* 112, 353–63.
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### Matthew Hurles (*cont.*)

- C. Tyler-Smith). The genetic legacy of the Mongols. *American Journal of Human Genetics* 72, 717–21.
- 2003 (with E. Matisoo-Smith, R.D. Gray, D. Penny). Untangling Oceanic settlement: the edge of the knowable. *Trends in Ecology and Evolution* 18, 531–40.
- 2003 (with J.D. Stead & A.J. Jeffreys). Global haplotype diversity in the human insulin gene region. *Genome Research* 13, 2101–11.
- 2003 Can the hypothesis of language/agriculture co-dispersal be tested with archaeogenetics?, in *Examining the Farming/Language Dispersal Hypothesis*, eds. P. Bellwood & C. Renfrew. Cambridge: McDonald Institute, 299–309.

### *Slave trade in the Pacific*

Since Thor Heyerdahl asserted in 1950 that Polynesia was first colonized from the Americas, geneticists have sought — but have not found — evidence to support his theories. In a study led by Matthew Hurles, Native American Y chromosomes were detected on the Polynesian island of Rapa. This, together with other odd features of the island's Y-chromosomal gene pool, is best explained, however, as the genetic impact of a nineteenth-century Peruvian slave trade in Polynesia. These findings underscore the need to account for history before turning to prehistory, and the value of archival research in understanding modern genetic diversity. This study is the first to investigate the impact of an underappreciated episode on genetic diversity in the Pacific.

### *Admixture between Europeans and Eskimos in Greenland*

Around 58 per cent of Y chromosomes in Greenlanders were found to be of European origin. The high proportion of European Y chromosomes contrasts with a complete absence of European mitochondrial DNA (Nørby, Forster and colleagues 2000) and indicates strongly male-biased European admixture in

Greenlanders. Comparison of the European component of Greenlandic Y chromosomes with European population data suggests that they have their origins in Scandinavia. There are two potential source populations: Norse settlers from Iceland, who may have been assimilated 500 years ago, and the Danish–Norwegian colonists of the eighteenth century. Insufficient differentiation between modern Icelandic and Danish Y chromosomes means that a choice between these cannot be made on the basis of diversity analysis. However, the extreme sex bias in the admixture makes the later event more likely as the source.

### *Mongol expansions in the era of Genghis Khan*

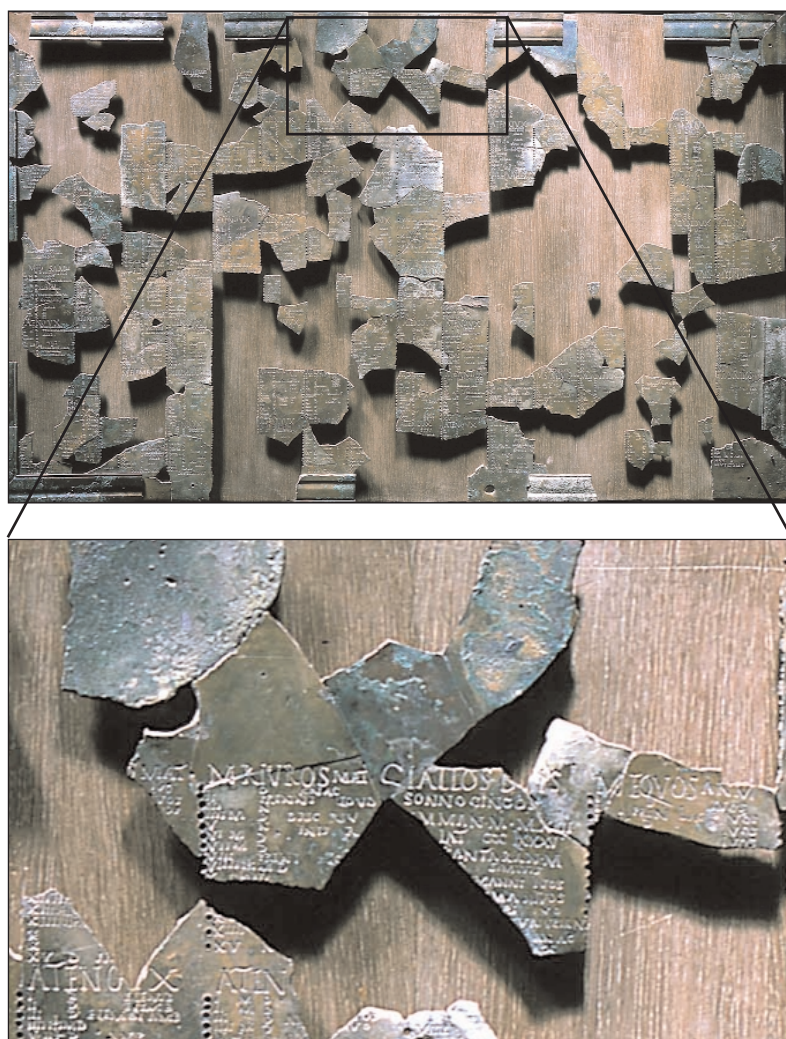
A Y-chromosomal lineage with several unusual features has been identified in 16 populations throughout a large region of Asia, stretching from the Pacific to the Caspian Sea, and was present at high frequency: approximately 8 per cent of the men in this region carry it, and it thus makes up approximately 0.5 per cent of the world total. The pattern of variation within the lineage suggested that it originated in Mongolia approximately 1000 years ago. Such a rapid spread cannot have occurred by chance; it must have been a result of selection. The lineage is carried by likely male-line descendants of Genghis Khan, and we therefore propose that it has spread by a specific form of social selection resulting from their behaviour.

### *The tree of Celtic languages*

Indo-European is the largest and best-documented language family in the world, yet the reconstruction of the Indo-European tree, first proposed in 1863, has remained controversial. Complications may include ascertainment bias when choosing the linguistic data, and disregard for the wave model of 1872 when attempting to reconstruct the tree. Essentially analogous problems were solved in evolutionary genetics by



DNA sequencing and phylogenetic network methods respectively. Laboratory members have adapted these tools to linguistics, and analyzed Indo-European language data, focusing on Celtic and in particular on the ancient Celtic language of Gaul (modern France), by using bilingual Gaulish-Latin inscriptions. Our phylogenetic network reveals an early split of Celtic within Indo-European. Interestingly, the next branching event separates Gaulish (Continental Celtic) from the British (Insular Celtic) languages, with Insular Celtic subsequently splitting into Brythonic (Welsh, Breton) and Goidelic (Irish and Scottish Gaelic). Taken together, the network thus suggests that the Celtic language arrived in the British Isles as a single wave (and then differentiated locally), rather than in the traditional two-wave scenario ('P-Celtic' to Britain and 'Q-Celtic' to Ireland). The phylogenetic network furthermore permits the estimation of time, by analogy to genetics, and we obtain tentative dates for Indo-European at  $8100 \pm 1900$  BC years, and for the arrival of Celtic in Britain at  $3200 \pm 1500$  BC years. The phylogenetic method is easily executed by hand and promises to be an informative approach for many problems in historical linguistics.



*The Coligny lunar calendar. The ancient Celtic language of Gaul (modern France) became extinct after the Roman conquest 2000 years ago, but some bilingual Gaulish-Latin inscriptions have survived. Gaulish is therefore a Rosetta stone for understanding the origins of the Celtic languages. The Coligny calendar uses Roman numerals but Gaulish words: in the detail (below), the inscription 'M(ID) XIII, LAT CCCLXXXV' announces a 13th lunar leap month (MID), yielding a year which is 385 days (LAT) long. (Photograph courtesy of the Musée de la Civilisation Gallo-Romaine, Lyons.)*

#### STAFF

##### Postdoctoral researchers:

Peter Forster  
Matthew Hurles  
Mim Bower

##### PhD students:

Lucy Forster  
Felix Riede  
Karin Haack

##### MPhil student:

Tracey Pierre

##### Academic visitor:

Eleanore Conant

## PUBLICATIONS

### Preston Miracle

- 2003 Review of *Depositional History of Franchthi Cave: Stratigraphy, Sedimentology, and Chronology*, by W.R. Farrand. *American Journal of Archaeology* 107(2).
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### Dusan Boric@

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- 2003 'Deep time' metaphor: mnemonic and apotropaic practices at Lepenski Vir. *Journal of Social Archaeology* 3(1), 41–75.

### Helen Lewis & Ryan Rabett

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- 2002 (with G. Barker, H. Barton, M. Bird, F. Cole, P. Daly, Earl of Cranbrook, D. Gilbertson, C. Hunt, J. Krigbaum, L. Lloyd-Smith, J. Manser, F. Menotti, V. Paz, P. Piper, B. Pyatt, T. Reynolds, M. Stephens, M. Trickett & P. Whittaker). The Niah cave project:

## Grahame Clark Zooarchaeology Laboratory

The past year has been a very productive one for the Zooarchaeology Laboratory. Dr Preston Miracle continued his analyses of Middle Palaeolithic to Hellenistic faunal assemblages from a number of sites in Croatia (e.g. Pupicina Cave, Mujina pećina, Nakovana Cave). Several past and present members of the Grahame Clark Laboratory (Laura Pugsley, Krish Seetah, David Orton) assisted in these analyses, as well as several Croatian research students. Recently, Dr Miracle has started work on Palaeolithic and Neolithic faunas from the Kurnool District of India. Other researchers from the laboratory have examined zooarchaeological assemblages, whether in Cambridge or abroad, from many parts of the world, including Turkey (Stephanie Meece, Emma Jenkins), Russia (Bryan Hanks, Krish Seetah), Malaysia (Ryan Rabett), Britain (Krish Seetah), and Italy (Lisa Marlow, Carolyn Szmidt). Congratulations to our recent PhDs (and on their gainful employment!) — Dr Laura Pugsley (teaching history at Haileybury School, Herts.), Dr Bryan Hanks (Assistant Professor, University of Pittsburgh), Dr Dusan Boric@ (Postdoctoral Fellow, Center for Archaeology, Columbia University), and Dr Aleks Pluskowski (JRF, Clare College). Dr Ryan Rabett has taken up a post-doc at Leicester University, while Dr Carolyn Szmidt will be teaching part-time at the University of Toronto. Iain Morley has just submitted his PhD dissertation on the evolution of music (animal bone flutes from the early Upper Palaeolithic are the earliest known instruments), while Emma Jenkins (microfauna from Çatalhöyük),



Red deer pelvis, Late Upper Palaeolithic, Pupicina Cave, Croatia.





*Zooarchaeology Field Laboratory, Dane, Croatia (Sinisa Radovic and David Orton).*

entered the home stretch en route to submitting their dissertations. An ongoing strength of the Grahame Clark Laboratory is teaching zooarchaeology to undergraduate students. Several excellent undergraduate dissertations and course projects were completed this past year by Elizabeth Bates, Elizabeth Norton, and David Orton (the latter garnering the Daniel Prize for his dissertation). All of them have plans for graduate work in archaeology, and we hope to see them back in the Grahame Clark Laboratory in the future.

### ***Hunters and Herders in Istria, Croatia: Study and Survey Season 2003***

For six weeks in July–August 2003, at Dane in Croatia, Preston Miracle was assisted by seven past, present or future Grahame Clark Laboratory members or visitors (Laura Pugsley, Masa Mlakar, Sinisa Radovic, Kazimir Miculinic, Krish Seetah, David Orton, Adriana Chira), in the analysis of many thousand animal remains from Pupicina Cave (Mesolithic assemblage), Vesanska Cave (Late Upper Palaeolithic assemblage), and other sites in northeastern Istria. At times participants in this bone-coding marathon/zooarchaeological boot camp were still at it after midnight! As a result, almost all of the post-excavation analyses of Mesolithic assemblages from Pupicina Cave were completed, and the team is now poised to start work on the second, Mesolithic, monograph from the site.

Although Miracle's hands rarely touched a trowel in 2003, team members assisted Darko Komsar (Archaeological Museum of Istria) in the continued surveying and test-



*Wild boar skull (burned on top), Late Upper Palaeolithic, Pupicina Cave, Croatia.*

## **PUBLICATIONS**

**Helen Lewis & Ryan Rabett (cont.)**  
the third (2002) season of field-work. *Sarawak Museum Journal* (N.S.) 78, 87–178.

**Iain Morley**  
2002 Evolution of the physiological and neurological capacities for music. *Cambridge Archaeological Journal* 12(2), 195–216.

Lisa Marlow (scavenging opportunities and the earliest occupation of Europe), and Masa Mlakar (Material Science perspectives on bone technology) have



*Novacka Cave, Croatia.*

ing of cave and open-air sites in the region. Work at Ovcja Cave and Lokve open-air site was completed, while Novacka and Ivkina Caves were surveyed and tested. The former appears particularly promising, with Copper Age and/or Neolithic remains discovered immediately beneath the surface. The team's understanding of the site was also enriched by interviews with villagers who had used the cave as a sheep pen, shelter, and source of ice before the Second World War.

Another small team, supervised by Gordana Jambresić (Croatian Academy of Sciences and Arts), test-

ed 'Pecina na Brehu' Cave, discovering abundant evidence of cave bears and other Pleistocene fauna, as well as a mixed assemblage of pottery from the Middle Neolithic to Bronze Age. The cave appears to have been a 'cave-bear den' during the Pleistocene, and almost no stone artefacts were associated with the Pleistocene fauna. Pecina na Brehu will provide an important comparison with faunal assemblages from other Palaeolithic sites in the region. Geoarchaeological sampling of a number of sites was completed by Dr Giovanni Boschian (University of Pisa), while Andrea Balbo initiated a survey of the geomorphology of Cepićpolje and the Boljunska-Rasa drainage system.

Plans for 2003–2004, and the foreseeable future are to complete the publication of the Mesolithic assemblages and finish the post-excavation analyses of Late Upper Palaeolithic assemblages from Pupina Cave and other sites excavated by the Pupina Cave Project.

#### **STAFF**

**Laboratory director:** Dr Preston Miracle

**Laboratory manager and Chief technician:** Jessica Rippengal

#### **Research students:**

Helen Farr	Stephanie Meece
Bryan Hanks	Masa Mlakar
Emma Jenkins	Iain Morley
Lisa Marlow	Krish Seetah

#### **Associated researchers:**

Dr Marsha Levine, Dr Katie Boyle, Dr Ryan Rabett, Dr Carolyn Szmidt

#### **Academic visitors:**

Kazimir Miculinic (Institute of Quaternary Geology and Palaeontology, Croatian Academy of Sciences and Arts, Zagreb)  
Beata Kozdeba (Department of Prehistory, University of Tübingen)



## George Pitt-Rivers Laboratory for Archaeobotanical Research

The George Pitt-Rivers Laboratory continues its research into the exploitation of plant resources from the Palaeolithic through to the historic period in diverse regions of the world. Over the last academic year this included laboratory research on the origins and spread of agriculture in the woodland edge sites of Southeast Turkey and northern Iraq, visited and studied by Manon Savard. Scott Martin is progressing with his research on the early spread of maize agriculture in northeast America. The laboratory's research into the agriculture of later prehistoric and classical Europe has spanned from Greece and Cyprus (Evi Margaritis), to Rome (Laura Motta), Poland (Hanna Zawadzka) and Britain (Rachel Ballantyne, Kate Roberts). Brigitta Kulcsarne-Berzsenyi studies Bronze Age agriculture from the Danube Valley in Hungary. With Mim Bower, the laboratory has developed and expanded its collaboration with the University of Manchester Institute of Science and Technology, and the National Institute of Agricultural Botany, in the use of modern and ancient DNA evidence to track the spread of agriculture across Europe.

The laboratory's research on the interface between past plant exploitation and environmental change has ranged from wet regions, for example Rachel Ballantyne's research into plant exploitation in the East Anglian fens, to highly-stressed zones, as in David Beresford-Jones's continued study of the fast-disappearing drought-tolerant *Prosopis* tree from coastal regions of Peru. Marco Madella's Argentinean research on the Santa Clara-Mar Chiquita Project (with the Universidad Nacional de Mar del Plata) is investigating the



*The team of the Santa Clara-Mar Chiquita Archaeological Project (project directors M. Madella & M. Osterrieth) excavating the trench at Camet Norte. The excavation yielded lithic tools of quartzite, chalcedony and dolerite from a layer dated at 520±50 BP.*

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#### Martin Jones

- 2003 Ancient DNA in pre-Columbian archaeology: a review. *Journal of Archaeological Science* 30/5, 629–35.
- 2003 Bio-archaeology and the Proto-Indo-European lexicon: the kurgan hypothesis revisited, in *Ancient Interactions: East and West in Eurasia*, eds. K. Boyle, C. Renfrew & M. Levine. Cambridge: McDonald Institute, 293–7.
- 2003 Issues of scale and symbiosis: unpicking the agricultural package, in *Examining the Farming/Language Dispersal Hypothesis*, eds. P. Bellwood & C. Renfrew. Cambridge: McDonald Institute, 369–77.

#### Liliana Janik

- 2002 Wandering weed: the journey of *Fagopyrum* plant as an indicator of human movement in Eurasia, in *Ancient Interactions: East and West in Eurasia*, eds. K. Boyle, C. Renfrew, M. Levine. Cambridge: McDonald Institute, 299–308.
- 2003 Changing paradigms: food as a metaphor for cultural identity among prehistoric fisher-gatherer-hunter communities of northern European, in *Food, Culture and Identity in the Neolithic and Early Bronze Age*, ed. M. Parker-Pearson. (BAR International Series 1117.) Oxford: BAR, 113–23.

#### Marco Madella

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### Marco Madella (cont.)

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- 2003 (with M. Osterrieth & G. Ayala). The Late Pleistocene–Holocene environment and early human occupation of the Pampean coastal area, the Mar del Plata Project (Argentina), in *Second International Conference on Soil and Archaeology*, ed. G. Boschian. Pisa: Felici Editore, 167–70.
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### Evi Margaritis

- 2003 Archaeobotanical data, in *Ancient Country Houses on Modern Roads*, Ministry Of Culture, Archaeological Museum of Thessaloniki, XVI Ephorate of Prehistoric and Classical Antiquities. Archaeological Receipts Fund, 61, 70.
- 2003 Archaeobotanical data from the Neolithic site of Stavroupoli Thessalonikis: a preliminary report, in *The Neolithic Settlement of Stavroupoli Thessalonikis*, eds. D. Grammenos & S. Kotsos. Archaeological Institute of Northern Greece, 805–24.



*1000-year-old Prosopis tree in the Usaca forest fragment, south coast of Peru.*

human occupation of the pampas through a combined survey of the archaeology, pedology and geomorphology and uses phytoliths to explore the palaeoecology of the region. Phytoliths are also the basis of his study of the Neolithic ashmounds of South Indian (see p. 31) and of a project in Ethiopia to develop a new method of palaeotemperature analysis (in collaboration with NERC).

The evolving relationship between archaeology and the natural environment was reflected in a proposal to confer World Heritage status on a cluster of Jomon cultural sites and stretches of ancient woodland in northern Honshu in Japan. Martin Jones was invited to visit and give advice. It would be the first WHO complex that specifically celebrated a culture for its ecological sustainability. Another group of fisher-hunter-gatherers are the focus of Liliana Janik's research into prehistoric depictions of trees in rock art from north Russia and Europe (see p. 40).

In addition to several papers delivered in the UK, over the past year laboratory members have given papers in Thessaloniki (Greece); St Petersburg (Russia) Khanty-Mansiisk (Siberia); Bellagio (Italy); and Aomori (Japan).

### STAFF

**Laboratory director:** Professor Martin K. Jones

**Laboratory manager:** Dr Liliana Janik

**Post-doctoral researchers:** Dr Marco Madella

**Affiliated researchers:** Dr Alan J. Clapham, Ms Kate Roberts

### PhD students:

Rachel Ballantyne

David Beresford-Jones

Brigitta Kulcsarne-Berzsenyi

Evi Margaritis

Scott W.J. Martin

Laura Motta

Manon Savard

Hanna Zawadzka



# Projects

The project rooms of the McDonald Institute provide working space for a number of field projects which typically spend two or more months annually in the field. Other project rooms are allocated to teams that are preparing results of excavations for publication. Among the active field projects located at the McDonald Institute are those at Amarna in Egypt, Çatalhöyük in Turkey, and Tell Brak in Syria. During the academic year 2002–2003, the McDonald Institute also provided research space for the preparation of reports on field survey in Boeotia and on excavations at Markiani and Phylakopi in the Cyclades, and Kilise Tepe in Turkey.

The Institute also provides support for field projects and certain other research initiatives through its annual allocation of grants from the D M McDonald Grants and Awards Fund. The Advisory Committee meets in February or March every year to consider applications to the fund from Cambridge-based researchers. In 2003, grants totalling £125,631 were awarded to 18 projects, ranging widely in time and space from Denmark to South India, and from the Palaeolithic to the colonial period. Accounts of several of these projects are given here; others have been described in previous Annual Reports.



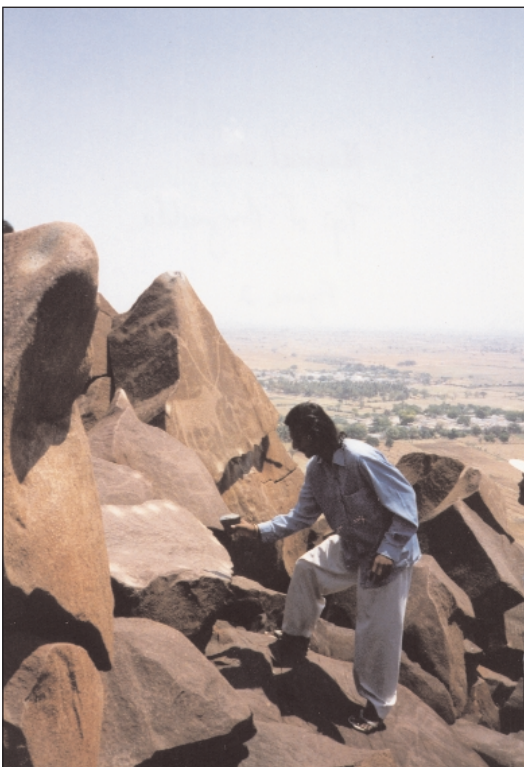
*Map showing locations of projects supported by the McDonald Institute for Archaeological Research.*

## Confronting Diversity in the South Indian Neolithic: the Sanganakallu-Kupgal Project

The important Neolithic sites in the Sanganakallu-Kupgal area of Bellary District in Karnataka, South India are threatened with short-term destruction as a result of commercial quarrying and agricultural expansion. The Sanganakallu-Kupgal project aims to record and excavate key sites before they are destroyed. Investigation of a series of different site types will present the opportunity to examine more closely the diverse lifestyles evident in the Southern Neolithic (e.g. agricultural/pastoral/hunter-gatherer, settled/nomadic), and to try to understand the relationship between different sites, activities and groups in South Indian Neolithic society. This important project will shed light on the still poorly understood Neolithic groups who created the enigmatic 'ashmounds' of South India.



*Large-scale industrial quarrying in the Sanganakallu-Kupgal area is destroying the concentration of sites located on and around the granitic hills.*



The Sanganakallu-Kupgal project is co-directed by Dr Nicole Boivin (McDonald Institute) and Professor Ravi Korisettar (Karnatak University), and involves a team of international specialists from the UK, India, Sweden, and Australia. Various sites in the Sanganakallu-Kupgal area will be targeted for recording and excavation, including a stratified habitation site, tool-production area, rock-art sites, a rock shelter, and hillside and hilltop terraces. The project will also emphasize the training of Indian students in field archaeology, and evening classes will be offered by researchers and specialists involved in the project during the course of the field season in 2004. The project is funded by the British Academy and the McDonald Institute.

*Rock-art sites bearing bull petroglyphs and 'ringing rocks' are just one of the many types of site found in the Sanganakallu-Kupgal area.*

### PUBLICATIONS

#### Nicole Boivin

2002 (with R. Korisettar, P.C. Venkatasubbaiah, H. Lewis, D. Havanur, K. Malagyannavar & S. Chincholi). Exploring Neolithic and Megalithic South India: the Bellary District Archaeological Project. *Antiquity* 76, 937-8.

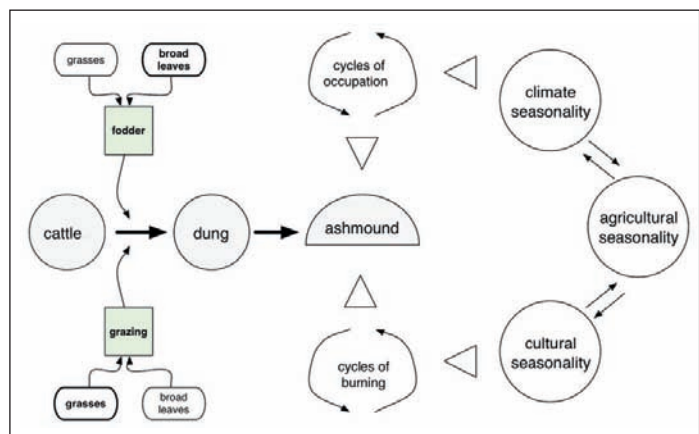
## *Herders's Monuments: Neolithic Ashmounds of Southern India*

The ashmounds of the Deccan are probably the most striking and unique component of the southern Indian Neolithic and are the subject of a second McDonald project. They have been formed by the heaped accumulation of large quantities of cattle dung, episodically burned at high temperatures (see Fig. 1). The sites have been plausibly linked to Neolithic rituals and the symbolic importance of cow, dung and ash in the Indian society, starting from the Neolithic period.



**Figure 1.** A long cell dendritic phytolith from the epidermis of cereal inflorescence, Kupgal ashmound.

A number of issues have arisen from recent work on the ashmounds particularly the causes of their formation and the nature of human activity associated with them. The project undertaken by Marco Madella & Ravi Korisettar aims to elucidate the relationship between the formation of the ashmounds at short (annual cycle) and long (life cycle) time-scale (Fig. 2), the environment resource utilization, the catchment area, and their symbolic meaning in the landscape. As for the Sanganakallu-Kupgal Project, the importance of this research derives in part from its timing. The ashmounds are today endangered by destruction, and some have already been destroyed by agricultural intensification. A project of survey and excavation of the most endangered ashmounds has accordingly been initiated.



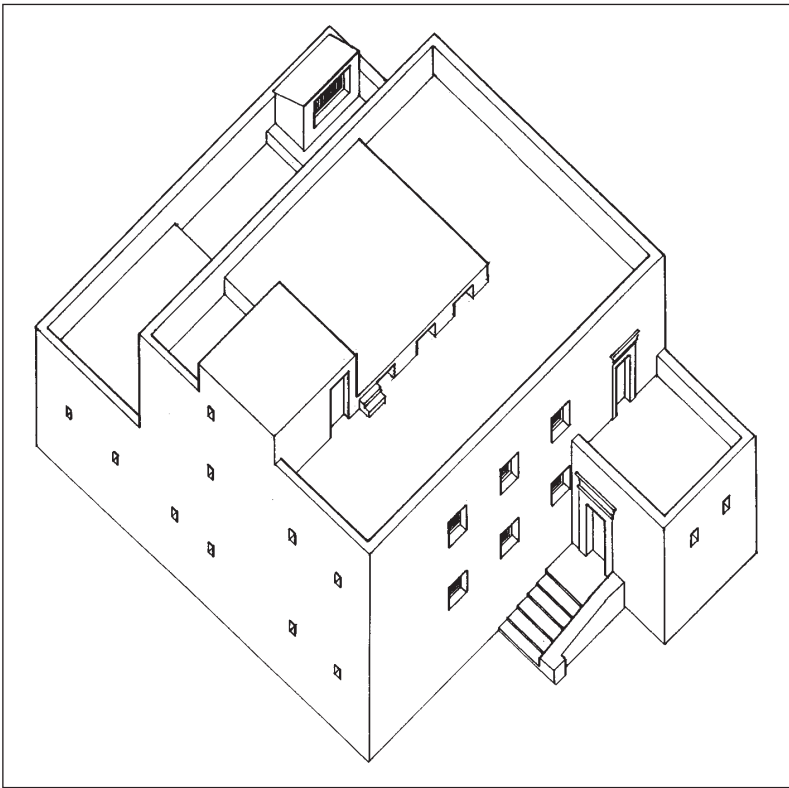
**Figure 2.** The ashmound's life cycle.

## *Ancient Egyptian Architecture*

Kate Spence, McDonald Post-Doctoral Research Fellow in Cognitive Archaeology, has been working on two projects over the past academic year, one dealing with domestic architecture and the other monumental religious architecture. In both cases the focus is on analyzing situation and spatial sequence, and on investigating design decisions as a means of approaching the question of how architecture was perceived in ancient Egypt.

The first project deals with houses from the site of el-Amarna for which we have numerous archaeologically-recovered ground plans. These ground plans have been analyzed paying specific attention to features of environmental or structural importance, such as wind-catchers, windows and staircases, as a result of





*Reconstruction of a large house at el-Amarna, exterior view.*

which a new interpretation of the three-dimensional form of the houses has been made. This allows a more nuanced assessment of the relationship between domestic architecture at el-Amarna and that found at other sites, contributing to ongoing debate on the nature of urbanism in Ancient Egypt. Comparison with representations of houses from elsewhere in Egypt provides additional information on the upper parts of the house. An examination of design decisions made during the process of laying out houses allows a reconsideration of the way in which spatial sequences within the house and conditions within specific rooms may structure the nature of social interaction in the city, both within and without the household.

The second project examines the architecture of the pyramids. Detailed studies of the orientation and situation of the pyramids carried out during the first year of the research fellowship have been supplemented by research into the larger complexes of which the pyramids formed the foci. Spatial sequences within the temples attached to the pyramids have been examined for patterning and for changes within that patterning. The strong emphasis on physical distance encapsulated within the causeway, the repetition of liminal spaces, and spatial sequences involving off-axis movement all contribute toward heightening the awareness of transition as the ritual participant moves through the complex. The decoration of individual rooms within the temples, as well as the use of coloured stone and a variety of finishes, moderates the transitional experience and provides specificity within the ritual spaces.



*The ruined mortuary temple and pyramid of Sahure (c. 2458–2446 BC), Abusir, Egypt.*



## *Phylakopi*

Phylakopi is an important Bronze Age town on the island of Melos in the Greek Cyclades. Three campaigns of excavation were carried out there under the auspices of the British School at Athens (1896–9, 1911 and 1974–8), but today the site is in a very poor condition. Its coastal location lays it open to attack by the sea and many old excavation trenches (which had been left open) are badly overgrown and collapsed (Fig. 1). The site was also damaged by the German army during World War II, when it was used as a defensive position.

In Summer 2002 a team under the co-directors Michael Boyd (British School at Athens), Neil Brodie (McDonald Institute) and Rebecca Sweetman (University of St Andrews) set out to re-examine the site and develop a strategy for its future management. It was cleared of vegetation and all exposed walls were cleaned and planned (Fig. 2). For the first time an accurate plan of the current state of the site is being prepared, and the full extent of German activity has been assessed. A geophysical survey of the unexcavated eastern part of the site was also carried out using a fluxgate gradiometer and a resistivity meter.

The planning and geophysics were supplemented by a high-resolution global positioning system survey which was carried out by Roger Doonan of Bournemouth University (Fig. 3). This GPS survey will allow the creation of an accurate digital model of the site's topography and locale which will form the digital basis onto which data from the other surveys can be located in a geographical information system (GIS) data base. It will be combined with information obtained from archival sources to produce a virtual stratigraphic model of the site showing depths of archaeological deposits for each period, together with the penetration of old excavation trenches. The results of this work will allow a reconsideration of the early excavations, particularly those of 1896–9 which were carried out at a time when the comparative archaeology of the area was poorly understood, and of the 1911 excavations which were published only in summary form.

Concomitant with the above research, a conservation study was carried out by Timothy Darvill of Bournemouth University to produce a series of recommendations that will allow the Greek Archaeological Service to carry through a much-needed programme of repair and conservation. As part of this programme, discussions took place with representatives of the Archaeological Service regarding a future visitor route through the site which will enhance its educational value.



**Figure 1.** *Southeastern part of Phylakopi, excavated in 1911, before cleaning.*



**Figure 2.** *Southeastern part of Phylakopi, excavated in 1911, during cleaning.*



**Figure 3.** *GPS surveyors in a WWII German trench.*

## *Training, Education, Management and Prehistory in the Mediterranean: The ‘Temper’ Project*

The ‘Temper’ project is a two-and-a-half-year research initiative funded by the European Union. Based at the McDonald Institute, the project brings together an international consortium of universities, government agencies and non-governmental organizations: University of Cambridge; Oxford Brookes University; Economic and Social History Foundation, Turkey; Aristotle University of Thessaloniki, Greece; Israel Antiquities Authority, Israel; and Fondazzjoni Wirt Artna, Malta.

The project has three key objectives: the development of management plans for prehistoric sites; the development of educational programmes for prehistoric sites; and the provision of training for archaeologists and heritage professionals in the Mediterranean. Five pilot sites are involved: Çatalhöyük in Turkey; Paliambela in Greece; Kordin III on Malta; and Ubeidiya and Sha’ar Hagolan in Israel. The project will draw to a close in 2004 with an international conference on the management and interpretation of prehistoric sites. The project website ([www.temper-euromed.org](http://www.temper-euromed.org)) is regularly updated with results and information about project events.



*‘Temper’ training workshop taking place on site at Çatalhöyük, Turkey.*



*Site Director, Shahina Farid, taking the training participants on a site tour of Çatalhöyük.*



*On-site educational activities at Paliambela, Kolindros, Greece.*



*Children excavating at Çatalhöyük, Turkey.*



## North Kharga Oasis Survey

The aim of the North Kharga Oasis Survey (NKOS), a five-year project co-directed by Dr Corinna Rossi (Cambridge University) and Dr Salima Ikram (American University in Cairo), is to produce a first archaeological survey of the northern portion of the Kharga Oasis, one of the major oases in Egypt's Western Desert. The goals for the 2003 season were to define the limits of the late Roman site of Umm el-Dabadib and to map the site using a theodolite. The site consists of two main settlement areas, the Northern Settlement and the Fortified Settlement, as well as a complex water system, cemeteries, and religious buildings.



*Aerial photograph of Umm el-Dabadib, taken by Richard Knisely-Marpole (©NKOS/Richard Knisely-Marpole).*

The Northern Settlement consists of a series of blocks of buildings two storeys in height, some of which have been destroyed or adapted during the twentieth century when the site was reoccupied and the water systems cleared and reused. A careful study of the Fortified Settlement revealed that it was built in one phase, together with the small fort that lies in the middle. It was surrounded at least along three sides by a continuous wall, and reinforced by sloping buttresses. A Christian church was added to the original settlement at a later stage.

To the east of the Northern Settlement lie a series of two-storey vaulted mudbrick buildings and a pigeon tower. Further to the north stands a large religious building, which appears to have been built in at least three phases, culminating in the addition of a large vaulted room adorned with torus mouldings and a cavetto cornice. Its ceiling was painted with possibly three different types of decoration: geometric patterns, vegetal motifs, and Egyptian deities.

Ten cemeteries associated with the site were identified, mapped, and studied. Some consist of tombs cut in the gravel surface, occasionally lined or covered by mudbrick structures, whilst others take the form of rock-cut tombs. Various methods of mummification appear to have been used throughout the different cemeteries.

Other ruins were located and mapped. They include a square tower in the northeast, a round mill to the east, and a small Hermitage to the north of the main concentration of remains. The five subterranean aqueducts were mapped and explored, and their sections above ground studied in relation to the remains of ancient fields. The archaeobotanical analysis shows that several crops were formerly cultivated at the site, including nabk, wheat (macaroni and bread wheat), six-row barley, date and dom palm, *Cordia sinensis*, and olive.

The ceramic evidence points to activity at this site from the Late Period until at least the fifth century AD. In particular, it suggests a date of the third century AD for the Northern Settlement, and confirms the fourth-century AD foundation date for the Fortified Settlement. Evidence of extensive prehistoric settlements in the area was also recorded.

## Palaeopathology and the Origins and Evolution of Horse Husbandry

### PUBLICATIONS

#### Marsha Levine

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- 2003 (ed. with C. Renfrew & K. Boyle). *Prehistoric Steppe Adaptation and the Horse*. Cambridge: McDonald Institute.
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- 2003 (with S.N. Dudd & R.P. Evershed). Organic residue analysis of lipids in potsherds from the early Eneolithic settlement of Botai, Kazakhstan, in *Prehistoric Steppe Adaptation and the Horse*, eds. M. Levine, C. Renfrew & K. Boyle. Cambridge: McDonald Institute, 45–54.
- 2003 (with T.C. O'Connell & R.E.M. Hedges). The importance of fish in the diet of central Eurasian peoples from the Mesolithic to the Early Iron Age, in *Prehistoric Steppe Adaptation and the Horse*, eds. M. Levine, C. Renfrew & K. Boyle. Cambridge: McDonald Institute, 253–68.

The horse was crucial to the development of early societies but despite intensive investigations over many years, researchers know very little about the origins and evolution of horse husbandry and the osteological consequences of riding and traction.

It was believed that the earliest origins of horse domestication dated to the Eneolithic period as larger quantities of horse remains were recovered from central Eurasian Eneolithic sites (c. 4800–3000 BC) than from Neolithic ones (c. 6000–4800 BC). Some researchers believe that horses became extinct throughout most of Europe at the end of the Ice Age. This, however, is disputed as horses were widespread throughout Eurasia during the early post-glacial period. The increase in horse remains during the Eneolithic is probably due to increased hunting rather than the introduction of herding.

The earliest undisputed evidence for horse domestication probably dates only to the end of the third millennium BC. Evidence of horses in graves with humans, accompanied by artefacts obviously associated with riding or traction, is even more recent, dating to no later than the beginning of the second millennium. By the middle of the second millennium BC horses were widely used to pull chariots. It seems reasonable to suggest that the earliest domestic horses would have preceded the earliest horses in graves. Additionally, because herding horses either on foot or from a chariot is such an unlikely proposition, it is probable that horses were first domesticated for riding. The problem then resolves itself into the search for the earliest evidence of horse riding.

Palaeopathological analysis — the study of ancient pathology — provides one of the most promising approaches to the origins of horse domestication and the evolution of horse husbandry. The results so far indicate that the types and incidences of certain abnormalities of the caudal thoracic vertebrae (the vertebrae under the saddle area) could be connected with riding.

A major new project, 'Palaeopathology and the origins and evolution of horse husbandry', funded by the AHRB, is now in progress, with Professor Leo Jeffcott (School of Clinical Veterinary Medicine, Cambridge) as Principal Investigator and Dr Marsha Levine as Senior Research Associate. Collaborators on this project



include Katherine Whitwell, FRCVS (Newmarket, UK), Professor Li Shuicheng (Arthur M. Sackler Museum of Art and Archaeology, Peking University) and Linas Daugnora (Lithuanian Veterinary Academy). Early Iron Age horses, which wore pad saddles, have been compared with free-living modern Exmoor Ponies, which were never saddled, and medieval Turkic horses (Ak-Alakha 1, Altai) which wore frame saddles. The initial results strongly suggest that the vertebrae abnormalities are associated with the use of pad saddles and, most probably, with riding bareback. Furthermore, these types of abnormalities are entirely absent from the sample of caudal thoracic vertebrae that Dr Levine studied from the Eneolithic site of Botai. This suggests that those bones came from horses which had never been ridden. Although the sample investigated so far is relatively small, the results support those of other analyses which also indicate that the horses from Botai were wild. The next step in this project will be to compare the osteological abnormalities of draught horses with those of riding horses and free-living horses including: 1) Chinese chariot burials from four periods: the Shang dynasty, the Western Zhou dynasty, the Warring States period, and the Qin dynasty; 2) modern Lithuanian draught horses; 3) Early Iron Age Scytho-Siberian horses; and 4) modern unriden Exmoor ponies and ridden ponies.



*Horse thoracic vertebrae showing a caudal abnormality probably due to riding.*

### *English Heritage Project: Roman Pottery Specialist Trainee & Digital Dissemination of Roman Pottery Reports*

The new Roman pottery project, based at the McDonald Institute and funded by English Heritage, is designed to address two issues. First is the need to train new pottery specialists, and, second, the requirement to develop a system for the digital publication of pottery reports. There are now few younger specialists working on Roman pottery. Established specialists with expertise and accumulated experience are very busy, several with forward programmes of writing reports that stretch 2–3 years ahead. There is little or no provision, however, for passing on their expertise to the next generation. Furthermore, few people are coming through Universities with PhDs that allow them to develop skills in pottery research appropriate to the profession. Conventional pottery reports represent an uneasy compromise between what it is possible to publish through the print medium, what we can afford to print, and what it would be ideal to present. The best specialists collect a lot more information than is used in published reports but this is generally only available through their paper archives. Digital dissemination through proper electronic publication offers the prospect of making this information more widely available in a more useful form.

The project is addressing these issues by training Philip Mills as a specialist in Roman pottery, whilst deploying his computing skills to develop and pilot a new system for creating an integrated digital pottery archive. The ADS and Internet Archaeology in York are helping to produce a fully-integrated digital publication of the pottery on which he is working. This project is being run by Martin Millett in collaboration with Dr Jeremy Evans, a specialist in Roman pottery who is well-established in the profession. It is using the pottery from the research excavations at Hayton, East Yorkshire as the basis for the project. Work started in summer of 2003 and will continue for 12 months.

## *A New Phase of Excavation at Çatalhöyük*

This has been an exciting time at Çatalhöyük: after several years of post-excavation analysis and writing, in 2003 excavation started again in earnest. The resumption seemed appropriate as the project also celebrated its 10-year anniversary. Work had begun in 1993, and the first major period of excavation by the Cambridge–Stanford team took place in 1995–99. In the meanwhile other teams had also started digging — especially a team from Poznan in Poland (TP — Team Poznan led by Lech Czerniak and Arek Marciniak), a team from the University of California at Berkeley (BACH — led by Ruth Tringham and Mira Stevanovic) and the West Mound team (led by Jonathan Last and Trina Gibson). But it was with great anticipation and relief that the main team started excavations again this year. It was good once again to get the trowel out!



*View of the South Shelter, Çatalhöyük.*

The project had decided to shift gears in terms of its aims. Earlier work had concentrated on individual houses, how they were lived in, re-used and re-built and abandoned. This had built up a complex picture of the life-histories of individual houses. The project had come to understand the way the site was formed by conducting detailed anatomies of individual houses. It was time now to return to the bigger picture. Mellaart had excavated large areas in the 1960s, and it was necessary to return to this larger scale and address how the site as a whole was organized. Were the buildings organized into groups? What was the social geography of the town? Were there bureaucratic or ceremonial centres that regulated the 3000 to 8000 people that lived there? How had the whole thing worked?

In order to examine these questions, the team decided to return to a technique that Roger Matthews had introduced in its earliest work on the site — surface scraping. It was found in 1993–94 that the soil on the top of the mound was very thin, and only needed to be scraped with hoes for the walls of the latest buildings of the site to show up. In fact, by scraping large areas, the overall plan of part of the town could be recovered. So in 2003 an area 40 m × 40 m in size was laid out adjacent to an area in the northern part of the East Mound which had previously been scraped and had revealed the plan of about 40 houses. The team quickly started seeing the layout of more buildings. But they also came across various difficulties. For a start, the 40 m × 40 m area extended down the sides of the northern eminence. But as soon as the scraping got off the crown of



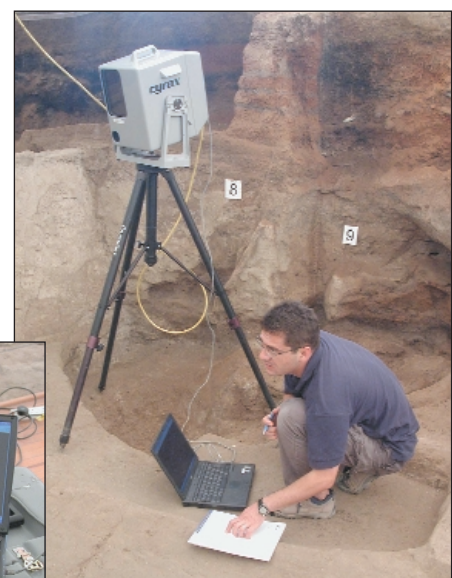
*A stamp seal found in the 40 m × 40 m area.*

the mound, the amount of soil that had to be removed increased, hoes had to be exchanged for heavier tools, and work slowed. Another difficulty was that burials kept appearing. These were right at the surface of the mound and had been partly destroyed by erosion and soil slip. Their archaeological context was thus insecure. Nevertheless some rich Byzantine and Neolithic graves were discovered. One Neolithic burial pit contained more than 15 individuals, some with copper and alabaster armbands. Another Neolithic burial contained two geometric design stamp seals — the best-preserved found so far by the current project. A third stamp seal found in a midden context was very remarkable. It looked like a leopard, but with its head broken off. Part of its tail was also missing but curved back to rest on top of the leopard.

Right at the top of the northern area the foundations for a large building were found. There was no dating material for this but it is presumed to be Hellenistic, Roman or Byzantine, and of uncertain function. Hopefully, future excavation will find some dating evidence in the foundation trench. The overall plan of the Neolithic buildings, especially when linked up to the earlier scraped area was fascinating. Definite 'sectors' could be identified. Houses were as usual tightly packed together, but there were gaps which defined clusters of houses. In fact, these long linear gaps looked like 'streets' or 'alleyways'. They all seemed directed towards the top of the mound. But instead of these alleys leading to public or ceremonial buildings, the top of the mound appeared to have been used primarily for refuse discard or midden. For the moment there is little evidence of public spaces or buildings — once again Neolithic Çatalhöyük seems to consist of just houses and midden.

Excavations also started in the South Area of the mound. This is where Mellaart had excavated in the 1960s and excavations had continued there in the 1990s, but each year the snows and rains had caused erosion and damage, and the trenches had to be covered up each year to protect them. Over the last year, however, a huge shelter had been constructed which could be completely closed in the winter. This was completed just before the digging season by Atölye Mimarlık. It covered about 50 m × 25 m and created a wonderful even light and a protected environment for excavation, conservation and public display. The team has already started putting back reconstructions of the art found by Mellaart so that visitors can understand the site better. But they also started working beneath the shelter, continuing the excavation of Building 10 that had been started by a team from Thessaloniki. In this building were found a number of platforms with traces of red paint along the north and east walls and in the southwest corner, all of which had been remodelled through the occupation of the building. There were traces of two benches against the east wall, one of which may have once had horns inserted into its sides. The oven and hearth activity was in its regular location against the south wall.

The team were very excited to have the opportunity to use a portable Cyra<sup>®</sup> 2500 3D Laser Scanner. The scanning equipment was generously loaned by Cyra Technologies through their parent company Leica Geosystems and the professional geomatic experience was provided by Plowman Craven & Associates, UK. This equipment enabled the recording of the Neolithic buildings at Çatalhöyük in a way that has been impossible in the past. The advantage lies in the system's optimal combination of accuracy-at-range, highly adjustable scan density, high scanning speed, adjustable field-of-view, and ease-of-use. The result was that millions of 3D points were collected across the surfaces of walls and floors and features picking up tiny details and undulations. This greater resolution will help to interpret the function and use patterns of the houses. The scanning equipment will ultimately enable the presentation of a 3D model of the Neolithic buildings and in future years, of the settlement, permitting one to move around and explore from any angle and perhaps from views that the Neolithic people may have experienced themselves.



*Scanning Building 5, North Area using a portable Cyra<sup>®</sup> 2500 3D Laser Scanner.*

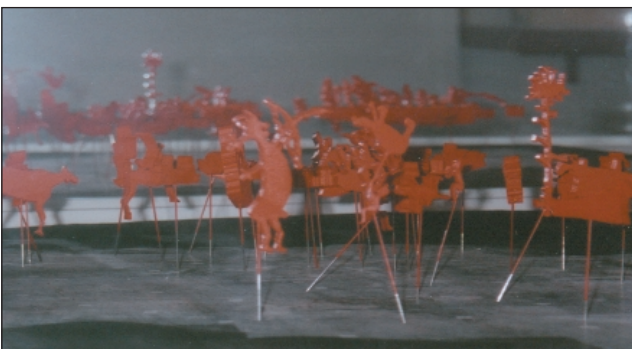


## *Rock Carvings of Northern Russia*

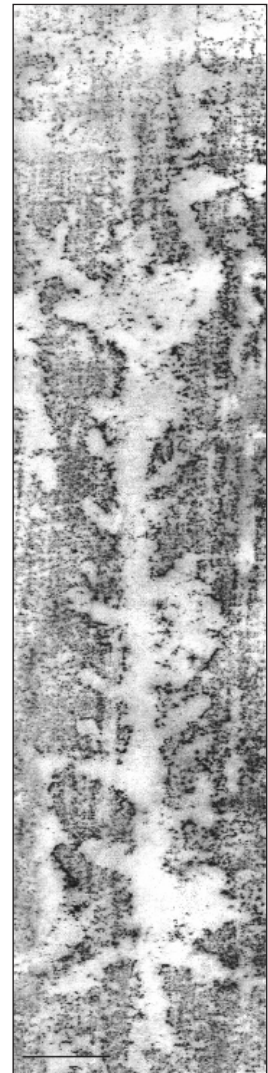
The second season of the project 'Visual Perception and Cognition in the Rock Carvings of Northern Russia', directed by Dr Liliana Janik, took place in June 2003. The project started in 2002 as part of a wider study concerned with understanding the art of prehistoric fisher-gatherer-hunters in Northern Europe. This year Dr Janik concentrated on particular imagery relating to the plant kingdom. Plants in general are rarely represented in visual depictions by prehistoric fisher-gatherer-hunters. Among all known White Sea carvings, in total about two thousand images, only three are considered to be of trees. These images are all located in the complex of New Zalavruga, Groups IV, XII and XX.

Recording techniques developed during the previous season were used once again, in which the rock surfaces were surveyed and subsequently reconstructed in virtual form using GIS and digital imagery with orthorectification. The latter allowed the correction of lens distortions during the virtual reconstruction of the rock surfaces. In addition, this year's recording strategy included taking rubbings of the rock surfaces, which will help with understanding the nuances of the carvings of the trees and possibly with distinguishing the species of particular trees. These rubbings were obtained by placing paper on the rock surface and rubbing powdered graphite on it. This technique permitted the researchers to copy the image as carved into the granite surface by the prehistoric carver, while at the same time recording all marks on the rock, thus providing a one-to-one copy of the carvings and their background.

The recording techniques and visual reconstruction used in the project were presented as a part of the exhibition 'ROCK-ART- image - people - land - knowledge' at the Cambridge University Museum of Archaeology and Anthropology in May 2003. A variety of techniques were illustrated, the most prominent place being given to the reconstruction of Group IV, which combines computer-generated images of the rock surface and cut-outs of the carved images. The cut-out figurines are a representation of the images carved into the rock surface and they are painted



*3D model of Group IV, New Zalavruga rock art exhibited at the Cambridge University Museum of Archaeology and Anthropology.*



*New Zalavruga, Group XX, rubbing of tree with a bird sitting on the top of it.*

red, reflecting the tradition of filling carvings with red paint in Scandinavian archaeology. Placing them vertically above the surface allows visitors to the exhibition to see clearly what is going on within the composition. The installation of a mirror on the two walls restricts the way that visitors can walk around the reconstruction and permits details of the various activities depicted to be seen from all directions. This device allows the viewer to follow the visual narrative encapsulated in the visual composition by prehistoric artists.