PALEOPATHOLOGY ASSOCIATION

Papers and Posters on Paleopathology

presented at the

Thirteenth Biennial European Members Meeting

18 - 22 September 2000

Chieti, Italy
XIIIth European Meeting of the PALEOPATHOLOGY ASSOCIATION

CHIETI 2000

CHIETI - ITALY 2000
18th-23rd September 2000

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1st Circular, July 1999
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THE BIOANTHROPOLOGY FOUNDATION PRIZE FOR PALEOPATHOLOGY
Thanks to the participation of the Bioanthropology Foundation, we have established a special cash prize of US $1,000 for the best poster (multiple authors will share equally from this amount).

SECRETARIAT OF THE MEETING
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All correspondence should be sent to the Secretariat.
Dear Colleague,

It is my pleasure to inform you that the XLII European Meeting of the Paleopathology Association will take place in Chieti, in September of the year 2000. I know that it takes time and effort to attend meetings, but you will find your efforts well rewarded in many ways.

From a scientific standpoint: Indeed, for the first time there will be a section devoted to animal paleopathology, which will examine the relationships between human and animal diseases in the course of the evolution of terrestrial environments. It is obvious that the scientific standard of the meeting will depend upon those who participate, and this is why I am requesting your presence.

From a cultural standpoint: There will be guided visits to local museums to learn about the ancient Italic culture of the Abruzzo region in the VI-V Centuries BC, prior to the Roman conquest. There will also be a visit to Herculaneum, the city sealed under the ashes by Vesuvius in 79 AD, and now one of the world’s most important archaeological sites.

From an environmental standpoint: There’s no denying that a visit to Italy, enjoying our mild September weather, our warm welcome, and our delicious cuisine is eminently pleasing!

Finally, from a historic standpoint: 2000 is the Jubilee year, and will be marked by many special shows, itineraries and events that you will be able to work into your trip.

An Arrivederci from Chieti, and we expect to see you in September 2000!

Luigi Capasso
PRELIMINARY PROGRAMME

18 September
• Arrival of participants
• Welcome section
• Opening Sections

19 September
• Invited Talks
• Scientific section
• Lunch
• Scientific section
• Dinner

20 September
• Scientific section
• Lunch
• Visit to town
• Social dinner

21 September
• Poster section
• Lunch
• Scientific section
• Dinner

22 September
• Excursion to Herculaneum (optional)

GENERAL INFORMATION

The official language of all communications and posters will be English.
There will be the opportunity for only one oral presentation for each participant.
Oral and poster presentations will be clustered in the programme into topic related sessions, as e.g. tumors, metabolic diseases, soft tissue paleopathology, paleohistology, molecular paleopathology, etc.

In case of excessive requests for oral presentations, the Local Committee will have to accommodate some of them into a second, concurrent session.

Provided the registration fee has been paid, all abstracts of oral and poster presentations that have passed the Scientific Committee will be published and distributed to the participants during their registration.

The opportunity exists to have papers published in a special issue of the Journal of Paleopathology. As a matter of course, papers will be subjected to peer review by the Editorial Boards of this Journal.

The 2nd circular will be sent only to those of you who send their reply to the 1st Circular. It will include a registration form, an abstract reproduction form, a social events form and a hotel accommodation (see the enclosed brochure for first notice).

FUNDING FOR TRAVEL AND ACCOMMODATION GRANTS

The Bioanthropology Foundation has provided limited funding for travel and accommodation grants (maximum US $ 500 per person). Applicants should write to the meeting’s Organising Committee, specifying the amount requested and including either a letter of reference from one of their professors or a member of the PPA (student applicants) or stating their academic affiliation (professor and senior staff). Independent researchers are also encouraged to apply, including a letter of reference from another PPA member.

The organizing committee of the Convention has chosen not to propose a variety of package plans at various prices because it has obtained an excellent discount from the Serena Majestic Hotel (see attached).
The Paleopathology Association offers its heartfelt gratitude of all its members to the organisers and sponsors of this meeting. Their hard work and generosity brought together scholars from 20 nations to share their scientific research and fellowship on the shores of the Adriatic in Italy.
WELCOME TO THE DELEGATES

Eve Cockburn, Past President, Paleopathology Association, Detroit MI (USA)

What a joy it is to be able to welcome so many PPA members to our XIIIth Biennial European meeting, the third to be held on Italian soil. The Second Biennial, organised in 1978 by Professor Emma Rabino Massa, took place in Torino, and Siena was the venue for the Vth meeting in 1984, again organised by Dr. Rabino Massa, but inspired by Professor Brunetto Chiarelli and chaired by Professor V. Capecchi. Now, after a 16-year hiatus, we are back again. For nearly four years, Dr. Luigi Capasso and multiple committees, both Italian and international, have worked indefatigably to bring this meeting to fruition, and the response can be gauged by the number of abstracts presented to you here. There are 147 papers and posters, with participants from more than 25 countries, and we look forward with anticipatory delight to five days of concentration on the fascinating topic of paleopathology -- but we are also responding to the call of this magical land, described forever in Goethe's longing words: "Kennst du das Land, wo die Zitronen blühen?... Kennst du es wohl? Dahin, dahin, geht unser Weg!" Until we meet again in Chieti.

Luigi Capasso, President, International Scientific Committee, PPA XIII Biennial European Members Meeting, Chieti (Italy)

Dear colleagues, ladies and gentlemen: I am very honored and proud to open the XIII European Meeting of the Paleopathology Association. There are several reasons for my pride. First of all, our XIII European Meeting corresponds to the year 2000 meeting, and I think that this correspondence has a symbolic value. In fact, in this year of passage between two centuries and two millennia, our country is receiving millions and millions of visitors, many of them drawn by the extraordinary religious event that is the Jubilee Year. Those few who comprise the paleopathological world will increase this number only slightly, but from our point of view, they are the most significant people. To underline this symbolic value, I have received a series of official messages from the highest Italian authorities. First of all, it is my great honor to present the message of Carlo Azelio Ciampi, the President of the Italian Republic, who extends his high patronage to our Meeting. In addition, we have obtained the high patronage of the National Council of Research, of the Ministry of Italian Universities, of the Ministry of Cultural Heritage, and from the local authorities as well as the Regional Council, the Provincial Boards, and the Municipal Boards. Finally, I recognize the support of the Italian Society of Paleopathology (Società Italiana di Paleopatologia) towards the local organization of this meeting.

The second reason is that after sixteen years of absence, from the time of the Siena meeting in 1984 organized by Professor Capecchi, the European Meeting of the Paleopathy Association has returned to Italy, and it is an honor that this return is to Chieti. Moreover, the decision to set the meeting in Chieti indirectly demonstrates that our study group, such as the Laboratories of Paleobiology of the National Archaeological Museum and the University Museum of Chieti, established in 1982, have acquired an international role; and this represents another important honor for us.

The third reason consists of the scientific program of this XIII European Meeting, because it is important to underline the presence of 147 presentations - both podium and poster - by colleagues of 26 countries from all over the world. These people represent the major institutes of research in paleopathology today. This XIII European Meeting represents an important occasion for the global exchange of new information on the topic that represent our professional interests.

Anyway, the success of this meeting is in your hands, and I really want to thank all of you for coming to Chieti. Because I know that most of you faced a long and hard journey, we hope that you will enjoy your stay. We thank the Bioanthropology Foundation for its particular support for our student members. And finally, we hope that the Meeting will offer you a good opportunity to visit our country, our region, and our museums. Welcome to Chieti, and enjoy the Meeting.
BIOARCHAEOLOGICAL ANALYSIS OF SEX DIFFERENCES IN MORTALITY PROFILES AND STRESS LEVELS IN THE LATE MEDIEVAL POPULATION FROM MISTEHALY, BOSNIA AND HERZEGOVINA

Tatiana I. Alexeeva. Moscow State University (Russia)

A sample of 308 individuals (92 subadults, 216 adults) from a 15th Century cemetery showed differential adult male/female mortality profiles. Female mortality peaked at 26-35 years (average age: 35.6 years) while male mortality peaked at 36-45 years (average age: 38.7 years). Total sample average age at death was 27 years. Adult prevalence of enamel hypoplasia was 19-22%, but subadult prevalence was 33%. Cribra orbitalia was present in 41-44% of adults but 97.1% of subadults. Neither condition showed differential prevalence by sex.

METHOD FOR RE-EVALUATING THE PREVALENCE OF SPINAL DISEASE IN HUMAN PALEOPATHOLOGY (poster)

Yann Ardagna. University of La Mediterranée, Marseille (France); University of Szeged (Hungary)

A method for standardization of vertebral pathology observations is presented which specifies type and location of lesions in vertebral bodies, apophyses, interapophyseal joints, intervertebral discs (synchondroses), and costal facets. Such uniformity of recording will permit construction of standardized databases for accurate comparative studies. The method was applied to a 17th Century skeletal series from Bacsalamas-Homokanya in Hungary. Numerous cases of degenerative, infectious, and inflammatory conditions pathology were identified (e.g., more than 10 cases of vertebral tuberculosis and 2 cases of ankylosing spondylitis).

INTERCEPTION AND PATHOPHYSIOLOGY OF ACCESSORY ARTICULAR FACETS IN A DWARF BELONGING TO X-XII CENTURY

Gaspare Baggieri. Ministero per I Beni Culturali e Attività Culturali, Roma (Italy)

Archaeological excavations in 1998 by the Head of Monuments and Fine Arts of Friuli Venezia Giulia at the Longobard necropolis of Cividale del Friuli uncovered a grave with two bodies, a male aged between 30 and 40 and an adult female, dated to the Late Middle Ages. The male was clearly affected by dwarfism, and showed an unusual bilateral opposition of articular facets on the diaphyses of tibia and fibula. The fragmented neurocranium was brachycephalic with a restricted occipital foramen, facial hypoplasia, and dental hypoplasia. The trunk is relatively developed and shows a rachis affected by a medium scoliosis with the sacro-epistrophes vertebral axis deviated about 30° rightwards at the 11th thoracic vertebra. All of the limbs are short, and the diaphyses of the lower limbs are remarkably curved. The fibulae are flattened and boomerang-shaped, and the hip-knee-ankle axis showed a malalignment which presumably would have made walking difficult. The tibia and fibula diaphyses display anomalous articular facets just distal to midshaft; their depressed surfaces suggest that fibrous interdisks were originally present. The physiological height measured in

Despite reports of 60 cases of primary or secondary malignant growths in specimens from pharonic Egypt, the assumption still persists that such tumors were very rare in the past. We have reported previously a malignant tumor rate (4 cases in 315 ancient Egyptians individuals) similar to prevalence in a middle European 19th Century population, and we report here one new case in a sample of 87 New Kingdom (c. 1250-500 BC) individuals from Thebes-West. Several adjacent vertebral bodies showed several large osteolytic defects with marginal osseous remodelling and focal new bone reaction. The adjacent parts of the bodies and the arches were normal. No other skeletal remains could be definitely attributed to this adult. We suggest multifocal metastatic infiltration of the vertebral bodies, probably from a carcinoma. Alternate diagnoses (multifocal osteomyelitis, hyperparathyroidism, etc.) are unlikely.
the grave was 120 cm (± 5 cm). These morphologic characteristics suggest achondroplasia, the most widespread type of dwarfism.

MAXILLARY LESIONS IN ONE OLD SPECIMEN OF *URSUS ARCTOS* L. (poster)

Antonio Bandres and Francisco Exteberria. Sociedad de Ciencias Aranzadi (Spain)

This specimen is an elderly adult *Ursus Arctos* L. from the Holocene (5,000 years BP) in the Aralar Mountains of the Basque region of Spain. There are several lytic lesions in the maxillary bone at the roots of both canines. The right side is more severely affected. The lesions with peripheral granulation reaction suggest pathology of long duration with abscess formation and post-canine tooth loss. Differential diagnosis is based on photographs, radiographs and CT scans of the specimen.

EVIDENCE OF SURGICAL KNIFE MARKS ON A LATE ROMAN SKELETON: A FACIAL NEOPLASIA EXERESIS ATTEMPT

J. Baxarias, J.A. Ginestà, E. Subirà, and D. Campillo, Museo d’Arqueología de Catalunya, Barcelona (Spain)

This case of maxillary neoplasia is from the Late Roman necropolis of Prat de Riba, Tarragona (III-V Century AD). At the level of the left maxilla is an irregular conical erosive lesion with an exterior base that perforates the anterior surface and communicates with the maxillary sinus. In the superior and inferior parts of the lesion are visible two incised lines with very regular margins and patina. X-ray study confirms osteoblastic reaction around these lines. The most probable cause of the lesion was an epithelioma. The evidence of surgery conforms to descriptions in the Celsian medical texts, which recommend surgical excision of facial neoplasias except for those on the lips, where cauterization is advised.

DEGENERATIVE DISEASE CHANGES FROM PREHISTORIC CHANDMAN BURIALS FROM WESTERN MONGOLIA

Naran Bazarsad. Mongolian Academy of Sciences, Ulaanbaatar (Mongolia)

This paper reports degenerative changes (osteocondritis, osteophytosis, and Schmorl’s nodes) in vertebrae from the Late Bronze Age/Early Iron Age Chandman burial ground. Small stone boxes contained single and double burials, and the larger timber graves contained from two to twelve individuals. A total of 156 postcranial skeletons were available for study. Males and females differ considerably for osteochondritis (31.7% vs. 17.9%) and osteophytosis (50.0% vs. 29.4%) but not for Schmorl’s nodes (18.3% vs. 17.6%). This distribution suggests different social roles for the two sexes. Several young individuals show pathology probably resulting from very heavy physical labor that damaged the developing skeletal tissue.

CRANIAL TRAUMA IN THE INDIVIDUALS FROM THE CEMETERY OF PIAZZA SAN GIOVANNI (TORINO): THE MEDIEVAL EXAMPLE


We present here three cases of cranial trauma found in adult males in the cemetery of Piazza San Giovanni, dated to the Medieval period (IX-XIIIth century) and excavated by the Archaeological Superintendency of Piemonte since 1997. These lesions have probably been caused by cutting weapons during an assault that caused the immediate death of two individuals.

EXTRA-MASTICATORY WEAR PATTERNS IN THE HORSEMEN OF VICENNE-CAMPOLCHIARO MEDIEVAL NECROPOLIS (MOLISE, ITALY)

Maria Giovanna Belcastro and B. Bonfiglioli. Università degli Studi di Bologna (Italy)

In the necropolis of Vicenne Camporachi, 13 graves of horsemen buried with horses were found. This mortuary custom has not been found elsewhere in Western Europe. Unusual dental
alterations, not associated with normal chewing and not observed in other male adults in the cemetery, affected both anterior and posterior teeth of these horsemen. The chipped enamel along incisal and occlusal surfaces and the anomalous lingual aspect abrasions may represent the effect of various non-masticatory activities using the teeth, such as some process for the preparation of foods or the manufacture of articles.

CRANIAL TRAUMA IN THE INDIVIDUALS FROM THE CEMETERY OF PIAZZA SAN GIOVANNI (TORINO): A MULTIPLE BURIAL DATES TO THE RENAISSANCE (poster)


"Anthropo zoologica", Livorno*; Universita degli Studi di Pisa; Soprintendenza Archeologica del Piedmonte, Rino V; Studium, Torino (Italy)

Three out of four adult males buried together in one grave – close to the northern side of San Giovanni cathedral – presented cranial lesions due to injuries from weapon points or blades, arrows, and crossbow bolts. In two cases immediate death followed the traumatic event.

THE AGEING OF FRACTURE HEALING IN PALEOPATHOLOGY WITH LIGHT MICROSCOPIC OBSERVATION

Joël Blondiaux. Centre d’Etudes Paléopathologiques du Nord, Walincourt-Selvigny (France)

Microscopic patterns of fracture remodelling are neglected in paleopathology. Fractures may be diagnosed as unhealed, healing, or healed, but the timing of the three classic phases of callus bone formation and formation is sometimes divergent. Several factors influence the duration of each sequence of healing: these include the type of element fractured, the type and position of the fracture, the apposition of fractured elements, the stability of the fragments, the severity of the fracture, and the age, health, and nutritional status of the individual. For cranial, facial, and rib fractures, typically only the last two factors interfere with the healing process. The analysis of 10 archaeological cases is presented to illustrate the utility of applying information from microscopic examination of macerated modern bone samples to the interpretation of post-traumatic sequences of healing from the first week to the first year after injury.

INFANT HEALTH STATUS IN AN IMPERIAL ROMAN URBAN POPULATION: EVIDENCE FROM PORTUS ROMAE

Luca Bondioli and Roberto Macchiarelli. Museo Nazionale Preistorico Etnografico “L. Pignorini”, Rome (Italy)

Recently, research into the bioanthropology of Classical Rome has shifted from the “individual” to the “population” level of analysis. Our study of the odontoskeletal remains from the necropolis of Isola Sacra - the funerary site used by the inhabitants of Portus Romae during the 2nd-3rd century AD - encompasses the systematic histological analysis of the primary dentition. The major goal is to establish the chronology and intensity of stress events suffered during childhood, through analysis of the amount and relative chronology of microdefects in dental enamel, a tissue capable of permanently recording the stresses that are of sufficient magnitude to reach the threshold of individual susceptibility. Developmental enamel microdefects are detectable in form of microstructural "scars" - termed Wilson bands, or modified Retzius striae - reflecting temporary disruption of the normal enamel formation pattern. A total of 228 deciduous teeth from 122 infant-juvenile individuals from the necropolis of Isola Sacra were analysed. The entire body of digital images, the extensive histomorphometric database, and the related methodological information have been stored and made available for free circulation into an interactive CD-ROM realised within the series of the Digital Archives of Human Paleobiology. This research was supported by the Italian National Research Council (Cultural Heritage Project).

BILATERAL BRACHYMELIA IN A SKELETON FROM A NURAGIC SARDINIAN SITE

The case reported here is a male (aged 45-50 years) found in a collective grave known as the “Giant’s Tomb” near Donori, Sardinia, dated to the end of the Bronze Age (Nuragic III, c. 2800 years BP). The incomplete skeleton was characterized by marked robusticity, notably at the scapular and humeral muscle insertions. Both radii and ulnae were strongly bowed and shortened. The left radius lacked its distal end, the left ulna had a deformed distal epiphysis and a displaced proximal epiphysis, and the right ulna lacked both epiphyses. Unfortunately, the carpal bones were not recovered. Stature estimated from the length of the right humerus was about 158 cm. The whole picture seems to fit well with a diagnosis of bilateral Madelung’s deformity, which consists of an uncommon developmental deformity of the wrist characterized by marked shortening and bowing of the forearms and deformation and dislocation of the radial and ulnar epiphyses and carpal ossicles.

PATHOLOGICAL CONDITIONS IN THE LOWER EXTREMITIES OF TWO SKELETONS FROM EARLY BYZANTINE GREECE

Chryssa Bourbou. Chania, Crete (Greece)

Two adult male skeletons display round or oval erosive lesions in their metatarsal diaphyses. One also shows a destructive lesion on the lateral malleolus of the left fibula. The distribution of the lesions is asymmetrical and x-ray analysis reveals sclerotic margins. New bone formation is also evident around the margins of one lesion. Excluding diagnoses of rheumatoid arthritis, other seronegative arthropathies, infection, or granulomatous disease, the lesions are most suggestive of gouty arthritis. Gout is a disease characterized by accumulation of sodium urate in the body; it is more common in men than in women, and the first attack of gout most frequently appears during the fifth decade of life. Paleopathological evidence of gout is rare, though it is mentioned 22 times in the Hippocratic treatises; it was called ‘podagra’ by Greek physicians, from the words for ‘foot’ (pous) and ‘attack’ (agra). It was regarded as an everyday disease whose nature and symptoms needed no explanation.

A CASE OF DEFORMATION OF THE VERTEBRAL COLUMN IN AN ADULT FEMALE OF THE 19th CENTURY AD

Patricia Brasili, A. Ventrella, and B. Bonfiglioli. Università di Bologna (Italy)

In the study of a sample of individuals from Sardinia (Italy), we have found an interesting case of severe scoliosis of the spine. It was a female of 33 years old who presented a double lateral curvatures of the spine with rotation of the vertebrae and the spinous processes. The curvature was more serious in the thoracic region and was associated with the fusion of a few thoracic vertebrae; moreover we noticed the ankylosis of the sacro-iliac joint on the right side of the sacral area. According to our observations, we suppose that it is not a case of congenital scoliosis but a case of idiopathic scoliosis.

CONGENITAL MALFORMATIONS OF THE VERTEBRAL COLUMN: “BUTTERFLY” VERTEBRAE (poster)

Patricia Brasili, A. Ventrella, and B. Bonfiglioli. Università di Bologna (Italy)

We describe a rare congenital malformation of the spine known as “Butterfly Vertebra” discussed by Rokitansky (1850) in the twelfth thoracic vertebra of a 55 year old adult. Few cases have been reported in the paleopathological literature: one in an adult Tanoan burial at the Henderson site in the Pecos Valley (New Mexico, U.S.A.), five cases in Sadlermiut skeletons (Canada), and one case in a female from Pacatnamuu (Peru) (Barnes, 1994). "Butterfly vertebra" is classified as a congenital developmental anomaly in the early embryonic period, resulting in a sagittally cleft vertebral body. In our case the anomaly affects an adult female and involves the last lumbar vertebra and the first sacral vertebra and it is not associated with other anomalies.

A STUDY USING NITROGEN ISOTOPES AND HISTORICAL SOURCES FOR DETECTING WEANING

Megan Brickley* and A. Millard**. University of Birmingham*, University of Durham** (England)
This study investigated weaning patterns in the 19th century skeletal collection from the Cross Bones Burial Ground, Southwark, London (AD 1600–1853). The excavated material comes from the later phase of use when it was a pauper cemetery and used extensively by the workhouses. Both nitrogen isotope assay and the Bourgeois-Pichat method of historical analysis were employed. Detection of weaning in the archaeological record is an important issue in assessing (a) fertility of past populations, due to the contraceptive effects of breast-feeding and the consequent effect of age-at-weaning on birth spacing, and (b) causes of infant mortality, because a suckling child obtains immunological factors from its mother’s milk which guard against a variety of pathogens. A weanling child is exposed to infection through non-milk foods, so that the weaning and post-weaning period is one of increased mortality. Nitrogen isotopes show a difference of 34% between trophic levels in a food chain, and as the suckling infant is one trophic level above its mother, a child’s d15N varies with age: at birth it approximates that of the mother, but with suckling it rapidly increases and then with weaning declines again. However, the change of diet with weaning is not instantaneous but a process of decreasing milk intake and increasing solids.

TRAUMATIC INJURIES IN SKELETONS FROM THE ANTWERP CATHEDRAL, BELGIUM (poster)

Tjasse D. Bruintjes. Barge’s Anthropologica, Department of Anatomy, University of Leiden (The Netherlands)

From 1987 to 1989 archaeological excavations have been conducted in the Antwerp Cathedral, Belgium. The excavations revealed a total of 854 individuals, dating from the 15th to 18th century. The skeletons were investigated by the late Paul Janssens and A. Marcisk, who reported on their findings in a hitherto unpublished manuscript. Pathology included various cases of traumatic injuries, some with dislocation and neoarthrosis formation. Almost 5% of the individuals showed one or more fractures of the skull, long bones or vertebrae. The frequency as well as the pattern of traumatic injuries sheds some light on the health of a population in a post-medieval city in the low countries.

THE FOUNDERS OF THE COPAN DYNASTY: A LIFE HISTORY APPROACH

Jane E. Buikstra*, Doug Price**, J. Burton**#, and Lori Wright#. University of New Mexico*, University of Wisconsin**, Texas A&M University# (USA)

The "life history approach" emphasizes detailed accounts of individual human lives. It has developed naturally from the confluence of two trends: increased archaeological attention to historical contexts, and development of remarkably precise bioarchaeological techniques for documenting a person’s history from birth until death, based on chemical signals of health, diet, and residence that are literally crystallized within the body's tissues. For the ancient Maya, the presence of hieroglyphic texts and decorative motifs provide documentary evidence of individual histories. For example, K'ik' Yax Ku'uk Mo' is said to have arrived and consolidated political power within the Copan valley in A.D. 426. Contemporary Early Classic Copan Acropolis structures provide evidence of architectural links to other well-known Mesoamerican regions: the central Peten, the Valley of Guatemala and even the Valley of Mexico. Texts associate this ruler with the site of Tikal prior to his arrival at Copan. Are these statements in stone an accurate reflection of Copan’s Early Classic connections? What of the founder’s history and exploits prior to his 426 A.D. arrival? How embellished might these texts be, given the political, ideological and economic complexities of the early Classic Maya world? In this paper, we apply a life history approach to seven tombs excavated within the Copan Acropolis. We begin with physical and contextual descriptions for the remains, with emphasis upon age-at-death, sex, cultural ornamentation, and pathology, especially pre-mortem trauma, and then focus upon the residential histories, as revealed by strontium and oxygen isotope analyses, and dietary patterns, as expressed by the values of light isotopes of nitrogen and carbon.

HYPEROSTOSIS FRONTALIS INTERNA IN SCYTHIANS OF THE MIDDLE DON REGION, RUSSIA

Alexandra Buzhilova and Maria Kozlovskaya. Russian Academy of Sciences, Moscow (Russia)
Skeletal remains from 18 individuals were recovered from a mound cemetery at the archaeological site of Kolbino, dated c. IV Century BC which represented an aristocratic group of nomad Scythians of the Don (Tanais) river region. The Scythians, known as warrior horsemen of the steppes, are famous for their numerous gold funeral artefacts. Billowed symmetrical or non-symmetrical new bone, characteristic of Hyperostosis Frontalis Interna (HFI), was observed on the endocranial surface of the skull of 6 mature females and one senile male. HFI is a common clinical finding in post-menopausal women and, less often, older men. The possible implications of such a high frequency of the pathology (38.9%) in this group are discussed.

BATTLE INJURIES IN A MEDIEVAL NOMAD, INTERPRETED IN THE CONTEXT OF NOMAD FUNERAL CUSTOMS

Alexandra Buzhilova, S. Vnukov, and E. Antipina. Institute of Archaeology, Russian Academy of Sciences, Moscow (Russia)

A Medieval burial was excavated from a Greek-Scythian site in the west-north of the Crimea peninsula in 1990. The person was buried without both forearms, which had been replaced by the forelegs of a young goat. Anthropological analysis showed evidence of decapitation: cutmarks on the cervical vertebrae. Thoracic and lumbar vertebrae and ribs showed battle injuries such as cuts and punctures from sharp weapons. Both femora also showed evidence of cutting, perhaps when the forearms were disarticulated. All findings are discussed in the context of nomadic funeral practice in relation to battle victims.

TWO MEDIEVAL PALEOPATHOLOGICAL CASES

Domingo Campillo, M. Subirà, and S. Vila. Museo d’ Arqueologia de Catalunya, Barcelona (Spain)

In the course of the restoration works carried out in the church at Sant Feliu del Racó (Vallès Occidental, Catalonia, Spain) the remains of 3 individuals, probably belonging to 11th-12th Centuries, were exhumed. Skeleton 1 is an elderly female, remarkable for its small size and lightness of its bones. The skeleton shows moderate arthritic alterations, most intensively in the cervical region, and the spine has an intense dorsal kyphoses with marked diminution of the cervical lordosis. The right tibia is curved laterally, with the distal 2/3 thickened. X-ray examination confirms a severe osteoporosis, the tibia presenting the common aspect of Paget’s deforming osteitis with the cortical bone showing the characteristic ‘pumice stone’ appearance. No other bone shows any traces of deforming osteitis. Skeleton 2, from a robust young adult, shows severe exostotic alterations in both lower extremities with intense arid irregular swelling of the fibulae that show the typical aspect of melorheostosis. Both tibiae are robust and the upper diaphyses present an appearance of genu valgus. The diaphyseal surfaces show a rough aspect with irregular exostoses. The femora present Rouget’s crests, exceptionally thick and extended through the lines of bifurcation. A type ‘C’ melorheostosis (Kraft’s classification) is suggested.
THE PATHOCENOSIS OF HERCULANEUM (79 AD)

Luigi Capasso. National Archaeological Museum, Chieti (Italy)

The anthropological and paleopathological examination of the skeletal remains of the victims of the August 25 (79 AD) eruption of Mount Vesuvius, which were found on the ancient beach of Herculaneum, has shed light on the principal paleobiological characteristics of the population that lived in the city of Herculaneum prior to the eruption, in other words during the heyday of Ancient Roman civilization. The paleopathological diagnoses were made easier by the completeness of the skeletons and the exceptional state of preservation of the remains, which allowed the diagnosis of a number of diseases that generally leave few, limited traces on the bones. The most common diseases observed are congenital anomalies of the spinal column, especially the cervical section, and anomalies of the ribs. The frequency of these anomalies is much higher than that observed either in modern populations or in other ancient populations studied to date, and may be interpreted as an indication of a high frequency of familial relationships among the individuals whose remains were examined.

Among the degenerative diseases of the joints, arthrosis was quite common: it developed in the spinal column of more than 63% of the individuals, both male and female, and occurred in young people as well. This high incidence of the condition and its occurrence among young people indicates that the population of Herculaneum was subject to work-related stresses of the spinal column.

Some lesions of the foot bones are quite common: bone neoformations and syndesmopathic ossifications of the dorsal ligaments of the foot. It is interesting to note that these lesions occur at the points where the shoes commonly worn during the period came in contact with the foot.

Dental pathology includes a high prevalence of caries (greater than 40%), which indicates a fairly cariogenic diet. The wear of the anterior teeth shows they were used for extramasticatory activities, which were certainly work-related, and perhaps tied to fishing, a common activity in ancient Herculaneum.

Skeletal lesions attributable to brucellosis, which were undoubtedly related to the consumption of cheeses produced from sheep’s milk, are also quite common, as are lesions to the visceral surfaces of the ribs produced by activation of the periosteum due to its proximity to the pleura (pleurisy may have been common due to high pollution levels in enclosed spaces). Finally, 70% of the individuals display hypoplastic lines in tooth enamel, indicating they suffered frequent periods of stress in infancy.

TOXICOLOGY IN A NOBLE CLASS OF THE ITALIAN RENAISSANCE

Rosalba Ciranni, L. Marradi, M. Guisiani, and Gino Fornaciari. Università di Pisa (Italy)

Hair samples removed from a large number of mummies belonging to the Aragonese dynasty of Naples were examined to identify both organic and inorganic toxic compounds. The organic substances (cannabinoids, opiates and cocaine) were enzymatically digested, analysed by immunohistochemistry, and submitted to gas chromatography and mass spectroscopy. The outcome was negative for all data, suggesting that none of the analysed individuals had made use of drugs. Different results were achieved with regard to toxic inorganic substances such as arsenic and mercury. The hair was digested using a sulphuric/nitric acid mixture. Arsenic was analysed by means of the colorimetric method, while atomic absorption spectroscopy (AAS) was applied to mercury. None of the individuals was affected by arsenic intoxication, but the results for mercury were clearly positive and provide important paleopathological data. The employment in the past of mercury as a drug is historically well known, but direct chemical and dosimetric data are for the first time available to show its presence in ancient human remains which date to the great European epidemic of syphilis. This confirms the widespread use of mercury in the antisyphilitic therapy of the 16th Century.

GAUCHER’S DISEASE (1854-1928): PERSPECTIVES ON THE MOST PREVALENT JEWISH GENETIC DISEASE

Massimiliano Marco Corsi* and P. Zampetti**, Università degli Studi di Milano*; Università dell’Insubria, Varese** (Italy)

A century ago, Philippe Charles Ernest Gaucher described the first case of Type I Gaucher’s

cheeses produced from sheep’s milk, are also quite common, as are lesions to the visceral surfaces of the ribs produced by activation of the periosteum due to its proximity to the pleura (pleurisy may have been common due to high pollution levels in enclosed spaces). Finally, 70% of the individuals display hypoplastic lines in tooth enamel, indicating they suffered frequent periods of stress in infancy.
disease in a 32-year-old woman who had remarkable splenomegaly, as part of his thesis titled "De l'epithelioma primitif de la rate, hypertrophic idio pathique de la rate sans leucemie". From his microscopic examination of postmortem material, he suggested that the peculiar, large cells in the massively enlarged spleen (now called Gaucher cells) were the result of a primary splenic neoplasm. By 1901, the eponym, “Gaucher’s disease” had been introduced into the medical literature. It is appropriate, a century after Gaucher’s original description, to review the historical highlights of this disease. Current research efforts are directed to elucidate the molecular genetic pathology and to develop efficacious therapy.

BIO-CULTURAL EVIDENCE OF STRESS IMPACT IN ANCIENT ITALY FROM THE ANALYSIS OF LINEAR ENAMEL HYPOPLASIA

A. Cucina*, A. Coppa*, R. Viariuu*, and D. Mancinelli ▼. University of Missouri - Columbia (USA)*; University of Rome “La Sapienza” ®; University of L’Aquila ▼ (Italy)

This study focuses on analysis of human dental enamel in Italian skeletal samples, ranging from the Neolithic to the Middle Age, in order to reconstruct cultural and environmental impacts on these populations. Enamel defects were scored on all permanent dentitions, with particular attention to the maxillary central incisors and mandibular canines. Defects were scored under proper lighting conditions, with the help of a 4x magnifier. Defects’ positions on the crown were measured with a thin-point digital caliper, and to record ‘age of onset’ and ‘end of event’ for each defect. The analysis revealed an increased exposure to stress during the early years of life in all periods. A diet with adequate animal protein provided greater physiological resistance to stressors than an agricultural subsistence pattern: the Neolithic sample from Trentino, basing upon hunting and gathering, suffered from less physiological disruption than the Early Bronze Age agriculturalists from the same area. Larger groups gathered together in urban communities increased the possibility of disease spread, resulting in longer, earlier, and more severe stress periods, as in the Middle Ages sample from Cancelleria in downtown Rome, whose level of stress turned to be the higher among all the samples analyzed.

A CASE OF PULMONARY CALCIFICATION FROM IMPERIAL ROME (poster)

Cucina*, L. Ottini*, R. Vargiu*, F. Verginelli*, A. Coppa*, and R. Mariani-Constantini ®. University “La Sapienza”, Rome*, and University “Gabriele D’Annunzio” 0, Chieti (Italy); University of Missouri – Columbia (USA)

Pathologic calcifications recovered in association with ancient skeletal remains represent rare evidence pointing to diseases affecting soft tissues. Recent excavations of a combined columbarium/hypogaeum dating to the 2nd/3rd centuries AD, on the via Cassia near Rome, recovered the skeleton of an adult male with a remarkable calcified mass, measuring about 6.5 cm x 5.0 cm in maximal diameters, located in situ within the ribs. The burial was not disturbed and all the skeletal elements appeared to be in place, which strongly suggests that the calcified mass did indeed originate from the chest. The possibility of a calcification within a pleural exudate appears unlikely, based on the morphology. Mineral microanalysis is consistent with the presence of hydroxyapatite. The complex, coral-like gross appearance of the calcified mass, as well as its scanning electron microscopy morphology, are also not consistent with calcified pulmonary tuberculosis, calcified toxoplasmosis, dystrophic calcifications or alveolar microlithiasis but rather suggest that the calcification originated from a healed localized inflammatory pulmonary lesion, such as those that may occur, although rarely, in lobar pneumococcal pneumonia, bronchopneumonia or varicella pneumonia. This work was supported by the C.N.R. Finalized Project "Beni Culturali-Archivio Biologico" (contract # 96.1152 PF36).

SPONDYLOARTHRopathies IN MODERN PORTUGUESE ARCHAEOLOGICAL SAMPLES: PREVALENCE AND INTERPRETATION

Eugenia Cunha*, Claudia Umbellino*, Ana Carina Marques*, S. Martin-Dupont**, and Ana Maria Silva*. Universidade de Coimbra* (Portugal); Faculté de Medecine de Limoges** (France)

Ongoing research on spondyloarthopathies in the Coimbra Identified Skeletal Collection points to a high prevalence of seronegative diseases. For comparison, some 200 individuals exhumed from the Monastery of Pombeiro, the Convent of S.Francisco (Santarém) and the Convent of
Loios (Arraiolos) dated from the 16th to the 19th Centuries were examined. The most striking cases are presented here. Differential diagnosis between various types of spondyloarthopathies in archaeological material, often badly preserved, is difficult. As expected, the differentiation between Reiter's syndrome and psoriatic arthritis was not easy, and other pathologies which can manifest in the skeleton in a similar way, such as rheumatoid arthritis, must be excluded. In a retrospective analysis, only the most severe cases can be diagnosed with accuracy, while cases in their early stages can only be given a probable diagnosis. The case prevalence by age and sex of ankylosing spondylitis, the best known group, tends to support the idea of a significant incidence of these diseases.

PALEOPATHOLOGY OF THE MUMMY OF SANTA ROSA FROM VITERBO (CENTRAL ITALY, XIII CENTURY AD)

Ruggero D'Anastasio, Salvatore Caramiello, and Luigi Capasso. Museo Nazionale di Arqueologia, Chieti (Italy)

Santa Rosa da Viterbo’s body was naturally mummified following her death at the age of about 18 years, in 1233. The recent restoration of the mummy provided an ideal opportunity to carry out a detailed anthropological study, including radiographic and endoscopic examinations. From a paleopathological standpoint, the study revealed traces of a healed skin wound with the formation of a scar on the left arm. The thoracic radiographs revealed the agenesis of the sternum; its place is taken by a fibro-cartilaginous plate located in the center of the thorax whose presence is well documented by the endoscopic examination. This rare bone anomaly is associated with a complex anomaly of the heart, which has recently been examined. Indeed, the heart presents a bifid tip, marked asymmetry of the interventricular septum, and, as was shown by the radiographic examination, a radiopaque mass at the distal termination of the interventricular septum. This mass can be interpreted to be a homartoma. Finally, the scalp also displays some morphological anomalies, in that the hairs emerge in pairs, following a disposition that has been observed in primitive mammals. Thus, the mummy of Santa Rosa da Viterbo reveals the presence of a complicated anomaly of the medial line, with skeletal and cardiac defects that result in an extremely rare clinical picture.

DUPLICATION OF THE LUMBAR SPINAL COLUMN IN AN ADULT MEDIEVAL INDIVIDUAL FROM LIGURIA (NORTH ITALY) (poster)


An osteological collection gathered a century ago in Liguria by Dr. Zambelli was broken up at the end of the Second World War. Following a court case undertaken by the Magistrates of Savona, the anthropological part of the collection, which contains ancient human remains from Liguria, was reunited. All the specimens were carefully registered and catalogued, and were displayed in a small private museum in Diano Marina, near Savona. Among the specimens in the collection, an adult spinal column that is probably Medieval in origin is especially interesting: it comprises three ankylosed bones of the lumbar section, probably L1, L2, and L3. A bony septum divides the spinal canal of these vertebrae; this indicates that the individual's spinal cord was split in life. This is an extremely rare anomaly known as "duplicate spine" which has only been mentioned a few times in the literature.

THE DISTRIBUTION OF BONE LESIONS IN TREPONEMAL DISEASE: IS THE LYMPHATIC SYSTEM RESPONSIBLE? (poster)

George J. Dias. University of Otago Medical School, Dunedin (New Zealand)

While the diagnosis of treponemal bone lesions is well established, there is some confusion as to the actual pathological mechanism responsible for the characteristic distribution of diffuse subperiosteal bone production. Two mechanisms are proposed in the literature. First, bone lesions result from direct spread of skin lesions to underlying bone, especially to those which are situated closer to the skin. However, bone lesions are not always associated with the skin lesions observed in clinical situations. Second,
the most commonly affected bone regions lie close beneath the skin and are more likely to be exposed to mechanical trauma leading to the characteristic bone lesions. However, accidental trauma by its nature is random, unilateral and asymmetrical, and trauma patterns differ according to cultural activities such as modes of subsistence, patterns of interpersonal violence, etc. Yet the reported symmetrical and bilateral pattern of skeletal involvement is largely universal. We propose an alternative explanation for the postcranial distribution of bone lesions based on the anatomical distribution of regional lymph nodes in the lymphatic system. Initial skin lesions usually develop at the site of inoculation. The spirochetes enter the lymphatic system in the early stages of the disease. When haematogenous spread of the infection begins, during the secondary stage of infection, microbes from the lymph nodes and/or the inflammatory response spread to the surrounding tissues. In bone, the periosteum becomes inflamed, with consequent new bone formation. The positions of superficial and deep lymph nodes of the lymphatic system, which lie in very close proximity (with minimal soft tissue intervention) to the bones, mirror the characteristic pattern of skeletal distribution of bone lesions. The above hypothesis cannot, however, explain the distribution of cranial vault lesions; we suggest that these reflects lodging of the pathogens in the thick, highly vascular, diploe in this bone.

THE PALEOBIOLOGY OF A PRE-ROMAN CENTRAL ITALIAN POPULATION (OPI, VAL FONDILLO, VI-V CENTURY BC)

Luisa Di Domenicantonio and Luigi Capasso.
Museo Nazionale di Arqueologia, Chieti (Italy)

An anthropological and paleopathological study was carried out on the remains of 105 individuals buried in the Opi-Val Fondillo necropolis, a cemetery dating to between the V and V Centuries BC located in the Parco Nazionale d’Abruzzo (L’Aquila). The anthropological study provided the sex and age of the each individual; 11.4% of the population died before reaching the age of five, and only 6.7% lived to be more than fifty. This mortality pattern is typical of the archaic populations of Central Italy, such as those from Alfedena, Bazzano, Campovalano. There are cases of congenital pathology (spina bifida, spondylolischisis, trauma (completely healed fractures and fractures that were in the process of healing at the time of death), inflammatory disease (a possible case of tuberculosis, and many non-specific bone inflammations), joint disease (arthrosis), and dental disorders (caries, dental wear due to extramasticatory use of the anterior teeth.

A PREHISTORIC SKULL FROM MORAVIA WITH UNUSUAL METASTASES OF AN UNKNOWN TUMOR (poster)

Milan Dokladal, M. Roth, and A. Nemeckova.
Masaryk University (Czech Republic)

(No abstract available.)

THE SWEDISH ROYAL PRINCESS ANNA VASA – HER LIFE AND SKELETAL REMAINS

Ebba During. Stockholm University, Solna (Sweden)

The Princess Anna Vasa was born in Sweden in 1568, the daughter of the Swedish king Johan III and his wife, the Polish Royal Princess Chaterine Jagiello. She was brought up as a Catholic but became a Protestant in 1583. She was an exceptionally intelligent and extensively educated woman. When her brother became king, Sigismund III, of Poland, she accompanied him there. She never married and died at age 57 in 1625. For religious reasons her body had to wait 11 years for a funeral of royal standing, which took place in 1636 in St Mary’s Church in Torun, Polen. During restoration work at the church in April 1994, Anna Vasa’s skeleton was removed and an anthropological investigation in order to establish her identity was carried by Dr Andrzej Florkowski at Nicholas Copernicus University in of Torun. I examined her remains in May 1995. Her grave had been plundered at least twice, and the right forearm and hand were missing, probably as the result of the pillage of her rings and bracelets. The skeleton revealed a number of anatomical deformations and pathological abnormalities. A conventional radiography and CT of Anna Vasa’s skeletal remains in 1995 by M. Grzegorzewski, Z. Boron, and W. Lasek at the Medical Academy of Bydgoszcz, Polen, found a great number of anatomical deviations and pathological abnormalities. DNA analysis was carried out by
Anders Götberström at Stockholm University, an odontological and radiological study was performed by Sigrid I. Kvaal of the University of Oslo, Norway, and $^{14}$C (Ua-10417) and $^{13}$C analyses were carried out by Göran Possnert at Uppsala University. Anna Vasa's remains were reburied in the restored church.

DIFFERENTIAL DIAGNOSIS OF A PERFORATING INJURY IN THE FRONTAL BONE (poster)

Francisco Exteberria*, A. Bandres**, and L. Herrasti**. Universidad del País Vasco* and Sociedad de Ciencias Aranzadi** (Spain)

A cranium belonging to a masculine individual from the Eneolithic period shows a rounded perforation with irregular edges over the right-hand orbital cavity. The differential diagnosis of this injury can be made:

a) Taphonomic phenomenon: fortuitous post-mortem perforation.
b) Trepanation: deliberate perforation with or without survival.
c) Traumatic perforation: by direct impact with or without survival.
d) Fistula: due to drainage of the frontal sinus.

In Spain, two very similar perforations have been described on crania. One from the Cova d’el Toll (Moia, Barcelona) presents a perforation of 7 by 8 mm, which is attributed to a fistulous frontal sinusitis due to the fact that it communicates with the frontal sinus (Campillo 1977). Likewise, Armentano y col. (1999) offered the same diagnosis for a Bronze Age case from Can Filià (Barcelona).

A CASE OF CEREBRAL CYSTICERCOSIS IN AN ANATOMICAL COLLECTION OF THE LAST CENTURY

Luisa Ferrari and Salvatore Micalizio. University of Turin (Italy)

Cysticercosis is the most frequently observed parasitization, due to the larval form of *Taenia Solium*. A case was described in an anatomic specimen belonging to the University of Turin that dates to 1911. The sections of the encephalon were examined, and minute rounded formations with a maximum diameter of 0.4 cm. were observed in the cortex. The prepared histologic sections were coloured with hematoxylin-eosin using Masson’s technique, which revealed the presence of the parasite in a perfect state of preservation. This case shows the importance of material from old anatomical collections for paleopathology as well as for didactics, as they often show disorders that are rare now, such as the present case.

ADAPTATION OF THE ARGENTIC IMPREGNATION TECHNIQUE ACCORDING TO GOMORI FOR THE STUDY OF ANCEINT MATERIAL

Luisa Ferrari and Salvatore Micalizio. University of Turin (Italy)

The traditional histochemical technique developed by Gomori for the study of the reticular fibres is not often used now because of the complexity of the methodology and the necessity to prepare the solution immediately before use. A modified form of this method was tried out on old material belonging to the anatomical collection of the University of Turin. Some cases of Leiomyoma uteri dating back to at least the beginning of the 20th century were preserved in alcoholic solution. The sections were coloured with hematoxylin-eosin and with the reticular fibres technique modified in our laboratory. The preparation time is comparable with the technique of Gomori, but the histological resolution seems to be better. The execution is easier and the solutions remain stable for at least 6 months, so they can be reused. We therefore propose this methodology for the study of reticular fibres in old anatomical specimens.

THE LEPROSY OF HENRY VII (1211-1242), SON OF THE EMPEROR FREDERIC II AND KING OF GERMANY: INCARCERATION OR ISOLATION?

Gino Fornaciari and Rosalba Ciranni. Università di Pisa (Italy)

Henry VII, the eldest son of the Emperor Frederic II and King of Germany died in 1242 and was buried in the cathedral of Cosenza (Calabria, southern Italy). His precious Roman sarcophagus, recently explored, revealed the skeleton, in partial anatomic connection, of a vigorous man, 30-35 years old and 1.72 m tall. The facial bones revealed total resorption of the
anterior nasal spine with exposure of cancellous bone and partial cortical "capping"; smooth remodelling of the inferior margins of nasal aperture; bilateral, extensive fine pitting, with remodelled subperiosteal new bone, of the nasal surface of the palatine; and confluent pits and erosions on the oral surface in the mid-zone of the palate processes. These facial findings are pathognomonic of the "facies leprosa" or "rhinomaxillary syndrome" of leprosy. The feet showed bilateral thinning of the distal diaphyses of the fourth metatarsals and the proximal phalanxes, with typical resorption of the metatarsophalangeal joints, and severe femoral and tibial periostitis, findings also present in leprosy. We can conclude that this was a case of lepromatous leprosy; the first to be diagnosed by osteoarcheological methods in Italy.

Henry VII, instigated by the German nobles, rebelled against his father but was defeated in 1235. After his submission he was confined in the castles of southern Italy and died a suicide in 1242, by a fall into a ravine, after 7 years of imprisonment. His leprosy certainly started some years before his death and the disfiguring conditions must have obliged him to forced isolation.

CRANIAL TRAUMA IN THE INDIVIDUALS FROM THE CEMETERY OF PIAZZA SAN GIOVANNI (TORINO): CRANIAL TRAUMA AND SURGICAL OPERATION IN A RENAISSANCE INDIVIDUAL

Gino Fornaciari*, F. Bertoldi v, P. R. Faggioni v, F. Mallegni, G. Pagni, L. Pejrani Baricco, M. Subbrizio, L. Usai*, and E. Bedini*. Università di Pisa*; "Anthropozoologica", Livorno v; Universita degli Studi di Pisa; Soprintendenza Archeologica del Piedmonte, Rotino; Studium, Torino

The adult male buried in Tomb 92 presented a lesion on the left fronto-parietal region, due to a cutting weapon. An infection following this injury led to the subject's death, in spite of a surgical operation that removed the bone splinters resulting from the wound.

A CASE OF GENERALIZED PERIOSTITIS IN A MEDIEVAL INFANT (XII CENTURY AD) FROM OLÉRDOLA (BARCELONA, SPAIN)

Juan A. Ginestà*, M.E. Subirà*, and Domingo Campillo*. Museu d'Arqueologia de Catalunya, Barcelona*; Universitat Autònoma de Barcelona (Spain)

A case of generalized periostitis is presented. The skeleton corresponds to an infant aged 0-2 months, sexed as a probable male. The remains are very well preserved and almost 100% of the skeleton was recovered. The burial was located below a flagstone pavement of an important construction near the access to a medieval wall (12th Century AD). The archaeological site is located at Olérdola (Barcelona, Spain). The goal of this study is to approach the etiology of this periostitis.

OLD BONES, NEW QUESTIONS II: CONSERVATION, COLLECTION MANAGEMENT, AND RESEARCH AT CENTRO MALLEQUI, PERÚ

Sonia Guillén, Centro Mallequi, Lima (Perú)

(No abstract available.)

CONDYLOMA ACUMINATUM IN A 16th CENTURY MUMMY

Lausa Guisti, Rosalba Ciranni, D. Baraco, and Gino Fornaciari. Università di Pisa (Italy)

The artificial mummy of Maria d'Aragona (1503-1568), a Renaissance noblewoman, was diagnosed with venereal syphilis by paleopathological study, and recent studies have permitted identification of other diseases. The mummy revealed an arborescent pedunculate neoformation corresponding to the inguinal area inside a wide skin fold. The peduncle (2x7mm) was rehydrated and submitted to histological analysis. Slides were stained using haematoxlin-eosin, Van Gieson and Masson's trichromic methods. Optical microscopy observation showed an exophytic skin lesion with a papillary feature and thickening of the edge, probably caused by a severe parakeratosis. The connective axis was less thick but well evident. This loss of density could be interpreted as a dermal inflammation accompanied by angiodermic ectasia. All these histological aspects are very common in the verrucous neoformation caused by human papilloma virus (HPV). The site of the neoformation, the presence of syphilis, a sexually transmitted disease and the histology...
features described above, are strongly suggestive of a case of condyloma acuminatum.

ANIMAL PALEOPATHOLOGY IN A ROMAN PERIOD BURIAL SITE AND TWO SETTLEMENTS IN THE NETHERLANDS (poster)

Maaike Groot. Free University of Amsterdam (The Netherlands)

During surveys in the municipality of Tiel (Gelderland, the Netherlands), amateur archaeologists discovered a burial site and two settlements belonging to the Roman period. Animal remains are relatively well preserved and are analysed by an on-site zooarchaeologist. Most of the bones in the settlements are refuse but a number of animal burials have been found. Most bones belong to domesticated species: cattle, horse, pig, sheep/goat, and dog. Some chickens (mostly found in graves) and a few wild mammals and birds are also present. So far, about fifty animal bones revealed a pathological condition. Most frequent are dental anomalies, broken bones, oral pathology, and osteoarthritis. Some disorders are clearly species-related, being more prevalent or only occurring in one species. From the burial site, the skeleton of a chicken found in one grave showed clear signs of avian osteopetrosis in an advanced stage.

MACROSCOPIC AND ENDOSCOPIC EXAMINATION OF THE HEAD AND NECK REGION OF ANCIENT EGYPTIAN MUMMIES

H.G. Hagedorn, Albert Zink, U. Szeimies, and Andreas G. Nerlich. Ludwig-Maximilians-University, Munich (Germany)

In the last 4 years we analysed about 250 mummies/skeletons found in the necropolis of Thebes-West, Upper Egypt, with particular reference to normal and pathological findings in the head and neck region. Beside macroscopic examination we employed ear and nose endoscopy (using a 30°, 70° and 90° endoscope, Fa. Storz) for the inspection of the nasal cavity, the paranasal sinus, the external auditory meatus, the middle ear and the cranial cavity. Most individuals revealed normal macroscopic and endoscopic features. In particular, several skulls showed the auditory ossicles in normal anatomic position. Several individuals presented with fractures of the nasal bones, and one case revealed a healed severe fracture of the mid-face (Le Fort III) with complete loss of all teeth, suggesting adequate “therapeutic” treatment. Further findings from endoscopy included significant dentogenic sinusitis and chronic middle ear infection with intracranial perforation in one case. In addition, the fixation of auditory ossicles (stapes) suggests the residues of otosclerosis.

A CASE OF SEVERE CHANGES OF THE SHOULDER IN A MEDIEVAL POPULATION (ZÜLPICH, GERMANY) (poster)

Nora Hantsch and K. Kreutz. University of Geissen (Germany)

Excavation of a medieval cemetery in Zülpich, Germany recovered nearly 50 skeletal individuals. A 40-60 year old male showed severe pathological changes to the left shoulder that could not be caused solely by functional stress. The left scapula and clavicle show signs of arthritis and inflammatory reactive bone remodelling. There are signs of a subluxation of the left articulatio acromioclavicularis, the left coracoid and the left tuberositas coracoidea show corresponding flattened layers of newly formed bone, due to the arthritis (hyper functional stress), and traumatic lesions caused by the subluxation. The joint itself could still have been actively used, but with severe restrictions. The flattened osteophytes and the homogenous appearance of both sides of the corresponding joint areas show that the process had been well established. Traumatic lesions like this one are known from sports like horse riding, boxing and judo. They can be caused by a fall on the extended arm or directly onto the shoulder, or by stretching of the arm to the front or rear by another person or obstacle.

HOLOCENE URSUS ARCTOS TARSAL COALITION FROM NAVARRA (NORTHERN SPAIN) (poster)

A. Isidro* and Francisco Exteberria**. Universidad Autónoma de Barcelona*; Universidad del País Vasco** (Spain)

The cave bear (including Ursus deningeri, speleaeus and arctos from Europe and Arctodus...
simus from N. America) of the Pleistocene and Holocene may be the mammal for which disorders are best known (Tasnadi-Kubaskeia, 1962). This case study from an adult male Ursus arctos from La Sima de Illobi de Aralar / Navarra (N. Spain) presents complete fusion of the left talus and calcaneus. This deep burial has been dated to at least 5,000 years BP, during the Copper Age (Holocene). Macroscopically, no signs of articulation are visible with the exception of the distal talus facet. This alteration is associated with hypertrophy of the troclea peronealis in the calcaneous lateral wall. The radiological and the helicoidal CT images show an absence of subtalar joint complexity. The differential diagnosis is quite clear: it is not an ankylosis condition (i.e., rheumatoid disease, a fusion post-infection, arthritis, a syndesmophyte bridge, or post-traumatic fusion).

EPIDEMIOLOGY OF LITHUANIAN IRON AGE POPULATIONS

Rimantas Jankauskas. University of Vilnius (Lithuania)

Skeletal remains of 1465 individuals (553 males, 449 females, 434 subadults and 29 undetermined individuals) were examined. Analysis of patterns of traumas revealed that in the Old Iron Age (100-450 AD) they were relatively rare, prevailing in males but fewer than half of them related to violence. In the Middle Iron Age (450-600 AD) trauma significantly increased, gender differences become even more prominent, the left side of the body is more affected, and about 2/3 were caused by interpersonal violence probably reflecting conflicts between communities. Degenerative joint disease (DJD) does not demonstrate any clear pattern except higher prevalence in males. DISH was diagnosed exclusively in males of robust body build and mature to elderly age; almost all of them dated Middle and Late (600-800 AD) Iron Age. Nonspecific inflammatory bone lesions were found mostly on tibias and fibulas, with male cases prevailing. Several cases of skeletal tuberculosis prove that TB was not a rare disease and was present as early as the Old Iron Age. Cribra orbitalia was found almost exclusively on children skulls. Poor nutrition and infections of the digestive tract were among the principal causes of high morbidity and mortality among children. Cases of rheumatoid polyarthritis were noted, as well as benign tumours and malformations. In concert with burial practices, demographic profiles and data on stature, the patterns of some disorders, especially traumas, DJD and DISH, reflect the development from egalitarian towards stratified society.

A MEDIEVAL MASS GRAVE IN SIGTUNA, SWEDEN – AN INTERPRETATION OF MULTIPLE FINDS OF TRAUMA FROM SEVERAL SKELETONS

Anna Kjellström. Stockholm University (Sweden)

In 1998, the remains of at least 17 individuals were found in a mass grave during an excavation of a medieval churchyard close to the ruins of St. Lars church, Sigtuna. The individuals were of both sexes and varied in age from 8-9 to 60 years. Cutmarks were found on a majority of the individuals, and forensic experts were consulted to help determine the weapon characteristics. The lesions are concentrated to the neck and cranial region, where several of the blows were lethal. Cutmarks are also found on a variety of long bones. No predominance in the anterior-posterior or left-right pattern of cuts was observed, which suggests that the cuts were not the result of face-to-face combat. None of the individuals show any signs of earlier, healed lesions. The characteristics of the cuts show that a sword, axe or knife could have inflicted them, though the sword is the most likely weapon. The location of the pit inside the cemetery walls, the orientation of the bodies, and the presence of old people and children suggests that it is not a burial of soldiers, criminals, or social outcasts. These people were probably the victims of a recorded attack on the city in AD 1187.

NUTRITIONAL TRADITIONS AND HEALTH STATUS OF THE ANCIENT HUNTER-GATHERERS OF CENTRAL RUSSIA

Maria Kozlovskaya. Russian Academy of Sciences, Moscow (Russia)

Societies of hunter-gatherers played an important part in prehistory of the forest lands of Central Russia, where the abundant flora and fauna and relatively unfertile soils encouraged the long-time continuation of a hunting economy until first millenium B.C. Bone tissue concentrations
of zinc, copper, and strontium were measured by the atomic absorption method. Terrestrial mammals, fish, and some plants formed the base of this population's nutrition, but each local society showed variants on the basic pattern. The frequency of the stress markers cribra orbitalia and enamel hypoplasia are also variable. Perhaps the high frequency of cribra orbitalia (31.25%) was caused by helminth parasitization in some populations whose sites were built on the shores of shallow lakes. Numerous helminth eggs (*Diphyllobothrium latum*, *Capillariidae* gen. sp.) were discovered by coprolite analysis. The unexpectedly high frequencies of enamel hypoplasia (up to 100%) can be considered as evidence of unsatisfactory nutrition in childhood.

**Humeral Asymmetry in a Late Medieval Mass Burial from the Battle of Towton (AD 1461) (poster)**

Christopher Knüsel. University of Bradford (England)

Mechanical stresses exceeding the physiological capacity of bone and its associated musculo-tendinous units may result in fractures and tears. Certain architectural features of bone elements - their shape and orientation - seem to confer an adaptive advantage in circumstances of continued strenuous use. This poster provides some examples of architectural features in humeri of a group of medieval combatants found in a mass grave and bearing traumatic injuries indicative of their having perished at the Battle of Towton (A.D. 1461), a decisive encounter of the Wars of the Roses that saw Edward IV accede to the throne of England.

**Paleopathologic Study of Four 19th Century Mummies from Goriano Valli (L'Aquila, Italy) (poster)**

L. Leocata*, L. Ventura*, O. Michelini*, T. Ventura*, M. Pasqua*, and Gino Fornaciari**. San Salvatore Hospital, L'Aquila*, Università di Pisa** (Italy)

Four well-preserved natural mummies (two males and two females), dating to the 19th Century, were found in an ossuary near the 18th Century friary of San Giorgio degli Osservanti in Goriano Valli (L'Aquila, central Italy). Computed tomography scanning revealed pathologic processes in the bones and internal organs. Autopsies were performed via the posterior surface of the bodies to better preserve their frontal aspects and allow future exhibition of the mummies. GVSG 02 was a 50-60 year-old man presenting thyroid goiter, pulmonary tuberculosis and anthracosis, and prostatic hyperplasia. A 70-80 year-old male (GVSG 04) presented ossification of the anterior longitudinal spinal ligament, vertebral osteophytosis and ossification of laryngeal cartilages (suggestive of DISH), and prostatic hyperplasia. In this subject CT scanning had shown a dense mass in the sigmoid-rectum, generating the hypotheses of a post-mortem rectal tampon, an intestinal neoplasm, or coprolites. At autopsy no plug was observed in the lumen and the rectal wall appeared normal, containing dehydrated feces. The study of the female individuals is still in progress. CT scanning demonstrated an osteochondroma of the distal femur, subcutaneous dense nodules of the anterior
abdominal wall and a calcification of the bladder wall in the younger adult woman (GVSG 01), and no significant pathology in the older woman (GVSG 03).

A PRECOLUMBIAN INDIAN CARVED HUMAN BONE DEMONSTRATING ANTEMORTEM TRAUMA (poster)

Peter Lewin. Hospital for Sick Children, Paediatrics, Toronto (Canada)

The chieftains of the Tairona Indians of the Sierra Nevada in northern Colombia in South America (800-1400 AD) often used carved human bones as scepters. This humerus from a young adult bears intricate carvings of facial images on the distal shaft, and the distal end has been carved to resemble a boar. Macroscopic and x-ray examination demonstrated healing calcified periosteal lesions at the lateral aspect of the epicondyle and the upper 1/3 of the shaft, but no trace of osteomyelitis. The injury causing these lesions probably occurred about three months before death.

PLATYMERIA-PLATYCNEMIA: A POPULATION STUDY (cemetery “ANTIGUO CALVARIO”, MORELLA, ELS PORTS, VALENCIA, SPAIN) (poster)

F. Llacer-Borrás, A.B. Forner-Canos, and J. D. Villalain. Universitat de Valencia (Spain)

In this poster, we present data on platymeria and platycnemia in human remains from the Cemetery “Antiguo Calvario” at Morella, Els Ports, Valencia. Two hundred individuals were recovered from a communal burial area used from the 12th Century to 1665, and 70 individuals were recovered from separate graves dated 1665–1812. The sample shows a high proportion of lower limb trauma, probably due to the very rugged terrain of the mountainous landscape. Platymeria and platycnemia were very common, and there was a strong association between platymeria and two other conditions: cribrar femora and a high pilastric index. This suggests a multifactorial cause for this particular anatomical variation: malnutrition, magnesium deficit, and strenuous physical exercise. A hypothesised association between platycnemia and habitual squatting posture could not be verified because of postmortem damage to long bone epiphyses.

OCCUPATIONAL STRESS MARKERS IN A MEDIEVAL FARM FROM CORROIOS, PORTUGAL


Since 1994, 130 individuals have been recovered from individual burials and ossuaries (14th-16th Centuries) adjacent to the church of Quinta de São Pedro (Corroios-Seixal). Historical data revealed that the bodies of farm workers may have been buried here. The prevalence of degenerative changes – both articular (arthritis, particularly in the spine and lower limbs) and traumatic injuries, observed in about 20% of the adults, suggests that these people spent their lives doing hard physical labor. Even when age is taken into account, the strong effect of strenuous biomechanical exertion persists. The historical sources make reference to a population composed of rural workers, and their heavy labor clearly left its mark on their skeletons.

AVULSION INJURIES OF VERTEBRAL ENDPLATES

George J.J. Maat and R.W. Mastwijk. Leiden University Medical Centre (The Netherlands)

Bone changes resulting from avulsions involving vertebral endplates have received little attention from paleopathology. Two skeletal series from AD1455-1824 were examined for this condition. One quarter (11/44) of the adults with adequate vertebrae for systematic observation showed minor to major vertebral endplate changes due to avulsion injuries. The male/female ratio was 7/4. The ratio of injuries contracted during youth or during adulthood was 3/8. About half of affected individuals showed changes in multiple vertebrae. In about 1/3 of the cases, vertebral fractures not involving endplates were recorded. Since the existing classifications of endplate changes from avulsion injuries were developed on the basis of clinical diagnosis made by means of X-ray or autopsy, an adapted and extended outline for paleopathological observations is proposed.
Brazilian shellmound populations (5ky-3ky BP) are usually seen as small mobile hunter-gatherer bands, but recent studies suggest a more complex picture including higher demographic density and some degree of sedentism. The presence of contagious diseases in a shellmound population from the Jaboticabeira site strengthens this view. The skeletal remains of two children found in a double secondary burial show the same type, distribution, and severity of systemic periostitis. The bony lesions were inconsistent with osteomyelitis and congenital syphilis but were compatible with scurvy. However, no sign of scurvy was found in the other 87 individuals excavated from this site. Since both children were probably still nursed by their mother, and since vitamin C is efficiently transferred from the mother through her milk to the baby, she may have consumed a vitamin-C deficient diet if she had a different social status. The burial pattern does not confirm a social difference and thus indirectly excludes a distinct diet for her. It is not possible to confirm the diagnosis as scurvy, and some other contagious disease may be present. Grant sponsor: Fapesp, Wenner Gren Foundation, USP.

METABOLIC DISEASE IN ARCHAEOLOGICAL HUMAN SKELETONS (lecture)

Donald J. Ortner. Smithsonian Institution (USA)

Metabolic disease includes a broad range of human diseases that affect the skeleton, often in fairly distinctive ways. Data on these diseases provide an important window on the health of archaeological human populations. Of particular interest are those diseases that are linked to a specific dietary deficiency such as rickets and scurvy. Iron deficiency anemia normally is not classified as a metabolic disease although dietary deficiency is the underlying cause. Indeed iron deficiency anemia is known to occur in clinical patients with scurvy and/or rickets. Ongoing research on archaeological skeletal samples in England, North and South America provide data indicating that scurvy, rickets, and iron deficiency anemia occur in these samples. The research also reveals variation in prevalence of these diseases that may have important underlying cultural components that contribute to this variation. For example, scurvy seems to be absent from Native American Great Plains archaeological samples where specially prepared winter food may be a factor in prevention. The highest prevalence (38%) encountered in North America thus far is in a sample of Native American subadults from the American Southeast, in a geographical area where access to fresh foods should have been possible virtually year around. Heavy dependence on corn (maize) may have been a factor.

A PROBABLE CASE OF PITUITARY DWARFISM FROM IMPERIAL ROME (poster)


The necropolis located in Viale della Serenissima, in the eastern part of Rome, yielded one skeletal individual of abnormally small proportions, estimated at 120 cm in height based on field measurements. The lack of preservation of the pelvic skeletal elements does not allow sex typing. The skull is poorly preserved, and only the cranial vault could be reconstructed. The fronto-parietal, sagittal, and lambdoid sutures appear to be fused. Unfortunately, the base of the skull, including the sella turcica, is lost. The long bones are proportionate but appear gracile and slender, while the epiphyses are unfused. In contrast, the permanent dentition is fully developed, including the third molars, and the degree of dental wear is consistent with an age at death between 20 and 30 years. The teeth show evidence of marked linear enamel hypoplasia, while the median incisors show severe wear which contrasts with the mild to moderate wear of the occlusal surfaces of the other teeth. Overall, the proportionately small stature, and the discrepancy between dental age and skeletal age, suggest that this individual was affected with a deficiency of the pituitary gland, resulting in hypopituitarism.

PALEOPATHOLOGICAL INDICATORS OF LIFE CONDITIONS IN CLASSICAL ROMAN NECROPOLISES
Of all the skeletal lesions in venereal syphilis, the most characteristic are those of skull bone, most commonly affecting parietal and frontal bones. The bones of the facial skeleton are often affected showing severe and destructive lesions. On the skeletons from the Santa Maria a Monte cemetery two possible cases of syphilis were observed. On a femur (the only preserved part of an adult skeleton of indeterminate sex), we find a characteristic lesion of the cortex. The second case is a maxillary bone of a child (7 years old). The first permanent molar shows defects in development of the crown. These specimens were dated by radiocarbon to 360 ± 50 yr BP (1590 ± 50 AD).

PATHOLOGICAL CASES FROM THE MIDDLE AGES IN HUNGARY

Antonia Márcsik*, Naran Bazarsad**, A. Hegyi*, and G.C. Kocsis*. University of Szeged* (Hungary); National University of Mongolia ** (Mongolia)

The purpose of this study is to present the pathological lesions and to outline health conditions of three medieval populations from Röszke, Téglaš, and Ópusztašzer. The demographic profile of the Röszke and Téglaš samples includes 37 males, 40 females, 10 juveniles, and 34 infants, while the larger Ópusztašzer cemetery contained 469 males, 260 females, 269 infants and 34 unsexable adults. Many individuals showed skeletal lesions, mostly developmental anomalies, traumatic lesions, specific and nonspecific infectious diseases, porotic hyperostosis, and osteoarthritis. In the Röszke and Téglaš samples, the nonspecific infectious diseases are the most significant features. The effects of nutritional deficiency and traumatic lesions reflect their living circumstances. The pathological alterations in the Ópusztašzer sample are more serious (osseous leprosy, syphils, and tuberculosis) and characterize a larger community with different conditions. This research has been supported by the National Research Foundation (OTKa grant No. T029606) for which the authors are grateful.

SUBLUXATION OF RIGHT COXO-FEMORAL JOINT IN A ROMAN SKELETON (T.115) FROM CASALECCHIO DI RENO (BOLOGNA, II-III AD)

V. Mariotti and Maria Giovanni Belcastro. Università degli Studi (Bologna), (Italy)

This skeleton shows subluxation and severe articular degeneration at the right coxo-femoral joint. A conspicuous exostosis at the femoral head prevents the extension of the femur, thus blocked in a flexed position at about a 45° angle. Movements at the hip joint could be very little. Pathological features are present in other joints and bones. The patterns of articular degeneration and enthesis development have been studied in order to understand the possible functional implications of these severe alterations. It is possible that this individual utilized an external support to walk. The hypothesis of crutch use has been considered and tested through the comparison with other cases reported in literature.

A NEOPLASTIC LESIONS IN A MUSLIM INDIVIDUAL (poster)

Carina Marques, Eugenia Cunha, and Ana Maria Silva. Universidade de Coimbra (Portugal)

A sample of 42 individuals was recovered from a Muslim necropolis located in the village of Loulé excavated in 1999. We present the most unusual pathology observed, a neoplastic lesion. The well preserved skeleton of an adult male showed abnormal morphology, a protuberance on the medial aspect of the distal third of the left femur. Casual observation could mistake this lump for an old fracture callus, but radiological examination revealed that the etiology was a bit more complex, a benign neoplasia (probably an osteofibroma).

A CASE OF TALUS CALCANEUS ARTHROSIS SECONDARY TO A VALGUS FOOT IN A LATE ROMAN SECONDARY INDIVIDUAL (poster)

M. J. Martinez, J. Baixerias, A. Isdre, S. Vila, and Domingo Campillo. Museum d'Arqueologia de Catalunya (Spain)

We report here a specimen from the late Roman necropolis of Prat de la Riba (Tarragona) in one of the old gateways of the city, dated 3rd-5th Century A.D. The skeleton was contained in an amphora, well articulated and preserved, supine with the extremities extended, the arms along the
trunk and the cranium in normal position. Cranial and pelvic morphology indicate an adult male, aged 45-55 years according to joints, pubes, and costal ossification and degree of cranial synostosis. The stature is 161 cm., calculated from femoral length (422 cm.) after Trotter and Gleser. The pathology found included multiple Schmorl hernias, a femoral angle of the 125°; genu varum; valgus foot; recurved femur and bilateral arthrosis of the talo-calcaneus joint. The tibias and the talus bones show pathologic lesions. The right talus-calcaneus articulation shows an important periarthrosis. The left talus is missing, but the interbone talus-calcaneus ligament appears to be calcified. All of these alterations probably resulted from the valgus foot.

GEOGRAPHICAL AND LONG-TERM DISTRIBUTIONS OF PREHISTORIC TREPANATIONS IN RUSSIA

Maria Mednikova. Russian Academy of Sciences (Russia)

The oldest examples of trepanation in Russia are found on Mesolithic and Neolithic skulls from the Dniepr river region (now in the Ukraine). One Mesolithic operation from 10,000 years BP involved drilling in the centre of the left temporal bone, after trauma to that area. Clear traits of regeneration were recognised both visually and by X-ray. In the Early Bronze Age (4th-3rd millennia BC) trepanations were ante mortem, made by the scraping technique. Many perforated skulls were found in the lower Don River basin; most trepanations were on temporal and occipital bones. Middle Bronze Age (first half of the 2nd millennium BC) trepanations were more often in the occipital area, and the majority showed signs of survival. In the Lower and Middle Volga River drainages, some skulls had many holes in temporal and occipital bones. Between the Vetluga and Unza Rivers, at an Iron Age settlement (4th Cent. BC), amulets were found made from temporal bones. During the 1st millennium BC in European Russia, the common practice of cremation has obscured the distribution of trepanations. The centre of Early Iron Age trepanation lies south of Siberia, where skull perforations were a part of burial rites of mummification. Early Mediaeval trepanations are concentrated in the European part of Russia, on the Middle Volga, the Middle Don, and in Northern Caucasus. Cases from the 7th-9th

Centuries mostly belong to the symbolic ante mortem category because they were made around bregma and did not open the cranial cavity. Some skulls from Volga region demonstrate also large perforations on temporal bones, often well healed.

A BRONZE AGE BATTLE IN EUROPEAN RUSSIA: THE PALAEOPATHOLOGICAL EVIDENCE

Maria Mednikova and G. Lebedinskaya. Russian Academy of Sciences, Moscow (Russia)

In 1960 not far from Cheboksary, a burial mound called Pepkino (18th century BC) was excavated. In the long grave were exposed the remains of 27 adult males, buried simultaneously. Our study of skulls and postcranial elements discovered many traumatic lesions. Most lesions were probably caused by battle axes, but some crania showed multiple hacking injuries. One skull had 4 such lesions, and another had 3 lesions. None of them showed any indications of inflammatory processes, indicating that death came immediately. Two cranial injuries resulted from arrows. The third kind of artificial damage, seen in two crania, can be classified as trepanation, indicated by scraping of bone in the area of bregma. There were no traces of bone callus development for these two cases. Two skulls show parallel cut marks in the right parietal area. Extensive perforations found on parietal and temporal bones may be also artificial. The epiphyseal regions of many postcranial bones were destroyed and show cut marks on the muscle insertion surfaces.

DETERMINATION OF REHYDRATION AND STAINING CONDITIONS FOR THE HISTOLOGICAL AND IMMUNOHISTOCHEMICAL ANALYSIS OF MUMMIFIED SOFT TISSUES (poster)

A. M. Mekota, Albert Zink, M.G. Esterhazy, and Andreas G. Nerlich. Ludwig-Maximilians-University, Munich (Germany)

* Winner of the Bioanthropology Foundation Prize for Paleopathology (best poster)

The histological analysis of soft tissue remains from mummies provides considerable information on physiological as well as pathological conditions of the respective
individual and presents data on the state of tissue preservation including that of ancient biomolecules. However, the brittleness of the tissue and the autolytic processes complicate such an analysis and it is therefore crucial to use optimal rehydration and reaction conditions of the tissue. Up to now, several investigators suggested diverse procedures, but there exists no study that compares those previous analysis in order to identify the optimal preparation of the tissue. Furthermore, only few studies have used immunohistochemical techniques which allow a much more detailed molecular insight into tissue remains. Likewise, those approaches have also not been compared systematically. In the present study, we used soft tissue specimens (skin, meniscal cartilage and a liver tissue specimen) from ancient Egyptian mummies dating back to the New Kingdom and subsequent periods (approx. 1500 – 500 BC) originating from the necropolis of Thebes-West, Upper Egypt. These specimens were systematically subject to rehydration using the protocols indicated by Ruffer (1909), Sandison (1955), Nerlich (1994), Grupe (1997), Turner & Holtom (1981), Fulcheri (1985), Wilder, (1904), Graf (1949), Piepenbrink & Herrmann (1988), Kleiss & Simonsberger (1984), and Gordon & Bradbury (1977). Three own modifications (I, II and III) were also included. Following embedding into paraffine wax, histological sections were stained using routine histological (haematoxiline and eosin) and histochemical stains (Elastica-van Gieson stain, PAS-staining, Grocotts silver impregnation). The degree of tissue conservation, the staining properties and the identificiation of specific tissue structures were graded by a scoring system. In addition, immunohistochemical stainings were performed using specific antibodies against pan-cytokeratin, vimentin, Actin, basement membrane collagen type IV and S100-protein. The ongoing analysis shows that one of our own modified rehydration procedures (III) provided the as yet best results with respect to tissue conservation and staining properties. Similarly, this approach provides at least a focal specific positive immunostaining of tissue structures, such as the small basement membranes of blood vessels in the dermal stroma. Our preliminary data provide substantial evidence that the careful rehydration allows the proper identification of various tissue substructures. The rehydration steps seem to be critical and further investigations are planned to enhance the staining procedure.

CRIBRA ORBITALIA VS. CRIBRA FEMORA: NEW CONTRIBUTIONS TO THE CRIBOSE SYNDROME

M. Miquel-Feucht, M. Polo-Cerdà, and J. D. Villalain. Universidad de Valencia, E.G. (Spain)

The cribose syndrome (using the concept proposed by Thillaud) is defined by the presence in infant/juvenile subjects (over the age of 3 and under the age of 19 years) of cribra orbitalia, symmetrical femoral cribrum in hyperplatynemic or platynemic femora and variable symmetrical humeral cribose lesions. All these porotic or cribose lesions (orbital, femoral, and humeral) constitute one single lesion or anatomic-pathological entity with identical macroscopic, microscopic, and radiographic characteristics. Although platynemia or hyperplatynemia in femora are both produced by the constant use of the gluteal muscles, recent studies have attributed these conditions to malnutrition. This fact is supported by the biochemical analysis of the different cribotic bones, in which we have observed a decrease of magnesium and iron, characteristic signs of malnutrition of malabsorption syndrome, as our experimental research carried out on Wistar rats has demonstrated.

PARASITIC INTESTINAL HELMINTH OVA FROM THE LATRINES OF THE 13TH CENTURY CRUSADER HOSPITAL OF ST. JOHN IN ACCE, ISRAEL

Piers D. Mitchell* and E. Stern**. University of London* (UK); Israel Antiquities Authority, Akko** (Israel)

The medicomilitary Order of St. John of Jerusalem was formed in the early 12th century AD to protect pilgrims in the Crusader States and care for those who became sick. The latrines in their hospital at Acre were used both by knights of the order and sick pilgrims. The sick were given both shoes and cloaks to wear to the latrines in cold weather. These toilets were in a large room with toilets seats arranged in parallel rows; the excrement was flushed through by rainwater collected on nearby roofs, landing in a room below. The latrines were destroyed in the sack of the city by Islamic forces in 1291 AD and never used again. A coordinated approach has been used to study the soil for parasitic intestinal helminth ova, pollen from dietary and
medicinal plants, and blood breakdown products from bloodletting. This first study of latrine soils at a crusader site tested samples from 5 areas from the latrines, with control samples from 13th century layers elsewhere in the complex and 18th century layers above the latrines. The soil was prepared with standard techniques to remove mineral and plant debris prior to microscopy. Parasitic intestinal helminth ova identified include whipworm (Trichuris trichuria) roundworm (Ascaris lumbricoides) and fish tapeworm (Diphyllobothrium latum). No ova were present in the control samples, suggesting that they did not percolate down with rainwater from higher levels. The fish tapeworm is a particularly interesting find as it is usually present in northern European sites and does not appear to have been identified at a site this early in the Middle East before.

DETECTION OF TUBERCULOSIS IN AN ANCIENT EGYPTIAN POPULATION AND THE ESTIMATION OF ITS FREQUENCY

Andreas G. Nerlich and Albert Zink. Ludwig-Maximilians-University, Munich (Germany)

This paleomicrobiological study on 28 skeletal tissue specimens from the necropolis of Thebes-West, Upper Egypt (1500 – 500 BC) – and one from the necropolis of Abydos (3000 BC) – includes samples with either typical macro-morphological evidence for osseous tuberculosis (n=3) or with morphological alterations not specific, but probably resulting from tuberculosis (n=12), as well as those without morphological osseous changes (n=14). DNA was extracted and amplified by PCR using a primer pair recognising mycobacterial DNA-segment of the M. Tuberculosis complex (IS6110). The amplification products of several samples were subjected to restriction enzyme digestion and/or direct sequencing. Of 29 analysed cases, 7 were positive for M. tuberculosis DNA, confirmed by the restriction enzyme digestion and sequencing. A positive result for typical mycobacteria was seen in 2 of the 3 cases with typical skeletal signs of tuberculosis, in 3 of 12 non-specific, but probable cases (including the case from 3000 BC), but also in 2 of 14 cases without bone changes. The positive molecular reaction in most of the typical cases of skeletal tuberculosis, in 25% of probable tuberculous cases, and, surprisingly, in about 14% of cases without distinctive changes, suggests that infection with M. tuberculosis may have been a frequent disease in ancient Egypt.

PALEOPATHOLOGICAL EVIDENCE FOR SURGICAL TREATMENT IN ANCIENT EGYPT

Andreas G. Nerlich, Albert Zink, U. Szeimies, H. Rohrbach, B. Bachmeier, and H. Hagedorn. Ludwig-Maximilians-University, Munich (Germany)

We describe the first paleopathological findings confirming that ancient Egyptians successfully performed surgery. Medical papyri, e.g. Papyrus Smith, describe the treatment of traumatic lesions, and a IXth dynasty example (c. 2500 BC) of a presumably postraumatic amputation of the fore arm with subsequent distal synostotic fusion of radius and ulna is strongly suggestive. We have identified one almost complete female mummy and an isolated disarticulated foot that clearly showed intravital amputation of either the complete fore foot or the big toe, from the necropolis of Thebes-West. Both were from the so-called “Tombs of the Nobles”. The female mummy was found in tomb TT-95 (21st dynasty, ca. 1070-850 BC), while the isolated foot was found in TT-183 (20th dynasty, ca. 1300-1000 BC). Both amputation sites were covered by intact layers of soft tissue and skin indicating intravital amputation long before death. The amputated big toe had been replaced by a carefully crafted wooden prosthesis, the oldest one known.

MOLECULAR INDICATORS OF THE BLACK PLAGUE IN SCANDINAVIA (poster)

Emilia Nuorala, A. Götherström, K. Liden. Stockholm University (Sweden)

(No abstract available.)

PALEOPATHOLOGY AS ONE OF THE TOOLS TO UNRAVEL THE WAY OF LIFE OF A BRAZILIAN SHELLMOUND POPULATION (poster)

M.M.M. Okumura and S. Eggers. Universidade de São Paulo (Brazil)
Brazilian shellmound populations (5ky-3ky BP) are usually seen as small mobile hunter-gatherer bands, but recent studies suggest a more complex picture including higher demographic density and some degree of sedentism. The presence of contagious diseases in a shellmound population from the Jaboticabeira site strengthens this view. The skeletal remains of two children found in a double secondary burial show the same type, distribution, and severity of systemic periostitis. The bony lesions were inconsistent with osteomyelitis and congenital syphilis but were compatible with scurvy. However, no sign of scurvy was found in the other 87 individuals excavated from this site. Since both children were probably still nursed by their mother, and since vitamin C is efficiently transferred from the mother through her milk to the baby, she may have consumed a vitamin-C deficient diet if she had a different social status. The burial pattern does not confirm a social difference and thus indirectly excludes a distinct diet for her. It is not possible to confirm the diagnosis as scurvy, and some other contagious disease may be present.

Grant sponsor: Fapesp, Wenner Gren Foundation, USP.

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(lecture)

Donald J. Ortner. Smithsonian Institution (USA)

Metabolic disease includes a broad range of human diseases that affect the skeleton, often in fairly distinctive ways. Data on these diseases provide an important window on the health of archaeological human populations. Of particular interest are those diseases that are linked to a specific dietary deficiency such as rickets and scurvy. Iron deficiency anemia normally is not classified as a metabolic disease although dietary deficiency is the underlying cause. Indeed iron deficiency anemia is known to occur in clinical patients with scurvy and/or rickets. Ongoing research on archaeological skeletal samples in England, North and South America provide data indicating that scurvy, rickets, and iron deficiency anemia occur in these samples. The research also reveals variation in prevalence of these diseases that may have important underlying cultural components that contribute to this variation. For example, scurvy seems to be absent from Native American Great Plains archaeological samples where specially prepared winter food may be a factor in prevention. The highest prevalence (38%) encountered in North America thus far is in a sample of Native American subadults from the American Southeast, in a geographical area where access to fresh foods should have been possible virtually year around. Heavy dependence on corn (maize) may have been a factor.

A PROBABLE CASE OF PITUITARY DWARFISM FROM IMPERIAL ROME
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The necropolis located in Viale della Serenissima, in the eastern part of Rome, yielded one skeletal individual of abnormally small proportions, estimated at 120 cm in height based on field measurements. The lack of preservation of the pelvic skeletal elements does not allow sex typing. The skull is poorly preserved, and only the cranial vault could be reconstructed. The fronto-parietal, sagittal, and lambdoid sutures appear to be fused. Unfortunately, the base of the skull, including the sella turcica, is lost. The long bones are proportionate but appear gracile and slender, while the epiphyses are unfused. In contrast, the permanent dentition is fully developed, including the third molars, and the degree of dental wear is consistent with an age at death between 20 and 30 years. The teeth show evidence of marked linear enamel hypoplasia, while the median incisors show severe wear which contrasts with the mild to moderate wear of the occlusal surfaces of the other teeth. Overall, the proportionately small stature, and the discrepancy between dental age and skeletal age, suggest that this individual was affected with a deficiency of the pituitary gland, resulting in hypopituitarism.

PALEOPATHOLOGICAL INDICATORS OF LIFE CONDITIONS IN CLASSICAL ROMAN NECROPOLISES
We conducted a paleopathological survey of skeletal remains from 4 recently excavated Roman necropolises: Vallerano (17 males, 17 females and 3 infants), Quadraro (5 males, 5 females and 3 infants), Gabii (30 individuals that could not be reliably sexed), and San Vittorino (10 males and 4 females). The estimated age at death was generally c. 40 years. The skeletal individuals analyzed were dated from the Republican period to the Imperial age. We focused our attention on skeletal markers of occupational stress (osteoarthritis and entesopathic lesions at loci of muscular insertions) and a non-specific marker of nutritional and/or iron deficiency (cribra orbitalia). Cribra orbitalia was frequent at Vallerano (70%), much rarer at Quadraro (8%), and absent in the samples from Gabii and San Vittorino. In the population of Vallerano the severity of cribra orbitalia appear to decrease with advancing age at death, which is rather typical of sideropenic anemias. Cribra orbitalia appeared to be more common in females. Osteoarthritis was present at high frequencies: Quadraro, 80%; Vallerano, 60%; Gabii, 50%; San Vittorino, 70%. Entesopathic lesions were also common: 30% at Quadraro, 60% at Vallerano, 40% at Gabii, and 50% at San Vittorino. Most adult males from San Vittorino manifested a marked antero-posterior bowing of the femoral diaphysis, which could suggest activities requiring prolonged squatting, compatible with stone quarrying. Osteoarthritic and entesopathic lesions were frequent in both sexes which indicates that both were subjected to strong physical stresses.

CHILD MORTALITY IN EARLY MEDIEVAL MAASTRICHT: MISSING CHILDREN?

R.G.A.M. Panhuysen. Leiden University Medical Center (The Netherlands)

Fewer children displayed signs of pathology. In the adult population, changes that may have been caused by pathological strain during the growth period were rare. It is assumed that the examined population did not experience high levels of pathological strain during growth. This indicates that for early medieval Maastricht there is no reason to make use of demographic models with high child mortality rates.

EXPERIMENTAL CRIBRA ORBITALIA IN WISTAR RATS: AN ETIOPATHOGENIC MODEL OF POROTIC HYPEROSTOSIS AND OTHER POROTIC PHENOMENA (poster)

Manuel Polo-Cerdá, M. Miquel-Feucht, and J.D. Villalain-Blanco. Facultad de Medecina de València (Spain)

In this work we present the preliminary results of an experimental model of cribra orbitalia obtained in Wistar rats. The experimental populations was subjected to three factors of stress, of which two were already investigated (iron anaemia and early weaning); the third factor (magnesium deficiency in the diet) had not been studied until now. The parameters of interest are clinical symptomatology, weight/age rate, mortality, and orbital roof lesions. The results obtained allow us to propose a close relationship among these three etiologic factors and the presence of images compatible with cribra orbitalia (studied under binocular magnifying-loupe and TAC). This experimental
were poorly preserved. This particular individual is represented by scarce bony remains, but the conservation of the ulna and radius joints is good. Bilateral ankylosis in flexion of the ulna and humerus is evident, compatible with rheumatoid arthritis. Published cases of this condition are rare, hence the interest in this case.

TUBERCULOSIS IN THE PREHISTORIC POPULATIONS OF AMERICA: AN UPDATED LITERATURE REVIEW (poster)

J.G. Pratt, M. Mendoça de Souza, and C. Coimbra, Jr. ENSP/FIOCRUZ (Brazil)

This poster summarizes 21 recent studies discussing 130 cases of prehistoric TB in the Americas. North American studies present more paleoepidemiologic information, but the good preservation of mummmified remains in South America offers the opportunity to study in detail aspects of prehistoric pulmonary forms of the disease, including histology, microbiology, and pathogen aDNA. Most affected individuals show bone lesions, and at least 15% show rib lesions suggestive of pulmonary infection. About 5% of the cases show pathological lung tissue in mummmified corpses. In every case, crowding, intensification of contacts, and warfare are associated with the appearance of the disease. In some cases, the emergence of TB suggests an epidemic event. In most cases, animals utilized by the population could have acted as reservoirs for the mycobacteria. Reports published in recent years still reinforce the idea that TB is an ancient opportunistic disease, emerging in old and modern populations in response to poor and stressful life conditions. Variation in the prehistoric epidemiologic behaviour of the disease demonstrates that different models from the modern epidemiologic pattern are needed for prehistoric endemic or epidemic TB.

ANKYLOSIS OF THE ELBOW IN A MEDIEVAL SKELETON FROM THE NECROPOLIS OF PARAYAS (CANTABRIA, SPAIN)

Jose Luis Prieto Carrero, J. A. Sanchez, and P. A. Del Rio. Universidad Complutense de Madrid, Madrid (Spain).

This case is from a medieval necropolis of Parayas (Cantabria) in the north of Spain. It comes from a commingled burial, whose remains were poorly preserved. This particular individual is represented by scarce bony remains, but the conservation of the ulna and radius joints is good. Bilateral ankylosis in flexion of the ulna and humerus is evident, compatible with rheumatoid arthritis. Published cases of this condition are rare, hence the interest in this case.

USE AND ABUSE OF SKELETAL COLLECTIONS FOR TEACHING AND RESEARCH: THE NEED FOR DAMAGE LIMITATION


In some countries human skeletal collections are not available for teaching and research purposes because of the laws of repatriation and reburial. However, in other parts of the world skeletal and mummmified materials are curated in museums, Archaeological Unit stores, and University Departments. Some material is heavily used, particularly if the Collection is well known, unique and in a major museum. Some collections may never be studied beyond the initial report; potentially these are the safest in terms of damage risk. There is increasing evidence to suggest that skeletal remains heavily used for teaching are suffering considerably. This paper aims to provide some hard evidence for damage resulting from excessive handling and poor curation. It also emphasises the need to limit damage to this valuable non-renewable resource. Data on damage to skeletal material related to hours of use are presented, with recommendations for a standard condition assessment to be made prior to curation and use, and standards for packing, curation and handling established. Whilst standards for recording have been established in physical anthropology, those for a standard condition assessment are needed. A strong case for justifying the retention of skeletal and mummmified material for study can be made, and care of material is key to its quality for teaching and research.

INJURY CAUSED BY A LODGED PROJECTILE, FROM SABANALARGA (ATLÁNTICO, COLOMBIA) (poster)
Recent reports of injuries produced by arrows in osteological collections mostly deal with flint arrowheads lodged in human skeletal remains from prehistoric sites of Europe. This case from South America describes an injury caused by an arrowhead or short spear made with a fish bone, lodged in the distal epiphysis of a left humerus. Reported injuries caused by arrowheads made of perishable materials are rare, such as the case of a vertebra pierced by a wooden spearhead from the cave of Majagora, Tenerife, Canary Islands (Spain).

SKELETAL ANALYSIS OF THE HUMAN REMAINS FOUND IN A CRYPT OF THE 18TH CENTURY IN LA LAGUNA (TENERIFE)

Conrado Rodriguez-Martin, M. Garcia, and C.D. Chinea. OAMC-Cabildo de Tenerife (Spain)

Excavations carried out by the Archaeological Museum of Tenerife, the Canarian Institute of Bioanthropology, and the Department of Conservation of the Autonomous Organism of Museums and Centers of the Cabildo de Tenerife in a crypt located in an ancient church in the municipality of La Laguna (Tenerife, Canary Islands) during the winter of 1994 discovered at least 9 individuals belonging to a high level of Tenerife’s 18th Century society. The value of this small sample is based in the fact that the probable identity of several of these individuals could be elucidated by forensic anthropology. Occupational markers on the skeletal elements and study of historical documents confirmed the identifications. Other abnormalities, specially dental and degenerative conditions, are also reported.

COMPUTER-BASED ANALYSIS OF THE PALEOPATHOLOGICAL FINDINGS IN THE HUMAN REMAINS FROM THE NECROPOLIS IN THEBES-WEST

H. Rohrbach*, A. Betz**, Andreas G. Nerlich*, and Albert Zink*. Ludwig-Maximilians-University, Munich*; Gesellschaft für informations- und Dokumentationssysteme (GIDS), Obertshausen** (Germany)

The tombs of the large necropolis of Thebes-West, Upper Egypt, have provided a high number of individuals. We created a computerised database program which allows virtual reconstruction on the basis of archaeological and osteological data, analysed by the Microsoft Access 2000 program. The data from two tombs, TT-183 and TT-196, were entered directly into the database at the site. Tomb TT-183 is a Ramesside tomb used between c. 1250–500 BC, while the side chamber of TT-196 dates to the Middle Kingdom (ca. 2100–1800 BC). All excavated human remains were identified and classified as distinct parts of the skeleton and any pathology recorded. We report here preliminary data on demography (male/female distribution, age at death, rate of infant mortality) and rates of major palaeopathological alterations.

BACTERIAL DNA ANALYSIS IN ANCIENT HUMAN REMAINS

Franco Rollo, I. Marota, S. Luciani, and M. Ubaldi. Università di Camerino (Italy)

Archaeological human remains may contain many types of ancient bacteria: gut flora, cadaveric microbiota, and pathogens. The best specimens for this study are mummies from cold dry environments. A particularly important specimen is the so-called Tyrolean Iceman, a male dating 5350-5100 years BP. Reconstruction of the original cadaveric flora through DNA analysis sheds light on the mummification process that preserved the corpse of this Neolithic shepherd. Another analysis, of microbial colon flora of an Andean mummy from 10th-11th Century Cuzco (Peru), identified several members of the normal fecal flora but also, unexpectedly, the genus Vibrio.

SPONDYLOARTHRATHROPATHY AS A TRANS-MAMMALIAN PHENOMENON,
REPRODUCIBLE IN ITS MANIFESTATIONS ACROSS SPECIES LINES (lecture)

Bruce M. Rothschild and Christine Rothschild. Northeastern Ohio Universities College of Medicine (USA)
Forms of erosive arthritis not caused by direct bacterial invasion include spondyloarthropathy and rheumatoid arthritis. Spondyloarthropathy has been reported in many species of fauna: 5-8% in elephants, 9-31% in bears, 4% in large cats, 10-20% in hyaenas, 3% in Old World monkeys and gibbons, 28% in chimpanzees, 20% in gorillas, and 9% in orangutans. Fusion of vertebral bodies with syndesmophytes, zygapophyseal and sacroiliac joint erosion and fusion, and peripheral erosive (especially subchondral in distribution) arthritis and fusion were diagnostic features. Spondyloarthropathy was typically present twice as frequently as osteoarthritis in zoologic park animals; the latter was extremely rare in free-ranging animals. Re rheumatoid arthritis, some would include all forms of predominantly non-axial inflammatory arthritis in the category, while others have a more narrow definition. Rheumatoid arthritis existed in North America c. 6500 years BP. Spondyloarthropathy was not present in those populations afflicted with rheumatoid arthritis; characters lacking in those early North American populations include peripheral joint fusion, axial joint disease (odontoid disease-excepted), subchondral peripheral joint erosions and limited (especially wrist predominant) distribution. It is clear that non-human mammals do not have rheumatoid arthritis. While the full explanation remains elusive, the prevalence of spondyloarthropathy suggests that it does not necessarily represent an adverse event. Its increased phylogenetic frequency over geologic time suggests that it may well have an evolutionary advantage.

**PALEOPATHOLOGY IN A COLLECTIVE BURIAL DATED FROM 1834 IN ALCALÁ LA REAL (SPAIN)**

J. A. Sanchez, P. A. Del Rio, and Jose Luis Prieto. Universidad Complutense de Madrid, Madrid (Spain)

We present in this work the results of our study of a collective burial dated from 1834. An epidemic of cholera was responsible for these deaths in the city of Alcalá la Real. After the study of 500 skeletons from a total of some 1,200, we present our paleopathological findings based on image analysis, histological and microscopical study, DNA, etc. There is a high rate of trauma, and infectious diseases including syphilis, tuberculosis, and brucellosis are present along with Paget’s disease and other metabolic and endocrine disorders.

**FIVE CASES OF OSTEOMYELITIS FROM THE COIMBRA COLLECTION: SKELETAL AND MEDICAL EVIDENCE (poster)**

Ana Luisa Santos, Departamento de Antropologia, Universidade de Coimbra (Portugal)

Three males and 2 females ranging from 8 to 16 years old from the Coimbra Identified Skeletal Collection have osteomyelitis listed as the cause of death. The bones affected are the tibiae in three cases, and the humerus and femur in the other two individuals. Macroscopic and radiological evidence including surgery marks are presented and compared with the patients’ medical records which include details about surgery, medication and diet during their treatment in the Coimbra University Hospital. The diagnosis of osteomyelitis in juveniles, as well as medical treatments for this disease before the acquisition of antibiotics, is discussed.

**PARTITE AND EMARGINATED PATELLAE IN VICTIMS OF THE 79 A.D. VESUVIAN EROUPT**

Raffaele Scapinelli* and Luigi Capasso**. Direttore della Clinica Ortopedica dell’Università di Padova*; Museo Nazionale di Arqueologia, Chieti** (Italy)

The authors describe the results of an anatomic and radiographic study on the patellae of 97 skeletons brought to light in Ercolano (Herculaneum). Patellar anomalies were found in 12 subjects of various ages: Patella partita in 3 (bilateral in one) and Patella emarginata or incisa in 9 (bilateral in 6). The frequency of 3.09% disagrees with the median rate of about 1.50% reported in the literature. In one case there was association of Patella partita on one side and patella emarginata in the contralateral knee. The longitudinal and transversal diameters of the adult patellae, measured in 87 subjects (48 males and 39 females), were smaller than in modern populations. In the cases of patella partita the presence of an accessory nucleus of ossification caused a moderate enlargement of the bone. The possible pathogenesis of this dysmorphism is
discussed on the basis of personal studies on the vascularization of the human patella.

PATHOLOGICAL PROFILE OF A PEUCETIAN HOPLITE OF THE 5TH CENTURY: THE WARRIOR OF GRAVE 10/II OF PADRETERNO (GRAVINA-BARI, ITALY) (poster)

V. Scattarella, S. Sublimi Saponetti, L. Laraspata, and A. Selvaggi. University of Bari (Italy)

At Padreterno, the tomb of a warrior from the 5th Century B.C. was discovered, buried with hoplite armor, a bronze belt and greaves, a spear, and a javelin. The individual was an adult male, with body mass of 76 kg and stature of 171 cm. The skeleton is robust, showing signs of muscular stress attributable to intense and repetitive activities performed with the entire body. There are 14 fractures, 1 on the skull and 13 on the post-cranial skeleton. Of these, 13 are consolidated old fractures, while 1 was in the reparative phase. The nasal bones show scarring from a transverse fracture, with partial fusion of the two elements, and the right 5th metacarpal is fractured at mid-diaphysis. There are 12 fractures distributed among 9 ribs: 4 on the right and 5 on the left, attributable to compressive events on the thoracic cage. Could these traumas have been the result of a collision during the charge of two hoplite formations facing each other on the battlefield?

A CONTRIBUTION TO HEALTH AND DISEASE IN PRE-COLUMBIAN NORTH AMERICA: THE CHILDREN FROM GRASSHOPPER PUEBLO

Michael Schultz and T.H. Schmidt-Schultz. Universitat Gottingen (Germany)

The skeletons of 81 children excavated at the Grasshopper Pueblo, a 14th Century A.D. Mogollon pueblo in the mountains of east-central Arizona, were examined by macroscopy and low power microscopy only. Pathological changes of the skulls and long bones were documented by measurements, photographs and drawings. This paper summarizes skeletal pathology in the skull. There is relatively little evidence of malnutrition: e.g. scurvy (4.5% - 17.9%). Rickets was not diagnosed. However, the frequency of anemia was extremely high (35.8% - 38.8%). Other infectious diseases, such as otitis media (13.3%) and sinusitis frontalis (15.4%), were relatively rare, whereas meningeal reactions (59.4% - 63.8%) and sinusitis maxillaris (47.4%) showed a higher frequency. The health situation was similar to results obtained from other Southwestern populations.

LESIONS IN ARTICULAR SURFACES OF CATTLE FOOT BONES: OBSERVATIONS OF THEIR PREVALENCE AT ROMAN SITES IN NORTHERN ENGLAND, PLUS A DISCUSSION OF SOME POSSIBLE INTERPRETATIONS

Susan M. Stalibrass. University of Liverpool (England)

(NO abstract available.)

MALIGNANT TUMOURS OF PAST POPULATIONS IN MIDDLE EUROPE (lecture)

Eugen Strouhal. Charles University, Prague (Czechia).

Recently cases of malignant tumours from the Old World were gathered from the available literature and enriched by newly detected ones. Of the total, a quarter came from Middle European countries (Germany, Switzerland, Poland, Czechia, Slovakia, Austria and Hungary) which represent the second richest region after Egypt, with Nubia yielding to date the greatest amount of finds. The most often diagnosed type was lytic metastatic carcinoma, followed by equal rates of sarcoma and multiple myeloma; least common was osteoblastic and mixed metastatic carcinoma. Primary carcinoma of soft tissue, detectable in some cases by changes in the surrounding osseous tissue, was absent. The earliest malignant cases are from the 4th millennium BC, but after the beginning of the Christian Era there was a steep increase of cases through the Middle Ages up to modern times.
ON THE POSSIBLE CASES OF TREPONEMATOSIS IN THE BRONZE AGE FROM QINGHAI PROVINCE, CHINA

Takao Suzuki*, T. Matsushima, and K. Han. Tokyo Metropolitan Institute of Gerontology*; The Doigahama Site Anthropological Museum (Japan); Chinese Academy of Sciences (China)

We investigated 294 skulls and 255 long bones dating from the Bronze Age (BC 1000-AD 500) excavated from 3 archaeological sites in the northern part of Qinghai Province, China: Lijiashan, Ahatelashan and Shangsunjia. No vertebral columns, pelvic bones, scapulae, clavicle and hand/foot small bones were available. It was very difficult to match the skulls and long bones from particular individuals because they had been curated separately without exact registration. Macroscopic observation revealed various pathological changes including trauma, bone tumours, congenital anomalies, periodontal lesions, and infectious diseases.

Three lower long bones belonging to two persons from the Shangsunjia site (femora from M981 and a right tibia with no registration number) showed marked hypertrophic and sclerotic changes consistent with treponematosis. No skulls showed the characteristic bone lesions of treponematosis. According to Hackett (1967), from about 3000 B.C. to the first century B.C., "an uninterrupted block of endemic syphilis extended from the northern part of Africa through western and central Asia". Inland China including Qinghai province with its desert and arid warm semi-desert area was the eastern limit for the prevalence of endemic syphilis. The endemic syphilis of this region was probably originally introduced from Middle East along the "Silk Road", about 1000 B.C.

HISTOPATHOLOGIC STUDY OF BONE REMAINS FROM PRE-HISPANIC COLOMBIA

Luis Tamarit* and Francisco Exteberria**. La Fe Hospital, Valencia*; University of the Basque Country, San Sebastian** (Spain)

Tibia and femur fragments from two skeletons found at the Obando and Palmira valleys in Colombia were decalcified and enclosed in paraffin. Thin sections were stained with silver, picrosirius variant, and tanisol red. The gross appearance was of “generalized thickening” of the cortex, with a rough surface, layers of new bone, deep furrows, and a porous pattern. Microscopically they showed sclerosing osteoperoiostitis, more prominent in one (Obando), while the other (Palrnira) seemed to have a more active, less ossifying proliferative osteoporostitis. The advanced mineral diagenetic changes in both cases indicate that the skeletons had been buried for a long time, perhaps many centuries before the Spaniards arrived.

TAPHONOMY AND PATHOLOGY, INCLUDING LEPROSY, IN IRON AGE SOUTHEAST ASIA

Nancy Tayles, K. Nelsen, and Kate Domett. University of Otago (New Zealand)

Recent excavations at the iron age site of Noen U-Loke, a large mound in Northeast Thailand dated to c. 300BC - c. 300AD., recovered 120 skeletons. Some bodies were interred in graves filled with unthreshed rice. These large quantities of rice suggest a productive agricultural economy with increasing population density, which has implications for the expectations of diseases affecting the population. The rice created an as yet unidentified reaction with the bone tissue which resulted in demineralisation. Many of the skeletons have numerous holes (apparently the result of insect activity) mimicking lytic lesions. Dental disease, particularly carries and loss of teeth during life, is at low levels but poor preservation reduce the value of the data on joint degeneration. Several individuals have lesions affecting the metacarpals, metatarsals, phalanges, and clavicles. The lesions include remodelling and resorption of the phalanges, subperiosteal reactive bone, and deformation of joints. Differential diagnosis for these lesions includes generalised infection, leprosy, trauma, certain arthridites, and congenital malformations. The most probable diagnosis is leprosy.

MALTREATMENT OF ANIMALS IN THE LATE 19TH AND EARLY 20TH CENTURY AD? EVIDENCE FROM THE JULIUS-KÜHN-COLLECTION, UNIVERSITY OF HALLE-WITTEMBERG (GERMANY) (poster)

Wolf R. Teegen* and J. Wussow**. University of Leipzig, University of Halle-Wittenberg (Germany)
The Julius-Kühn-Collection of the Martin-Luther University, Halle-Wittenberg (Germany) is one of the largest series of domestic animal skeletons in Europe. Several hundred swine and cattle are represented. A female swine of 8 years of age, dating from the late 19th century, showed several fractures of the cartilaginous ribs with extended callous formation and a complete ankylosed vertebral column, probably caused by erysipelas. Between two thoracic vertebrae, an area with callous formation is visible, probably due to inflammatory processes and/or fracture.

METASTATIC CANCER IN A 4TH CENTURY BC ETRUSCAN FROM POPULONIA (TUSCANY)

Roberto Tempestini*, Rosalba Ciranni*, L. Guisti*, D. Barraco*, A. Romualdi**, and Gino Fornaciari*. University of Pisa*; Superintendence of Archaeology of Tuscany, Florence** (Italy)

The skeletal remains of a vigorous man 45-50 years of age, about 165 cm tall, show strong muscular insertions and considerable wear of the superior medial incisors, suggesting that the teeth were used as a "third hand". Numerous Harris' lines reflect frequent stress episodes during childhood. The dating and the type of burial suggest a worker employed at Populonia in mining or processing, possibly iron on Elba. The vertebral bodies of the inferior thoracic and lumbar spine and the right iliac wing show coarse, roundish cavities, 1-3 cm in diameter, with erosion of the cortical bone. X-ray shows total absence of bone reaction and reveals numerous similar smaller lesions, 2-5 mm in diameter, in the skull, ribs, humeri and femurs. The morphology, skeletal distribution and total absence of bone reaction strongly support the diagnosis of osteolytic lesions caused by metastatic carcinoma. The adult age, sex, and possibly high-risk workplace suggest a case of lung cancer.

THE MEDIEVAL MANAGEMENT OF FALLOW DEER: A PATHOLOGIC LINE OF INQUIRY

Richard Thomas. University of Birmingham (UK)

The analysis of animal bone assemblages from castle sites in England has typically revealed consumption of deer in much higher proportions in castles than at urban or rural sites. Dudley Castle, West Midlands, is no exception: fallow deer (Dama dama) form 12% of the total assemblage in the period 1321-1397 (n=2555). Discussion of the management of medieval deer parks has normally been approached from a historical point of view; zooarchaeological evidence has tended to concentrate on temporal change in species exploration and the consumption of deer as expression of status. This paper uses both sources to analyse a frequently occurring pathological condition on fallow deer. The pathology is a smooth, discrete, lump located on the anterior surface of the metatarsal about three-quarters of the way up from the distal end on the medial side of the groove. Approximately 8% of the total number of complete fallow deer metatarsi (n=74) displayed evidence of this condition. Similar pathologies have also been found on a small number of cattle and red deer metapodials from other sites. Possible aetiologies are discussed and it seems likely that the observed condition is caused by some sort of trauma.

VAMPIRES BEYOND LEGEND: A BIOARCHAEOLOGICAL APPROACH (poster)

Anastasia Tsaliki. University of Durham (UK)

Necrophobia (the fear of the dead returning to haunt the living) has dominated the burial customs of the Greek world since the Neolithic period. A vampire is a bloodsucking ghost or reanimated body of a dead person who rises from the grave and wanders by night, sucking the blood of the living in order to satisfy its hunger. Examples of the ancient Greek undead date include the Lamia and the Mormo, and in Homer’s epics, the dead enjoy drinking blood. Byzantine Slavic folklore includes legends of ‘vrykolakas’ or ‘vourvou1akas’- the undead corpse restless because of excommunication, suicide, lack of baptism, lycanthropy or witchcraft. Observations of pathological aspects of certain individuals may have contributed to the formation of the vampire folk belief. Palaeopathological examination of skeletal remains of suspected ‘vampires’ discovered at ancient sites may shed light on why these corpses were treated in a different way. Forensic pathology proposes that most, if not all, of the
beliefs surrounding the vampire can be explained in terms of popular misconceptions of what happens to a cadaver after death. The clinical pathological record describes conditions producing symptoms which are similar to vampiric attributes, including rabies, anthrax, photosensitivity, and serious psychological disturbances. It is obvious that vampire lore and ethnography take it beyond the sphere of mere human imagination.

A HYDROCEPHALUS FROM THE NECROPOLIS OF PONTECAGNANO (IX-III CENTURIES B.C.)

Antonio Valette*, Luigi Capasso**, and B. Scarsini. Istituto di Antropologia, Università degli Studi di Firenze*; Laboratorio di Antropologia, Museo Nazionale di Arqueologia, Chieti**, (Italy)

The authors present a probable case of hydrocephaly in a 14 - 16 year-old male from the necropolis of Pontecagnano (Salerno). The neurocranium shows plagiocephaly, wormian bones, interparietal synostosis, cribræ orbitaliae, asymmetry of the basocranial occipital sculpture, and a shift to the right of the median endocranial structures. In the postcranial skeleton the presence of multiple monolateral right entesopathies (affecting both the upper and the lower limb) is significant, as are the hypotrophy of the right femur and the aseptic necrosis of the proximal articular epiphysis of the right femur, with consequent monolateral dislocation of the hip. The picture is consistent with hemiplegia with spastic lesions to the right side, consequent to possible alterations of the motor cortex of the left hemisphere.

POSTMEDIEVAL SKELETAL REMAINS AT OSTEND (WEST FLANDERS, BELGIUM) (poster)

Merit Vandebruaene. (Belgium)

(No abstract available)

MULTINODULAR GOITER AND PULMONARY TUBERCULOSIS IN A 19TH CENTURY ITALIAN

Luca Ventura*, Gino Fornaciari**, Pietro Leocata*, P. Colimberti*, C. Alonzi*, and T. Ventura*. San Salvatore Hospital, L’Aquila*; University of Pisa** (Italy)

The mummified body of a 50-60-year-old man from the friary of “San Giorgio degli Osservanti” (XVIII century) in Goriano Valli (L’Aquila, central Italy), was studied by computed tomography and autopsy. Samples of the organs were rehydrated using Sandison’s solution, fixed in 10% buffered formalin and embedded in paraffin to obtain 5 mm thick sections. A section of the thyroid was immunostained with polyclonal antibody to thyroglobulin (DBS, Pleasanton, CA) using LSAB peroxidase technique. Autopsy revealed a swelling of the thyroid gland with irregular outlines. Histologic examination showed fibrous tissue containing round follicles, filled with acidophil, PAS-positive, colloid-like material. The presence of acidophil PAS-positive material immunoreactive for thyroglobulin demonstrated the thyroid nature of the specimen. The different size of follicles, along with dense fibrosis and multifocal calcifications, supported the diagnosis of multinodular goiter. We also observed extensive left pleural adhesions and a large calcified area of the left lung characteristic of pulmonary post-primary tuberculosis. An ancient multinodular goiter in the inner Abruzzo region (central Italy) is not surprising, as the latter still represents an endemic area for this disease. Our case represents only the 2nd paleopathological diagnosis of goiter, after a case of macronodular goiter in an eighteenth-century Sicilian mummy.

HUMAN SACRIFICE AND POSSIBLE CANNIBALISM AT THE PYRAMID OF THE MOON, MOCHE VALLEY, PERU: THE SKELETAL EVIDENCE

John W. Verano. Tulane University, New Orleans (USA)

Since 1995, the skeletal remains of more than 90 individuals have been excavated from two walled plazas at the Pyramid of the Moon in the Moche Valley, northern Peru. They appear to be war captives sacrificed in elaborate rituals conducted atop one of the most important Moche ceremonial structures in the sixth century A.D. Excavation of the second sacrificial plaza, which was discovered and test-excavated in 1999, will be completed during the summer 2000 field
season. New discoveries made in 1999 include the skeletons of 9 victims who show complex post-mortem treatment, involving defleshing and partial dismemberment. The defleshing and dismembering of some of the victims suggests that cannibalism may have been a part of the sacrificial ritual. Research supported by the National Geographic Society.

PALEOGENETIC INVESTIGATIONS OF THE ROMAN MUMMY FROM GROTTOROSSA (poster)


The 8/9 year-old mummified girl of high social status from Grottarossa in 1964 is the only example of Roman artificial mummification to date from Italy. The mummy is dated to the 2nd century AD, when Egyptian culture and religion were particularly strong in Rome. Our objective was to verify whether the girl was of Italic or European origin, at least on the maternal side. Three samples (skeletal muscle, bone and lung) subjected to PCR amplification yielded DNA that was sufficient for molecular studies. The analysis used primers to amplify partially overlapping stretches of sequence up to 183 bp in length. PCR products were cloned and the sequences of the clones confronted to detect occasional nucleotide substitutions, probably due to DNA degradation, from nucleotide variants common to most or all of the clones examined. The nucleotide sequence thus obtained was compared to the Anderson reference haplotype, to verify the presence of combinations of nucleotide substitutions recurring in modern populations appropriate for the maternal origin of the mummy. Acknowledgments: This work was supported by the C.N.R. Finalized Project “Beni Culturali-Archivio Biologico” (contract # 96.1152.PF36).

MITOCHONDRIAL DNA ANALYSIS ON SKELETAL REMAINS FROM A WEALTHY ROMAN FAMILY OF THE LATE EMPIRE (poster)


University “Gabriele D’Annunzio”, Chieti*; Archaeological Superintendence of Rome**; University “La Sapienza”^, Rome (Italy)

We conducted DNA analysis of skeletal individuals recovered from an important monumental tomb connected with the ancient Via Latina in Rome, the Hypogaeum of Trebius Justus from the early 4th century AD. The hypogaeum contains 15 loculi with skeletal remains of 39 individuals. Loculus 1 is the tomb of a boy, whose remains were that shared by T5A, T6A and T7A share the Anderson's haplotype, which is specific to T5A, T6A and T7A share the Anderson's haplotype, which is frequent in Europeans. The sequence obtained from T7/B exactly matches with a sequence found in Anatolia, and that shared by T1A (Asellus), T4, and T9 was also described in a Turkish sample. Lineages found in T2D, T3B, T5A and T6C do not appear to match with a specific haplotype. Overall, the data suggest an ancestral Anatolian origin for members of the family of Trebius Justus. Acknowledgments: This work was supported by the C.N.R. Finalized Project “Beni Culturali-Archivio Biologico” (contract # 96.1152.PF36).
A WESTERN HEMISPHERE PERSPECTIVE
ON THE ETIOLOGY OF CRIBRA
ORBITALIA AND POROTIC
HYPEROSTOSIS

Philip L. Walker* and Richard H. Steckel**.
University of California-Santa Barbara*; Ohio
State University** (USA)

Data collected on a large skeletal sample (n= 5844) as part of the History of Health and
Nutrition in the Western Hemisphere Project
provide a unique opportunity to resolve some of
the uncertainties that exist concerning the
aetiology of cribra orbitalia and porotic
hyperostosis. The Western Hemisphere database
contains information on prehistoric and historic
people of Native American, European American,
and African American ancestry. The proportions
of men and women with cribra orbitalia
(males=12.6%, females 12.6%) and porotic
hyperostosis (males= 14.6%, females= 15.7%) in
this sample are very similar and do not differ
significantly (p < 0.3). However, there is a
significant sex difference in the age distribution
of cribra orbitalia. For adult females, the
frequency is highest in women who died during
their early twenties, and declines with increasing
age. For males, the frequency increases until the
age of 40, and then decreases. An analysis
conducted using site-specific ecological
information reveals statistically significant
correlations between the presence of both cribra orbitalia and porotic hyperostosis and ecological
variables such as altitude, the Normalized
Differential Vegetation Index (a measure of
primary productivity), and topographical relief.

IDENTIFICATION OF MYCOBACTERIUM
TUBERCULOSIS IN DIFFERENT STAGES OF
TUBERCULOSIS IN ANCIENT BONE
SAMPLES FROM HUNGARY (poster)

Albert Zink*, C J Haas**, E Molnar†, U
Szeimies*, U Reischl †, Antonia Márcsik †,
Yann Ardagnam, Olivier Dutourn, György
Palfi †, and Andreas G. Nerlich*

University of Munich*; University of Erlangen †;
University of Regensburg † (Germany);
Université de la Méditerranée, Marseille †
(France); University of Szeged † (Hungary)

We conducted a paleomicrobiological study on
bone samples from Hungarian skeletal samples
from the 7-8th and the 17th centuries AD with
typical macro-morphological evidence of
osseous tuberculosis (n=3), morphological
alterations probably due to tuberculosis (n=6), or
with non-typical osseous changes of vertebral
bodies suggestive of inflammatory reaction
(n=5). DNA was extracted and amplified by
PCR using various primer pairs recognizing
DNA-segments of different mycobacterial
species. The amplification products of several
samples were subjected to restriction enzyme
digestion and/or direct sequencing. Of the
analyzed 14 cases, 8 were unambiguously
positive for mycobacterial DNA of the
Mycobacterium tuberculosis complex as shown
by the amplification of the IS6110 sequence. In
13 cases we found a PCR-product with primers
specific for the 65 kDa antigen gene - including
2 cases without genomic DNA. We conclude that
the application of other mycobacterial DNA
primers may reveal contamination of bones with
atypical saprophytic mycobacteria. A positive
result for typical mycobacteria was seen in 2 of 3
cases with typical morphological signs of
tuberculosis and amplifiable DNA, in 3 of 6
probable cases, but also in 3 of 6 cases with
nontypical bone changes. This indicates that
minor osseous reactions of the surface of
vertebral bodies may be due to infections with
the M. tuberculosis complex. In these cases the
disease may have proceeded rapidly and the
morphological osseous changes may represent
"early" stages of tuberculous infection of the
vertebrae.
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