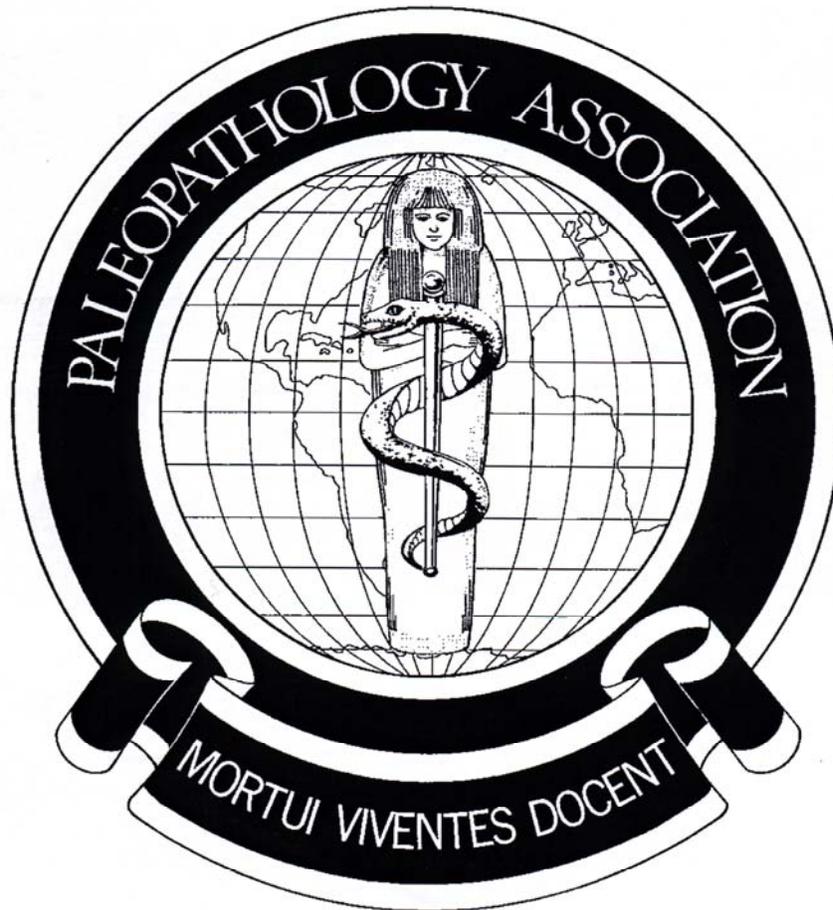


Supplement to the *Paleopathology Newsletter*

Paleopathology Association

XV European Meeting

Scientific Program & Abstracts



10th-14th August 2004

**University of Durham,
England**

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The Paleopathology Association would like to express the sincere gratitude of our members to the Organizers and Sponsors of this meeting. Their hard work and generosity brought together 160 participants from 25 countries to share their scientific research and friendship in the lovely city of Durham, England.

Cover design originated by Patrick D. Horne

**XV European Meeting of the Paleopathology Association
Durham, England 2004**

SCIENTIFIC PROGRAM

TUESDAY 10TH AUGUST

Department of Archaeology, University of Durham

Special Symposium: Upper Palaeolithic People from Sunghir, Russia
(sponsored by the Institute for Bioarchaeology)

- 10.00 Introduction (Roxie Walker, President, Institute for Bioarchaeology)
 - 10.10 Video: Early excavations at Sunghir
 - 10.30 Tatiana Alexeevna: New investigations of Sunghir data, 40 years later
 - 10.50 Maria Mednikova: Postcranial morphology of Sunghir remains
 - 11.10 Alexandra Buzhilovna: Pathology of the Sunghir peoples and ecology of Upper Palaeolithic Eastern Europe
 - 11.20 Coffee Break
 - 11:50 Vincenzo Formicola: From the Sunghir children to the Romito dwarf: reflections on pathology and Upper Palaeolithic funerary practices
 - 12.10 Erik Trinkaus: Appendicular robusticity and proportions of the Sunghir adults
 - 12.30 Maria Dobrovol'skaya (Kozlovskaya): Sunghir humans: the problems of diet reconstruction
 - 12.50 Michael P. Richards: Isotopic Evidence of diets at Sunghir and other European Gravettian sites.
- Lunch

Posters (Afternoon)

- Evgeniy Kulikov, Andrey Poltaraus and Irina Lebedeva: DNA analysis of Sunghir remains: problems and perspectives
- Galina Lebedinskaya: Anthropological reconstruction of the physical appearance of the Sunghur people
- Alexandr Zubov: Morphology of the Sunghir childrens' teeth
- Nikolay Bader et al.: Environment of the Sunghir people's habitat: the evidence of native sciences

XV PPA Meeting Registration (14.00-18.00)
Department of Archaeology, University of Durham

Plenary Lecture: Dr Keith Manchester (19.30)
The Great Hall of the Castle, Durham

WEDNESDAY 11TH AUGUST

Department of Archaeology, University of Durham

09.00 Welcome and Announcements (Charlotte Roberts)

Studies of Population Health I (Chair: George Maat)

- 09.10 Alexandra Buzhilova: Diseases of medieval migrants from the European Russian North
- 09.30 Joachim Baxarias: The Spanish Roman necropolis of Tarraco: final results
- 09.50 László Paja, Antonia Marcsik and Erika Molnar: Palaeopathological studies of a 10th-11th century Hungarian population

- 10.10 Malin Holst: Health in Medieval York, with particular emphasis on the Fishergate House population
10.30 Coffee (Posters 1-8)

Studies of Population Health II (Chair: George Maat)

- 11.00 Rebecca Redfern: Past masculinities: a male health perspective from the Iron Age to Romano-British period in England
11.20 Maria Mednikova: Lifestyle of the early Scyth population according to anthropological data
11.40 Richard H. Steckel: Survival under extreme pressure: early childhood stress and adult age at death in skeletal remains
12.00 Lunch

Dental Disease (Chair: Conrado Rodríguez Martín)

- 13.30 Announcements
13.40 Alan Ogden: Can we identify genuine periodontal disease in skeletal material?
14.00 Maria Dobrovolskaya: Dietary patterns and dental health in Bronze Age samples from the South Russian steppe
14.20 Zoran Rakočević, Marija Djurić and Srboľjub Živanović: Radiological interpretation of images of mandibles and maxillae from skeletal material derived from archaeological contexts

Trauma (Chair: Luigi Capasso)

- 14.40 Linda Fibiger: Conflict and violence in early post-medieval Europe: The evidence from two 17th century mass graves at Carrickmines Castle, Co. Dublin, Ireland
15.10 Tea (Posters 9-16)
15.30 Raphaël Panhuysen: Living by the sword? Sharp bladed trauma in early Medieval Maastricht
15.50 Conrado Rodríguez-Martín, L. Fondebrider, M. Salado: The value of osteopathology in the investigation of human rights violation and physical abuse

Infectious Disease I (Chair: Albert Zink)

- 16.10 Vitor Matos and Ana Luisa Santos: On the trail of pulmonary tuberculosis: results from the Human Identified Skeletal Collection from the Museu Bocage (Lisbon, Portugal)
16.30 Close of session and announcements

Reception: Oriental Museum, University of Durham (19.30)

THURSDAY 12TH AUGUST

Department of Archaeology, University of Durham

Infectious disease II (Chair: Albert Zink)

- 9.00 Announcements
09.10 Amy Gray Jones, B. Connell, R. Redfern and D. Walker: Tuberculosis at Spitalfields, London: an initial insight into Medieval urban living
09.30 Erika Molnar, M. Maczel, Antonia Marcsik, Gy Palfi, Andreas G. Nerlich and Albert Zink: A palaeopathological and paleomicrobiological study of a foreign ethnic group from the period after the Turkish occupation in Hungary
09.50 Helen Donoghue: *Mycobacterium tuberculosis* and *Mycobacterium leprae* DNA in archaeological specimens with palaeopathology typical of leprosy
10.10 Marie-Catherine Bernard: Tuberculosis in twentieth century Britain: a demographic analysis and social study of admissions to a children's sanatorium in Stannington, Northumberland
10.30 Coffee (Posters 17-24)
11.00 Caroline Arcni and Torbjörn Ahlström: The quest for syphilis in Sweden 850- 1536 AD
11.20 Václav Smrčka: Social relations, dietary trends in the La Tène period and infestation by parasites

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Metabolic and Endocrine Disease (Chair: Ana Luisa Santos)

- 11.40 Ruggero D'Anastasio and Luigi Capasso: Idiopathic hyperostosis: epidemiology and phylogeny
- 12.00 Shina Ameen: Harris lines of the tibia: a comparison of two populations, medieval and contemporary, in Central Europe
- 12.20 Lunch

Metabolic and Endocrine Disease continued (Chair: Ana Luisa Santos)

- 13.30 Announcements
- 13.40 Albert R. Zink, S. Panzer, M. Fesq-Martin, E. Burger-Heinrich, A. Lang, J. Wahl, Andreas G. Nerlich: Earliest evidence for primary hyperparathyroidism in the Neolithic
- 14.00 Megan Brickley, Simon Mays and Rachel Ives: Skeletal manifestations of Vitamin D deficiency in adults (osteomalacia)
- 14.20 Simon Mays, Megan Brickley and Rachel Ives: Changes associated with rickets in the immature skeleton
- 14.40 Tina Jakob: A population-based study of hyperostosis frontalis interna in early Medieval samples from England and Germany
- 15.00 Tea (Posters 25-32)

Studies of Population Health III (Chair: Simon Mays)

- 15.30 Naran Bazarsad: Health in the Bronze and early Iron Ages of Mongolia

A Miscellany (Chair: Simon Mays)

- 15.50 Charlotte Henderson: Recording musculoskeletal stress markers
- 16.10 George J.R. Maat: Two millennia of male stature development in the Low Countries
- 16.30 Handan Üstündag-Aydin: Vertebral osteophytosis in a skeletal sample from Klostermarienberg, Austria
- 16.50 George J. Dias, J.A. Kieser and K.J. Dennison: Patent premaxillary suture in early adult Polynesians: a pathological feature?
- 17.10 Ron Pinhasi, M. Teschler-Nicola, F. Kainberger, and M. L. Pretterklieber: Infectious and non-infectious joint diseases of the feet in an Avar period site from Austria
- 17.30 Camila Storto Frochtengarten, Cecilia Carlucci Petronilho, Ligia Bendetto Giardini, Célia Helena Boyadjian, Andreia Ranieri and Sabine Eggers: Bioarchaeology at school
- 17.50 Close of session and free evening

Paleopathology Association Executive Committee Meeting (18.30)

FRIDAY 13TH AUGUST

Department of Archaeology, University of Durham

Studies of Bioarchaeology in Greece – organised by Chryssi Bourbou (Chair: Piers Mitchell)

- 09.00 Announcements, and Introductory remarks for the session (Chryssi Bourbou)
- 09.10 Anastasia Papathanasiou: Analyzing health patterns in Mycenaean Greece
- 09.30 Lynne Schepartz and Sari Miller-Antonio: Temporal Perspectives of the Mycenaeans of Pylos: the palace of Nestor grave circle burials and neighboring tombs
- 09.50 Sherry Fox: Eastern Mediterranean health: comparative analysis of the human skeletal remains from two Hellenistic-Roman port sites
- 10.10 Anastasia Tsaliki: Tough Life: Deformity, disease and 'stress' in a small population sample from Greece
- 10.30 Coffee (Posters 33-40)

- 11.00 Chryssi Bourbou: Patterns of trauma in medieval (11th-12th centuries AD) populations from Crete (Greece)
- 11.20 Della Collins Cook: Normal goat or diseased human? Methodological issues in fragmentary remains
- 11.40 A. Lagia, C. Eliopoulos and S. Manolis: Differentiating the anaemias from the skeleton: the diagnosis of thalassaemia
- 12.00 Kirsi Lorentz: New evidence for headshaping in Greece and the Eastern Mediterranean
- 12.200 Ethne Barnes: Developmental defects from ancient Corinth
- 12.40 Lunch

Aidan and Eve Cockburn Memorial Session (Chair: Jane Buikstra)

Special Invited Guests: Erika (Cockburn) Arett and Kent Arett, Gillian (Cockburn) Burch, and Allison (Cockburn) Cox and Joseph, Peniel, David, and Michael Cox

- 14.00 Introduction and opening remarks (Jane Buikstra and the Cockburn family)
- 14.30 Pia Bennike: Porotic hyperostosis in Mesolithic Denmark?
- 14.50 Donald Ortner: Disease in the Early Bronze Age IA people of Bab edh- Dhra' Jordan
- 15.10 Eugen Strouhal, Alena Nimèková, Fady Khattar: Radiographic examination of a sacral neurilemmoma from Ancient Egypt
- 15.30 A.R. Zink, S. Kohler, N. Motamedi, U. Reischl, H. Wolf, A.G. Nerlich: Molecular evolution of the *M. tuberculosis* complex in ancient Egypt
- 15.50 Tea (Posters 41-51)
- 16.15 Piers D. Mitchell, Yossi Naggar, Ronnie Ellenblum: Weapon injuries in the 12th Century Crusader garrison of Vadum Iacob Castle, Galilee, Israel
- 16.35 Luigi Capasso and Ruggero D'Anastasio : Food contamination and state of health at Herculaneum (1st century AD)
- 16.55 Close of conference

Conference Dinner and Ceilidh: Town Hall, Durham (17.50)

POSTER PRESENTATIONS (11-13 August)

* Entry in the Institute of Bioarchaeology Poster Prize Competition

- *1. Elena Bedini, B. Lippi, Francesca Bartoli, L. Pejrani, F. Bertoldi, Gino Fornaciari: Death from cranial trauma in a medieval individual from the Abbazia di Fruttuaria (S. Benigno Canavese-Torino)
- *2. Elena Bedini, B. Lippi, L. Pejrani, Gino Fornaciari, Francesca Bertoldi: Palaeopathological study of the Longobard necropolis of Collegno (Turin, Italy)
- *3. Elena Bedini, B. Lippi, L. Pejrani, Gino Fornaciari, Francesca Bertoldi: An old mortally wounded warrior from Collegno (Italy)
- *4. Elena Bedini, Francesca Bertoldi, B. Lippi, L. Pejrani, Fulvio Bartoli: A study on the adequacy of diet and nutritional deficiencies of the Longobard population of Collegno (Italy)
- *5. Elena Bedini, Elena Cecconi, Francesco Mallegni, Fulvio Bartoli: Four cases of cranial wounds in a medieval cemetery located in Saluzzo, CN, Piedmont (Italy)
- *6. Francesca Bertoldi, S. Lora, M. Librenti, S. Gelichi: The cemetery of Nonantola (Modena, Italy): a preliminary study of the health status of the medieval population
- *7. Francesca Bertoldi, A. Alberti, F. Sbarra, Gino Fornaciari, S. Gelichi: Pathological conditions and stress markers in the medieval human remains from Vicopisano (Pisa, Italy)
- *8. Francesca Bertoldi, S. Lora, E. Grandi, M. Librenti, S. Gelichi: Palaeopathological data from the cemetery of S. Bartolomeo's Church-Formigine (Modena, Italy)
- *9. Trisha M. Biers: Investigating relationships among grave offerings, pathological conditions and burial rituals of the Falsita type mummy bundle at an Inca- period cemetery, Lima, Peru

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10. Joël Blondiaux, Nicolas Gabart and Erica A. Tyler.: Relevance of cement annulations to palaeopathology
- *11. Heather Bonney, Ron A. Dixon, Anthony Forde, Corinne Duhig: The River Witham skull: state of preservation allows for forensic analysis
12. Alexandra Buzhilova and Margarita Sokolova: Hyperostosis frontalis interna in the tribes of European Sarmations from the 3rd century BC to the 4th century AD
13. Alexandra Buzhilova and Anna Gorbacheva: Medieval examples of syphilis from the Russian town of Mozhaïsk, Russia
- *14. Francisco Curate: Two possible cases of brucellosis from a Clarist Monastery in Alcácer do Sal, Southern of Portugal
- *15. Marija Djurić, Zoran Rakočević, Srboľjub Źivanović: Palaeopathological evidence of cranial osteoma in the late Medieval graveyards of Serbia
- *16. M. Ege, Andreas G. Nerlich, Albert R. Zink: Epidemiological analysis of tomb complexes from the necropolis of Thebes-West
- *17. Maria Teresa Ferreira and Cláudia Santos : Oral Pathology in a sample from Castelo de Ansiães (Carrazeda de Ansiães, Portugal)
- *18. Carlos S. Garcia : Pathological study of mandibular and dental remains from the man of Sidron (Pilona, Asturias, Spain).
19. Thor Gjerdrum, Kaethin Prizer and Philip L. Walker: Activity-related osteoarthritis of the knee among Native Americans in Southern California
20. Mark Hubbe, Eugenia Cunha and Sabine Eggers: Asymmetric non-artificial cranial deformation in a Brazilian shellmound builder
21. Scott Legge: Compression and non-compression fractures in vertebrae of Alaskan Eskimos
- *22. Ana Machado, Ana Maria Silva and Eugénia Cunha: A case of DISH in an adult male skeleton (14th-18th centuries) exhumed from the São Jorge Chapel in Porto de Mós, Portugal.
23. Francesco Mallegni, Giuliana Cortesi Alice Pagni and Giuseppe Naponiello: A cranial trephination from the Renaissance aristocratic sacellum in San Cerbone, Populonia
24. Jan McEwan, Diana Rossi and Simon Mays: A case of secondary hyperparathyroidism from Medieval England
25. David Minnikin: Detection of lipid biomarkers for ancient mycobacterial disease
- *26. Maria Victoria Monsalve, Mike Nimmo, Wayne Vogl, Derrick Horne, Elaine Humphrey: Cellular components in tissue samples from Kwáday Dán Ts'inchi ancient remains, British Columbia, Canada
- *27. Andreas Nerlich, E. Egarter-Vigl, B. Bachmeier, S. Thalhammer, Albert. Zink: New evidence for skin wounds in the Tyrolean Iceman
- *28. Maria João Neves and Maria Teresa Ferreira: Perthes disease: a possible case from the medieval/modern Sta. Maria de Finisterra church necropolis (Soure, Coimbra, Portugal)
- *29. Dariusz Nowakowski and Barbara Kwiatkowska: Report of hyperostosis frontalis interna in a medieval skeleton from Lower Silesia (Poland)
- *30. Susana Carrascal Olmo and Thaïs Fadrique Rubio: unilateral dysplasia of a humerus in a medieval skeleton
- *31. László Paja, L.Gyula Farkas, László Józsa: Ankylosis of the knee and hip joints in a medieval series from Bátmonostor (Southern Hungary)
- *32. Doris Pany, Maria Teschler-Nicola, F. Kainberger, T. Prohaska, G. Stinger: Klippel-Feil syndrome in a Magyar Conquest Period juvenile skeleton from Austria
- *33. Stephanie Panzer, Albert R. Zink, M. Fesq-Martin, E. Burger-Heinrich, A. Lang, J. Wahl, Andreas G. Nerlich : Radiological findings in a Neolithic case of hyperparathyroidism (**WINNER OF THE 2004 INSTITUTE OF BIOARCHAEOLOGY POSTER PRIZE**)
- *34. Peggy Philippe, Xavier Demondion, Bernard Cortet, René-Marc Flipoľ, Erica A. Tyler, Joël Blondiaux: Ankylosing gout from the medieval period to the Present (**HONORABLE MENTION, 2004 INSTITUTE OF BIOARCHAEOLOGY POSTER COMPETITION**)
- *35. Alejandro Romero, Noemí Martínez-Ruiz and Joaquín De Juan: Buccal microwear variability between Early Prehistoric and Historic human groups from Eastern Spain

36. Ana Luísa Santos, Paula Tavares and Ana Gonçalves: Paleopathological study of the remains of individuals exhumed from the Castle of Viana do Alentejo (Portugal)
- *37. Cláudia Santos: A case of venereal syphilis in a young adult female from Ribeira de Santarém (Santarém, Portugal)
- *38. Marianne Schweich: Was there a secular trend for stature in England before the 19th Century?
- *39. Václav Smrèka: Scaphoid nonunion from the medieval site of Kladruby
40. Eleni Stravopodi, Sotiris Manolis and Michael Schultz: Porotic hyperostosis: an epidemic outbreak in Neolithic Greece? Revising the data.
- *41. Paula Tavares, Maria João Neves, Maria Luís Vilhena de Carvalho and Ana Maria Silva: The emergence of modern medicine in Portugal: evidence of surgical interventions in crania
42. Maria Teschler-Nicola, Mark Spigelman, Ron Pinhasi, Helen D. Donoghue and Vernon Kim: Molecular evidence of tuberculosis in the early mediaeval site of Gars/Thunau, Austria
- *43. I. Trautmann: Cremations of the Linearbandkeramik culture in relation to burial practices of Early Neolithic communities in south-western Germany
44. Karin Wiltshcke and Anna Maria Höger: A bony tumour of the skull base – a case report
- *45. Albert R. Zink, Andreas G. Nerlich, Stephanie Panzer, Erika Molnar, L. Paja, Antonia Marcsik: A case of metastatic cancer from the 10th - 11th century in Hungary
46. M. Merckx and R.G.A.M. Panhuysen: Enamel hypoplasia and health during childhood in early Medieval Maastricht and nineteenth century Zwolle (The Netherlands)
47. Evgeny E. Kulikov, Andrey Poltarau, and Irina Lebedeva: DNA analysis of Sunghir remains: problems and perspectives
48. Segei Vassilyev: Craniotrigonometry of Sunghir skulls
49. Galina Lebedinskaya: Anthropological reconstruction of physical appearance of Sunghir people
50. Alexander Zubov: Morphology of Sunghir children's teeth
51. V.M. Alifanova et al.: Environment of the Sunghir people: the evidence of native sciences

ABSTRACTS OF PAPERS AND POSTERS

NEW INVESTIGATIONS OF SUNGHIR DATA: 40 YEARS LATER. Tatiana Alexeeva.
(Sunghir Symposium)

This symposium presents the results of four decades of analysis of the Middle Upper Palaeolithic site of Sunghir, located in the Central Russian Plain. Radiocarbon dates on animal and human bones from the site place the main occupation between 28,000-22,000 years before present (ybp). Three well-preserved human burials were recovered: Sunghir 1, a very robust adult male, and two juveniles whose bodies had been covered with red ochre and buried head-to-head with a wealth of shell, bone, and ivory ornaments, perforated fox teeth, and spears made from straightened mammoth tusks: Sunghir 2, a young boy aged 12-14 years, and Sunghir 3, a young girl aged 9-10 years old, accompanied by the femur of a second adult male, Sunghir 4. The skeletal morphology, funerary details, and paleopathology of these individuals are described in individual papers in the symposium.

HARRIS LINES OF THE TIBIA: A COMPARISON OF TWO POPULATIONS, MEDIEVAL AND CONTEMPORARY, IN CENTRAL EUROPE. Shina Ameen

The prevalence of Harris lines (HL) in two medieval populations from central Switzerland was compared with data from a contemporary Swiss sample. Radiographs of 112 well preserved tibiae from the 8th-13th century were reviewed for the presence of Harris lines. Retrospective examination of 138 radiographs of a contemporary population was performed and the incidence of HL was determined. Age and sex was determined according to known anthropological methods. Age of the formation of the HL was estimated

using the method of Maat. A simplified method for measuring the age of the individual at the time of formation of Harris line is also considered. HLs were found in 80% of the Medieval population and in 20% of the contemporary population. HLs in both populations were associated with degenerative bone changes, osteoporosis, rickets, trauma, and psychological stress. This study gave insight to the health status of two Medieval populations in central Switzerland. Assessing the age of the individual at the time of formation of HL may have future applications in paediatric population for medicolegal purposes.

THE QUEST FOR VENEREAL SYPHILIS IN SWEDEN 850 -1536 AD. Caroline Arcini and Torbjorn Ahlstrom

This paper presents evidence for venereal syphilis from skeletal remains in Sweden dated to the end of the Medieval period. In all, 10 000 individuals from Viking age and Medieval cemeteries were analysed for evidence of venereal syphilis. Obvious cases dated by means of ¹⁴C indicate that no unambiguous case of venereal syphilis has a date prior to 1440 AD. The clearest case with caries sicca has been dated 1440 to 1640 AD with a 95 % confidence interval. The skeleton was one of the last to be interred in a medieval cemetery which was in use until 1536 AD. Thus, the data suggest that the presence of tertiary venereal syphilis is restricted to the last phase of the medieval period

ENVIRONMENT OF THE SUNGHIR PEOPLES' HABITAT: THE EVIDENCE OF NATIVE SCIENCES. Nikolay O. Bader, V.M. Alifanova, et al. (Sunghir Symposium)

The Sunghir site is located on the Klyasma River, some 192 km from Moscow. It was evidently occupied intermittently, probably in summertime by groups of nomadic hunter-gatherers, for 2000-2500 years. The river valley was swampy, covered with fir and pine trees, during the first part of the occupation during the interstadial warming of the Middle Valdai. As the climate became cooler, these trees were replaced by open periglacial landscapes. Bones of mammoth, horse, bison, deer, and other cold-climate mammals and birds recovered from the site support the climate evidence from pollen.

DEVELOPMENTAL DEFECTS FROM ANCIENT CORINTH. Ethne Barnes

Developmental defects range from mild to severe in skeletal collections at Ancient Corinth. Cervical ribs and lumbar ribs from cranial-caudal shifting and block vertebrae show up in infants and young children as well as adults. Rare vertebral defects include dens separation from cranial shifting at the atlanto-occipital border and severe lateral hypoplasia and aplasia of vertebral bodies. Ulnar styloid ossicles appear rare while a 3rd metacarpal styloid ossicle is not uncommon. Symphalangism of the 5th toe is common, as is cranial thoracolumbar border shifting of transitional facets from T12 to T11.

THE SPANISH ROMAN NECROPOLIS OF TARRACO: FINAL RESULTS. Jochim Baxarias

This paper reports an extensive study of skeletons from the late Roman necropolis of Tarraco, Spain. This necropolis extends to the west side of the city of Tarragona on the Mediterranean coast. Its location was along one of the ancient roads entering the Roman city of Tarraco, capital of Hispania Citerior. Using the Anforic Keay's method, the site was dated to between the 3rd and 5th centuries AD. It contained 243 inhumations, the majority of which were buried in amphorae, and was part of a great funerary complex which may contain as many as 2000 burials situated below adjacent buildings. In the series, 43% of adults were male and 57% were female; most died between 21 and 30 years of age, with the average life span at 33 years. Mean height for males was 157cm and 152cm for females. Fractures affected 18.1% of individuals, with osteoarthritis targeting 24.4% of the sample. Dental abscesses (9.9% of individuals), maxillary sinusitis (6.3%), two cases of surgery, spina bifida (5.2%), one congenital hip dislocation, caries

(31%), calculus (2.9%), enamel hypoplasia (22.7%), Schmorl's nodes (24.8%) and cribra orbitalia (11.8%) were recorded.

HEALTH IN THE BRONZE AND EARLY IRON AGES OF MONGOLIA. Naran Bazarsad

The Chandman burial ground of Western Mongolia dates to the Late Bronze and Early Iron Age. The human skeletal material was excavated between 1972-1974 during a Russian-Mongolian collaborative expedition, conducted by the archaeologists Tseveendorj (1978) and Bolkov (1972). The palaeoanthropological, palaeodemographic and palaeopathological investigations were undertaken by anthropologist Mamonova (1978) and Bazarsad (1997, 2003). Two types of burials were uncovered during archaeological excavation of the burial ground: timber and stone box graves. Small stone boxes contained single and double inhumations. Wooden timber graves, larger than the stone boxes, contained from two to twelve individuals. The pathological changes provide useful information about nomadic living conditions. Many individuals suffered bone lesions: trauma, specific and non-specific infectious diseases, degenerative joint disease, and dental pathology. Non-specific infectious diseases were the most frequent. The effects of nutritional deficiency and trauma reflect stresses of the nomadic lifeway.

DEATH FROM CRANIAL TRAUMA IN A MEDIEVAL INDIVIDUAL FROM THE ABBAZIA DI FRUTTUARIA (S. BENIGNO CANAVESE-TORINO). Elena Bedini, B. Lippi, Fulvio Bartoli, L. Pejrani, Francesca Bertoldi, and Gino Fornaciari

The oldest burials of the cemetery of the Abbazia di Fruttuaria, dated to the late 11th-13th centuries AD, are those of upper-class laymen buried in brick and stone coffins. In Tomb 166 the remains of three male adults may be related. The latest buried subject died of a cranial injury caused by an arrow whose iron tip was discovered inside the skull. The arrow obliquely entered the left orbit, destroyed its floor, hit the pterygoid plexus and stopped at the left occipital condyle. The death of the subject was immediate, due to neurological shock.

PALAEOPATHOLOGICAL STUDY OF THE LONGOBARD NECROPOLIS OF COLLEGNO (TURIN, ITALY). Elena Bedini, B. Lippi, L. Pejrani, Gino Fornaciari, and Francesca Bertoldi

The Longobard necropolis of Collegno contains burials in rows. A group of older burials in the main row is characterized by precious grave goods and wooden structures (common in Hungarian cemeteries but rare in Italy) built above ground along the necropolis walls. These features, belonging to a true "death house" supported by four wooden posts at the corners, enable us to recognize the "founders" of this necropolis around whom the descendant relatives, half-free individuals and servants were buried. Some individuals show osteoarthritis related to old age while others had evidence of exceptionally serious and interesting pathological alterations. Several armed subjects show evidence of sudden and violent deaths or trauma due to their engagement in military tasks. Morphometric and ergonomic analyses of the limb bones, the type and location of degenerative changes, and trauma in the later individuals (dated to the 8th century and lacking in grave goods) seem to indicate intense physical stress due to heavy labor.

AN OLD MORTALLY WOUNDED WARRIOR FROM COLLEGNO (ITALY). Elena Bedini, B. Lippi, L. Pejrani, Gino. Fornaciari, and Francesca Bertoldi

An elderly male buried fully armed in the cemetery of Collegno showed atrophy of the left radius and ulna, probably due to an obstetric lesion suffered during birth or to early poliomyelitis, and serious post-cranial skeletal alterations. The 5th-9th thoracic vertebrae show unusual degenerative changes of DISH, and other traumatic lesions probably caused by self-defence (the subject had reduced or absent function of the left

upper limb and in older age suffered from rigidity and difficulty of movement of the trunk and the shoulders). Completely healed rib fractures, and two cranial lesions on the right temporo-occipital region, one caused by an edged weapon, were noted. Furthermore, a quadrangular shaped wound on the right half of the lambdoid suture caused by a pointed weapon probably caused the death of this warrior.

A STUDY ON THE ADEQUACY OF DIET AND NUTRITIONAL DEFICIENCIES OF THE LONGOBARD POPULATION OF COLLEGNO (ITALY). Elena Bedini, Francesca Bertoldi, B. Lippi, L. Pejrani, and Fulvio Bartoli

A paleonutritional study, together with palaeopathological analysis of teeth and skeletal markers of nutritional stress, was undertaken using Atomic Absorption Spectroscopy on 45 skeletons from Collegno, Italy. The concentrations of five elements, Ca, Sr, Mg, Zn and Cu, were analysed. This 6th-7th century group of burials had a fairly rich and varied diet. They were not directly involved in food production but obtained resources through exchange and tributes. Diet was based on natural resources offered by the surrounding environment, such as cereals (as bread, soups and porridges), vegetables, fresh-water fish, crustaceans and molluscs, legumes, dried and fresh fruit, and red meat. This diet does not appear to have changed through time, though the 8th century group shows a slight worsening of nutrition and a decrease in consumption of red meat due to a probable general change in socio-economic conditions.

FOUR CASES OF CRANIAL WOUNDS IN A MEDIEVAL CEMETERY LOCATED IN SALUZZO, CN, PIEDMONT (ITALY). Elena Bedini, Elena Cecconi, Francesco Mallegni, and Fulvio Bartoli

In this preliminary study, four cases of unhealed blade injury to skull were found. Individual T63 (male adult) presents a transverse sharp blade injury to the left frontal bone probably related to the amputation at the left elbow joint; the victim may have lifted his arm for self defense. Moreover, he presented two transverse superficial cuts to the occipital bone and one to the left parietal (fatal). Therefore, from an examination of skeletal remains it is potentially possible to reconstruct the cause and manner of death. Individual T69s.6 (male adult) presented a blade injury to the right inferior orbital margin that produced a clean cut; the incision had probably been made from above by a sword. He also presented a large wound to the occipital bone (right side) from an axe, with fracture lines caused by the withdrawal of the weapon. Individuals T22 and T13 (males) presented holes located in their frontal bones (in T22 the hole was smaller and with fracture lines) probably produced by bullet-like projectiles, like those found during laboratory analysis (Us T68 and Us T69s.6).

POROTIC HYPEROSTOSIS IN MESOLITHIC DENMARK? Pia Bennike

In a previous study of Mesolithic skeletons from Denmark it was been reported that several skulls showed evidence of porotic hyperostosis (Meiklejohn and Zvelebil 1991). As the condition did not fit the classic pattern of this pathological change in populations which are either heavily dependent on a cereal diet, suffer from malaria, or live in an area with a high population density, the authors suggested that it could be attributed to fish tapeworms. This seems a reasonable suggestion as C-13 results and the presence of fish bones have revealed that the Mesolithic population was heavily dependent on a marine diet. The Danish Mesolithic skulls have been re-examined in order to study both the presence and pattern of porotic hyperostosis. However, the study has revealed a different interpretation of the bone changes and of the possible causes.

TUBERCULOSIS IN TWENTIETH CENTURY BRITAIN: A DEMOGRAPHIC ANALYSIS AND SOCIAL STUDY OF ADMISSIONS TO A CHILDREN'S SANATORIUM IN STANNINGTON, NORTHUMBERLAND. Marie-Catherine Bernard

This study analyses data from medical records of a former tuberculosis sanatorium for children at Stannington, Morpeth, Northumberland. The objective of the study was to understand the patterning of tuberculosis in the sanatorium by considering differences between male and female patients, ages affected, and the socio-economic backgrounds of patients in a sample of patient records taken from pre- and post-antibiotic eras, pre- and post-Second World War, and pre- and post-National Health Service years. Some 1,897 patient records were utilized in this study, all held at the Northumberland Record Office at Morpeth. Overall, more females than males were admitted to the sanatorium. The majority of the children (over 60%) were suffering from pulmonary tuberculosis, but there were a large number also suffering from tuberculosis of the bones and joints (230 cases or 12%). Most of the children came from poor backgrounds and originated from the Newcastle and Gateshead areas. The introduction of chemotherapy, the end of the Second World War and the implementation of the NHS did not have a great effect on who was being treated at the sanatorium. In conclusion, these records hold a wealth of information that may help build an epidemiological model for tuberculosis in the North-East of England.

THE CEMETERY OF NONANTOLA (MODENA, ITALY): A PRELIMINARY STUDY OF THE HEALTH STATUS OF THE MEDIEVAL POPULATION. Francesca Bertoldi, S. Lora, M. Librenti, and S. Gelichi

We present a preliminary palaeopathological study of the medieval cemetery recently discovered in Nonantola (Modena, Northern Italy). The cemetery of Piazza Liberazione, found in the main square of the city, was used between the 12th and 14th centuries AD. So far, more than 150 burials have been excavated; a large percentage of the sample comprises still-borns, infants and children buried in a reserved area along the northern section. The population was affected by several diseases. Dental pathology (caries, abscesses), infections (two cases of osteomyelitis, and a lymph node calcification probably caused by tuberculosis), osteoarthritis, fractures (clavicles, limb bones and skull), anaemia (especially among children), together with evidence of markers of occupational stress (MOS), have been recorded. The individuals buried in six stone and brick graves found close to the church apses were priests and abbots belonging to the Benedictine Order. They show different MOS patterning, specifically on the tibiae and skulls; this may represent the effects of repeated kneeling for prayer.

PATHOLOGICAL CONDITIONS AND STRESS MARKERS IN THE MEDIEVAL HUMAN REMAINS FROM VICOPISANO (PISA, ITALY). Francesca Bertoldi, A. Alberti, F. Sbarra, Gino Fornaciari, and S. Gelichi

Excavations at the Monastery of San Michele alla Verruca (Vicopisano) revealed several burials dated to the 12th-14th centuries AD. The cloister's porches were used as a burial area for monks, while the lay individuals in the sample, comprising individuals of both sexes and all ages, were buried in stone coffins in the church square. The occurrence of several discontinuous traits among the nine individuals buried in tomb 6 could indicate a close genetic relationship. Palaeopathological analysis revealed the presence of several dental and skeletal pathologies such as caries, osteoarthritis, fractures, infections and the occurrence of several markers of heavy occupational stress on the upper and lower limbs of individuals of both sexes, and on the teeth and upper jaw (unusual wear pattern and palatine torus) of a female subject that could be connected to the practice of hand-spinning.

PALAEOPATHOLOGICAL DATA FROM THE CEMETERY OF S. BARTOLOMEO'S CHURCH-FORMIGINE (MODENA, ITALY). Francesca Bertoldi, S. Lora, E. Grandi, M. Librenti, and S. Gelichi

The cemetery of S. Bartolomeo's Church was used during the 13th-15th centuries AD. The skeletal remains of more than 100 individuals, of both sexes and all ages, have been excavated and analysed. Infants and children were buried in a reserved area close to the church's apse, and the burials of a small dog, a woman wearing 37 metallic buttons along the arms and the thorax, and a still-born child under a bent tile have been discovered. The sample was affected by dental pathologies, joint disease, metabolic disease, congenital anomalies, benign tumours, and trauma. We report a probable case of dwarfism, a polimalformative syndrome and the presence of calcification in the left side of the thorax of a 45 year old individual probably caused by tuberculosis. The analysis of MOS suggested heavy physical labour for males and females and also for younger individuals, while the presence of marked muscular attachments in infants and children could be connected to the habit of child swaddling.

INVESTIGATING RELATIONSHIPS AMONG GRAVE OFFERINGS, PATHOLOGICAL CONDITIONS AND BURIAL RITUALS OF THE FALSITA TYPE MUMMY BUNDLE AT AN INCA- PERIOD CEMETERY, LIMA, PERU. Trisha Biers

Puruchuco-Huaquerones is an Inca-period (AD 1438-1535) cemetery in central Peru, on the outskirts of Lima in the Rimac River Valley. Excavations from 1999-2001 revealed 1286 burials representing nearly 2400 individuals. Preliminary studies have revealed several types of mummy bundles at the site. This project focuses on one type of bundle, designated the Falsita bundles by Peruvian project director Guillermo Cock. Thus far, only ten Falsitas have been identified out of 1286 burials and appear to have been buried in one localized area of the site. These bundles contain one to four individuals, including adults and sub-adults, are stuffed with cotton and vegetable material, have false fibre heads on top, and have a variety of external and internal grave offerings. Bioarchaeological analyses of the Falsita bundles have shown interesting relationships among grave offerings, pathologies, style of burial, and number of individuals for each bundle. These relationships shed light on the social positions of the people buried in the cemetery. These data from the Falsita mummy bundles provide new information on the burial rituals practiced at Puruchuco-Huaquerones.

RELEVANCE OF CEMENT ANNULATIONS TO PALAEOPATHOLOGY. Joël Blondiaux, Nicolas Gabart, and Erica A. Tyler

Microscopic observations were made of incremental or cement annulations of teeth extracted from four osteoarchaeological series (Neolithic, rural Merovingian and Medieval church burials), including several cases showing bone and joint tuberculosis. Conforming to previous observations on modern dentitions, the better correlation of the cemental line count to individual age at death (0.70 to 0.94) outlines its common use in any epidemiological investigation of past populations. It may also be an essential tool in palaeopathology as a potential record of duration, recurrence, or recovery from illnesses, as well as of pregnancy in females during the post-eruption life of individuals.

THE RIVER WITHAM SKULL: STATE OF PRESERVATION ALLOWS FOR FORENSIC ANALYSIS. Heather Bonney, Ron A. Dixon, Anthony Forde, and Corinne Duhig

A human skull was recovered from the River Witham (Lincoln, United Kingdom) during an unrelated police diving operation in 2002. Distinctive peri-mortem damage to the cranium apparently sustained from attack suggested that the skull could be of forensic rather than archaeological interest. Forensic anthropological investigation showed the skull to be from a male estimated 18-30 years of age at death,

possibly of non-caucasian or mixed race origins. A large stain tested positive for blood, suggesting that the skull was in a remarkably well-preserved state considering the probability of immersion for a long period of time. The recovery of head hair and skin cells confirmed the preserved state, and preliminary attempts show recovery of 97bp mitochondrial ancient DNA. Preservation of forensically informative preserved biomolecules such as blood and DNA over a period of time is discussed. Detailed examination of the injuries inflicted has provided some conclusions regarding the manner of death of this individual, however, at this time, the skull has not been dated.

SKELTAL MANIFESTATIONS OF VITAMIN D DEFICIENCY IN ADULTS (OSTEOMALACIA). Megan Brickley, Simon Mays, and Rachel Ives

Studies of archaeological bone have produced very few reported cases of adult vitamin D deficiency (osteomalacia) compared to juvenile cases (commonly referred to as rickets). This discrepancy means that it is likely that researchers have not been able to recognise the skeletal features of osteomalacia. The recent research project undertaken by the authors to investigate the expression of vitamin D deficiency in archaeological skeletal material at a gross, radiological, and histological level identified a number of important characteristics of osteomalacia. Detailed analyses of 19th century human bone excavated from St. Martin's cemetery, Birmingham, and investigation of changes observable at a gross level in two documented historical collections, have provided a clear indication of the range of skeletal changes associated with the condition. Seven adults with evidence of osteomalacia were identified from the adults examined from St. Martin's. We present the main findings of this investigation relating to gross and histological changes from bones across the skeleton. The results of this investigation will enable clear diagnosis and interpretation of vitamin D deficiency disease, an important socio-economic indicator.

PATTERNS OF TRAUMA IN MEDIEVAL (11TH-12TH CENTURIES AD) POPULATIONS FROM CRETE (GREECE). Chryssi Bourbou

The record of trauma imprinted upon an individual skeleton contains fascinating information about a lifetime of encounters with the environment and fellow humans. The most commonly noted category of skeletal trauma in archaeological samples is fractures of bones. This analysis focuses on the prevalence of fractures in three skeletal collections from medieval (11th-12th centuries AD) Crete (Greece). A variety of cranial and post-cranial fractures was recorded, and relevant aspects of healing are discussed in order to shed more light on the total picture of the observed pathological conditions. Most fractures were from the urban site of Kastella, in the upper limbs of males aged 26-45 years. Most were due to accidents, none had underlying pathological conditions, and there were few cases of multiple trauma. Complications such as infection, joint disease, deformation and damage to associated muscles or ligaments were noted in some individuals. Apart from Individual 14 who had a fatal injury to the skull, all other fractures demonstrated survival of injuries for varying periods.

DISEASES OF MEDIEVAL MIGRANTS FROM THE EUROPEAN RUSSIAN NORTH.

Alexandra Buzhilova

Surveys and excavations at early medieval rural sites in different areas of Northern and Central Russia create a background for general observations concerning the level of development of indicators of stress in migrant ancient Russian populations. Fifteen osteological series from the territory of the Russian North dated from the 11th-13th centuries AD were studied. The series from Nefedievo (about 100 skeletons) was used as an example for bioarchaeological reconstruction. Almost all indicators of physiological stress in the series demonstrate low frequencies. At the same time, advanced ages at death were noted, but few chronological trends in diseases. In the sample from 11th century AD Nefedievo, scurvy in children of migrants was within the range of 0-20 %, and later in the 12th-13th centuries AD, the frequency of the

disease changes to 22.2% – 44.4 %. Injuries, particularly of the skull, were lower in the older age categories. The analysis of various markers of mechanical stress provides insignificant data on occupations in the Russian North which, besides agriculture, included fur trapping, hunting and fishing.

PATHOLOGY OF THE SUNGHIR PEOPLE AND ECOLOGY OF UPPER PALAEOLITHIC EASTERN EUROPE. Alexandra Buzhilova (Sunghir Symposium)

The adult male, Sunghir 1, displays a healthy dentition (no caries, calculus, or linear enamel hypoplasia (LEH)), fragmentary craniostenosis of the metopic suture, slight medio-distal curvature of the forearm bones, and numerous post-cranial enthesopathies indicative of habitual vigorous physical activity. The slight curvature of the lower limb bones may be evidence of rickets. The young boy, Sunghir 2, also displays numerous robust muscle attachments, as well as LEH and a small oval defect in the superior portion of the left ilium, which may represent a hyatid cyst, from parasitic infection by echinococcus. The dentition of Sunghir 3, the young girl, exhibits LEH and slight dental calculus, and an unusual skeletal pathology: pronounced symmetrical anterior-posterior curvature of both femora with flattening in the mid-shaft regions, accompanied by asymmetrical (lesser) curvature of the tibia shafts, asymmetry of femur neck/shaft angles, and increased mineralisation of all tubular bones. Taken together, this suite of postcranial anomalies may represent CBLB (congenital bowing of long bones), a phenomenon of unknown etiology.

MEDIEVAL EXAMPLES OF SYPHILIS FROM THE RUSSIAN TOWN OF MOZHAISK, RUSSIA. Alexandra Buzhilova and Anna Gorbacheva

In a sample of 50 urban medieval burials, 2 adults show evidence of bone infection with classic signs of skeletal treponematoses. One was an adult male (20-30 years old) with lesions on both tibiae. The specific indications of treponemal infection were periosteal plaque and cortical thickening. There was no active cortical destruction. Radiographs show a boundary line of new bone on top of the original cortex. Partial obstruction of the medullary cavity of the tibiae was noted. The skull was not preserved. The second skeleton was a mature woman (40-50 years old) with specific changes of infection on both tibiae (mid shaft). Pathological changes on the cranial vault were absent. Radiographs of the tibiae present new bone with encroaching endosteal margin and lucent areas.

In both skeletons, the patterning and form of the lesions were consistent with those of venereal syphilis. Typically, such skeletal manifestations are bilateral and diaphyseal in occurrence, affecting the appendicular skeleton. Differential diagnoses of osteomyelitis and other treponematoses were taken into consideration. Primary osteomyelitis was excluded because the macroscopic and radiological views show no locally limited process, and osteomyelitis resulting from trauma can also be excluded due to the presence of bilaterally affected bones.

HYPEROSTOSIS FRONTALIS INTERNA IN THE TRIBES OF EUROPEAN SARMATIANS FROM THE 3RD CENTURY BC TO THE 4TH CENTURY AD. Alexandra Buzhilova and Margarita Sokolova

Skulls of 125 adult (72 males, 53 females) European Sarmatians (Iranian-speaking nomads) were examined, belonging to different periods of history (3rd century BC to 4th century AD). Differential diagnosis revealed 6 cases (4.7 %) of hyperostosis frontalis interna (HFI). The majority of cases (4 out of 72, 5.6 %) were males and 2 were female (2/53, 3.8 %) Three males and 1 female were mature adults, and 1 male and 1 female were somewhat younger. HFI was found to be quite varied in appearance, ranging from small isolated endocranial elevations (2 cases) to extensive nodular bony outgrowths, without discrete margins (4 cases). The frequency of HFI was much higher in the samples of later periods (1st half of the 2nd to the 4th century BC). It is known that hyperostosis frontalis interna is associated with

Morgagni-Stewart-Morel syndrome, characterized by obesity and hormonal imbalance. This analysis suggests that the Sarmatian tribes were strongly influenced by the environment and could have suffered from disturbances of their sexual systems. The results of our reconstruction confirmed the statements of ancient authors on nomads from this territory which noted that they were obese, with sexual problems and smoothing of typically male and female features.

FOOD CONTAMINATION AND STATE OF HEALTH AT HERCULANEUM (1st CENTURY AD). Luigi Capasso and Ruggero D'Anastasio

The authors examine a variety of foods perfectly preserved under the volcanic ashes that destroyed Herculaneum on August 25th in the 1st century AD. From a microbiological point of view, the authors demonstrated the presence of both lactobacilli and brucellae in cheese at Herculaneum, which explains the reason for the very high prevalence of brucellar lesions founded in the vertebral columns of the inhabitants. Authors have documented, through SEM analysis, the presence of various micro-organisms in bread, olive oil, vine, plum jam, baked eggs, pomegranates preserved in straw, various types of soups (including beans, rosemary, peas), various sorts of dried fruits (dried figs, nuts, almonds), and fermented fish sauce called garum. In all these foods we documented impressively high contamination by leavens, especially saccomycetacea in vegetative forms (*Candida*, *Sacchomyces*, etc). These micro-fungi have today possible pathogenetic relevance in man. In contrast, the authors did not find bone lesions characteristic of fungal infections, but demographic analysis of the population (based on both palaeobiological analysis of the skeletons and on the tombstones of the necropolis) shows high infant mortality and, in the absence of archaeological and palaeopathological evidence of malnutrition and starvation, it appears to be consistent with fungal infections playing a role in increased the infantile mortality.

NORMAL GOAT OR DISEASED HUMAN? METHODOLOGICAL ISSUES IN FRAGMENTARY REMAINS. Della Collins Cook

In his study of skeletal remains from Franchthi Cave, Greece, J. Lawrence Angel described three groups of small vault fragments as pathological, pointing out well-developed falciform impressions and unusual suture margins. Re-study reveals them to be small ungulate occipital fragments. The recognition of human versus non-human, and normal versus pathological bone, is related to fragment size, curvature, and the location and distribution of discrete morphological features. The taphonomy of cave deposits poses methodological problems regarding these variables. Training in comparative anatomy is desirable for palaeopathologists.

TWO POSSIBLE CASES OF BRUCELLOSIS FROM A CLARIST MONASTERY IN ALCÁ CER DO SAL, SOUTHERN OF PORTUGAL. Francisco Curate

The Convent of Nossa Senhora de Aracoelli was a Clarist monastery located in Alcácer do Sal, southern Portugal, founded at the end of the 15th century and abandoned during the 16th century. This poster considers the presence of changes consistent with brucellosis in two lumbar vertebrae originating from an ossuary recovered at the convent. In the first, epiphysitis of the anterior superior rim was noted, and in the second, the same changes were observed with a large osteophyte on the left side of the body. Both show changes of a lytic nature next to the annulus fibrosus attachment similar to those described by Extebarria (1993, 1994), Capasso (1999, 2001) and Ortner (2003).

IDIOPATHIC HYPEROSTOSIS: EPIDEMIOLOGY AND PHYLOGENY. Ruggero D'Anastasio and Luigi Capasso

Idiopathic hyperostosis cases are well known to palaeopathologists, since they have been described many times both in human and animal ancient remains. Nevertheless their aetiology is still enigmatic. The authors reconstruct a possible phylogeny of idiopathic hyperostoses through epidemiological data and a comparative histological analysis; in particular we studied thin sections of bone samples of modern and extinct animals showing hypertrophy (humans included). The research shows that all the hyperostotic bone samples have the same histological characteristics; besides the manifestations and frequency of the hyperostotic forms, described both in ancient (e.g. *Aphanius crassicaudis*, Teleostei) and modern species (e.g. *Dugong dugong*, Sirenia), they seem to be linked to their habitat. There might be a phylogenetic relationship among these forms of hyperostosis. On the grounds of the cases cited in the literature and of the histological data collected, the authors suggest the existence of a very ancient genetic trait that might have been selected for in the same vertebrate taxa and that might control the manifestations of idiopathic hyperostosis forms in other vertebrates.

PATENT PREMAXILLARY SUTURE IN EARLY ADULT POLYNESIANS: A PATHOLOGICAL FEATURE? George J. Dias, J.A. Kieser, and K. John Dennison

The patency of the premaxillary suture in adult humans remains controversial. We report on the extent and shape of the suture in 51 precontact New Zealand Maori adults (21 males, 30 females). Data were combined for the presence of the suture on both sides of the palate, and also for the extent of the suture (full or more than half patency). Males showed a prevalence of 44.2% and females of 33.5%. Females were found to have significantly more sinusoidal rather than V-shaped forms of the suture. We hypothesise that the retention of the premaxillary suture into adulthood is not due to any developmental anomaly, but may be a retained neotenic feature, which has allowed the Maori to achieve their uniquely large phenotype.

PALAEOPATHOLOGICAL EVIDENCE OF CRANIAL OSTEOMA IN THE LATE-MEDIEVAL GRAVEYARDS OF SERBIA. Marija Djurić, Zoran Rakočević, and Srboľjub Živanović

The present study investigates cranial osteomas in 392 skulls of adult individuals, from late medieval to early modern cemeteries in Serbia: Stara Torina, Čačak, Žiča, Valjevska Gračanica and Velimirovi Dvori. Macroscopic and radiological examination revealed twelve "button" osteomas of the cranial vault and an osteoma of the paranasal sinus of an adult female skeleton from Stara Torina. Radiographic examination showed a radiopaque mass composed of irregular cancellous bone obstructing the entire right maxillary sinus. The left maxillary sinus shows normal transparency with intact walls. Considering the size of the osteoma, it may be assumed that the person suffered from recurrent sinusitis. Until now no systematic study of cranial bone tumours has been published from the Balkan region. The frequency of cranial vault osteomas in the sample (3.6%) is less than the frequency detected in the majority of archaeological populations. The maxillary osteoma presented in this study is the first case of a sinus tumour recorded in archaeological material from the Balkans.

DIETARY PATTERNS AND DENTAL HEALTH IN BRONZE AGE SAMPLES FROM THE SOUTH RUSSIAN STEPPE. Maria Dobrovol'skaya (Kozlovskaya)

Human settlement in the steppe landscapes in Bronze Age Russia is connected with a nomadic life style. One of the earliest nomadic traditions was that of the Novotitorovskaya archaeological culture (Gey, 2000). The teeth of 180 individuals from the Bronze Age burial mounds (Novotitorovskaya and Catacombs cultures) were analysed for calculus, enamel hypoplasia, tooth wear, periodontal disease, and caries. Concurrently, trace element analysis was undertaken on 19 of the best preserved individuals. Concentrations of zinc, copper and strontium, determined by atomic absorption spectroscopy, were all high. Dental analysis indicated nutritional stress among the population. One hundred per cent of

individuals had calculus, 90% had periodontal disease and 50% of individuals had enamel hypoplasia. However, an extremely low rate of caries was noted (around 1%). Trace element analysis data suggested a mixed protein/carbohydrate diet, with sufficient nutrition. The pattern of dental health among individuals from both cultures was similar. Strontium concentrations were higher in the Catacombs culture; this may be explained by drastic climatic change.

SUNGHIR HUMANS: THE PROBLEM OF DIET RECONSTRUCTION. Maria Dobrovol'skaya (Kozlovskaya) (Sunghir Symposium)

Bone chemistry analysis of 8 elements (calcium, copper, zinc, lead, cadmium, nickel, strontium, and magnesium) in the four Sunghir skeletal individuals revealed no evidence of dietary deficiencies. Faunal bones were abundant, but the absence of plant remains cannot be taken to mean that vegetable foods were not available or consumed. The uniformly lower values of the Sunghir 4 femur may reflect its different mortuary treatment: the medullary cavity had been filled with red ochre, and its placement in the double burial resembled that of other artifacts.

MYCOBACTERIUM TUBERCULOSIS AND MYCOBACTERIUM LEPRAE DNA IN ARCHAEOLOGICAL SPECIMENS WITH PALAEOPATHOLOGY TYPICAL OF LEPROSY.

Helen Donoghue

Both tuberculosis and leprosy were prevalent in Europe during the first millennium but thereafter leprosy declined. It is not known why this occurred, but one suggestion is that cross-immunity protected tuberculosis patients from leprosy. To investigate any relationship between these diseases, 28 archaeological samples with suggestive pathology from sites dating to the Roman period to the 13th century in Hungary, Israel, Egypt, and Sweden were examined for both *Mycobacterium tuberculosis* and *Mycobacterium leprae* DNA. Both single-stage and nested PCR were performed using short, species-specific and multi-copy target sequences to increase the chance of detecting old and possibly fragmented DNA. MTB was detected by using the IS6110 sequence and *M. leprae* was identified using the RLEP sequence. The work was carried out and verified in geographically separate and independent laboratories. In all, 25 samples contained one pathogen or the other, and ten of these, several with palaeopathological signs of leprosy, were found to contain DNA from both pathogens, indicating that these diseases co-existed in the past. We suggest that the immunological changes found in multi-bacillary leprosy, in association with the socioeconomic impact on those suffering from the disease, led to increased mortality from TB and therefore to the historical decline in leprosy.

EPIDEMIOLOGICAL ANALYSIS OF TOMB COMPLEXES FROM THE NECROPOLIS OF THEBES-WEST. M. Ege, Andreas G. Nerlich, and Albert R. Zink

In the necropolis of Thebes-West, Upper Egypt, individuals from various time periods were buried, comprising the Middle Kingdom, New Kingdom and the Late Period (c. 2050BC-500BC). Previously the mummies were examined palaeopathologically and data from more than 1000 individuals have been entered into a database. We analysed the data with respect to age distribution, sex, social status, and indicators of distinct disease entities. We identified statistically significant associations between social status and the prevalence of caries. Degenerative disease and trauma were significantly more frequent in later time periods, whereas severe infectious diseases occurred more often in the Middle Kingdom. The odds ratio of signs of anaemia for children versus adults was about 3.1 (95% confidence interval 2.2- 4.3), independent of social status and epoch. No differences between time periods, social status and age distribution were found for the occurrence of scurvy and osteopenia. Despite the obstacles of missing data, selection bias because of selective burial practices, and information bias by intrusive burials, our results give an insight on disease distribution in ancient Egypt by population based data.

ORAL PATHOLOGY IN A SAMPLE FROM CASTELO DE ANSIÃES (CARRAZEDA DE ANSIÃES, PORTUGAL). Maria Teresa Ferreira and Cláudia Santos

During 2003, 19 skeletons (14 adults and 5 non adults) were exhumed from medieval Ansiães Castle in North-East of Portugal. Data on ante mortem tooth loss, caries, abscesses, calculus and tooth wear were collected. Fifty per cent of the adults show caries and one presented a large abscess whose cloaca opens into the maxillary sinus.

CONFLICT AND VIOLENCE IN EARLY POST-MEDIEVAL EUROPE: THE EVIDENCE FROM TWO 17TH CENTURY MASS GRAVES AT CARRICKMINES CASTLE, CO. DUBLIN, IRELAND. Linda Fibiger

Although historical sources offer detailed accounts of the ubiquitous nature of warfare and violence in medieval and early post-medieval Europe, relatively few skeletal remains of the victims of these conflicts have been excavated and analysed to date. In April 2001, two mass graves dating to the 17th century were exposed during excavations at Carrickmines Castle, Co. Dublin, Ireland. The two graves contained the remains of at least 16 articulated individuals aged between 3 and 45 years. Over half of these showed evidence for peri-mortem injuries. This report discusses the nature of the injuries and their importance for assessing historical accounts of the siege and destruction of Carrickmines Castle in the 1640s. It also addresses the issue of defining mass graves in an archaeological context and briefly compares the findings with other mass grave sites from the UK and Europe.

FROM THE SUNGHIR CHILDREN TO THE ROMITO DWARF: REFLECTIONS ON PATHOLOGY AND UPPER PALAEOLITHIC FUNERARY PRACTICES. Vincenzo Formicola (Sunghir Symposium)

The double burial of the children known as Sunghir 2 and 3 is the most spectacular Upper Palaeolithic funerary example known to date. The elaborate treatment has been interpreted as signifying inherited high social status. However, two other well-known Upper Palaeolithic multiple burials paired non-pathological with pathological individuals: the double interment of an adult woman and an adolescent dwarf in the Romito Cave in southern Italy, and the triple burial of late adolescents and Dolni Vestonice in Moravia. At Sunghir, the evident skeletal pathology of the young girl (Sunghir 3) may have influenced the form of her interment. Clinical evidence suggests that the bilateral A-P bowing of her femur shafts may reflect maternal diabetes during her gestation.

EASTERN MEDITERRANEAN HEALTH: COMPARATIVE ANALYSIS OF THE HUMAN SKELETAL REMAINS FROM TWO HELLENISTIC-ROMAN PORT SITES. Sherry Fox

This research focuses upon the analysis of comparative health as discerned from palaeopathological analysis of human skeletal remains dating to the Hellenistic and Roman periods from Paphos, Cyprus (n=275) and Corinth, Greece (n=95). Analytical techniques include gross morphological and metrical examination and radiography of select samples. Limited molecular analysis is also employed. The transition to Roman rule was relatively uneventful in Cyprus, including Paphos, which is in contrast to the situation at ancient Corinth where the city was sacked. Not surprisingly, evidence of stress, as indicated by the presence of enamel hypoplasias, was greater at Corinth. Results also demonstrate that infant mortality was greater at Corinth and that statures were relatively shorter. Although cribra orbitalia, possibly indicative of anemia, was present at both sites, porotic hyperostosis was identified only at Paphos, perhaps suggestive of the presence of a different type of anemia. Malaria and the thalassaemias have been identified in modern times at both locales, but based upon the palaeopathological results from this study,

there is no gross evidence of congenital hemolytic anaemias at ancient Corinth. Thalassaemia was not likely a serious problem at Corinth at this time as it may have been at Paphos. Further molecular analysis could test this hypothesis.

BIOARCHAEOLOGY AT SCHOOL. Camila Storto Frochtengarten, Cecilia Carlucci Petronilho, Ligia Bendetto Giardini, Célia Helena Boyadjian, Andreia Ranieri, and Sabine Eggers

Bioarchaeology examines the interactions between biology and behaviour, and therefore it can be explored by various approaches. Different techniques play crucial roles in bioarchaeology, and also represent promising educational approaches. We created a teaching kit which included ‘finds’ generally excavated from Brazilian prehistoric funerary contexts, such as human skeletal remains (some with health problems evident), mortuary assemblages, and dietary evidence. Plastic boxes with sediment, crushed mollusc shells and sand, and small brushes, spoons, and dust pans made up this educational kit which could be used in different ways. Teachers and undergraduate students excavated previously constructed miniature burials and were asked to try to reconstruct the dead person’s fate and cultural provenance. Eleven-year-old school children, divided into subgroups, read texts about different Brazilian prehistoric cultures, chose objects fitting those cultural contexts, and prepared miniature burials in the school garden. Later, they excavated their colleague’s burials and interpreted the cultural affiliation of each one. With the purpose of initiating curiosity and motivating investigation, six-year-old children were also asked to excavate miniature burials. In all cases “Bioarchaeology at School” was received positively, as shown by the motivation expressed, comments written and records left by participants. *Funded by FAPESP, CEPID-FAPESP*

PATHOLOGICAL STUDY OF MANDIBULAR and dental REMAINS FROM THE MAN OF SIDRÓN (PILOÑA, ASTURIAS, SPAIN). Carlos S. Garcia

In 1994, archaic human remains were discovered at the site of Cueva de Sidrón (Piloña, Asturias, Spain). Anthropological analyses provided morphological data relating to the phylogenetic position of the “Man of Sidrón”; the remains have since been attributed to *Homo neanderthalensis*. In this report, a wider analysis of one complete mandible (SDR-007+008) with 12 teeth in situ and one hemimandible (SDR- 005+006) preserving a nearly full set of teeth is presented with the objective of showing new aspects of the oral pathology of the Man of Sidrón. Pathological analysis was performed using radiography and the long cone collimator technique. The main findings were an image compatible with retention of a canine tooth (zone 37-38) (already described in a previous radiological analysis), discreet taurodontism in molars, calculus in the distal wall of the pulp cavity, and diffuse apical cement dysplasia. The radiological findings offer new information about oral pathology not previously described for the Neanderthal group, and provide new data for the study of hominids that inhabited this part of Europe.

ACTIVITY-RELATED OSTEOARTHRITIS OF THE KNEE AMONG NATIVE AMERICANS IN SOUTHERN CALIFORNIA. Thor Gjerdrum, Kaethin Prizer and Philip L. Walker

Analysis of the distribution of arthritic lesions in the knees of prehistoric Native Americans from the Santa Barbara Channel area of southern California suggests that some individuals were engaged in strenuous activities that involved kneeling for prolonged periods of time. Activity-related arthritic changes in this population include porosity, osteophytes, and eburnation of the postero-superior surface of the femoral condyles, and complimentary changes in the articular surfaces of the proximal tibias. These lesions are similar to those found in European ecclesiastical populations where kneeling in prayer for long periods was a common practice. Ethnographic evidence suggests that similar lesions among Native Americans from the Santa Barbara Channel area are an osseous response to habitual digging stick use, a subsistence activity that was predominantly the domain of women. These data are consistent with computed

tomography studies showing that the cortical thickness of female humeri is less than that of males in this Native American population.

RECORDING MUSCULOSKELETAL STRESS MARKERS. Charlotte Henderson

Musculoskeletal stress markers (MSM) have been widely used as indicators of activity-levels and specific activities undertaken. These markers can appear as sites of roughness, bone destruction, or bone formation. The position of the attachment site on a bone determines, to some extent, the type of forces acting at that site, and this in turn is an important factor in enthesis (attachment site) morphology. Factors known to affect the normal structure include age, disease processes, and physical stress. However, recording and interpreting MSMs relies on the theory that there is a direct relationship between these changes and physical stress. Although there is almost certainly a relationship, it is unlikely that this is a direct one. Therefore, recording methods need to be adapted to take into consideration normal morphology and factors that cause MSM-like changes. Recording methods also should be objective and repeatable and should be tested on skeletal samples with known activity-levels (or occupations) to ascertain whether they can be interpreted in a meaningful way.

HEALTH IN MEDIEVAL YORK, WITH PARTICULAR EMPHASIS ON THE FISHERGATE HOUSE POPULATION. Malin Holst

The recent full analysis of the medieval skeletal assemblage from Fishergate House in York has provided the opportunity to gain further insights into the health of the populations of medieval York. Results from the analysis have been compared by the author with those from Jewbury, St Helen-on-the-Walls, and St Andrew's Fishergate, as well as with a sample of skeletal remains from York Minster. Comparative analysis of five cemetery populations of different social, cultural, religious and professional backgrounds from York allows some tentative conclusions. The osteological and palaeopathological evidence suggests that health was affected by socioeconomic status, environment and cultural affiliation. These factors affect diet, environment, type of work, housing, education, social contact, and therefore nutrition, exposure to pathogen load, and risk of trauma. The complex interaction of these factors has left distinct pathological signatures in the different populations from York. Thus, the York Minster population, who would have been the most privileged individuals of this group, was the tallest, and enjoyed the longest life span and the best general health. Individuals from one of the poorest parishes in York, at St. Helen-on-the-Walls, suffered the greatest hardship, were of short stature, and showed considerable evidence of infectious and other diseases.

ASYMMETRIC NON-ARTIFICIAL CRANIAL DEFORMATION IN A BRAZILIAN SHELLMOUND BUILDER. Mark Hubbe, Eugenia Cunha and Sabine Eggers

One of the 19 well preserved skeletons from the 1200 year old shellmound, Porto do Rio Vermelho, excavated by Marco de Masi in 1999 in Southern Brazil (27°31' S and 48°25' W) shows unusual skeletal features. Most conspicuous in this old adult female is the persistence of a deviated metopic suture associated with craniosynostosis, or possibly agenesis of the right coronal suture, and a frontally located bossa parietalis. Other features include a systemic infection, with no evidence of cloacae, suggesting osteomyelitis, and altered os pubis and scapulae. Although there are genetic syndromes associated with this cranial asymmetry (plagiocephalia), differential diagnosis is not straightforward due to the nature of archaeological human remains in general.

A POPULATION-BASED STUDY OF HYPEROSTOSIS FRONTALIS INTERNA IN EARLY MEDIEVAL SKELETAL SAMPLES FROM ENGLAND AND GERMANY. Tina Jakob

Despite a growing body of palaeopathological studies on hyperostosis frontalis interna (HFI), population-based research on the occurrence of this disease is still rare. The new bone formation consisting of an irregular nodular cortical layer of variable thickness is usually situated symmetrically on the frontal bone and more rarely on the parietals. It is a regularly reported finding during radiographic studies of the skull in modern clinical practice. Prevalence in modern populations varies considerably with a peak incidence in individuals between 40 and 60 years of age. Today, the female-male ratio is 9:1 and the development of HFI is associated with post-menopausal changes involving the pituitary glands, but the aetiological factors have not yet been exhaustively investigated. In this study, a three-stage scoring system was adopted and a total of 450 well-preserved individuals dating to the early medieval period were scored for HFI. The observed age-related increase in prevalence seen in the study samples conforms to modern clinical research. However, an unexpected result was that women and men from the study populations showed a similar frequency of HFI. These findings will be discussed in the light of clinical and palaeopathological interpretations of the disease.

TUBERCULOSIS AT SPITALFIELDS, LONDON: AN INITIAL INSIGHT INTO MEDIEVAL URBAN LIVING. Amy Gray Jones, Brian Connell, Rebecca Redfern and Don Walker

Given that tuberculosis has recently been designated a global emergency by the World Health Organisation, we must not underestimate the serious risk that it held in past societies. Our study of the Medieval Spitalfields cemetery from London, although in its early stages, has found a high prevalence of tuberculosis within the sample, and especially so within non-adult groups. These bioarchaeological data, along with an unrivalled understanding of living conditions in Medieval London derived from a wealth of literary and archaeological sources, gives us a unique opportunity to examine the prevalence and effects of this deadly infectious disease within the urban environment. The total number of individuals from the Spitalfields cemetery is 10,500, a globally unparalleled number of excavated skeletons which will allow for a better understanding of tuberculosis throughout the entire life-course. This paper presents our initial findings based on a sample of c.1400. Early results show a crude prevalence rate of 1.7% for TB (28/1654 individuals); 79% were adults cases, with 64% being male. Taking a life-course perspective within a biocultural framework, we will explore these results utilising themes such as the relationship between adult and non-adult health, gender, sex and status differences, the effect of the living environment upon health, disease transmission and exposure, health-care, treatment, and the understanding of tuberculosis at this time.

DNA ANALYSIS OF SUNGHIR REMAINS: PROBLEMS AND PERSPECTIVES. Evgeniy E. Kulikov, Andrey B. Poltarau, and Irina V. Lebedeva (Sunghir Symposium)

Bone samples were taken from the femora of Sunghir individuals 1, 2, and 3 and subjected to PCR. Amplification of the DYZ1 locus (linked to the Y chromosome) confirmed the earlier identifications (based on skeletal morphology) of Sunghir 1 and 2 as male and Sunghir 3 as female (i.e., missing a Y chromosome). The amplified mtDNA HVS1 nucleotide sequences for the two adolescents are identical (save for a single locus, a G-A transposition in position 16129), which suggests a maternal familial relationship. However, additional data on the frequency of this haplotype within the Sunghir paleopopulation is required to evaluate this possibility. The mtDNA sequences associate the Sunghir adolescents with *Homo sapiens sapiens* rather than with *Homo Sapeins neandertanelsis*.

DIFFERENTIATING THE ANAEMIAS FROM THE SKELETON: THE DIAGNOSIS OF THALASSAEMIA. Anna Lagia, Constantinos Eliopoulos, and S. Manolis

Differentiation of the genetic from the acquired anaemias, particularly in areas of the world where the two may co-exist, has been a challenge for palaeopathologists for over 100 years. The aim of this paper is to present macroscopic and radiographic skeletal lesions that are associated with thalassaemia in a 14-year-old from the modern skeletal reference collection of the University of Athens. The individual has a known cause of death, date and place of birth and death, and sex, and is examined in terms of epidemiology, growth, distribution and severity of lesions and differential diagnosis. The birth of this patient before the onset of hyper-transfusion regimes probably explains her “advanced” age-at-death and the development of severe bone lesions. The entire skeleton is affected by marrow hyperplasia: lesions of the axial skeleton are extreme, although the appendicular skeleton is severely affected. The odontofacial manifestations that are diagnostic of thalassaemia and differentiate it from other anaemias are present and include: maxillary and mandibular hyperplasia, reduced sinuses, and displacement of maxillary dental structures, overbite, and generalized osteopenia. The potential contribution of this analysis in differentiating the anaemias in antiquity is evaluated.

ANTHROPOLOGICAL RECONSTRUCTION OF PHYSICAL APPEARANCE OF SUNGHIR PEOPLE. Galina V. Lebedinskaya. (Sunghir Symposium)

To date, three-dimensional reconstructions of four individuals from the Sunghir site have been created. In 1968, M. M. Gerassimov sculpted a reconstruction of the very robust adult male known as Sunghir 1. In 1974, the double burial of the two children, Sunghir 2 and 3, was excavated as a block and taken to the Institute of Archaeology (Russian Academy of Sciences) in Moscow for cleaning and study in the Plastic Reconstruction Laboratory at RAS. A reconstruction of the adolescent boy (Sunghir 2) was created by the author, and a sculpture based on the well-preserved skull of the young girl (Sunghir 3) was created by T.S. Surina. An adult female (Sunghir 5) was reconstructed in 1998 by the author from a poorly preserved skull (found immediately above the burial of Sunghir 1) and fragments of a mandible (Sunghir 6) found nearby.

COMPRESSION AND NON-COMPRESSION FRACTURES IN VERTEBRAE OF ALASKAN ESKIMOS. Scott Legge

Vertebral fractures and wedging were observed in skeletal collections of Eskimos from Golovin Bay and Nunivak Island, Alaska. Vertebral body fractures were divided into several categories based on Urcid and Bird (1995) including compression, single end-plate depression without wedging, single end-plate depression with wedging, congenital or idiopathic wedging, and biconcave bodies with or without wedging. Frequencies for fractures based on sex and age were calculated, and the pattern of this condition in each collection is characterized for age, sex, and location in the spine. There was no significant difference in frequencies of compression fractures among adults at Golovin Bay and Nunivak Island. However, when separated by sex, females at Golovin exhibited a significantly higher frequency than females at Nunivak. No difference was noted between males in the two populations. Non-compression related fractures were rare in both samples, with only four affected individuals from Golovin Bay and none observed from Nunivak Island.

NEW EVIDENCE FOR HEADSHAPING IN GREECE AND THE EASTERN MEDITERRANEAN. Kirsi Lorentz

This paper takes as its focus a particular type of intentional cultural body modification affecting the skeletal frame: headshaping, and its occurrence, morphological effects, and socio-cultural context in Greece and the Eastern Mediterranean. The geographical and chronological occurrence of headshaping in Greece is compared to the geographical and chronological occurrence of this phenomenon in the Eastern Mediterranean at large. The morphological characteristics of headshaping occurring in Greece are discussed and compared to material from the surrounding regions, and its potential connection to

pathologies assessed, specifically in terms of premature cranial synostosis. Pathological versus cultural nature of changes in head shape are discussed and assessed, and differential diagnoses conducted. Finally, the socio-cultural context of headshaping practices is discussed, as intentional headshaping is inherently a cultural modification of the bodily form. Methods used included the assessment of sutural complexity according to Hauser and Stefano (1989), assessment of premature cranial synostosis according to Anton (1989), White (1996), Bennett (1965), El-Najjar and Dawson (1977), and Aufderheide and Rodríguez Martín (1998), and the standard methods of sex and age estimation from cranial remains (Schwartz 1995, Buikstra and Ubelaker (1994). The study lays out the evidence for the first known occurrence of headshaping of cultural origin in Greece, and the occurrence of premature cranial synostosis in relation to this practice. The results are compared to studies of headshaping and premature cranial synostosis in Cyprus (Lorentz, in prep.) and the Americas (Anton, 1989, White, 1996).

TWO MILLENNIA OF MALE STATURE DEVELOPMENT IN THE LOW COUNTRIES. George J.R. Maat

This paper offers a review of shifts in average male stature and their relationship with health and wealth in the Low Countries from 50 to 1997 AD. Twenty-one population samples were studied to cover the full time span. To make data compatible, so-called 'virtual statures' were used, i.e., the statures which adult males were supposed to have had at the end of their growth period before they started shrinking by aging. Original data were extracted from 'in situ (in the grave) measured statures', 'calculated statures' and 'corrected cadaveric statures'. If possible, maximum femoral lengths were also collected from the same population samples to check if trends in stature development were in agreement with raw skeletal data. A long phase of stature decrease from ca. 176 cm to 166 cm, a so-called 'negative secular trend', was noticed from the Roman Period up to and including the first half of the 19th century. This was followed by a sharp and still ongoing increase in stature to 184 cm, a typical 'positive secular trend', from the second half of the 19th century to the present time. General shifts in stature and 'outliers' illustrative for the process are viewed in the context of socio-economic, demographic, health and nutritional factors.

A CASE OF DISH IN AN ADULT MALE SKELETON (14TH-18TH CENTURIES) EXHUMED FROM THE SÃO JORGE CHAPEL IN PORTO DE MÓS, PORTUGAL. Ana Machado, Ana Maria Silva and Eugénia Cunha

In 1959, several skeletons (> 20 individuals) dating from the 14th to 18th centuries AD, were recovered from the São Jorge Chapel in Porto de Mós (Portugal). In one male skeleton (> 50 years of age), exhumed from a double burial, several pathological conditions were recorded. These included fusion of several vertebrae from three regions of the spine: C6 - C7; T3 - T12; L2 - L4. In the thoracic segment, the ossification consists of massive bony overgrowth of marginal bone between T3-T6 on the antero- right side and for T7-T12 on both sides. The disk spaces are preserved, the diarthrodial joints lack osteophyte development, and no joint space reduction is visible. In the appendicular skeleton, enthesal ossifications are recorded for the left olecranon, both patellae and both calcanea. The described lesions are compatible with a case of DISH.

A CRANIAL TREPHINATION FROM THE RENAISSANCE ARISTOCRATIC SACELLUM IN SAN CERBONE, POPULONIA. Francesco Mallegni, Giuliana Cortesi Alice Pagni and Giuseppe Naponiello

The case study we present is based on a c. 40 year old male individual buried inside a Renaissance aristocratic sacellum in San Cerbone (Populonia). The skull bears an evident trephination hole on the left parietal bone, performed during the man's life by a mixed technique: a large area has been scraped off but there are also tiny traces of an incision. The instrument had probably been rubbed backwards and forwards

against the bone, gradually scarifying until perforated. Due to this technique, the hole (3 x 1.5 cm) had an elliptical shape and was surrounded by a craterlike depression. Considering the kind of lesion, the man must have been struck on the head with a small edged weapon, which has produced a very short wound (maybe a war hammer, since a sword or an axe would have produced a longer slash). The man survived at least for 2 years after the surgery - performed to remove bone slivers and to clean up the area - and there are no signs of serious infection (thanks to the cauterization of the wound). All this evidence witnesses the great care for this man, probably because of his noble status.

ON THE TRAIL OF PULMONARY TUBERCULOSIS: RESULTS FROM THE HUMAN IDENTIFIED SKELETAL COLLECTION FROM THE MUSEU BOCAGE (LISBON, PORTUGAL). Vitor Matos and Ana Luisa Santos

In the last 20 years, studies on human identified skeletal collections have revealed a significant relationship between new bone formation on the visceral surface of ribs and pulmonary tuberculosis (TB). In order to overcome the problem of differential diagnoses of respiratory diseases in archaeological skeletons, an investigation was conducted on 197 individuals from the Human Identified Skeletal Collection of the Museu Bocage (Lisbon, Portugal). This sample includes 109 males and 88 females, with ages at death ranging from 13 to 88 years, who lived during the 19th and 20th centuries. The individuals were grouped according to their cause of death: a) pulmonary TB (N=84); b) non-tuberculous pulmonary diseases (N=49); and c) a control group (N=64) randomly selected amongst individuals with non-tuberculous and non-respiratory causes of death. The ribs, sternum, scapulae, and clavicles were macroscopically observed. New bone formation on the visceral surface of ribs was recorded in 90.5% individuals who died from pulmonary TB, in 36.7% with a non-tuberculous respiratory disease as cause of death, and in 25.0% of the control group. These differences were statistically significant ($p < 0.001$). Furthermore, in the pulmonary TB individuals the lesions are mainly presented as lamellar bone on the vertebral end of the middle thoracic rib cage. Bone lesions also occurred on one sternum and in 5 clavicles and 5 scapulae. This work strongly supports studies performed on other documented collections, and thus it is suggested that new bone formation in these locations can be a criterion for differential diagnosis of pulmonary TB.

CHANGES ASSOCIATED WITH RICKETS IN THE IMMATURE SKELETON. Simon Mays, Megan Brickley, and Rachel Ives

In 1998, Ortner & Mays (IJO 8:45) published several criteria for the recognition of rickets in skeletal remains of infants and young children, using skeletons from the Medieval site, Wharram Percy. The aim of the present work is to evaluate and, if possible, to refine and augment these criteria using a larger and better preserved skeletal sample. The study material comes from the churchyard of St Martins, Birmingham, UK, and dates to the nineteenth century AD. Twenty-one immature individuals show features indicative of inadequate bone mineralisation due to rickets. The larger sample size potentially offers the opportunity to observe a greater range of skeletal expression of the disease than was present in the material from Wharram Percy. In addition, the condition and composition of the St Martins sample provides the opportunity to evaluate radiographic signs of the disease and to study healed rickets, neither of which was possible in the Wharram Percy remains. Preliminary results from the radiographic work suggest that alterations to the internal structure of trabecular and cortical bone, although not emphasised in clinical radiological studies, may be of value in establishing a diagnosis of rickets in palaeopathological studies.

A CASE OF SECONDARY HYPERPARATHYROIDISM FROM MEDIEVAL ENGLAND. Jan McEwan, Diana Rossi, and Simon Mays

Differential diagnosis of disease in skeletal remains is fraught with problems. The continuing study of the Wharram Percy skeletal sample by various workers has brought to light an interesting case. The individual, a female estimated to be aged 30 years, has various skeletal anomalies. On initial macroscopic examination, a slipped capital femoral epiphysis and spondylolysis were noted. Bone mineral density of the radius measured by dual energy absorptiometry was significantly higher than the mean for her age group at the ultra-distal (trabecular) site, but normal at the mixed cortical and trabecular sites. Radiogrammetry indicated that the cortical index was increased, with corresponding reduction in the medullary cavity. On plain film radiography the bone appeared highly mineralized. Bone histomorphometry of the iliac crest was the most recent investigation. This indicated abnormally high trabecular bone volume with reduced marrow spaces. Clinically, histomorphometry is the examination of choice for diagnosis of metabolic bone disease. We suggest that the various tests performed on this individual indicate metabolic disease in life, probably secondary hyperparathyroidism. Although several other diagnoses were considered, given the age of the individual and the other skeletal anomalies, we suggest renal osteodystrophy with sclerotic bone resulting from increased osteoblastic activity as the most likely cause.

LIFESTYLE OF THE EARLY SCYTH POPULATION ACCORDING TO ANTHROPOLOGICAL DATA. Maria Mednikova

The life of the Scythians, the people of the Early Iron Age, is mirrored in Assyrian and Babylonian cuneiform texts, the writings of classical historians, and in Biblical prophets' books. Anthropological study of Scythian skeletal remains is of significance for the reconstruction of lifestyle at this time. The cemetery Novozavedennoe II in the North Caucasus is viewed as the aristocratic site of the last quarter of the 7th century BC, and the result of the final stage of Scythian war raids through the Caucasus to Mydia (modern day Iran and Iraq). The skeletal series, comprising the remains of 18 individuals, derives from burial mounds. The peak of adult mortality both in males and in females was in the youngest subgroups (20-24 years). Caries was not present in the group, but two individuals demonstrated antemortem tooth loss, and one case of odontogeneous osteomyelitis was recorded. The reconstruction of palaeodiet using atomic absorption spectroscopy indicated variable nutritional states. The burials with exceptionally rich grave goods demonstrated higher concentrations of zinc, indicating milk and meat consumption. Fifty-one per cent of the series demonstrated enamel hypoplasia, while 80% of the male group and 75% of the females had Harris lines (all multiple). The high rate of characteristic changes in the sacroiliac joints may be connected with horse riding.

POSTCRANIAL MORPHOLOGY OF SUNGHIR REMAINS. Maria Mednikova (Sunghir Symposium)

The Sunghir 1 male is similar to other eastern European Upper Palaeolithic adults: he resembles Cro-Magnon males in his tall stature, longer distal than proximal limb segments, marked platycnemia, and relative brachydactylia, with some resemblance also to the 'sapient Mousterians' Skhul 4 and 5 and also to Predmosti 3. His femora and that of Sunghir 4 exhibit straight shafts with thick walls and a high compactisation index, spherical medullary canals, and robust pilasters. The Sunghir adolescents 2 (male) and 3 (female) display 'African' lower limb proportions, 'Arctic' ratios of arm to leg lengths, and relatively broad, 'Hypereuropean' shoulder widths. This 'variable' appearance suggests a prolonged period of linear growth, and may reflect adaptation to their far Northern European location during a period of great climatic severity.

ENAMEL HYPOPLASIA AND HEALTH DURING CHILDHOOD IN EARLY MEDIEVAL MAASTRICHT AND NINETEENTH CENTURY ZWOLLE (THE NETHERLANDS). M. Merckx and R.G.A.M. Panhuysen

Two series of skeletal remains from The Netherlands were examined in order to determine the impact of known differences in life conditions on health in the skeleton. This poster presents the analysis of the age of occurrence of enamel hypoplasia. The first sample consists of 60 individuals from the Pandhof cemetery in Maastricht, dated between 350 and 950 AD. These individuals were of intermediate to high social status and had a varied diet. The second sample was excavated in the Broerenkerk cemetery in Zwolle and consists of 54 individuals of intermediate social status who died between 1819 and 1828 AD. The presence of enamel hypoplasia was recorded according to Buikstra and Ubelaker (1994). The age of occurrence was calculated as described by Goodman and Rose (1990). In both samples almost the same percentage of individuals had enamel hypoplasia in one or more teeth. A significant difference was found between the samples regarding the age of occurrence. In the Pandhof sample most enamel hypoplasias occurred between 2 and 4 years, whereas in the Broerenkerk sample the hypoplasias occurred earlier, namely between 1 and 3 years. It is tempting to suggest this difference in the age of occurrence was associated with differences in the nutrition of young children.

DETECTION OF LIPID BIOMARKERS FOR ANCIENT MYCOBACTERIAL DISEASE. David Minnikin

Evidence for tuberculosis (TB) infection can be found in the archaeological skeletal record, using analysis of DNA and lipid biomarkers. The sensitive analysis of TB mycolic acids (Gernaey et al. 2001) has been successfully carried out by fluorescence HPLC of anthrylmethyl esters, but the procedure is time-consuming and the derivatives are labile. Preliminary studies have shown the presence of components of phthiocerol dimycocerosate (PDIM) waxes from *Mycobacterium tuberculosis*. This communication describes a new derivatisation and analysis protocol for hydrolysates of ancient bones. Pentafluorobenzyl (PFB) esters are prepared from mycolic and mycocerosic acids and these derivatives are separated from each other and underivatized phthiocerols. Mycocerosate PFB derivatives are analysed by negative ion-chemical ionisation gas chromatography-mass spectrometry. Mycolate PFB esters and phthiocerols are reacted with a new derivatisation reagent and profiles recorded by fluorescence high performance liquid chromatography (HPLC).

Reference:

Gernaey, A.M., Minnikin, D.E., Copley, M.S., Dixon, R.A., Middleton J.C. and Roberts C.A. (2001) Mycolic acids and ancient DNA confirm an osteological diagnosis of tuberculosis. *Tuberculosis* 81: 259-265.

WEAPON INJURIES IN THE 12TH CENTURY CRUSADER GARRISON OF VADUM IACOB CASTLE, GALILEE, ISRAEL. Piers D. Mitchell, Yossi Nagar, and Ronnie Ellenblum

Jacob's Ford Castle in Galilee was built in 1177 by the King of Jerusalem to guard a crossing on the river Jordan. However, it was besieged and sacked by Saladin's troops just one year later. Contemporary written sources described how the dead from the battle, along with executed archers and Knights Templars, were dumped under the rubble as the castle was destroyed. Here we present the weapon injuries of those soldiers recovered from under a collapsed building within the castle. They sustained multiple wounds from sword blows and arrows. These are discussed in the context of Islamic weaponry and Frankish defensive armour. The distribution and number of wounds suggests that the fighting was both bitter and brutal. There have been few excavations of dead soldiers from medieval battles, and none at all from the Crusades. In consequence the Vadum Iacob project is of great significance in our understanding of medieval warfare.

A PALAEOPATHOLOGICAL AND PALEOMICROBIOLOGICAL STUDY OF A FOREIGN ETHNIC GROUP FROM THE PERIOD AFTER THE TURKISH OCCUPATION IN HUNGARY. Erika Molnar, M. Maczel, Antonia Marcsik, Gy. Palfi, Andreas G. Nerlich, and Albert Zink

During the Turkish occupation of Hungary many inhabited areas became depopulated. In some places the resettlement of deserted land took place by foreign ethnic groups, such as Serbians. Skeletal remains of a presumed Serbian population (dated to the 16-17th century) were recovered near Bacsalmas (Southeast Hungary). After palaeopathological study of the 166 skeletons, a paleomicrobiological analysis of 46 skeletal samples was performed. They provided either typical macro-morphological evidence for osseous tuberculosis (n=2), nonspecific skeletal lesions probably resulting from tuberculosis (n=28), or did not show any osseous changes (n=16). From the samples, DNA was extracted, followed by PCR amplification of a 123bp fragment of the IS6110, characteristic for the *M. tuberculosis* complex. To confirm the specificity of the analysis the amplification products were tested by restriction enzyme digestion and/or direct sequencing. The positive samples were subjected to spoligotyping for further strain identification. From the analyzed 46 specimens, 14 were positive for *M. tuberculosis* complex DNA. The molecular results revealed a higher rate for males, and children were more often affected than adults. Results were not statistically significant. Our observations indicate that tuberculosis may have been frequent in this population, probably due to an increased susceptibility to infectious diseases as a consequence of various factors.

CELLULAR COMPONENTS IN TISSUE SAMPLES FROM KWÄDAY DÄN TS'INCHI ANCIENT REMAINS, BRITISH COLUMBIA, CANADA. Maria Victoria Monsalve, Mike Nimmo, Wayne Vogl, Paul Hazelton, Derrick Horne, and Elaine Humphrey

In 1999 human remains were found frozen in a glacier in Tatshenshini-Elsek Park in British Columbia, Canada. Carbon dating of the remains, called "Kwäday Dän Ts'ınchi" (Long ago person found) by the local First Nations, indicated an age of 550 years. The quantification of nitrogen and carbon in the collagen of soft and hard tissue remains inferred good preservation of protein. We consequently extracted and amplified mtDNA and placed the remains in a context of Native American mtDNA lineages. We are now analysing soft tissue from the arm, thigh and spine, and hard tissue from the spine to determine the states of preservation by identifying cellular components in both human and animal remains at the light and electron microscopy levels. Using light microscopy, we identified collagen fibers in some of the material and, somewhat surprisingly, striations in muscle tissues. We also identified Haversian canals, trabeculae and lamellae in the human hard tissue. The Haversian canals contained remnants of soft tissues. By electron microscopy, we were able to identify collagen fibers and collapsed blood vessels in soft tissue of the human remains, indicating that there may be some degree of soft tissue preservation in the material. In addition, gram positive cocci, which appear to be chain forming, were identified in the blood vessels and the sub-mucosal tissue.

NEW EVIDENCE FOR SKIN WOUNDS IN THE TYROLEAN ICEMAN. Andreas G. Nerlich, E. Egarter-Vigl, B. Bachmeier, S. Thalhammer, and Albert R. Zink

Recently, we carefully re-examined the Tyrolean Iceman, commonly known as "Ötzi", and detected an irregularly shaped 3.7 cm long, deep stab wound on his right hand extending from the palmar surface to the lateral side of the back of the hand. Additionally, we found some small skin alterations on Ötzi's back of probable traumatic origin. Macromorphologically it was unclear whether these wounds had happened during his lifetime or whether they were postmortem artefacts. We therefore rehydrated small tissue sample from the sites for histological analyses, including histochemical staining for haemosiderin deposits (on Prussian blue stains). The resulting morphology provided well preserved dermal collagen fibres and subcutaneous fat with slight adipocere formation. The fat tissue revealed inclusions of an amorphous, autofluorescing material with isolated focal haemosiderin pigment droplets in Prussian blue staining. In order to confirm these observations, we isolated from the sample of his right hand the amorphous material by laser based microdissection and tested for the presence of haemoglobin. The Guaiac-based test provided a faintly, but clearly positive result, thereby confirming the presence of a blood clot. This

indicates that the wound was acquired *intra vitam* and that the injury happened at least a few days before his death. At present, we do not know if these skin wounds may have happened simultaneously or shortly after Ötzi has been hit by the arrow that was found during a re-examination of thoracic CT scans. We suggest that the ongoing careful examination of the Iceman will provide further significant information on his life and his death.

PERTHES DISEASE: A POSSIBLE CASE FROM THE MEDIEVAL/MODERN STA. MARIA DE FINISTERRA CHURCH NECROPOLIS (SOURE, COIMBRA, PORTUGAL). Maria João Neves and Maria Teresa Ferreira

In 1985 the medieval Sta. Maria de Finisterra church necropolis was submitted to extensive, yet incomplete, archaeological excavations that did not include recovery of skeletal remains. During archaeological survey prior to construction of a public swimming pool in 2003, we conducted the excavation of a significant part of the remainder of the necropolis. This necropolis, in use during the 12th-18th centuries, consists of a vast area delimited by the castle walls, partially unexplored before this survey. Several burial levels were identified that reflect the intensive use of the churchyard, first in structured graves (during the Medieval period) and then in individual pits in the soil (in the modern era). One hundred and one individuals and 37 ossuaries were excavated, of both sexes and all age ranges. All skeletal elements were recovered and identified during fieldwork, providing an *in situ* diagnosis of pathological conditions including trauma, infection, and degenerative lesions. This paper presents an individual from ossuary 10, represented by an os coxa and femur, showing significant bone deformation in the femoral head and acetabulum, consistent with a case of Perthes disease.

REPORT OF HYPEROSTOSIS FRONTALIS INTERNA IN A MEDIEVAL SKELETON FROM LOWER SILESIA (POLAND). Dariusz Nowakowski¹ and Barbara Kwiatkowska²

Overgrowth of bone tissue (hyperostosis frontalis interna) is symptomatic for the condition called Morgagni's syndrome. The pathogenesis of this rare disorder is unknown, but it is possible that it is caused by the malfunction of the pituitary gland. Diagnoses of HFI are very rare but, according to some authors (Armélagos and Chrisman 1988; Anton 1997; Aufderheide and Rodriguez-Martin 1998), hyperostosis frontalis interna appears in ancient human populations with a frequency ranging from 3 to 15 %. There are three cases previously described from Poland, one from the northwest and two from the southeast. In the present work we demonstrate the first case from the region of Lower Silesia (southwest Poland). This skull (dated from 13th century) with pathological characteristics specific for HFI represents an adult female, found in a churchyard (Saint Jakub Church in Wrocław). Diagnosis was established on the basis of clearly visible gross findings, including the overgrowth of the inner table, irregularities in the structure of the bone tissue (based radiological analysis), and abnormalities in histological appearance. Our investigation complements the few reports evaluating pathological changes of such precious historical material.

CAN WE IDENTIFY GENUINE PERIODONTAL DISEASE IN SKELETAL MATERIAL? Alan Ogden

Prior to the 17th century in Britain, few individuals retained their dentitions intact into the fifth decade. With caries prevalence relatively low, root exposure in skulls has therefore been interpreted as inflammatory alveolar bone loss. However, with the heavy occlusal attrition in these populations, compensatory eruption occurred and it is difficult to determine whether root exposure has been mainly because of this or periodontal disease (Kerr 1998, 1999). It is now thought that most modern populations have fewer than 10% of individuals with advanced periodontitis (Jenkins & Kinane 1989). Population differences have been reported but these may be due to smoking or specific items of diet (Fyfe et al. 1993; Indriati & Buikstra 2001). The prevalence of periodontal disease in archaeological populations is

therefore considered to be much lower than previously thought, but its significance as a marker of general health has considerably increased in recent years. Clinical workers have found relationships between periodontal disease and psychosocial factors, stress, atheroma, heart disease, strokes, rheumatoid arthritis, body mass index, diabetes, underweight offspring and even prospects for survival in the elderly. This paper reports on studies of three widely different Medieval English populations from Norton Priory, Hereford Cathedral and the Chichester leprosy hospital, and suggests how true periodontal disease can be identified.

UNILATERAL DYSPLASIA OF A HUMERUS IN A MEDIEVAL SKELETON. Susana Carrascal Olmo and Thaïs Fadrique Rubio

The left humerus of a well-preserved young-adult female skeleton (PE'02 UF9) exhumed from a 9-10th century necropolis (Plaça de l'Església, Granollers, Spain) shows dysplasia of the proximal portion while the distal portion is normal. The shoulder joint presents a deformed humeral head and an arthrotic glenoid cavity. To achieve a differential diagnosis for these pathological findings, morphological and radiological analyses were performed. It was a clear case of unilateral anomalous growth. A probable lysis or malfunction of the proximal growth cartilage is proposed as the most probable cause and its etiology (infectious, traumatic or congenital) is discussed. This study presents the diagnostic problems of this uncommon condition.

DISEASE IN THE EARLY BRONZE AGE IA PEOPLE OF BĀB EDH-DHRĀ', JORDAN. Donald Ortner

Current evidence suggests that the EB IA (ca. 3300-3200 BCE) people of Bāb edh-Dhrā', Jordan were nomadic pastoralists. Because of the transition to a more sedentary economy at the site starting in EB IB the skeletal sample from the EB IA shaft tombs at Bāb edh-Dhrā' (ca. 373 secondary burials) provides comparative data on the relative health of pastoralists and more sedentary people. The EB IA people of Bāb edh-Dhrā' were small in size although relatively robust. Subadult mortality was high, with death before the age of 15 accounting for about 47% of the human burials in the EB IA tombs. Estimated life expectancy at birth was 21.36 years which is well below the lowest life expectancy today. Plausible evidence of tuberculosis, brucellosis, staphylococcal infection, scurvy and osteoporosis occurs in the skeletal sample. Evidence of trauma is uncommon as is skeletal evidence of osteoarthritis. Non-specific evidence of stress includes 8 cases of cribra orbitalia. The probable presence of TB and brucellosis at Bāb edh-Dhrā' implies that infectious disease was a significant factor in morbidity for the living population. The short life expectancy argues for a population in which acute infectious disease was common and particularly troublesome for subadult people.

ANKYLOSIS OF THE KNEE AND HIP JOINTS IN A MEDIEVAL SERIES FROM BÁTMONOSTOR (SOUTHERN HUNGARY). László Paja, L. Gyula Farkas, and László Józsa

Bony ankylosis of the large joints is a rarely described alteration in the palaeopathological literature. Its etiology may be variously explained. The failure of normal joint function following contractures and ankylosis from any cause produces disability by interfering with daily activities and by restricting locomotor function. Our study presents five cases of ankylosis in the series of Bátmonostor-Pusztafalu (Southern Hungary), the largest Medieval cemetery yet excavated in Hungary. In 4 cases the femora and the tibiae were fused, preventing movement. Osseous bridges can be seen around the involved articulations. In the fifth case the right hip bones were fused. On the left side, as a result of increased use, severe degenerative changes can be observed. The aetiology of the changes is unknown in two cases, while the development of the other three cases may be explained by specific responses to infection following trauma (e.g., subcondylar fracture).

PALAEOPATHOLOGICAL STUDIES OF A 10TH-11TH CENTURY HUNGARIAN POPULATION. László Paja, Antonia Marcsik and Erika Molnar

The cemetery of Homokmégy-Székes (Southern Hungary), excavated in 1996-2000, revealed the skeletal remains of 195 individuals. The material is curated in the Department of Anthropology, University of Szeged. Following determination of the demographic profile of the population sample, the skeletal remains were subjected to palaeopathological examination. Macroscopic and radiographic analyses, and in some cases histological and immuno-histological techniques, were utilised. Palaeodemographic analysis revealed 141 adults and 54 subadults, and the sex distribution was equal. The sample was mostly Caucasoid, but included some individuals with Mongoloid features. A wide range of pathological changes were identified in the series, including degenerative articular changes, fractures, diffuse idiopathic skeletal hyperostosis, non-specific infections, minor congenital alterations and dental disease. The skeleton of an old male revealed multiple osteoblastic and osteolytic lesions, probably due to metastatic carcinoma. In three cases traces of symbolic trephination were seen, an intervention that is typical for this archaeological period.

LIVING BY THE SWORD? SHARP BLADED TRAUMA IN EARLY MEDIEVAL MAASTRICHT. Raphaël Panhuysen

Apart from fractures, injuries caused by sharp bladed objects were the most frequent type of trauma in skeletal remains from early medieval Maastricht (480-950 AD). Trauma cases were studied to discover more about the historical context. Skeletal remains from four early medieval cemeteries from Maastricht and its surroundings were examined. Evident blunt force trauma was not found in the sample and trauma due to the impact of pointed objects was generally superficial and ambiguous. Sharp bladed trauma was found in eight adult male individuals. The characteristics of the wounds suggest that swords inflicted all of the wounds. In one case the tibia was involved; in all other cases the skull was affected. In four individuals the trauma displayed signs of healing, and the other cases lacked any sign of healing. Analysis of individuals with sharp bladed trauma suggests that generally this type of trauma was found among males of high social status. The preliminary results from samples of lower social status indicate that the prevalence of sharp bladed trauma was considerably lower in these groups.

KLIPPEL-FEIL SYNDROME IN A MAGYAR CONQUEST PERIOD JUVENILE SKELETON FROM AUSTRIA. Doris Panyl, Maria Teschler-Nicola¹, Franz Kainberger, T. Prohaska, and G. Stinger

A very well preserved skeleton displaying the rarely documented congenital Klippel-Feil Syndrome (KFS) was investigated. These skeletal remains of a 15 year old boy (buried with parts of a horse) from the Magyar Conquest Period were excavated recently in Gnadendorf (Austria). His axial skeleton shows some typical Type II KFS attributes, e.g. fused cervical vertebrae 2 and 3, fused thoracic vertebrae 3 and 4, spina bifida and scoliosis. Moreover, bilateral symmetrical hypoplasia of the basilar part of the occipital bones was present. Since deafness or hearing loss is noted as one of the most common features occurring with KFS, we used computer tomography to investigate the internal structure of the ear. Whereas the inner ears were regularly formed, the external acoustic pores were extremely constricted. Enamel hypoplasia, maxillary and frontal sinusitis, hematomas and general porosities point to malnutrition or immune or chronic deficiencies. Unusual characteristics in the right elbow joint could be interpreted as injury. The distinct pathological alterations were analysed using novel techniques (CT, SEM-BSM), and questions concerning the provenance of the individual (using LA-ICPMS) were examined.

RADIOLOGICAL FINDINGS IN A NEOLITHIC CASE OF HYPERPARATHYROIDISM.

Stephanie Panzer, Albert R. Zink, M. Fesq-Martin, E. Burger-Heinrich, A. Lang, J. Wahl, and Andreas G. Nerlich **(WINNER OF THE 2004 INSTITUTE OF BIOARCHAEOLOGY POSTER PRIZE)**

We investigated the skeleton of a female individual aged 25 to 35 years from an Early Neolithic settlement excavated at the site of Viesenhäuser Hof, South West Germany. Radiocarbon dating indicated an age of 5100 to 4900 BC. The skeleton showed multiple osseous lesions on the vertebral column including deep smooth-walled erosions, fusion and a pathological fracture of a thoracic vertebra with collapse and angular kyphosis. Additionally, two erosive lesions at the proximal end of the right humerus were detected. We performed a detailed radiological examination of the skeletal lesions by digital radiography and Multislice-CT. The radiographs and high resolution scans revealed significant general demineralization of the skeleton. The erosive lesions of L4 and L5 showed a smooth contour, no remarkable sclerosis and no trabecular osteolytic reaction, excluding infectious processes or malignant tumors. The fused vertebrae and the collapsed thoracic spine revealed advanced rarefaction of trabecular bone but no evidence of osteolytic defects. The phalanges provided subperiosteal and endosteal bone resorption and the skull showed a typical 'salt and pepper' appearance caused by trabecular resorption of the diploe. The lesions at the proximal end of the humerus appear to be residues of brown tumours. Taken together, the radiological examination strongly suggests hyperparathyroidism in this Neolithic individual. Our study clearly demonstrates that conventional radiology and multislice CT can serve as an important tool in differential diagnosis of palaeopathological cases.

ANALYZING HEALTH PATTERNS IN MYCENAEAN GREECE. Anastasia Papathanasiou

This study provides insight into Bronze Age life and health in Greece through the analysis of the human osteological remains from three Mycenaean peripheral urban center sites: Sykia, Kalamaki and Spaliareika in the Peloponnese, dated to the Late Helladic period (14th to 12th century BC). The osteological material comes from chambered tombs from the three corresponding cemeteries and represents the commingled and fragmentary remains of the inhabitants of towns not yet located. The minimum number of individuals is 36, 23, and 35 respectively, consisting of approximately equal numbers of males and females but characterized by a paucity of subadults, including infants, probably due to the burial customs. Mean adult age-at-death and mean stature for both males and females fall within the expected range for Greek Bronze Age populations. The pathological conditions observed include caries, linear enamel hypoplasias, premortem tooth loss, periosteal reaction, osteoarthritis, enthesopathies and anaemia. Although the samples are small, the results point towards populations that are physically stressed (as inferred from the prevalence of osteoarthritis and enthesopathies) and physiologically stressed (enamel hypoplasias), exhibit low prevalence of anaemia, and show a moderate prevalence of periosteal reaction, trauma, and dental pathologies.

ANKYLOSING GOUT FROM THE MEDIEVAL PERIOD TO THE PRESENT. Peggy Philippe, Xavier Demondion, Bernard Cortet, René-Marc Flipol, Erica A. Tyler, and Joël Blondiaux **(HONORABLE MENTION, 2004 INSTITUTE OF BIOARCHAEOLOGY POSTER COMPETITION)**

Bone ankylosis in gout is nowadays an exceptional feature (only ten cases published to our knowledge) and is considered a characteristic of untreated tophaceous chronic gout. Comparative descriptive and radiological analysis of two cases observed in the last ten years, and two palaeopathological cases dated to the 12th century AD was made. The first contemporary case is that of a 47 year old man with hyperuricaemia untreated for 10 years; he had carpal and tibio-talar ankylosis, and a "bristled" (multiple spicules) foot. He did not present any radiological signs of DISH. The second was that of a 57 year old woman with tophaceous untreated gout for 10 years. The patient developed tarsal ankylosis and did not present any radiological signs of DISH. Palaeopathological evidence came from the exhumation of

skeletons inside the parish church of St Pierre of Thaon, Normandy (7th to 17th centuries AD). Inside the 12th century choir, three observations allowed discussion of a diagnosis of DISH associated with gout. Two individuals, Thaon 15 and Thaon 18, provided possible evidence for ankylosing gout associated with marginal erosions of the hands and carpal and tarsal bone ankylosis. This study emphasizes the characteristics of prolonged evolution, and absence of treatment, in the occurrence of ankylosing gout, possibly associated with DISH.

INFECTIOUS AND NON-INFECTIOUS JOINT DISEASES OF THE FEET IN AN AVAR PERIOD SITE FROM AUSTRIA. Ron Pinhasi, Maria Teschler-Nicola, Franz Kainberger, and Michael L. Pletterklieber

A systematic investigation of infectious and non-infectious diseases of a skeletal population from an Avar period necropolis (Zwölfaxing, Austria) yielded a variety of pathological alterations in the feet, particularly at the first metatarsophalangeal joint. The initial examination of such markers suggested the prevalence of septic leprosy lesions. Subsequently a list of 18 significant traits was selected from the prevalent literature and a systematic investigation was performed of the total population. All pathognomonic signs were described, quantified, and evaluated by non-invasive radiological techniques (conventional radiographs and computerized tomographs). Eighty-five specimens were investigated, comprising 37 females, 47 males, and one specimen of undetermined sex, with an age range between 17 to 60. Our findings suggest that two individuals had joint lesions due to secondary infections probably caused by leprosy, while several erosive conditions in eight specimens were probably caused by gout. Our diagnosis is based on (1) the high frequency of MTP joint involvement, (2) the diagnosis of discrete circumscribed lytic lesions, and (3) the sex distribution (6 males, one female and one of undetermined sex).

RADIOLOGICAL INTERPRETATION OF IMAGES OF MANDIBLES AND MAXILLAE FROM SKELETAL MATERIAL DERIVED FROM ARCHAEOLOGICAL CONTEXTS. Zoran Rakočević, Marija Djurić, and Srboľjub Živanović

When common diagnoses such as dental attrition, caries, and enamel hypoplasia are excluded, all other pathological conditions of the dento-maxillofacial region, such as developmental abnormalities of teeth, periodontal disease or diseases within the alveolar bone (i.e. tumors, cysts, inflammations, metabolic disorders), show a considerable increase in diagnostic yield when radiography is used. There are some lesions that affect mainly the internal structures of the jaws with no tendency to spread to the bone surface (central eosinophilic granuloma, histiocytosis X, impacted teeth, and metastatic lesions). Moreover, the majority of lesions change the macroscopic bone features only in an advanced stage of disease (osteosarcoma, osteomyelitis, ameloblastoma) and their prevalence is consequently underestimated without radiological examination. The amount of information that could be obtained favoured panoramic radiography as a method of choice in anthropological studies. The aim of this study was to develop guidelines for interpreting the radiographs of jaws in anthropological studies. Skeletal material used in the study comprised 140 skulls from late Medieval graveyard of Stara Torina (northern Serbia), and 3000 radiograms of the living patients from Belgrade. The following criteria for the analysis of panoramic radiograms are discussed in terms of diagnostic considerations: location and number of lesions, size, shape, margins and content of the lesion, and its relationship to adjacent structures (teeth, supporting structures of the teeth, cortex, sinuses, and mandibular canal).

PAST MASCULINITIES: A MALE HEALTH PERSPECTIVE FROM THE IRON AGE TO ROMANO-BRITISH PERIOD IN ENGLAND. Rebecca Redfern

Focusing on males in past communities is a trend recognised from the inception of archaeology. However, masculinity theory has shown that it is only recently that males have been researched as explicitly

gendered individuals. Palaeopathological research using masculinity theory is not developed; the focus tends toward how biological, rather than social, differences affect male health. The effects of masculinity should not be confined to the social sphere; the World Health Organization and others show it to be a significant factor in morbidity throughout the male life-course. The definition of masculinity is determined by the community's socio-cultural context, which is therefore negotiable and subject to change by intrinsic and extrinsic factors. By examining a skeletal sample from Dorset (N= 62 Iron Age and N=89 Romano-British), the influence of changing concepts of masculinity were investigated through the health status of males from the Iron Age to Roman-British period. Four aspects of health were the focus of this study: age at death, indicators of stress, fractures and sharp force weapon trauma. Statistically significant differences for each health indicator were observed between the Iron Age and Romano-British periods; this represents a time of dramatic socio-cultural and environmental change.

ISOTOPIC EVIDENCE OF DIETS AT SUNGHIR AND OTHER EUROPEAN GRAVETTIAN SITES. Michael P. Richards (Sunghir Symposium)

Analysis of stable isotopes of carbon and nitrogen from bone collagen extracted from the Sunghir individuals 1, 2, and 3 suggests a diet heavily focused on terrestrial animal protein, with relatively little contribution from plants or freshwater or marine resources. This pattern is not surprising, considering that they represent the northernmost European Upper Palaeolithic population known to date. The isotope values resemble those of Neanderthal populations, rather than early Holocene populations who often show higher nitrogen isotope values indicative of significant consumption of aquatic foods. However, baseline data on nitrogen isotope values in Upper Palaeolithic fauna from the Sunghir region are needed before the human range of values can be adequately interpreted.

THE VALUE OF OSTEOPATHOLOGY IN THE INVESTIGATION OF HUMAN RIGHTS VIOLATION AND PHYSICAL ABUSE. Conrado Rodríguez-Martín, L. Fondebrider, and M. Salado

The wave of violence that affects the world is forcing a variety of specialists to take part in the investigation of human rights violation in different parts of the planet. One of these specialties is osteopathology. The study of the lesions found in dry bone, mostly of traumatic origin, may contribute to elucidating some cases of human rights violation for missing persons ("desaparecidos") under dictatorial regimes, or in situations of conflict in which torture and other types of physical abuse, including maltreatment and execution, are suspected. The same statement can be applied to the case of child abuse. There are limitations inherent in the nature of the evidence studied and the circumstances of these findings and situations, but the use (when necessary) of methods such as radiology (plain film, CT scans, and mammography), and in some instances microscopy, can help to explain some of these cases. In this paper we also review the statements by the main international organisations on different methods of physical abuse, as well as methods for producing a legal report based on the pathological changes observed.

BUCCAL MICROWEAR VARIABILITY BETWEEN EARLY PREHISTORIC AND HISTORIC HUMAN GROUPS FROM EASTERN SPAIN. Alejandro Romero, Noemí Martínez-Ruiz and Joaquín De Juan

Buccal microwear analysis was applied to samples of archaeological and modern hunter-gatherer human groups. Intergroup variability results obtained suggest that this is a valuable quantitative method for discerning dietary habits and food processing technology. In this study, non-occlusal dental microwear is used to examine patterns from prehistoric and historic populations located in Eastern Spain. High-resolution replicas of postcanine molar teeth (one tooth per individual) were made of seven Bronze Age and nine historic human groups. Replicas were examined by Scanning Electron Microscopy (SEM) at 100x magnification. Microwear density and length of micrographs that showed well-preserved enamel

were recorded, using a semiautomated computer program. Analyses of variance indicate significant differences in the density and length of striations on teeth ($p < 0.05$) between prehistoric and historic groups. Bronze Age economies had a more abrasive diet than their Roman or Medieval counterparts. These results suggest changes in the constituents of the food eaten and this relates to food processing techniques.

A CASE OF VENEREAL SYPHILIS IN A YOUNG ADULT MALE FROM RIBEIRA DE SANTARÉM (SANTARÉM, PORTUGAL). Cláudia Santos

During construction of drainage works in the summer of 2003 in Ribeira de Santarém (Santarém, Portugal), a small part of a necropolis probably linked to a former hospital from the 17th century (according to the historical references) was discovered in Largo de Palhaes. An emergency excavation and recovery of the human remains took place between August and September, and 123 skeletons were recovered (from all age and both sexes) and ossuary material. Burial 48 represents a young adult male with severe asymmetrical bone lesions, for which the most reliable diagnosis is venereal syphilis. Although these lesions have similarities to those found by Codinha (2002) in two adult skeletons from the cemetery of Igreja do Convento do Carmo, Lisbon (16th-18th centuries), in this skeleton they are more severe and with additional and different characteristics. Since these cases are very rare in the Portuguese archaeological record, with only 3 skeletons having been diagnosed with this disease (two males and one female), this study constitutes a contribution to the study of the etiology of venereal syphilis in Portugal in terms of chronology, provenience and dissemination.

PALEOPATHOLOGICAL STUDY OF THE REMAINS OF INDIVIDUALS EXHUMED FROM THE CASTLE OF VIANA DO ALENTEJO (PORTUGAL). Ana Luísa Santos, Paula Tavares, and Ana Gonçalves

During the renovation of the Castle of Viana do Alentejo (Évora, Portugal) a necropolis associated with the Misericórdia Church was found within this fortification. Sixteen articulated skeletons and commingled bones, which represent a minimum number of 21 individuals, were excavated. All skeletons were inhumed in decubitus dorsalis position and were oriented in different directions. This sample consisted of 8 non-adults (38.1%) and 13 adult individuals (61.9%) of which 7 were males and 4 were females. Dental analysis revealed moderate dental wear and ante mortem tooth loss, as well as two molars presenting hypercementosis of their roots; one of these had an extra vestibular cusp. Other pathological lesions included a benign tumor in a skull fragment, two cases of spina bifida, and vertebral lesions, for example vertebral fusion. One individual showed traumatic lesions in the 4th and 5th right metatarsals, right ulna and left clavicle. Despite the small number of individuals excavated, these data increase our current understanding of the population that lived in Alto Alentejo from the 15th to 16th centuries to the post-medieval period.

TEMPORAL PERSPECTIVES OF THE MYCENAEANS OF PYLOS: THE PALACE OF NESTOR GRAVE CIRCLE BURIALS AND NEIGHBORING TOMBS. Lynne Schepartz and Sari Miller-Antonio

Mycenaean burials near the Palace of Nestor were excavated by Blegen and colleagues between 1939 and 1966. They span the pre-palatial and palatial periods, providing a diachronic perspective on the health and burial practices of the population possible. The earliest graves, from the 'so-called' Grave Circle, date to the end of the Middle and beginning of the Late Bronze Age prior to construction of the Palace. These individuals (N=31), found with prestigious grave goods, probably represent the founding elites of Pylos. The later Pylian Mycenaean population (N=83), from the 14th-13th Centuries BC, is represented by multiple and secondary burials from the Tsakalis, Kondou, and Kokkevis tomb groups. Few Pylians lived beyond age 35, and there is limited evidence of osteoarthritis or other age-related pathological conditions.

Some individuals display diaphyseal expansion and marked limb shaft cortical thickening that may have a genetic or stress-response basis. When dental pathology (caries, antemortem tooth loss, enamel hypoplasia) is assessed, the Grave Circle individuals differ from the later burials. The overall frequency of dental pathology is greater in the later burials. Females have the highest rates of dental decay and tooth loss, potentially linked to gender specific dietary stresses or the depletion of resources during reproduction.

WAS THERE A SECULAR TREND FOR STATURE IN ENGLAND BEFORE THE 19TH CENTURY? Marianne Schweich

There is evidence in the Western World for a positive secular trend for stature in the modern era. However, in some regions there is evidence for a negative secular trend before and during the modern era. When did the positive secular trend start in the Western world? How can the negative secular trend be explained? This paper uses data obtained from English archaeological populations, ranging in date from Romano-British to Post-Medieval periods, to analyse stature trends in the pre-modern period. Trotter's methods (1970) were utilised for stature estimations, and Ruff et al.'s methods were used (1991) for weight estimates. All measurements and index calculations were based on Knussmann (1988). In these populations, a negative secular trend for stature can be explained by changes in the bio-cultural environment, i.e., social, economic, political, health, and nutritional status. It is hypothesized that, once such changes crossed a certain threshold, the well-known positive secular trend in the Western World was initiated. Thus, only for modern Western populations should secular trends in stature be used in assessment of social status. For pre-modern populations other anthropometric or osteometric data, such as body proportions or weight estimations, can be used.

SCAPHOID NONUNION FROM THE MEDIEVAL SITE OF KLADRUBY. Václav Smrčka

At the medieval burial site of Kladruby, scaphoid nonunion was identified in two graves: No 4019 (male aged 40-50 years) and No 4025 (added to the main burial and of unspecified sex and age). A model created by Hidaki and Nakamura (1998), based on three-dimensional computed tomographic clinical data from three skiascopically checked patients (5 months, 7 years and 19 years after injury), set up a chronological succession of the development of degenerative changes in nonunited scaphoid bone fractures. Between the 4th and 7th years, onset of the development of degenerative changes on the distal scaphoid fragment took place. From the 7th to 10th year tapering of the styloid process of the radial bone occurred, and cysts were visible on radiographs. As a rule, enlargement of the distal fragment osteophyte occurs after the 10th year. Using this classification it may be possible to determine the timing of the injury prior to death if the distal fragment of the scaphoid and the radius are preserved.

SOCIAL RELATIONS, DIETARY TRENDS AND INFESTATION BY PARASITES IN THE LA TÉNE PERIOD OF THE CZECH REPUBLIC. Václav Smrčka

From an archaeological point of view it is often accepted that the classification of graves according to their funerary furnishings illustrates social differentiation. Waldhauser's (2001) classification of funerary furnishings was applied to the graves of four La Tène burial grounds and the classification explored according to trace element content of bone samples. Eggs of parasites were found in the La Tène skeletal burial ground at Kutná Hora-Karlovy. Results indicated that this classification system is independently supported by other evidence.

SURVIVAL UNDER EXTREME PRESSURE: EARLY CHILDHOOD STRESS AND ADULT AGE AT DEATH IN SKELETAL REMAINS. Richard H. Steckel

In recent years numerous studies have found that signs of early childhood biological stress, such as low birth weight, impair the health of older adults. Overwhelmingly these studies are based on modern data when health conditions were quite good by historical standards. Potentially much can be learned by examining the survival of populations that lived under enormous pressure, enduring life expectancies less than one-half of those found in industrial countries of the late twentieth century. This paper uses the skeletal remains of over 3,000 individuals who lived in the Western Hemisphere as long as 6,000 years ago to probe the connection between several markers of early childhood stress and adult survival. Linear enamel hypoplasias, stunting, and signs of anemia substantially reduced the chances of survival beyond age 30. In a logit model with explanatory variables that control for sex and ethnicity, the probability of survival was systematically 7.6% less with two or more hypoplasias, 7.2% less with cribra orbitalia or porotic hyperostosis that was severe, and 36% less if stunted by 10 centimetres in height.

POROTIC HYPEROSTOSIS: AN EPIDEMIC OUTBREAK IN NEOLITHIC GREECE? REVISING THE DATA. Eleni Stravopodi, Sotiris Manolis, and Michael Schultz

The investigation of ancient disease within a sociocultural perspective has intensified in Greece over the last decades. From this perspective, a large number of scholars support the notion that the advent of the Neolithic in Greece, a period of abrupt demographic and socioeconomic changes in prehistory, is associated with an increase of porotic hyperostosis, with genetic and iron-deficiency anemia considered as the possible causes. Recent findings dispute the above model and aims to re-evaluate the identity, biogeography and etiology of porotic hyperostosis in prehistoric Greece. The profile of this pathological condition in samples from different settings is presented. The site-specific characteristics, the multifactorial etiology of the condition, and prevalence variability between prehistoric groups are discussed. The cause-effect relationship of porotic hyperostosis and the Neolithic revolution in Greece is re-assessed. For the first time in palaeopathological research in Greece, the investigation of the histopathological nature of this pathological condition was undertaken in order to establish a differential diagnosis, provide a data bank of pathological tissues in prehistoric collections, and introduce new reliable analytical techniques.

RADIOGRAPHIC EXAMINATION OF A SACRAL NEURILEMMOMA FROM ANCIENT EGYPT. Eugen Strouhal, Alena Nimečková, and Fady Khattar

The sacrum of a 35-45 year old lady called Imakhetkherresnet was permeated by a large smooth-walled cavity, moulded from pressure by a relatively hard globular lobulated tissue mass. The lady was buried in the southern corridor of the undisturbed Shaft Tomb of the priest Iufaa at Abusir (before 625 BC), excavated by the Czech Institute of Egyptology from 1996 to 2004. Blood analysis of Iufaa and epigraphic evidence confirmed that she was his sister. Diagnosis of the lesion using histological methods indicated a benign tumour called a neurilemmoma. The extent of the tumour in the second and third segment of the sacrum, and its lobulated form, was assessed by radiography. In order to ascertain in detail the number and location of the lobes, the sacrum was scanned using a Siemens Somatom and Spiral CT Scanner. The scanned images were transferred to a Silicon Graphics workstation with Virtuoso 3D manipulation software. By coronal and sagittal reconstruction it was possible to see enlarged spaces with arched outlines projecting from the spinal canal around the right and left 2nd sacral foramina and the left 3rd sacral foramen; the third lobe of the tumour, situated on the left side, extended also to the right side. The spatial form of the four lobes can be best observed in 3D surface rendering, showing the multidirectional growth of the tumour.

THE EMERGENCE OF MODERN MEDICINE IN PORTUGAL: EVIDENCE OF SURGICAL INTERVENTIONS IN CRANIA. Paula Tavares, Maria João Neves, Maria Luís Vilhena de Carvalho, and Ana Maria Silva

Until 1772 medical practice in Portugal was mainly non-professional, resulting in a precarious situation in hospital institutions. In order to face this problem a major medical reform was conducted to improve medical courses and performances. One of the purposes was to provide medical students with a stronger empirical basis for their future practice, including autopsies of cadavers and surgery during their training. In this paper we present three archaeological cases that illustrate this late appearance of modern medicine in Portugal: an autopsied cranium and two cases of cranial intervention. The autopsied cranium of a young adult male was recovered from a late 18th century ossuary in Serra do Pilar necropolis monastery (Vila Nova de Gaia). A young adult male from one of the first modern cemeteries in Portugal (1833/1839), the Sto. António da Cidade Convent (Porto), showed evidence of cranial surgical intervention (frontal and left parietal bone) performed some time before death. The last case, exhumed from the Santa Maria de Semide (Coimbra) convent (probably 18th or 19th century), belongs to an old male (> 50 years). The intervention, on the left parietal bone, seems to have been carried out after a severe traumatic event.

MOLECULAR EVIDENCE OF TUBERCULOSIS IN THE EARLY MEDIAEVAL SITE OF GARS/THUNAU, AUSTRIA. Maria Teschler-Nicola, Mark Spigelman, Ron Pinhasi, Helen D. Donoghue, and Kim Vernon

Systematic macro- and microscopic investigations of pathological lesions of individuals from the late Medieval site of Gars/Thunau, Austria revealed Pott's disease, joint tuberculosis, pleurisy and a high frequency of pathological changes on the endocranium (probably caused by Meningitis tuberculosa). Ribs from five individuals exhibiting characteristic symptoms of tuberculosis (graves 19, 28, 45, 75 & 170) were analysed using a modified guanidium thiocyanate protocol and purified with silica bead. DNA was amplified using Platinum taq polymerase for the following genetic targets: TB detection was carried out with IS6110, INS, RD9, TbD1 and Brucella with B4/5, Omp2. Whereas the 123bp IS6110 amplifications of Gars #28 and Gars#75 were sequenced, only part of these sequences exhibited homology with the *Mycobacterium tuberculosis* complex DNA reference sequence. All other amplicons revealed sequence data with no significant sequence homology. Amplification of the B4/5 amplicon for the Brucella genus was insignificant without confirmation from the Brucella Omp2 gene. The results of morphognostic screening and histological investigations, carried through to assess the degree of diagenetic alteration, are discussed and compared to the molecular analyses.

CREMATIONS OF THE LINEARBANDKERAMIK CULTURE IN RELATION TO BURIAL PRACTICES OF EARLY NEOLITHIC COMMUNITIES IN SOUTH-WESTERN GERMANY. Iris Trautmann

This pilot study seeks to identify trends and tendencies that clarify the role of cremations in the burial record of the Linearbandkeramik culture of Central Europe. This characteristically homogenous culture originated in communities along the middle Danube in Hungary 7,500 years ago and existed for 700 years. Using cremated remains from the LBK cemeteries of Schwetzingen and Fellbach-Oeffingen, Baden-Württemberg, an attempt is made to determine whether cremations represent a special burial form limited to certain individuals or groups of individuals within the community, based on social status, differentiation among sex or age groups, or manner of death. The overall preservation of the cremated remains, similarities of burn stages, and degree of fragmentation, imply a consistent cremation ritual throughout the LBK. Twice as many females as males were identified in the sample, yet the presence of both sexes among the identified material suggests that sex was not the only factor determining whether an individual was to be cremated. Statistically, all age categories were identified. The percentage of sub-adult to adults is nearly identical for both cemeteries. Similar distributions were recorded for inhumation burials. It is concluded that cremations represent a group of individuals with special social status, either within the LBK culture, or attributable to other factors such as belonging to a different cultural group.

APPENDICULAR ROBUSTICITY AND PROPORTIONS OF THE SUNGHIR ADULTS.

Trinkhaus, Erik. (Sunghir Symposium)

The Sunghir site is located at 56° north latitude, far north of any other known Gravettian sites. The Sunghir 1 male displays a typically Late Pleistocene high degree of humerus shaft asymmetry, suggesting right-handedness; the right humeral dimensions and indices are quite robust, yet more gracile than typical Neanderthal samples. The very long clavicles of Sunghir 1 gave him an exceptionally broad upper torso and a high claviculo-humeral index. Sunghir 1's femur and tibia measurements and indices reflect his typically 'sapiens' longer distal limb segments. Both Sunghir 1 and 4 have very robust pilastric femora, quite unlike the non-pilastric femora of Neanderthals and all other archaic humans. This feature suggests habitual long-distance walking, consistent with the proposed nomadic lifeway of these far northern people. In general the Sunghir adults resemble those from more western and southern Gravettian sites in Europe.

TOUGH LIFE: DEFORMITY, DISEASE AND 'STRESS' IN A SMALL POPULATION SAMPLE FROM GREECE. Anastasia Tsaliki

In 1999, the 14th Ephorate of Byzantine Antiquities supervised a salvage excavation north of the small Early-Byzantine (324-610 AD) church of Taxiarchis on Lesbos island. Five graves were excavated and five individuals are clearly represented. The presence of extra isolated bones in the sample indicates a disturbed burial context and that the graves are possibly part of a larger cemetery around the church. The dating of the burials is not secure, as the church was in use for centuries. The grave types, the position of the bodies, and the crossed hands over the chests are consistent with Christian burials of the 18th-19th c. AD. Adults of both sexes are present, as well as adolescents. The human remains of the five main individuals show evidence of a variety of pathological conditions including dental pathology, tumours, metabolic disease, infection, trauma, joint degeneration, fused vertebrae, kyphosis, and other bone deformities. The fact that there exist two types of graves, namely simple pits and stone cists, could suggest some social differentiation ante and/or post mortem, but the excavated sample is too small for conclusive results to be drawn.

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VERTEBRAL OSTEOPHYTOSIS IN A SKELETAL SAMPLE FROM KLOSTERMARIENBERG, AUSTRIA. Handan Üstündag-Aydin

This presentation is based on an analysis of vertebral osteophytosis in a skeletal sample from 16th-18th century cemetery of Klostermarienberg, Austria. The frequency and distribution of vertebral osteophytosis were determined in 7072 vertebral segments of 473 adults over 20 years of age. Vertebral osteophytosis was predominantly observed in the lumbar vertebrae, followed by the thoracic vertebrae, and was uncommon in the cervical vertebrae. The most severely affected intervertebral joints were found at C5-C6 in the cervical region, T7-T8 in the thoracic region and L4-L5 in the lumbar region. The least severely affected vertebral segment was T1. The distribution of vertebral osteophytosis seems to reflect the stresses imposed on the spine by spinal curvature and the weight-bearing function of the spine due to an upright posture. However, there are some differences between males and females. Vertebral osteophytosis was more common in females than males in young adults, whereas it was more common in males than females in old adults. Females were more frequently affected by vertebral osteophytosis in the vertebral segments between T4 and T8. The differences between the sexes could be identified as relating to different activity patterns.

CRANIOTRIGENOMETRY OF SUNGHIR SKULLS. Segei Vasillilyev (Sunghir Symposium)

The cranial dimensions and morphology of the Sunghir 1 adult male clearly identify this robust individual as *Homo sapiens sapiens* rather than *Homo sapiens neandertalensis*. Canonical analysis of the angular parameters of the Sunghir 1 braincase reveal a close resemblance to the Brno-Predmosti type, with a long low braincase of moderate height. Principal components analysis of the angular parameters of his face group him with adults from the Upper Palaeolithic sites of Florisbad, Marina Gora, Mladec Lauc 1, Oberkassel, Predmosti 3, Fish Hook, and Zhoukoudian 101.

A BONY TUMOUR OF THE SKULL BASE – A CASE REPORT. Karin Wiltschke and Anna Maria Höger

Studying human bones from ancient populations may shed light on rare diseases in individuals. During an investigation of an Avar period (800 - 900 A.D.) skeletal sample, the skull of a 20-30 year old woman with massive osteoblastic and osteoclastic bone rebuilding on the cranial base attracted our interest. The main bony structure of the tumour lies in the basal part of the sphenoid bone. The sella turcica is involved and the lower portion of the sphenoid bone is completely destroyed. Osteolytic as well as osteoblastic bone reaction has rebuilt the base and part of the right pterygoid process. The most plausible type of tumour would be a chordoma, chondrosarcoma or craniopharyngioma. These tumours are rare and uncommon in the skull base. The characteristics of these three tumours and possible interpretations for this case study, and with regard to future palaeopathological findings, are discussed.

A CASE OF METASTATIC CANCER FROM THE 10TH - 11TH CENTURY IN HUNGARY.

Albert R. Zink, Andreas G. Nerlich, Stephanie Panzer, Erika Molnar, László Paja, and Antonia Marcsik

The examination of 195 skeletons from a Hungarian cemetery at Homokmégy-Székes (between the Danube and Tisza rivers), dated to the 10th-11th centuries, showed a severe malignant tumour in a 50-60-year-old male. A number of osteoblastic alterations were found in many bones of the postcranial skeleton, especially in the pelvis, ribs and vertebrae. Osteolytic lesions were only present on the base of the skull. The skeletal lesions were studied using metrical, radiographic and gross morphological observation. Additionally, a detailed histological, immunohistological and CT analysis was performed. These investigations clearly revealed that the alterations are mainly osteoblastic with the most massive involvement located in the pelvis. CT scans and histology showed that the alterations are due to metastasis of a carcinoma. The distribution and the extent of the lesions are most indicative of prostate cancer.

MOLECULAR EVOLUTION OF THE M. TUBERCULOSIS COMPLEX IN ANCIENT EGYPT.

Albert R. Zink, S. Kohler, N. Motamedi, U. Reischl, H. Wolf, Andreas G. Nerlich

Biomolecular analyses were performed on ancient Egyptian mummy material covering the time from the Pre- to Early Dynastic period in Abydos (3500-2800 BC) to the Middle and New Kingdom until the Late Period in Thebes-West (c. 2050BC – 500BC). In 160 bone samples, several partial gene sequences were amplified to obtain additional molecular data on the ancient MTB strains. Thirty-nine samples provided molecular evidence for the presence of MTB DNA. Spoligotyping revealed either *M. tuberculosis* or *M. africanum* specific signatures, but no *M. bovis* specific pattern was found. The molecular genetic analysis revealed that the variable region RD9, characteristic for *M. africanum*, was already deleted in the Middle Kingdom 4000 years ago. The *M. tuberculosis* specific deletion TbD1 was absent in some New Kingdom/Late Period samples but seems to be present in the older specimens. At least one sample could be unambiguously attributed to genetic group 2 resembling a "modern" *M. tuberculosis* strain. These results demonstrate the capability of ancient DNA findings to characterise ancient tubercle bacilli for a better understanding of the occurrence and frequency of TB, and for reconstructing the evolutionary time scale of the *M. tuberculosis* complex.

EARLIEST EVIDENCE FOR PRIMARY HYPERPARATHYROIDISM IN THE NEOLITHIC.

Albert Zink, S. Panzer, M. Fesq-Martin, E. Burger-Heinrich, A. Lang, J. Wahl, and Andreas G. Nerlich

Skeletal manifestations of hyperparathyroidism have only very rarely been identified in historic material. We describe the findings in a skeleton representing the oldest case of hyperparathyroidism described as yet in the literature. It dates back to the Early Neolithic period, i.e. approx. 7000 years BP. The skeleton comes from the site of Viesenhäuser Hof, Stuttgart-Mühlhausen, South West Germany. The archaeological record has shown that the burials belong to the Linear Band Pottery period. This was confirmed by radiocarbon dating. The female individual of 25 to 35 years showed multiple osseous lesions: deep smooth-walled erosions of two lumbar vertebrae (L4 and L5) with concomitant fusion of the adjacent lumbar vertebrae L3 and L2; compression fracture of L2 with extensive osteophytes at the superior margin; a pathological fracture of T5 with collapse, partial destruction and angular kyphosis; and finally, two deep erosive lesions at the margin of the proximal joint surface of the right humerus. These findings were confirmed by plain radiology and CT scans. The histological examination showed, besides considerable diagenetic alterations, a significant enlargement of Haversian canals in compact bone and focally broadened endosteal resorption zones with small foci of tunneling osteoclasia in spongy cancellous bone. Our observations strongly suggest that this disease was already present in one of the earliest farming populations of Central Europe.

MORPHOLOGY OF SUNGHIR CHILDREN'S TEETH. Alexandr A. Zubov (Sunghir Symposium)

The larger dental dimensions of Sunghir 2, relative to Sunghir 3, support the data from skeletal morphology and aDNA analyses that identify this adolescent as a male. However, both adolescents exhibit robust jaws with large vestibulolingual diameters of incisors and canines and high molar crowns, typical of early Upper Palaeolithic populations prior to the initiation of dental reduction in the later portion of that era. Archaic dental traits include a median ridge on the lingual surface of the maxillary incisors, 'molarisation' of second mandibular premolars, reduction of the metacone of maxillary molars with large hypocone, and rounded crown shape of mandibular molars.

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