

# *PAMinSA III*

3rd Paleopathology Association Meeting in South America

October 14-16, 2009

Necochea – Quequén, Argentina

## **Scientific Program and Abstracts**

*Puentes y  
transiciones*

*Bridges and  
transitions*

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**Table of Contents**

Introduction.....	3
Welcome from the Organizing Committee.....	5
Program schedule.....	6
Symposium: Ecologic Adaptations and Human Health.....	11
Symposium: New Methods in Paleopathology.....	14
Symposium: Health at the Moment of Native-European Contact in America.....	18
Podium Presentations.....	21
Poster Presentations.....	35
Author Index.....	57

The abstracts have been divided by symposia, podium presentations and poster presentations. In each, the works are ordered alphabetically, by the last name of the first author. There is at least one email contact for each presentation included with the author's affiliation. The Spanish version of these abstracts may be found on the PAMinSA III web site

<http://www.quequen.unicen.edu.ar/paminsaIII/>

There are no abstracts for the special lectures at this meeting.

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**PAMinSA: HELPING TO MAKE PALEOPATHOLOGY BIGGER AND BETTER IN SOUTH AMERICA**

SHEILA MENDONÇA DE SOUZA

Paleopathology is a South American theme of research since the 19th century, but the last 50 years were the period when scientific research, professionalization and academic structures were improved. The professional accumulation, the interest of the public, the papers and also the museum exhibitions, as well as the discussion considering the relationships between health and the social, cultural and environmental conditions, turned paleopathology into a prominent subject of interest in recent years.

During the decades, many countries of the Northern Hemisphere, even those where paleopathology started in more recent times, were able to develop an expressive contribution to the field. The academic expansion in countries like the USA naturally provided a huge amount of papers and expertise. The emergence of professional spaces and opportunities such as the scientific societies and meetings strongly contributed to the development of specialized fields.

The creation of the Paleopathology Association in the United States pushed forward a group of professionals, either to technical and scientific improvements, or to professional organization, assuring space and voice in the anthropological field. To be together in annual meetings means more than just contacting friends and exchanging experiences. To be together in specialized annual meetings means to share the experience of doing, preparing students, improving methods, sharing political strategies essential for the professional fields and to grow strong.

In many of our countries a few professionals remained scattered around the countries for a long time. In some places people still remain isolated. Communicating and exchanging ideas for a long time were a real challenge, especially for those who were far from the main Universities.

The meetings of the Paleopathology Association, as well as the Newsletters, were fundamental in keeping the professionals in contact, during those times when the facilities of the virtual world were a far distant dream. For decades the Annual Meetings of the Paleopathology Association have been a tradition in North America, helping to consolidate the field of paleopathology in the North American academy. Some years after the first meeting in the United States, the European colleagues felt the necessity of doing the same. Biennial meetings started to provide a chance for European colleagues to gather, and also to contact North American people more frequently, contributing to a more unified paleopathology.

In 2002, the European Meeting of the Paleopathology Association was in Coimbra, Portugal. We, North and South American professionals, were wonderfully hosted, an excellent opportunity to reinforce the personal and professional links, besides exchanging ideas. Once more, the South American people were few; the costs of travelling to Europe and the United States have always been a limit to the students and professionals interested in taking part in scientific events.

Among many colleagues, in the friendly and warm space of the corridors of Coimbra University, we talked about the limited access to meetings of that kind. Discussing the experience of the Paleopathology Association with the meetings in North America, Jane Buikstra remembered the efforts of North American colleagues to keep the students and junior professionals in the meetings and their limits to travel to other countries. To travel the North American Meeting to other countries was not an option, as it should be a hardship for the North American students. Otherwise, North American Meetings were certainly excluding for

professional communities in the other continents. Europe had already solved this problem: the European Biennial Meeting.

The possibility of having a traveling meeting in South America was immediately considered. Paleopathology Association Meetings in South America were proposed and enthusiastically supported by some of our colleagues, including Jane Buikstra, to whom we thank for the stimulus to keep going full steam ahead!

PAMinSAs were conceived as meetings that could be held in South America every other year when no European Meeting was planned. Attracting European, North American and other professionals to our countries was especially helpful for students and professionals who were not able to travel far from their country or continent.

PAMinSAs were also a chance to have a special forum for South American professionals to build a progressive corpus of knowledge in paleopathology. Experiencing common interests and challenges, South American professionals and students could finally have a proper space to discuss experience and learn about diseases and bicultural contexts.

PAMinSAs were finally conceived as a stimulus to those academic spaces where paleopathology and bioarchaeology had flourished in the last decades. A meeting helping the internationalization of scientific production, the promotion of training opportunities, the presence of different voices, tendencies and schools, and other benefits of the international scientific meetings would certainly be fertilizers to a whole new generation in progress.

Two other international Meetings helped PAMinSA gestation: the Mummy Meeting in Torino, Italy (2003) and the Paleopathology Meeting in Tampa, Florida, USA (2004). In those friendly spaces we could meet other South American colleagues and invite people, convincing the colleagues from the Paleopathology Association that South American countries were ready to have their meeting and had a lot to say.

In Coimbra, talking to Mario Chaves, Guido Lombardi, Sergio Silva, Sonia Guillen, among others, we decided to propose Rio de Janeiro, Brazil, as the first city for the PAMinSA, in 2005. The National School of Public Health Sérgio Arouca, of the Oswaldo Cruz Foundation was the institution where paleopathology had the strongest roots in Brazil. No other place could represent the hope of a brilliant future for paleopathology in South America.

In 2005, Rio was the proud city to receive many colleagues to the FIOCRUZ campus. We were lucky to have people from different countries in attendance and many, many students from Brazil. Good memories, good papers, excellent interaction. 1st PAMinSA convinced the skeptics of the importance and interest of having South American Meetings.

In 2007 it was the time for Santiago de Chile to be the city to host the 2nd PAMinSA. Again we could testify to the interest of colleagues of the Northern Hemisphere for the South American paleopathology; again we succeeded in the Meeting.

In 2009 it is the time of Necochea, Argentina, to host the 3rd PAMinSA. We are sure this meeting will confirm that we are professionally mature and ready to proceed. For the first time, even before the meeting, other countries have considered to be the next. The 4th PAMinSA is being discussed already.

Remembering the first talks in the Garden of the Roses, at Coimbra, and the long sequence of challenges that were faced before we could arrive to Necochea, we are happy to have had a chance to take part in PAMinSAs' history. We are sure that the efforts of all those who helped to bring PAMinSA meetings to reality were absolutely compensated by the increasing enthusiasm we see in the new faces of South American paleopathologists.

Thank you all, and congratulations, friends and colleagues in PAMinSA!

**WORDS OF THE ORGANIZING COMMITTEE**

Welcome to all the participants of the PAMinSA III. Thank you for responding to our invitation. Necochea and Quequén are happy to receive you and we hope you enjoy the meeting and our city.

In these introductory words we want to tell you how the PAMinSA III was organized. It probably started in the best possible way: with lots of enthusiasm and some fear. Professionals, scholarship holders, researchers and teachers of all the country, who work in different research teams, got together in the course that Dr. Sheila Mendonça de Souza offered in the Laboratorio de Ecología Evolutiva Humana (Quequén), in the Social Sciences department of the Universidad Nacional del Centro de la Provincia de Buenos Aires, in November, 2007. Colleagues from Buenos Aires city, several provinces of Argentina (Buenos Aires, Cordoba and Mendoza), Colombia and Chile were present. The PAMinSA II had just finished in Santiago de Chile, and Dr. Mendonça came from there. Argentina was a possible candidate to be the organizer of the next PAMinSA and we had to decide if we could assume that challenge. Sheila Mendonça encouraged us and joined in the first steps.

The previous meetings were in Rio de Janeiro (Brazil) and Santiago de Chile (Chile), two very important cities in South America and two countries with an international presence in paleopathology. Both meetings were also a call for a commitment to generate an interaction and learning space in paleopathology in South America. The question was: Could we organize an international congress of these characteristics? Besides, Necochea-Quequén is a small city, 500 Km. from Buenos Aires, without an international airport and without experience in congresses. Ricardo Guichón, president of this organizing commission, remembers that facing the alternative of organizing the PAMinSA III in another city in Argentina, the president of the Sociedad Argentina de Antropología Biológica, Dra. Noemí Acreche, told him: "If you are going to do it, do it at home", referring to Necochea-Quequén. And we followed her advice.

In general, these meetings are organized by a research group. This particular meeting was organized by members of the majority of research groups which are beginning their work in Paleopathology in Argentina. To constitute a work group was an absolutely enriching experience, where we learned and shared moments of great effort but always with enthusiasm and fun for a common project.

The truth is that economic funds are not abundant nowadays in these latitudes. So, we started the official procedures to solicit the support of several universities from the country and research institutions. Likewise, we organized a schedule considering the presentation dates for economic support requests for specific organisms (CONICET, Agencia Nacional de Promoción Científica y Tecnológica FONCyT, CIC, Wenner Gren Foundation from USA and Universidad del Centro and Mar del Plata).

Little by little, financing, endorsements and sponsorships arrived. The reality of the world and country, as we all know, limited the economic support and made us work harder to achieve positive conditions so that more students and professionals could come to the meeting. Every detail took a lot of time, from selecting a simultaneous translation service to the translation to English of all the tourist material about the city made by a group of teachers from Necochea who worked ad-honorem and whom we thank. The local commission organized an English course for hotel and restaurant personnel that lasted two months and provided training for them to receive our guests. A series of extension activities were prepared before the meeting in schools of our city and the surroundings. There are varied expositions and conferences suitable for all types of public that you will enjoy these days.

A website was designed (thanks to the collaboration of Marcos Trotti) and a PowerPoint presentation, which was presented in the European Congress of the Paleopathology Association in Denmark, 2008, and in various Latin American congresses, was prepared. Our announcements (4 in total) were published in the PPA (Paleopathology Association) Newsletter in English.

Slowly, we started receiving some queries on the website and the first pre-registrations. The abstracts were evaluated and the requested corrections were sent back to the authors. Last month, with all the corrected abstracts and their Spanish and English versions, we prepared this book that today you are holding. Thus, we are here receiving colleagues from Turkey, New Zealand, the UK, Austria, Portugal, Germany, Italy, Spain, the USA, Mexico, Colombia, Ecuador, Venezuela, Chile, Bolivia, Brazil and all Argentina. All of them will present 28 podium presentations, 40 posters, 16 presentations distributed among three symposia and 6 special lectures. These works cover a wide variety of themes which include pathology analyses of dental, human and non-human bones, studies of violence markers, forensic anthropology, paleoparasitology, molecular studies, radiographic and tomographic analyses, studies of contemporary and archaeological bone collections, and studies on historical sources. We hope to share our work offering a cozy and friendly work environment, representing our country in the best possible way.

We only have appreciative words to all those who supported this project and gave us their assistance, time and commitment.

**Thanks and welcome to PAMinSA III!**

*Organizing committee and Local Organizing Committee*

## **PROGRAM SCHEDULE**

### **Wednesday 14th of October 2009**

#### **9:00 –Presentation Session**

- 1) Development and achievements in Paleopathology in Argentina. - Organizing Committee
- 2) On the history of Paleopathology in Brazil and Argentina. – Dr. Sheila Mendonca de Souza and Dr. Ricardo A. Guichón

10:00 – **Guest speaker** Dr. Haagen Klaus (Utah Valley University, USA). Title: Health and adaptation during the colony in Lambayeque.

#### 11:00 – Podium presentations

- 1) Dental modification in a 16-17th century sample of African slaves found at Lagos (Portugal): pathological consequences of intentional chipping. – Neves, Maria Joao; Wasterlain, Sofia and Ferreira, Maria Teresa
- 2) The women of San José Mogote. – Alfaro Castro, Martha Elena and Gómez Serafín, Susana
- 3) Analysis of a case of amputation from skeletal remains recovered from shipwreck of a ship of the century XVII. – Salles, Adilson; De Castro Faria, Luis Octavio; Tonomura, Elise and Rodriguez Carvalho, Claudia
- 4) Trephination: Looking for the detail. – Wiltschke-Schrotta, Karin; Viola, Bence & Kucera, Matthias

#### 14:45 – **Symposium *New methods in Paleopathology***

- 1) Molecular paleoepidemiology of *Ascaris* in South America. - Leles, Daniela; Araújo, Adauto; Paulo Vicente, Ana Carolina y Mayo Iñiguez, Alena

- 2) Reevaluation of the paleoradiographic method for the paleopathological study of ancient human skeletal remains (Condorhuasi-Alamito, Catamarca, Argentina). - Roldán, Jimena; Roldán, Carlos Enrique y Sampietro, María Marta
- 3) New approaches in paleo-parasitology in Spain. - Gijón Botella, Herminia; Araújo, Adauto and Mayo Iñiguez, Alena
- 4) First ancient DNA paleoparasitological analysis in Patagonia, Argentina. - Leles, Daniela; Fugassa, Martin; Araújo, Adauto; Mayo Iñiguez, Alena
- 5) Mitochondrial ancient DNA analysis of human remains from the metropolitan cathedral of Rio de Janeiro, Brazil (XVII-XIX). - Mayo Iñiguez, Alena; Leles De Souza, Daniela; Valdirene Dos Santos, Lima; Araújo, Adauto; Paulo Vicente, Ana Carolina; Ribeiro Da Silva, Laura Da Piedade & Dias Jr, Ondemar F.

#### 16:30 – **Symposium *Ecologic Adaptations and Human Health***

- 1) Review of the parasitological research on primates, with emphasis on anthropoids, as a tool for the study of emerging and retrospective zoonoses in archeology. – Fugassa, Martín Horacio
- 2) Parasitism in pre-Columbian populations: the case of National Park Serra Da Capivara, Pi, Brazil. – Sianto, Luciana; Chame, Marcia; Teixeira Dos Santos, Isabel; Vieira De Souza, Mônica; Saldanha, Bruna Montenegro; Ferreira, Luiz Fernando y Araujo, Adauto
- 3) Evidence of lizards consumption by human groups: a case of paleoparasitology. - Sianto, Luciana; Teixeira Dos Santos, Isabel; Chame, Marcia; Vieira De Souza, Mônica; Ferreira, Luiz Fernando and Araujo, Adauto
- 4) Paleoparasitology of holocenic rodents from the archaeological site “alero destacamento guardaparque”, Santa Cruz province, Argentina. – Sardella, Norma; Fugassa, Martín Horacio; Rindel, Diego y Goñi, Rafael

18:00 – **LECTURE:** Dr. Jane Buikstra Arizona State University (USA).

Tuberculosis, a deep time perspective.

#### 19:00 – **Poster session**

##### Oral Health / Diet

- 1) Temporal trends in dental caries and wear in human populations of Neuquén (Patagonia, Argentina) during the late Holocene. - Novellino, Paula Silvana; Bernal, Valeria & Della Negra, Claudia
- 2) Health and illness: The late prehistoric population from the northern sector of Calchaquí Valley, Salta province, Argentina. - Baffi, Elvira Inés
- 3) Dental pathology in the anthropology collection of the Museum Of Natural Sciences, Zoobotanic Foundation, State of Rio Grande Do Sul, Brazil. - Demamann, Maria Da Gloria
- 4) Bioarchaeology of the site arq 43, San Juan province, Argentina. – Mazzanti, Carolina; Novellino, Paula Silvana; Campos, Guillermo and Durán, Víctor
- 5) Oral pathologies on human skulls of northeast Patagonia (República Argentina). - Menéndez, Lumila

##### Interpersonal Violence

- 1) Interpersonal violence in Quebrada del Toro (Salta, Argentina). - Plischuk, Marcos; De Feo, María Eugenia & Desántolo, Bárbara
- 2) Osteological evidence of interpersonal violence at Cañadón Leona 5 (Magallanes, Chile) during the late Holocene. - L'heureux, Gabriela Lorena & Amorosi, Tom
- 3) Probable perimortem trauma and infectious lesions in a complex multiple burial proceeding from Chenque I site. - Luna, Leandro; Aranda, Claudia and Berón, Mónica

- 4) Interpersonal violence in northern Patagonia (Argentina): Methodology proposed. - Gordón, Florencia
- 5) Bioarchaeological indicators of interpersonal violence in Quebrada de Humahuaca and Valles Calchaquíes ca. 1000-1430 a.d. - Seldes, Veronica & Gheggi, Soledad

#### **Thursday 15th of October 2009**

##### **9:00 – Podium Presentations**

- 1) A preliminary approach to Lagos Leprosarium (Portugal): direct and indirect evidence of leprosy. - Neves, Maria João; Ferreira, Maria Teresa; Almeida, Miguel y Matos, Vítor
- 2) Body modification and paleopathological evidence in the iconography from the “Philosophical Travel” to Brazilian Amazonia by Alexandre R. Ferreira (1783-1792). – Martins, Maria do Rosario; Santos, Ana Luisa; Miranda, Maria Arminda and Matos, Vítor
- 3) Historical epidemiology in Tierra del Fuego: interpreting the events related to tuberculosis between Selk’nam. - Casali, Romina; Fugassa, Martín Horacio and Guichón, Ricardo
- 4) Dudignac: health of the population between 1937 and 1975. - Massa, Maria Victoria; Zamagna, Liliana and Iglesias, Maria Teresa
- 5) Diagnostic expressions and causes of death: Some specifications regarding their use in the study of mortality. - Requejo, Jorge Alberto
- 6) The cholera epidemic of 1887 in Calchaqui Valley. - Iglesias, María Teresa; Zamagna, Liliana y Massa, María Victoria

##### **11:30 – Poster Session**

##### Paleoparasitology

- 1) First paleoparasitological results From Late Holocene in Patagonia (Argentina). - Beltrame, M. Ornela; Fugassa, Martín H; Sardella, Norma H; Civalero, M. Teresa and Aschero, Carlos
- 2) Food remains, parasitological infections and evidence of the use of medicinal plants in prehistoric groups of Americas. - Teixeira Dos Santos, Isabel; Sianto, Luciana; Vieira De Souza, Mônica and Araujo, Adauto
- 3) Palynological and paleoparasitological study of holocene camelid coprolites from the site Casa de Piedra 7, Santa Cruz. - Velázquez, Nadia Jimena; Fugassa, Martín Horacio and Burry, Lidia Susana
- 4) Methodological proposal for the study of microfossils in coprolites. - Palacio, Patricia Irene; Fugassa, Martín Horacio and Burry, Lidia Susana
- 5) Paleoparasitological, paleogenetic and archaeobotany analysis from 18th century coprolites of the church La Concepción, Santa Cruz De Tenerife, Canary Islands, Spain. - Gijón Botella, Herminia; Afonso Vargas, J.A.; Arnay De La Rosa; Leles, Daniela; Araujo, Adauto; Paulo Vicente, Ana Carolina & Mayo Iñiguez, Alena
- 6) Acauã: using tomographic images to study a mummified body of a horticulturalist Brazilian group. - Mendonça De Souza, Sheila; Tessarolo, Bernardo; Malerba Sene, Glaucia Aparecida; Ribeiro Da Silva, Laura Piedade and Araújo, Adauto

##### Applied Research

- 1) Ihhh, bones – cool, bones: A pedagogical approach to modern physical anthropology for the general public, using the skeletons from Hallein Dürrenberg, Austria. - Wilschke-Schrotta, Karin; Knopp, Florian
- 2) Mycological analysis of soils of an archaeological site in Calchaquí Valley, Salta, Argentina. - Zamagna, Liliana; Iglesias, María Teresa; Massa, María Victoria; Guerrero, Fausto and Capeletti, Luis

Genetics

1) Genetic evidence of infection by helicobacter pylori in Precolumbian Chilean mummies and analyses of genetic divergence between associated strain and current Chilean populations. -

Frías Villarroel, Liesbeth; Moraga Vergara, Mauricio & Flores Carrasco, Sergio

2) HTLV in Pre-Columbian mummies in Bolivia. - Orellana, Nancy; Mayo Iñiguez, Alena; Otsuki, Koko y Paulo Vicente, Ana Carolina

12:00 – **LECTURE:** “Forensic Anthropology and Paleopathology, a necessary relationship”

Dr. Mercedes Salado Puerto (EAAF, Argentina) y Dr. Conrado Rodríguez- Martín (Instituto de Bioantropología, España)

14:45 – **Symposium *Health at the moment of Native-European Contact***

1) Advances in the paleopathological study of La Petrona site (Pdo. of Villarino, Pcia. Buenos Aires, Argentine). - Flensburg, Gustavo Ariel

2) Pre-Columbian tuberculosis in the Argentine northwest: The Rincón Chico 21 cemetery (RCh21) Santa María, Catamarca. – Arrieta, Mario; Bordach, Asunción y Mendonça, Osvaldo

3) Pre-interethnic contact tuberculosis in Tierra del Fuego: Confirmation by molecular methods in the site Myren (Chile). - Guichón, Ricardo; Buikstra, Jane; Massone, Mauricio; Wilbur, Allison; Suby, Jorge A; Constantinescu, Florence and Prieto, Alfredo

4) Pinta versus syphilis; medical models for Columbian contact. - Cook, Della Collins

5) Treponemal infectious disease in human skeletal remains from San Félix, an archaeological site in the province of Santiago del Estero. - Drube, Hilton; Togo, José and Salceda, Susana

6) Hierarchy and status of health: a study case in Pueblo Viejo Pucará (horizonte tardío), Valle de Lurin, Perú. - Watson, Lucia; Palma, Malaga Martha Rosa; Vega Dulanto, María Del Carmen; Kolp-Godoy, Maria and Makowski, Krzysztof

17:00 – **Poster Session**

Analyses on non-human bone remains

1) Description of dental and bone lesions in a skull of a giant bear: *Arctotherium angustidens* (Ursidae, Mammalia). - Acosta, Walter Gustavo & Soibelzon, LH

2) Pathological evidence in a pleistocene glyptodont from Cordoba state, Argentina. - Druetta, H. Santiago

Interethnic contact

1) The cemetery of the old salesian mission “La Candelaria” (Tierra del Fuego, Argentina). - García Laborde, Pamela; Suby, Jorge Alejandro; Guichón, Ricardo; Velázquez, Nadia Jimena; Burry, Lidia Susana and Palacio, Patricia Irene

2) The sisters of the end of the world: The health of the salesian sisters in the mission “La Candelaria” (Tierra Del Fuego-Argentina). - Suby, Jorge Alejandro; Guichon, Ricardo and Ibañez, Alejandra

17:30 – **Podium Presentations**

1) The cost of lifestyle revisited: musculoskeletal stress markers in Brazilian prehistoric coastal populations: Methodological and interpretation Challenges. - Rodrigues Carvalho, Claudia

2) How much do we know about spondylolysis and os acromiale? Their study and analysis in two skeletal populations from Northern Chile. – Ponce, Paola

3) Vertebral osteophytosis and Schmorl’s Nodes in human bone remains from Southern Patagonia. – Suby, Jorge A

4) The costoclavicular ligament as an indicator of general workload: Preliminary investigations. - Lara Fontenelle Picaluga, Renata; Salles, Adilson Dias & Rodrigues Carvalho, Claudia

5) Special Communication: New insights in Musculoskeletal Stress Markers studies: Reflections from the Coimbra Workshop (Portugal). - Santos, Ana Luisa; Alves Cardoso, Francisca, Assis, Sandra & Villotte, Sébastien

19:00 – **LECTURE:** "Paleopathologies, isotopes and other markers: Their convergence in an archaeology of populations" Dr. Luis A. Borrero (IMHICIHU, CONICET, Argentina)

### **Friday 16<sup>th</sup> of October 2009**

10:00 – Workshop: "Paleopathology of human bone remains". Laboratorio de Ecología Evolutiva Humana (Universidad Nacional del Centro)

#### **14:30 – Podium Presentations**

1) New contributions in the bioarchaeological study through informatic systems in collections of human remains from the necropolis of Ancón, Lima-Perú. - Watson, Lucía and Valladares Domínguez, Katya Benilde

2) Osteoarthritis in a contemporary skeletal sample. – Plischuk, Marcos; Salceda, Susana and González, Pedro

3) Children's health in Santiago (1940-1970): inferences from a skeletal collection. – Frias, Liesbeth

#### **15:15 – Poster Session**

##### Osteobiographies / Bone Pathologies

1) Case study: possible Klippel Feil in the skeleton of a young mixtec from postclassic Oaxaca. – Alfaro Castro, Martha Elena and Fernandez Davila, Enrique

2) Osteomyelitic process in a clavicle. - Kozameh, Livia F. and Brunás, Oscar Marcelo

3) Paget's disease in a pre-hispanic tibia is confirmed by histological sections. - Kozameh, Livia F. and Brunás, Oscar Marcelo

4) A possible case of a metastatic carcinoma in a skeleton from 15th-20th century Coimbra (Portugal). - Wasterlain, S.N. & Silva, A.M.

5) Possible non-intentional cranial deformation in a skeleton from the coast of Santa Cruz (Argentina). - Suby, Jorge Alejandro

6) Unusual manifestation of Stafne's bone defect of the mandible. - Dias, George; Üstündağ, Handan; Solokar, K.

7) A possible case of multicentric osteosarcoma in an individual from 19th century Wolverhampton, England. - Ponce, Paola; Buckberry, Jo; Ogden, Alan; Ortner, Donald

8) External auditory exostosis "at the end of the world": the southernmost evidence according to the latitudinal hypothesis. - Ponce, Paola; Ghidini, Gabriela and González-José, Rolando

9) Paleopathology of children and skeletal representativeness: The Sambaqui de Cabeçuda Series example. - Reis De Castro, Veronica; Salles, Adilson Dias and Rodriguez Carvalho, Claudia

10) Note on pathologies in populations of Mendoza (Argentina) during the colony: osteoarthritis. Mansegosa, Daniela Alit and Chiavazza, Horacio

11) Multiple pathologies and trepanation on the northern coast of Santa Cruz, Argentina. - Castro, Alicia; Salceda, Susana; Plischuk, Marcos; Desántolo, Bárbara; García Mancuso, Rocío and Gonzalez Toledo, Eduardo

12) Paleopathological analysis of human bone remains from the archaeological site Finca Elias 1 (Tucumán, Argentina). - González Baroni, Lucia Guadalupe

13) Skull base disturbances in subadult individuals from a contemporary osteological collection. – García Mancuso, Rocío; Plischuk, Marcos & Desántolo, Bárbara

14) Functional stress markers in archaeological populations from southern Sierras Pampeanas (Córdoba province, Argentina) during late Holocene. - Fabra, Mariana and Salega, María Soledad

15) Scurvy in a late Byzantine population from Kadikalesi/Anaia (Kusadasi, Turkey).  
Üstündağ, Handan

#### 16:45 – **Podium Presentations**

4) Dental enamel hypoplasias in late holocene hunter- gatherers from southern Patagonia. - García Guraieb, Solana

5) Evaluation of metabolic and functional stress in the osteological collection from Laguna el Doce site (Santa Fe, Argentina) - Píccoli, Carolina and Barboza, Carolina

6) Ancestral evidence of human T-cells linfotropic virus (HTLV) in Bolivia. - Orellana Halkyer, Nancy Carolina y Paulo Vicente, Ana Carolina

7) Contribution of forensic sciences and paleopathology to the determination of the social inclusion of an individual with physically limiting pathologies from the burial platform of Huaca San Marcos, Lima, Peru. - Valladares Domínguez, Katya Benilde

18:30 – **LECTURE:** "Human sacrifice in the archaeological record: contributions of paleopathology and forensic anthropology to their identification and interpretation"

Dr. John Verano (Tulane University, USA)

20:30 – **LECTURE:** "The application of Forensic Anthropology in the research of cases of political violence: reflexions and balances" - Lic. Luis Fondebrider (Equipo Argentino de Antropología Forense, Argentina)

### **SYMPOSIUM: ECOLOGIC ADAPTATIONS AND HUMAN HEALTH**

Coordinators: KARL REINHARD and ADAUTO ARAUJO

#### **REVIEW OF THE PARASITOLOGICAL RESEARCH ON PRIMATES, WITH EMPHASIS ON ANTHROPOIDS AS A TOOL FOR THE STUDY OF EMERGING AND RETROSPECTIVE ZONOSSES IN ARCHAEOLOGY**

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The parasitic specificity is mainly related to the phylogenetic history of both hosts and parasites. Sometimes the specificity is only apparent and this is due to differences between the ecological niche occupied by the host species and other potential hosts. For humans, because of the subsistence strategies that different cultural groups have developed - both ancient and also modern marginalized cultural groups - the ecological profile deviates from the typical model. The comparative study with closed phylogenetically species enables us to know parasitic species to which humans can be vulnerable when they occupy new "atypical" ecological niches, according to the terms of the occidental ethnocentric approach. This study focuses on the search for parasites from hosts which are evolutionarily close to humans, such as the primates and fundamentally anthropoids, with the aim to contribute to the knowledge of emerging and reemerging zoonoses and to broaden the regional paleoparasitological data. An online search from various international publications dedicated to primatology and parasitology, was conducted. The descriptors used were: parasites, enteroparasites, anthropoids, ape, *Gibbon*, *Hylobates*, *Gorilla*, chimpanzee, *Pan*, *Pongo* and monkey. The review produced a list of parasite species typically associated with the subtropical and tropical biogeography of their

hosts. These results limit the scope of this review to parasitic species with dispersal stages (eggs, larvae, cysts and oocysts) conditioned by the climate, and to parasites that exhibit intermediate hosts or vectors with distributions limited to the tropics. Despite this, the review provides valuable information on other parasites with broader adaptations to environmental conditions, as those in southern latitudes.

*Key words: parasitological research; primates; anthropoids; emerging and retrospective zoonoses; archaeology*

**PALEOPARASITOLOGY OF HOLOCENIC RODENTS FROM THE  
ARCHAEOLOGICAL SITE “ALERO DESTACAMENTO GUARDAPARQUE”,  
SANTA CRUZ PROVINCE, ARGENTINA**

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The archaeological site Alero Destacamento Guardaparque is a rock shelter situated in the Perito Moreno National Park (47°40'S, 72°30'W), Santa Cruz province, in a hill of low altitude. Since 1990 excavations have been conducted in the area. The aim of this work was to examine the parasitic remains present in rodent coprolites collected from the site. Forty-eight faeces were examined from layers 7, 6 and 5, dated at 6700±70, 4900±70 and 3440±70 years before present, respectively. Each coprolite was measured, whole processed, rehydrated with trissodium phosphate and 10% acetic formalin, homogenized and allowed to spontaneous sediment. Microscopic observations were made and the eggs of parasites were measured and photographed. A total of 582 eggs of helminths were found in 47 coprolites. Samples were positive for *Trichuris* sp. (Nematoda: Trichuridae), *Calodium* sp., *Eucoleus* sp., *Echinocoleus* sp., an unidentified capillarid (Nematoda: Capillariidae), and for *Monoecocestus* sp. (Cestoda: Anoplocephalidae). Quantitative differences among layers were registered for both coprolites and parasites. The specific filiation of parasites, their zoonotic importance, the rodent identity, on the basis of previous zooarchaeological knowledge and the environmental conditions during the Early Holocene in the studied area are discussed.

*Key words: paleoparasitology; holocenic rodents; Santa Cruz, Argentina*

**PARASITISM IN PRE-COLUMBIAN POPULATIONS: THE CASE OF NATIONAL PARK SERRA DA CAPIVARA, PI, BRAZIL**

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The National Park of Serra da Capivara has the oldest records for human presence in the Americas, dating to 50,000 years. Hunter-gatherers and agricultural populations occupied the region. Archaeological sites in areas of different physiognomies offer an excellent opportunity to gain knowledge on the diversity of parasite species of wildlife and human populations in prehistoric times, as well as changes and adjustments over time. Coprolites and sediments of human and animal origin dated up to 30,000 years found in 16 archaeological sites were rehydrated and examined under the microscope. Of 204 analyzed samples, 110 were positive and 24 parasites were identified. 37 samples were identified as of human origin, and 19 (51.35%) were positive for Ancylostomidae, Ascaridae, Oxyuridae, Trematoda, Trichuris sp., Parapharyngodon sp., Hymenolepis nana, Eimeria sp., unidentified Nematoda and protozoan cysts, and a possible Acanthor. Spirometra sp., Toxocara sp., Capillaria sp. and Acanthocephala eggs were identified in animal coprolites and all are able to cause zoonoses in humans. Results provide data to rebuild scenarios regarding host-parasite relationships in time and space. Supported by CAPES/FAPERJ/CNPq.

*Key words: paleoepidemiology; coprolites; America; zoonoses*

**EVIDENCE OF LIZARDS CONSUMPTION BY HUMAN GROUPS: A CASE OF PALEOPARASITOLOGY**

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Lizards were used as food in prehistory as showed by dietary analysis and paleoparasitology. Sometimes this was related to drought periods. Three human coprolites found in two archaeological sites of the National Park of Serra da Capivara region, Brazilian northeast, were positive for Parapharyngodon sp. eggs. This is a parasite found in lizards, and was never found infecting humans. This is the first record of this parasite in humans and it points to lizard consumption. The analysis of food remains revealed the presence of intact reptile scales leading to the conclusion that they were consumed raw. There is no evidence of severe periods of drought in the studied region. Therefore, it is possible that the consumption of reptiles was a normal activity, not related to food scarcity. These findings were identified as typical cases of false parasitism when eggs pass directly through the intestinal tract of the individual

(without) causing any damage. However, reptiles host other parasites able to infect humans and cause diseases such as dermatitis, sparganosis, and gnathostomiasis. Thus, the habit of eating reptiles, and possibly other animals without cooking, could cause zoonoses.

Supported by CAPES/FAPERJ/CNPq.

*Key words: paleoparasitology; coprolites; paleoepidemiology; Parapharyngodon*

## **SYMPOSIUM: NEW METHODS IN PALEOPATHOLOGY**

Coordinators: ALENA MAYO IÑIGUEZ and JOSE NAPOLI

### **NEW APPROACHES OF PALEOPARASITOLOGY IN SPAIN**

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**Introduction:** Paleoparasitological studies in Spain follow the methodologies described in literature which have been used successfully. However, new approaches in paleoparasitology are applied, such as microscopy of interference or Normasky technique. The present study is an exposition of the methodology used in investigations with mummies from different origins and times.

**Methodology:** The samples analyzed are extracted from coprolites isolated from graves or directly from intestinal or ischiatic cavities of the mummies. The samples are rehydrated in 0.5% trisodium phosphate for 72 hours. Techniques of elimination of artifacts that prevent the isolation of parasites are applied. Because of this, a filtration method is used with disposable meshes (*Nytral*) of 100-200 µm. Additionally, sonication and boiling techniques are applied for this aim. The identification is through observation by optic microscope. Before the microscopic analysis, the parasitological direct method, as well as the traditional methods of concentration by flotation or by sedimentation, is applied. Finally, the samples are submitted to interference microscopy or Normasky technique, which reveals details of parasites without applying tinted methods or additional preparation of the sample.

**Results:** The parasitological methods of concentration yielded a high number of eggs by preparation and the filtration method is successful in the elimination of residues for the best identification of parasites. Nevertheless, the techniques of sonication and boiling do not generate advantageous results. The analyses allowed the identification of nematodes, such as eggs and larvae of *Enterobius vermicularis*, as well as eggs of *Trichuris trichura* and *Ascaris lumbricoides*. The Normasky technique allowed the visualization with high resolution of internal structures that mainly, in the case of protozoon *Entamoeba coli*, allowed species identification.

**Conclusion:** The standardization of the paleoparasitological performed methodology will allow conducting investigations about the origin and dispersion of the parasitic infections.

*Key words: paleoparasitology; Spain; interference microscopy or Normasky technique*

**MOLECULAR PALEOPIDEMOLOGY OF ASCARIS IN SOUTH AMERICA**LELES, DANIELA<sup>1,2</sup>; ARAÚJO, ADAUTO<sup>1</sup>; PAULO VICENTE, ANA CAROLINA<sup>2</sup> & MAYO IÑIGUEZ, ALENA<sup>2</sup>

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Unlike trichuriasis, the paleodistribution of *Ascaris* infection based on microscopic diagnosis is scarce in South America. There had only been 4 findings described: one from Peru, one from Brazil and two from Argentina, and in the latter the origin of infection is possibly European. Recently, an *Ascaris* paleoparasitological molecular diagnosis revealed the presence of parasite in 4/5 negative samples by microscopic diagnosis, indicating underestimation of *Ascaris* infection in the region. The aim of this work was to evaluate the *Ascaris* infection in 9 archaeological sites from South America by paleoparasitological molecular diagnosis based on 3 mitochondrial targets. 39 samples were analyzed from 8 archaeological sites from Brazil and 1 from Chile, which date from 3,490±120-430±70 to 8800 BP. The coprolites and/or sediments were decontaminated by scraping and/or UV light exposition, followed by rehydration in Na PO 0.5%. Ancient DNA (aDNA) extraction was performed by phenol/chloroform method. *Ascaris* PCR of mitochondrial genes fragments *cytb* (142 bp), *cox1* (150 bp) and *nad1* (200 bp) were applied. 9 samples from 6 archaeological sites from Brazil and Chile were positive for molecular diagnosis of the *Ascaris*. The sequence analysis determined that in Brazilian archaeological sites: 1 sample from Sítio do Meio-PI (8800 BP) was positive for 3 molecular targets, 3 samples from Boqueirão Soberbo-MG were positive for each target *nad1*, *cox1* and *cytb*, 1 sample from Boqueirão da Pedra Furada was positive for the target *nad1*, 2 samples from Gruta do Gentio II-MG were positive for each target *nad1* and *cytb* and 1 sample from Lapa Pequena-MG was positive for *cytb*. From archaeological sites from Chile, 1 sample from Tulán, San Pedro de Atacama was positive for 2 targets (*cytb* and *nad1*). The majority of sequences have polymorphisms different from *Ascaris*, modern sequences including South American samples. The discrepancy in PCR amplification of 3 molecular targets could indicate the differential of aDNA conservation. The preliminary results showed that *Ascaris* infection is more present and spread in South America than detected by microscopic analysis. The genetic analysis point out to a poor preservation of *Ascaris* eggs in archaeological sites from the continent.

*Key words: molecular paleoepidemiology; Ascaris; South America; mitochondrial genes*

**FIRST ANCIENT DNA PALEOPARASITOLOGICAL ANALYSIS IN PATAGONIA, ARGENTINA**LELES, DANIELA<sup>1,2</sup>; FUGASSA, MARTIN<sup>3</sup>; ARAÚJO, ADAUTO<sup>1</sup> & MAYO IÑIGUEZ, ALENA<sup>2</sup>

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The archaeological site “Nombre de Jesús”, Santa Cruz Province, belongs to the first European settlement in Patagonia (1584-1587 AD). In this site 5 human skeletons were

identified attributable to Europeans. Paleoparasitological studies showed that 2/5 were infected with *Trichuris trichiura* and/or *Ascaris*. The aim of this work was to confirm the presence of *Ascaris* infection in Patagonia by molecular analysis and to establish a relationship between modern and ancient *Ascaris* sequences from other regions. Two sediment samples were analyzed, NJ1 from sacral foramen and NJ4 from pelvic girdle, both were positive by paleoparasitological analysis for *Ascaris* and *Trichuris*, respectively. Sediments (2g) were rehydrated in Na PO 0,5%. The aDNA was extracted by physical-chemical treatment, where the sample was submitted to 3 4 boiling/freezing previous to phenol/chloroform extraction or QIAamp® DNA Stool Mini Kit (Qiagen). The molecular targets for *Ascaris* PCR were mitochondrial genes *cytb* (142bp), *cox1*(150bp) and *nad1*(200bp). PCR products were cloned and/or directly sequenced. *Ascaris* sequences obtained were compared to ancient and modern *nad1* sequences from South America and Europe available in GenBank database. The sequences analyses revealed that the 2 samples were positive for *Ascaris* infection, by amplification of *nad1* target. In sample NJ4, 3 *Ascaris nad1* haplotypes sequences were identified from 5 clones, 1/3 haplotypes (NJ4a) is the most prevalent in modern *Ascaris nad1* and others were new *nad1* haplotypes (NJ4b and c). In sample NJ1, 2 haplotypes were characterized, one (NJ1a) identical to modern haplotype from Brazil and other new haplotype (NJ1b). The initial sequence analysis revealed that *nad1* haplotypes from Patagonia are not present in samples from Europe or South America. However, more samples and data should be analyzed. The genetic analysis confirmed the microscopic diagnosis in one sample NJ1 and showed the presence of the *Ascaris* in sample NJ4 previously negative.

*Key words: paleoparasitological molecular diagnosis; Patagonia; Ascaris; nad1*

#### **MITOCHONDRIAL ANCIENT DNA ANALYSIS OF HUMAN REMAINS FROM THE METROPOLITAN CATHEDRAL OF RIO DE JANEIRO, BRAZIL (XVII-XIX)**

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**Introduction:** The old cathedral of Rio de Janeiro, the church *Nossa Senhora do Monte do Carmo* (1761), is located in the historical center of Rio de Janeiro and was the Metropolitan Cathedral from 1808 to 1976. As part of the celebrations of the 200 years of the arrival of Dom João VI to Brazil (1808 - 2008), the church was submitted to an artistic and architectonic restoration, including an archaeological rescue. In the process about 30 primary and secondary burials were exposed, corresponding to the period XVII-XIX, including an ossuary (century XIX) and 14 skulls of men, women and children (XVII century). The main purpose of the research is to perform a paleogenetic meta-analysis of the archeological remains retrieved from the *Nossa Senhora do Carmo* church that provides data for the population and diseases scenario from Rio de Janeiro from the colonial period to the end of the empire.

**Methodology:** Samples of bones, teeth and sediments from pelvic and rib areas were carefully collected and preserved following strict precautionary measures for genetic analysis of ancient DNA (aDNA). In order to determinate the mitochondrial (mtDNA) aDNA characterization, 31/78 bone fragments were analyzed. The surface bones were gently removed and

decontaminated with bleach and UV light exposition. 200mg of bone powder was processed according to the extraction protocol of dehybernation A and B solution of the GeneClean Kit for Ancient DNA (Bio101, La Jolla, CA, USA). The nucleotide sequence of the mtDNA hypervariable segment I (HVS-I) was determined. The sequences were analyzed in DNASTAR v.7.0.0, Bioedit v5.0.9, and compared to human mtDNA sequences from both GenBank database and laboratory staff.

**Results:** The preliminary results showed the recovery of human HVS-I aDNA extracted from sediments, and mainly from bones, however the retrieval of pathogen aDNA was poor. The first analysis of HVS-I aDNA sequences revealed that human archaeological remains exhibit assorted mtDNA haplotypes from the major European haplogroups U, T, R and V, suggesting a European origin.

*Keywords: paleogenetic, ancient DNA, Nossa Senhora do Carmo church, mtDNA haplotypes, Rio de Janeiro*

### **REEVALUATION OF THE PALEORADIOGRAPHIC METHOD FOR THE PALEOPATHOLOGICAL STUDY OF ANCIENT HUMAN SKELETAL REMAINS (CONDORHUASI, ALAMITO, CATAMARCA, ARGENTINA)**

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In the bioanthropology field one of the most recommended methods as a first approximation to the biological material is the paleoradiology, because it can obtain information as images of the specimen under study in a non destructive or invasive way. This will allow the preservation of its original form for future research, while the images can be reproduced as many times as necessary and it can be examined by the various interdisciplinary groups committed to the investigation. However, despite its great potential, this method is not widely used due to lack of communication between disciplines (medicine, bioanthropology, archaeology, etc.) and the necessary equipment in places where old biological remains are studied. In this context, the objective of this work is to show the applicability of diagnostic imaging methods to obtain paleopathological data from human skeletal remains found at the archaeological sites of El Alamito (Catamarca-Argentina), belonging to the formative culture known as Condorhuasi-Alamito (II-IV a.C.). In order to do that, two imaging methods were used: conventional x-ray radiography and computer tomography. In conclusion, the high applicability of the used method was proved. Thanks to it, we could obtain a group of data that contributes with new information regarding the way of life of these people and ratifies some assumptions made earlier by other researchers.

*Key words: paleoradiology; paleopathology; bioanthropology; interdisciplinary; Condorhuasi-Alamito*

**SYMPOSIUM****HEALTH AT THE MOMENT OF NATIVE-EUROPEAN CONTACT IN AMERICA**

Coordinators: Della Collins Cook and Claudia Carvalho Rodrigues

**PRECOLUMBIAN TUBERCULOSIS IN THE ARGENTINE NORTHWEST: THE RINCÓN CHICO 21 CEMETERY (RCH21). SANTA MARÍA, CATAMARCA**ARRIETA, MARIO<sup>1</sup>; BORDACH, ASUNCIÓN<sup>2</sup> & MENDONÇA, OSVALDO<sup>3</sup>

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The systematic excavation of collective burial sites renders possible the recovery of sets of skeletons in which some skeletons show bony evidence of infective pathological conditions. The presence and distribution of bony markers may reflect the way in which individuals reacted to diseases and states of morbidity, such as those caused by mycobacterial infection. We present here the results of an ongoing research on pathological conditions in prehistoric people of NW Argentina. The observed pathologies at the bone tissue in individuals from the Rincón Chico 21 cemetery were recorded, described, analyzed, discussed and interpreted as due to mycobacterial infections (*Mycobacterium tuberculosis* complex). The critical analysis and discussion on the dynamics of biocultural interactions takes into account information from contextual and chronological associations. We conclude that a tb like disease was present in prehistoric populations of NW Argentina. At Rincón Chico 21, six individuals out of seventy four, so far excavated, support the existence of the disease in the Santa María Valley probably in a period of time comprised between the end of Late Ceramic Period and an ever increasing imperial influence of the Inca expansion.

*Key words: Mycobacterium tuberculosis complex; differential diagnosis; prehistoric NW Argentina*

**PINTA VERSUS SYPHILIS; MEDICAL MODELS FOR COLUMBIAN CONTACT**

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Pinta or carate has been described as an endemic treponemal infection limited to skin. We examine the recent claim by Harper and colleagues that endemic treponematosi s in a newly contacted South American group is genetically identical to venereal syphilis. There is a substantial literature on pinta, much of it not widely shared among paleopathologists, and this literature presents a number of problems with regard to diagnostic standards. There is also a substantial literature on casual transmission of syphilis. We question which treponematosi s is the appropriate label for the reported cases, and whether the population in question is as isolated as has been claimed. A detailed natural history of pinta is sorely needed.

*Key words: treponematosi; pinta; syphilis; epidemiology*

References:

Harper KN, Ocampo PS, Steiner BM, George RW, Silverman MS, Bolotin S, Pillay A, Saunders NJ, Armelagos GJ. On the origin of the treponematoses: a phylogenetic approach. *PLoS Negl Trop Dis*. 2008 Jan 15;2(1):e148.

### **TREPONEMAL INFECTIOUS DISEASE IN HUMAN SKELETAL REMAINS FROM SAN FÉLIX, AN ARCHAEOLOGICAL SITE IN THE PROVINCE OF SANTIAGO DEL ESTERO**

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The incidence of infectious diseases in archaeological populations is very important in studies of ancient pathology as it can provide clues about social behavior of past people, including their nutritional and sanitary habits as well as the size and demographic density of their settlements. The purpose of the present discussion is to present evidence of bone lesions caused by bacteria of the genus *Treponema* in a small skeletal series recovered from the site of San Félix, located in the central plains in the province of Santiago del Estero. The archaeological site is representative of the Sunchituyo ceramic complex, which spans between XI and XVI centuries AD, during the Late Period of the ceramic sequence in northwestern Argentina. The observed pathological lesions in these skeletons are probably manifestations of treponemal infection and include bilateral and symmetrical inflammation affecting long bones, especially the lower limbs. Tibiae with saber shin appearance are also present. The cases of skeletal pathology presented in this study are relevant to the history of human disease because they mean that a disease causing lesions resembling those of treponemal infection was present in the area at least a few centuries before the initial contact with Europeans. Moreover, the prevalence of infectious disease found in this skeletal series resembles patterns of disease generally shown by sedentary human settlements with an increased population density and a decline in sanitation levels.

*Key words: treponematosi; prehispanic populations; Santiago del Estero*

### **ADVANCES IN THE PALEOPATHOLOGICAL STUDY OF LA PETRONA SITE (PDO. OF VILLARINO, PCIA, BUENOS AIRES, ARGENTINA)**

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The objective of this work is to present the results obtained from a paleopathological analysis of the human bones recovered at La Petrona archaeological site, a residential camp where human burials (secondary and primary) were also recorded. The four burials are represented by female adult individuals and an infant, whose radiocarbon dates range between 500 and 250 years BP, in the final Late Holocene. The macroscopic analysis of the human osteological sample revealed the predominance of degenerative lesions and, in a lesser degree, infectious ones. The lower extremities of an individual whose chronology corresponds to the Native-European contact show evidence of infectious lesions. The paleopathological research in the lower basin of the Colorado River is recent, and this is the first case where an infectious illness in the postcranial skeleton is recorded. In a regional scale (Pampa and Patagonia) the

mortuary contexts in which these lesions were observed are scarce and isolated. Consequently, this work contributes a new case of study for a regional discussion of paleopathological research.  
*Key words: Inferior Colorado River; final late Holocene; paleopathology*

**PRE INTERETHNIC CONTACT TUBERCULOSIS IN TIERRA DEL FUEGO:  
CONFIRMATION BY MOLECULAR METHODS IN THE SITE MYREN (CHILE)**

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Considering the available information about the distribution of tuberculosis (TB) in South America before 1492, a new determination by molecular methods is incorporated in the study of this issue that allows the expansion of paleoepidemiological scenarios in Patagonia. Until now, the presence of TB before the arrival of Europeans to South America has been confirmed using molecular methods by Arriaza et al. (1995) in the north of Chile. In continental Patagonia, the research team of Goñi and coworkers morphologically identified a possible case of TB in the basin of Lake Salitroso-Posada, dated in 1224-1380 years BP calibrated (García Guraieb 2006). In Tierra del Fuego, Constantinescu (1999) identified bone lesions compatible with TB in Myren site (Chile), without offering a radiocarbon date for those remains. Specifically, the present work allows confirmation of the diagnosis of TB in the remains of Myren site by molecular methods. Thus, IS6110 sequence was amplified in the Center for Bioarchaeological Research, Arizona State University, Tempe, in the United States (J Buikstra & AK Wilbur). Considering the obtained results, a radiocarbon dating was made in the Center for Applied Isotope Studies University of Georgia (USA), which informed an antiquity of  $640 \pm 20$  years BP (14<sup>th</sup> or 15<sup>th</sup> Century). Complementarily, contextual information of the site and bioarchaeological information of the remains are offered. These studies were made as part of the Research Grant 01520 (Argentina), oriented to study the changes in health as a consequence of inter-ethnic contact.

*Key words: tuberculosis pre-contact, Tierra del Fuego*

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## **HIERARCHY AND STATUS OF HEALTH: A STUDY CASE IN PUEBLO VIEJO\_PUCARÁ (HORIZONTE TARDIO), VALLE DE LURIN, PERÚ**

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The aim of this work is to compare the individuals of two groups of burials: one from the residences with palace characteristics; the other from residential sectors of elite and common people in Pueblo Viejo Pucará, main settlement of the Caringa de Huarochirí. The studied sample includes individualized bone remains that represent at least 25% of the skeleton, from simple and multiple funerary contexts found in structures of domestic uses and occasionally in funerary structures. In order to approximate the health status of the buried individuals of Pueblo Viejo, we considered nine non-specific indicators of stress: cribra orbitalia, porotic hyperostosis, periostitis/periostosis, antemortem trauma, antemortem tooth loss, hypoplasia of dental enamel, abscesses and dental caries, and other infectious diseases in 162 individuals. The objective of the present study is to contrast the hypothetical relationship between the higher frequency of non-specific stress markers in individuals of minor status inside this population of stratified character, hypothetically in charge of the defense and care of flocks of Pachacamac.

*Key words: Inca; late horizon; social hierarchy; non-specific stress markers; Valle de Lurín; Pueblo Viejo Pucará*

## **PODIUM PRESENTATIONS**

### **THE WOMEN OF SAN JOSÉ MOGOTE**

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This is a study of a pre-Hispanic village of Oaxaca. In recent years, the studies of ancient populations have been emphasizing the different shades and roles that individuals play in the society to which they belonged; showing with this, gender relations within the social structure. This work aims in this direction, makes an approach to the daily lives of women who lived in San Jose Mogote, one of the most remarkable villages in the central valleys of Oaxaca during the formative period, through an osteological analysis of diseases and indicators of occupational stress and as supported by the archaeological data reported on the site. So we can highlight some of the main features of the role played by women in various aspects of the mogoteña society.

*Key words: San José Mogote; Oaxaca; health; activity; women*

**DEVELOPMENT AND ACHIEVEMENTS IN PALEOPATHOLOGY IN ARGENTINA**

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The objective of this paper is to present a synthesis of some of the research projects that are currently being developed in Argentina related to issues in palaeopathology. It will also make reference to those projects being undertaken by academics working outside Argentina. The territory of Argentina occupies approximately two million eight hundred thousand square kilometres of the southernmost continental area of South America. There is evidence of human occupation in Argentina from at least 13,000 years BP. For this presentation, current projects taking place in six different regions of the country will be considered (North-west, North-east, Central region, Cuyo, the Pampas and Patagonian regions). In each particular case, this paper will make reference to the objectives, hypotheses, materials and methods, results, perspectives and funding. In the majority of the cases the research is taken place within a framework of archaeological projects, paying attention to a variety of topics including hunter-gatherers and agriculturalist groups. Likewise, a number of valuable studies are being carried out with samples belonging to contemporaneous osteological assemblages. Starting from the results obtained to date, the aim is to contribute information to give a step forward in the incorporation of our country into the worldwide scene of palaeopathology research.

*Key words: paleopathology; Argentina; hunter-gatherers; agriculturalists; contemporary samples*

**HISTORICAL EPIDEMIOLOGY IN TIERRA DEL FUEGO: INTERPRETING THE EVENTS RELATED TO TUBERCULOSIS BETWEEN SELK'NAM**CASALI, ROMINA<sup>1</sup>; FUGASSA, MARTÍN HORACIO<sup>2</sup> & GUICHON, RICARDO<sup>3</sup>

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The aim of this work is to increase the comprehension of the epidemic process that affected the natives who lived in the salesian mission La Candelaria (Tierra del Fuego, Argentina), during the beginning of the XX Century, and that points to tuberculosis (TB) as the main cause of death. Some interpretations have emphasized a genetic predisposition of the Amerindians to *Mycobacterium tuberculosis* before the inter-ethnic contact. Moreover, in Tierra del Fuego, biological variables such as subsistence modes, high latitude and genetic factors had been marked as causes of the virulent development of the illness. In addition, the molecular research made in several regions of America showed the prehispanic existence of the bacteria. From a holistic focus, the illness is understood as a product of the dynamic pathogen (parasite)–host–environment relationship. This system conditions the development of the illness in the individual and its circulation in all the population. This complex system includes biological, social and cultural factors in the human case, as well its dynamic interrelationship. The complexity of this process and the relevance of the involved elements in the case of TB in Selk'nam population is approached from the comparison with historical works developed on reduced populations in several regions, and current works about the behavior and genetic diversity of TB in white and native populations.

*Key words: tuberculosis; Selk'nam; reduction process; inter-ethnic contact*

**CHILDREN'S HEALTH IN SANTIAGO (1940-1970): INFERENCES FROM A SKELETAL COLLECTION**

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The aim of this study is to assess the general health conditions in children from the Cementerio General collection. For that purpose, 30 skeletal remains from both sexes between 10 and 18 years old were analyzed for osteological manifestations of diseases. Results revealed the existence of diseases related to malnutrition such as cribra orbitalia and femoral cribra, porotic hyperostosis, spina bifida occulta and enamel hypoplasia. Cases of rickets, tuberculosis, a cerebellar tumor and a possible cerebral palsy were found. The results suggest that some life conditions in Santiago, between 1940-1970, were characterized by inadequate vitamin intake in mothers and children, the presence of developmental anomalies and a limited access to preventive medicine, in agreement with current epidemiological data.

*Key words: children's health; Cemetery General Collection; diseases; malnutrition; life conditions*

## **DENTAL ENAMEL HYPOPLASIAS IN LATE HOLOCENE HUNTER-GATHERERS FROM SOUTHERN PATAGONIA**

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Archaeological research in Lake Salitroso Basin (Patagonia, Argentina) has led to the excavation of an osteological sample of 69 individuals, recovered from burial structures locally called *chenques*. These burials are dated between *ca.* 1500 and 350 years BP, with the 90% of the radiocarbon dates clustered between *ca.* 750 and 350 years BP. During the last millennia, Patagonia has undergone a progressive change towards dryer environmental conditions. Different lines of inquiry suggest that the hunter-gatherers, from which this osteological sample is drawn, would have coped with these environmental changes by decreasing their residential mobility and making a more prolonged and stable use of spaces with critical resources and habitability conditions, such as lake Salitroso Basin. Paleopathological studies on this sample have aimed to assess the health consequences of these organizational changes. Preliminary results have shown relatively high frequencies of linear dental enamel hypoplasias in comparison with both other stress markers and health conditions recorded in the sample and other hunter-gatherers samples in the country. This paper aims to complete these partial studies, by assessing the prevalence, sex and age distribution and time of formation of LHED in the entire available sample. LHED were recorded in the anterior permanent teeth of all the individuals available for the study (N=20 individuals). The age of formation of LHED was estimated using the new data on crown formation of Reid and Dean (2006) as a standard. The results are assessed in relation to the mortality profiles built for the Lake Salitroso sample and are discussed within the archaeological models that guide regional investigations.

*Key words: dental enamel hypoplasias; hunter-gatherers; Patagonia; Late Holocene*

## **THE CHOLERA EPIDEMIC OF 1887 IN CALCHAQUÍ VALLEY**

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The epidemic of cholera in Salta city is documented since December 25th, 1886. It spread quickly to some towns of the area. In Calchaquí Valley, the first deadly cases were registered in January 1887. This disease emerged in Capital Federal and spread from there to the provinces of Santa Fe, Entre Ríos, Córdoba, Mendoza, San Luis, San Juan, Tucumán, Santiago del Estero, Salta and Jujuy. Cholera is an acute, infectious disease caused by the bacterium *Vibrio cholerae*. This bacterium elaborates a toxin that produces increased secretion of water and minerals in the intestine, which leads to a massive diarrhea and, therefore, to severe dehydration. Other symptoms that may occur are vomiting, abdominal cramps, circulatory collapse, acidosis and kidney failure. Dehydration can occur quickly. Cholera symptoms are tachycardia, dry skin, intense thirst, glassy and sunken eyes, somnolency, fatigue and cramps, among others. This disease can also cause death. Transmission occurs through water contaminated with feces or vomit of infected subjects or carriers' hands or contaminated food. Further, the bacteria can be transported by rodents, flies and insects when they come into contact with infected material. Based on historical records, this paper analyzes the impact of the

epidemic on the populations of the valleys of Salta. It also addresses the beliefs and medical practices in force at that time.

*Key words: Cholera morbus; epidemic; Calchaquí Valley; Vibrio cholera; diarrhea*

### **THE COSTOCLAVICULAR LIGAMENT AS AN INDICATOR OF GENERAL WORKLOAD: PRELIMINARY INVESTIGATIONS**

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Systematic studies regarding ligament attachments as markers of occupational stress (MOS) are still incipient in Brazilian bioarcheology. This preliminary study focuses on morphological alterations at the costoclavicular ligament insertion areas in a pre-historic shellmound population, the Sambaqui de Cabeçada, in the South coast of Brazil. Two distinct series were studied: the skeletons recovered between 2-3m deep and those recovered in a sector named "site 2". Ligament insertion area modifications were recorded using four categories: 1) no reaction; 2) smooth bone grown and roughness; 3) crest extensions accompanied by marginal delimitation; 4) large alterations (hypertrophy, deeply excavated attachment areas and lytic lesions). The analysis considered all individuals assigned as adults and later adolescents with at least one clavicle with the ligament insertion area preserved. A total of 32 individuals were studied. In both series large alterations were observed only in males, although three individuals (two females and one male) with no hypertrophy presented signs compatible with lytic lesions. Size association is difficult to infer because of the fragmentary and incompleteness series condition, but massive alterations occurred in male individuals that exhibited greater bone robustness. Although other influential factors involved in ligament alterations, as hormonal influences, couldn't be properly evaluated, these preliminary results concur with previous MSM studies that suggested heavier upper limb loads in males and low impact of shoulder-related activities among females, such as swimming or paddling.

*Key words: costoclavicular ligament; Markers of Occupational Stress; Brazilian Shellmound; Sambaqui; Brazil*

### **BODY MODIFICATION AND PALEOPATHOLOGICAL EVIDENCE IN THE ICONOGRAPHY FROM THE 'PHILOSOPHICAL TRAVEL' TO BRAZILIAN AMAZONIA' BY ALEXANDRE R. FERREIRA (1783 - 1792)**

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Iconographic representation of individuals is an important source of evidence for paleopathologists. This is particularly so in acknowledging socio-cultural practices in present

and/or extinct populations. The aim of this work is to report images of body modifications and cases of paleopathological interest represented in the iconography and material culture recovered during the Philosophical Travel to the Brazilian Amazonia. Led by the naturalist Alexandre Rodrigues Ferreira (ARF) between August 1783 and January 1792, the expedition covered approximately 39.372 Km, at the Capitánias of Pará, Rio Negro, Mato Grosso and Cuiabá. Watercolors executed by the official expedition illustrators have been selected from the surviving archive. They portray individuals with their artifacts, clearly exhibiting cranial, facial and thoracic modifications, performed by such groups as the Cambeba, Jurupixuna, Uerequena and Mauá. ARF also recorded the procedures and underlying cultural significance of these practices. The unequivocal pathological cases represented include a 'male dwarf [sic]', and a Catauixi woman with skin lesions on her body. The author noted this skin condition as common in the Catauixi, describing in some detail its presentation and considering various differential diagnoses, including vitiligo, scabies or leprosy. He also questioned whether these were hereditary or environmental in origin. This study considers the documentary evidence in the context of modern paleopathological inquiry, contributing to our understanding of cultural practices and diseases affecting the Amazonian inhabitants during the 18th century.

*Key words: skull and soft tissues artificial modifications; dwarfism; skin diseases; differential diagnosis; biocultural approach*

#### **DUDIGNAC: HEALTH OF THE POPULATION BETWEEN 1937 AND 1975**

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Dudignac is located in the province of Buenos Aires, 318 km from Capital Federal. The city was founded on June 8, 1911 by Exequiel Dudignac in the context of the construction of the railway line by Midland Railway Company. Its founder established the enclosure called “La Avanzada” and donated the land where they built the main public buildings. The San Jose parish church and the cemetery were founded in 1937. The construction of the “Enriqueta Dudignac” Hospital began in December 4, 1949 and was inaugurated in 1951. The content of this paper is part of a more general study that addresses the history of Dudignac since its foundation up to present. This paper analyzes the health of the population focusing on the diseases and deaths between 1937 and 1975. The corpus of data was obtained from death certificates from the public record office of Dudignac. The causes of death were classified by taking into account the X International Statistical Classification of Diseases and Related Health Problems (ICD). Of the 1259 individuals who died in the historical period under consideration, 456 (36.22%) were females, while 803 (63.78%) were males. This situation shows a significant difference between the genders. It was also observed a high percentage of deaths of children under two years old. Their most common diseases correspond to congenital weakness and infectious diseases. The deliveries were made in the mother's houses under unhygienic conditions, which could have contributed to the high rates of infant mortality. The most frequent causes of death in adults correspond to circulatory system diseases, neoplasia and infectious diseases.

*Key words: Dudignac; mortality; pathologies; death certificates; health history*

**ON THE HISTORY OF PALEOPATHOLOGY IN BRAZIL AND ARGENTINA**MENDONÇA DE SOUZA SHEILA<sup>1</sup> & GUICHÓN, RICARDO A.<sup>2</sup>

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The development of Paleopathology, as so many other scientific fields, is certainly associated with the cooperation and interaction between groups of researchers, either in the same country or in different countries. Yet the history of Paleopathology in each country has its own peculiarities, explaining the differences and similarities that make them unique events. In this sense, the goal of this presentation is to compare the ways traced by Paleopathology in Argentina and Brazil since the nineteenth century, providing a case study and pointing to the future. Our two big countries had their scientific development, including Paleopathology, in a context characterized by academic discontinuity, political pressure and economic problems. In contrast to Argentina, Brazil found an escape developing this interdisciplinary area in the context of Biology and Medicine. As a consequence, many professionals of those two areas are still involved in that field of research. On the other side, in Argentina the archaeologists were those scientists who were always more involved in the paleopathological and bioarchaeological research. That was also reinforced by an expressive development of Forensic Anthropology that, contrary to Brazil, was pushed forward in Argentina in the last democratic decades. Both countries had archaeological and bioarchaeological research supported by colleagues of the Northern Hemisphere. Indeed, the scientific cooperation between Argentina and Brazil has also increased in the last four decades, pushing forward the production and international publication of papers in Paleopathology. The cooperation with other countries in South America has also been increasing for years. Our past and present point to the cooperation and sharing of methods, concepts and subjects as the fundamentals of South American Paleopathology, in order to build a solid continental corpus of scientific knowledge.

**DENTAL MODIFICATIONS IN A 16-17TH CENTURY SAMPLE OF AFRICAN SLAVES FOUND AT LAGOS (PORTUGAL): PATHOLOGICAL CONSEQUENCES OF INTENTIONAL CHIPPING**NEVES, MARIA JOÃO<sup>1</sup>; WASTERLAIN, SOFIA<sup>2</sup> & FERREIRA, MARIA TERESA<sup>3</sup>

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In 2009, the Dryas team performed an excavation at *Valle da Gafaria* (Lagos, Portugal), a site located outside the medieval walls of the city. The site revealed diverse occupations, the most significant being an urban discard deposit dated from the 16th-17th centuries. Among discarded objects and food remains, an important number of human remains were exhumed according to an archeoethanatomical protocol. In all, 155 individuals were excavated, including males and females, adults and sub-adults, many of them aged less than 30 years. The archaeological and historical context of the findings, as well as the morphometric analysis of skulls led us to attribute an African origin to these individuals. Sources document slave's capture and commerce by Portuguese merchants since the 15th century. Even though such trade expanded over time, no slave burial ground has ever been excavated in Portugal, so that the study of their lives and ways of death mainly have been known through historical documents. Strongly culturally related, dental intentional modifications translate some aspects of African slaves' lives in medieval and modern Portugal, which are not possible to document through historical

documentation. In this sample, presence or absence of dental modifications could be evaluated in 105 individuals. Of these, 27 presented tooth modifications (25.7%) on their anterior dentition. Only eight exhibited modifications on both superior and inferior teeth. Cultural modification was performed mainly on incisors and, in a small percentage, on canines. Both women and men presented with dental intentional modifications. In the present work, the influence of such cultural practices on oral health is evaluated by means of dental wear, caries, and calculus deposits analysis. Discrete traits are also investigated in order to contribute to a better paleobiological characterization of this burial group. Finally, inferences about a more specific ethnic affinity and geographical origin of these slaves are tested.

*Key words: dental modifications; Africa; Portugal; slaves; 16 / 17th centuries*

### **A PRELIMINARY APPROACH TO LAGOS LEPROSARIUM (PORTUGAL): DIRECT AND INDIRECT EVIDENCE OF LEPROSY**

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European medieval/post medieval historical sources and literature often emphasize leprosy (Hansen's disease) as a dreadful disease. Nearly 70 medieval leprosaria are known in Portugal from these sources. Nonetheless, the Portuguese archaeological record shows a scarcity of skeletal evidence of leprosy, as none of these leprosaria was yet excavated. The only direct evidence of bone changes due to leprosy comes from some of the individuals exhumed from Ermida de Santo André (Beja), in 2003. A recent archaeological operation at *Valle da Gafaria* (Lagos) produced significant data on this matter, as it included the excavation of both the medieval/modern leprosarium building and part of the related burial grounds. The aim of the present investigation is to present the bioarcheological results of this archaeological operation, and to discuss its relevance to the history of leprosy, medicine and social management of disease in Portugal. The human remains exhumed belonging to 13 individuals, and related to the leprosarium revealed that these were subject of particular burial practices inconsistent with the Portuguese medieval funerary behavior (respectful of Roman Christian rituals). The archeoanatomical procedure performed during fieldwork supports the observations produced concerning mortuary practices, biological profile and preliminary pathological characterization of the individuals exhumed during fieldwork. The taphonomic factors induced significant *post mortem* loss of skeletal information, thus making difficult the diagnosis of paleopathological conditions. Hence, only two of the 13 individuals presented skeletal direct evidence compatible with a leprosy etiology. Its differential diagnosis will be argued. The absence of bony changes on the remaining individuals will be interpreted considering multiple aspects, such as taphonomy, funerary practices, the osteological paradox and the sociocultural role of the Portuguese leprosaria and hospitals. The limitations of paleopathology, namely the (im)possibility of diagnosing leprosy - specially in fragmented and commingled bone series - without taking into account the overall taphonomic, archeoanatomical and geoarcheological factors and the local historical background will be also discussed.

*Key words: leprosy; paleopathology; differential diagnosis; taphonomy; Portugal*

**ANCESTRAL EVIDENCE OF HUMAN T-CELLS LINFOTROPIC VIRUS (HTLV) IN BOLIVIA**ORELLANA HALKYER, NANCY CAROLINA<sup>1</sup> & PAULO VICENTE, ANA CAROLINA<sup>2</sup>

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The provirus HTLV-1 and HTLV-2 are the human versions of the monkey retrovirus STVL-1 and STVL-2. Currently, the infection by HTLV-1 is found in several populations of the world, while the HTLV-2 is found mainly in native populations of America. As regards HTLV-1, it possibly arrived in America during the traffic of African slaves and Japanese migrations (XVI and XX Centuries). Considering the hypothesis about the antiquity of the virus in America, this work aims to determine the prehispanic presence of HTLV by generic analyses of archaeological material from Bolivia. Materials and Methods: samples of thirty prehispanic human remains from La Paz, Cochabamba and Sucre in Bolivia were analyzed. The extraction of aDNA (ancient DNA) was prepared by means of the kit AncientDNA of GeneClean (Bio 101, Vista, CA). Generic primers were used to amplify fragments of 200 pb of Tax gen in the PCR reactions. The amplified samples were cloned and sequenced. In the meantime, probes of HTVL-1 and HTVL-2 (pool regions pX and LTR) were used, marked with [<sup>32</sup>P] dCTP, for hybridization. Results and Discussion: the analyses revealed the infection by HTLV-2 in the sample 1590 of from Tiwanaku Culture (1.755 ± 35 B.P.) and HTLV-1 in the sample 1790 from Chuquisaca (aprox. 1200 d.C.). Li et al. (1999) also reported prehispanic infections by HTLV-1, in a mummy from North Chile (aprox. 1500 BP). The infection by HTLV-1 found in the mummy 1710 from Bolivia confirms the discovery in that group. The results in the sample 1590 are the first biological evidence of the antiquity of HTLV-2 in America. Besides, the presented evidence in this work supports the hypothesis about the ancestral introduction of both HTLV types in America.

*Key words: Bolivia; paleoparasitology; HTLV; aDNA; genetic analyses*

**EVALUATION OF METABOLIC AND FUNCTIONAL STRESS IN THE OSTEOLOGICAL COLLECTION FROM LAGUNA EL DOCE SITE (SANTA FE, ARGENTINA)**PÍCCOLI, CAROLINA<sup>1,2</sup> & BARBOZA, CAROLINA<sup>1,2</sup>

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This work describes the results regarding metabolic and functional stress evaluation of the Laguna el Doce collection. The skeletal assemblage was recovered mostly from the beach of El Doce lagoon (General Lopez, SW Santa Fe) and was associated with sediments deposited between 3000 and 1000 years BP. The analysis was mainly based on macroscopic observations. Also, observations and inferences were compared with the information derived from other sources (demographic, ethnographic, etc.). The aim of this work is to contribute to the comprehension of biocultural processes involving the populations that inhabited this type of environment. The results are consistent, in general lines, with the bioarchaeological profile related to hunter-gatherer populations, especially Late Holocene samples from *Region Pampeana* (Argentina). The metabolic stress evaluation, as well as the results of some sex estimation techniques, indicates a low recurrence of nonmitigated long environmental stress. A low degree of functional stress prevalence was identified, except for high dental attrition rates. In addition, few traumas and other type of lesions in the outer surface of the bone were observed. However,

the taphonomic history and the assemblage size must be taken into consideration when interpreting the results. Therefore, these results constitute a first characterization of the collection studied, from which to continue with future analytical efforts.

*Key words: metabolic stress; functional stress; hunter-gatherers; lake environment; taphonomic history*

### **OSTEOARTHRITIS IN A CONTEMPORARY SKELETAL SAMPLE**

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Osteoarthritis is the most common joint disease found in skeletal remains. It has been postulated that age, sex, genetic predisposition, obesity, trauma and the individual work activities are triggers of this disease. The purpose of this paper is to establish the prevalence of osteoarthritis in a contemporary skeletal sample and its relationship with sex and age of the individuals. The observed sample consists of 100 adult skeletons (67 male and 33 female) between 22 and 101 years old. This sample belongs to Prof. Dr. R. Lambre's Osteological Collection, composed of individuals from La Plata Cemetery with known age and sex, and dates of death between 1936 and 2001 (81 cases from 1990 to 1999). To diagnose osteoarthritis we identified 10 skeletal joint areas (temporo-mandibular, acromion-clavicular, sterno-clavicular, spine, glen-humeral, radio-ulnar-humerus, hand, coxo-femoral, femoral-patellar-tibial and foot). The presence of eburnation, osteophytosis, joint contour alterations and porosity in bone and joint surfaces was recorded. 81% of individuals had joint conditions attributable to osteoarthritis, among women prevalence was 87.9% and among men it was of 77.6%. The most affected joints were the acromion-clavicular (56%), followed by the vertebral joints (51%) and coxo-femoral (31%), coinciding with revealed information in specialized literature. Regarding factors that may predispose individuals to suffer from this disease, there are not major differences between the sexes in our sample, whereas there was a positive correlation between the number of joints affected and the age of individuals.

*Key words: osteoarthritis; pathology; articulation; collection; age*

### **HOW MUCH DO WE KNOW ABOUT SPONDYLOLYSIS AND OS ACROMIALE? THEIR STUDY AND ANALYSIS IN TWO SKELETAL POPULATIONS FROM NORTHERN CHILE**

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Spondylolysis and os acromiale are skeletal changes commonly found today affecting people, including athletes, who engage in competitive physical activities. The former consists of a separation of the neural arch and body of the vertebra at the pars interarticularis, usually of the lower lumbar vertebrae; the latter is the result of non-union of the epiphysis of the acromion of the scapula. Their aetiology remains speculative, although a strong connection with strain/trauma in the back and repetitive movement at the shoulder, respectively, have been suggested as likely causes. Palaeoepidemiological information on spondylolysis and os acromiale is very scarce for Amerindians from South America. The aim of this paper is

to present the results obtained from the analysis of these conditions in two skeletal populations from Arica, northern Chile. Adult individuals of both sexes were analysed, belonging to the so-called “Chinchorro” people: coastal fishers (n=75; 3rd-2nd millennium BC) and inland agriculturalists (n=100; 1st millennium AD). The results illustrated that the coastal groups were more affected by spondylolysis 4.0% (11/271) than inland agriculturalists 1.2% (5/411) and more affected by os acromiale 5.8% (5/86) compared to a prevalence of 4.2% (7/165) in the agriculturalists. Coastal males, in particular, showed a significantly high prevalence of spondylolysis compared to the females  $X^2=8.923$  (df=1) 0.004  $p<0.01$  and to the later agriculturalists  $X^2=8.404$  (df=1) 0.005  $p<0.01$ . Regardless of the aetiological factors involved in triggering these conditions, if spondylolysis and os acromiale result from physical stress, the results obtained suggest that early archaic populations, (males in particular) who engaged in fishing and coastal hunting activities, exposed their bodies to a higher degree of physical stress than that observed in later groups whose main subsistence economy was agricultural practice. Sexual division of labor may probably account for intra-group sex differences although this may remain difficult to confirm.

*Key words: os acromiale; spondylolysis; Chinchorro; Chile; prehistoric*

### **DIAGNOSTIC EXPRESSIONS AND CAUSES OF DEATH: SOME SPECIFICATIONS REGARDING THEIR USE IN THE STUDY OF MORTALITY**

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The paper starts by going through the principal purposes of the analysis of mortality. It shows, in the context of this analysis, the main difficulties posed by the use of diagnostic expressions at the moment of reporting the causes of death, taking into account that such expressions have been collected from different sources, as civil register office and parish records. Secondly, from an interdisciplinary standpoint (historical, anthropological, medical, economic, etc), it insists on the need for the causal explanation of mortality. The design of interpretative schemes is proposed. These schemes should be able to show the direct and indirect associations that might exist between the determinants of health and sickness. In addition, they should show the obstacles posed by the use of different diagnostic expressions for the same disease, or the same diagnostic expressions for different pathologies, over long periods of time.

*Key words: disease; mortality; causes; obstacles; interdisciplinary*

### **THE COST OF LIFESTYLE REVISITED: MUSCULOSKELETAL STRESS MARKERS IN BRAZILIAN PREHISTORIC COASTAL POPULATIONS: METHODOLOGICAL AND INTERPRETATION CHALLENGES**

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Musculoskeletal stress markers were systematically investigated in Brazilian prehistoric coastal populations since the latest years of the 20th century. Most studied skeletal series presented a vigorous to moderate pattern of workload, dominance of bilateral activities and heavier workloads in males. A critical review of those studies is under development, stressing the main challenges observed: methodological adjustments to small and fragmentary series, the difficulties to interpret skeletal markers and the complex interaction of MSM with other

occupational stress markers. A comparative reevaluation of primary data was made on four prehistoric coastal series from Rio de Janeiro State: Beirada (4.520±190 to 3.800±190 BP), Moa (3.960±190 to 3.610±200 BP), Zé Espinho, (1.180±170 to 2.260±160 BP), Ilhote do Leste (3060±40 AP to 2650±350 BP); and one from Santa Catarina State: Praia da Tapera (1140±180 to 1030±180 BP). All those series were studied under the same methodological approaches considering occurrences of robusticity, stress lesions and ossifications, following Hawkey & Merbs (1995). Although the first results confirmed the general pattern cited above, less ranked muscles analyses suggests that side differences were not completely obliterated by intense bilateral activities. The interaction with other stress markers such as osteoarthritis was differential and direct associations between markers' intensity must be made carefully considering that articular damage isn't directly linked to intensity of muscle insertion site development. The small series size is an unsolved challenge, once intra and inter series variability doesn't allow aggregations. The need to improve categorical standards in MSM evaluation was found crucial to avoid inter-observer bias. Those preliminary results reinforce investigations' pathways still open after almost a decade of MSM studies in Brazil.

*Key words: Brazilian shellmounds; Sambaquis; Occupational Stress Markers; applied study; Musculoskeletal Stress Markers*

References: HAWKEY, DE & MERBS, CF. 1995. Activity-induced musculoskeletal stress markers (MSM) and subsistence strategy among ancient Hudson Bay Eskimos. *IJO* 5: 324-338.

#### **ANALYSIS OF A CASE OF AMPUTATION FROM SKELETAL REMAINS RECOVERED FROM SHIPWRECK OF A SHIP OF THE XVII CENTURY**

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This study involves human skeletal remains recovered from a Portuguese ship that exploded and shipwrecked at Pernambuco coast, Brazil, in 1652. The rescue is being accomplished by divers of the Museu Naval e Oceanográfico da Marinha Brasileira. At this time, 22 fragments of human bones were recovered and three individuals were identified. In these remains, part of a left femur with clear amputation signals in its shaft was found. The aim of this study is to clarify if this individual stood up and walked on this femur, analyzing its inner structure. It is an adult individual whose sex and ancestry is undetermined. This bone is well-preserved exhibiting some taphonomic alterations, especially in its posterior surface. It was submitted to biplanar radiologic study and to helical computed tomography with 3D-reconstruction at the Hospital Universitário Clementino Fraga Filho/Universidade Federal do Rio de Janeiro. The images showed a great amount of spongy bone in the head and neck regions, a very thick cortical bone in diaphyseal walls and a medullar cavity relatively small but filled in with low-density material and air bubbles. In the neck region a greater thickness of the medial cortex than lateral cortex was found. Volume Reconstruction Technique revealed cortical remodeling alterations near the amputation stump. Taken together, those data lead us to conclude that this individual supported his body weight on this amputated bone walking, probably, on a prosthetic device.

*Key words: amputation; shipwreck; skeletal remains*

## **NEW INSIGHTS IN MUSCULOSKELETAL STRESS MARKERS STUDIES: REFLECTIONS FROM THE COIMBRA WORKSHOP (PORTUGAL)**

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One of the focuses of the *Research Centre for Anthropology and Health* is the relevance of the study of human skeletal remains to infer past human demography, pathology and behavior. Within this perspective, the idea of hosting an event such as the *Workshop in Musculoskeletal Stress Markers (MSM): limitations and achievements in the reconstruction of past activity patterns*, held at the University of Coimbra, Portugal, (2nd - 3rd July 2009) was born. The principal aspiration of the organizing committee was to provide a prolific environment for researchers that work within the field of *MSM* to discuss the methodologies and terminology, as well as the effectiveness of enthesopathies as markers of occupational stress. Bearing this in mind, the Workshop was organized in three major sessions each one dealing with specific subjects on: 1. Methodological issues; 2. *MSM* studies within archaeological samples as well as Identified Skeletal Collections; and finally, a 3rd session dedicated to the multifactorial etiology of enthesopathies. Each session was introduced with a keynote lecture on the topic under analysis. The Workshop concluded with a Plenary Session where two annotators made the balance of works and debates, followed by a general discussion with the contribution of all participants. The objective was to promote a continuum exchange of perspectives, ideas and solutions on the subject, resulting in the formation of three working groups, which will address some of the key factors discussed throughout the Workshop. The working groups will focus on the topics of Methods, Terminology and Occupation (homogenization of occupation groups defined for main identified skeletal collections). Details of the workshop are still available at <http://www.uc.pt/en/cia/msm/> and the site will continue to be updated according to the resolution arrived at in the Plenary Session. We invite all the researchers that share a common interest in *MSM* studies and weren't present in the Workshop to join us in the discussion of this issue. The individual experience and knowledge will be very helpful to unify procedures and methodologies, allowing the creation of a more unified scientific approach to future studies.

*Key words: standardization; enthesopathies; occupation; methodologies; terminology*

## **VERTEBRAL OSTEOPHYTOSIS AND SCHMORL´S NODES IN HUMAN BONE REMAINS FROM SOUTHERN PATAGONIA**

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The aim of this work is to explore the occurrence and stage of evolution of vertebral osteophytosis and Schmorl´s nodes in human bone remains from three regions of Southern Patagonia. The regional division is based on the observed differences in ecological and subsistence economy patterns evaluated from previous analyses, including stable isotopes and archaeological evidence. Comparative results of spinal osteoarthritis contribute to the evaluation of bone health related to mechanical loads associated with human activities in Southern Patagonia. Vertebral osteophytosis and Schmorl´s nodes were registered in individuals from three regions of Southern Patagonia: Coast of Santa Cruz-Argentina (n=5), Coast of Tierra

del Fuego (n=4) and Beagle Channel (n=5). All individuals were dated from medial and final Holocene. Only adults, dated, aged and sexed with complete vertebral column skeletons were included. The osteophytosis was classified in four categories: absent (0); slight (1); moderate (2) and severe (3). Moreover, Schmorl's nodes were recorded identifying their location (anterior, central or posterior). The individuals from the coast of Santa Cruz showed high frequencies of vertebral osteophytosis from moderate to severe grade in dorsal and lumbar portions of the vertebral column, usually with the presence of Schmorl's nodes of high evolution, all of them in central position. In contrast, individuals from North of Tierra del Fuego and Beagle Channel showed moderate or slight level of osteophytosis with absence of Schmorl's nodes. Although the studied sample is small, the results suggest more intense mechanical loads that affect vertebral columns in individuals from Santa Cruz than in individuals from Tierra del Fuego.

*Key words: osteophytosis; Schmorl's nodes; southern Patagonia*

### **CONTRIBUTION OF FORENSIC SCIENCES AND PALEOPATHOLOGY TO THE DETERMINATION OF THE SOCIAL INCLUSION OF AN INDIVIDUAL WITH PHYSICALLY LIMITATING PATHOLOGIES FROM THE BURIAL PLATFORM OF HUACA SAN MARCOS, LIMA, PERU**

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The results from two areas of study, pathology and skeletal trauma, are analyzed, contextualizing the biological individual in its cultural environment, to develop from there the matter of social inclusion of a person with physical limitations within the society, using comparisons such as spatial location, garments, and funerary treatment in relation to other individuals of the Burial Platform of Huaca San Marcos, from the Late Intermediate Period (1200-1400 DC), Lima, Peru. The case of study is part of a corpus of 35 skeletonized individuals. Macroscopic analysis allowed the determination that this individual presents seronegative spondyloarthropathy with fusion of the axial skeleton, secondary osteoarthritis and osteoporosis and antemortem injuries in ribs and tibia; histological analysis of the injuries is taking place to establish their time period and sequence in a more precise manner, going in depth into the consequences related to quality of life as a result of the many traumas produced in short periods of time. The characteristics of dependence and limitation were not factors that had incidence in the exclusion of the individual as a social being; no differences are found in the matter of spatial location, likewise, the intention of placing the individual in a flexed position causing the fracture of the leg on the fusion of femur and acetabulum shows the importance of keeping him within the funerary pattern of the society.

*Keywords: injuries; seronegative spondyloarthropathy; social inclusion; Late Intermediate Period; Huaca San Marcos*

### **NEW CONTRIBUTIONS IN THE BIOARCHAEOLOGICAL STUDY THROUGH INFORMATIC SYSTEMS IN COLLECTIONS OF HUMAN REMAINS FROM THE NECROPOLIS OF ANCÓN, LIMA-PERÚ**

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This work consisted in the study and digital record of a minimum number of 300 individuals from the collection of human bone remains of Ancón Site Museum. The material

comes principally from an excavation made during the 60's and 70's in the area of the Ancón Necropolis and Pasamayo, in the central coastline of Chillón Valley, Lima, Perú. The Ancón Site presents a continued cultural occupation from the Archaic period to the Late Horizon (8000 AC -1532 DC) and this establishes it as one of the most important cemeteries of the Andes, besides showing excellent conditions of preservation of the archaeological studied material. This work has allowed the identification and individualization of 100% of the sample deposited in the Ancón Site Museum, establishing the biological profile of the studied individuals and their characterization by different non-specific indicators of health and odontograms. The digital data base will constitute the first digital catalogue on human bone remains of the country, available on the internet, and it is thought to allow the specialized searches for specific research and to facilitate the access to a sample study of one of the most important necropolises of the Central Andes.

*Key words: digital catalog; Ancón Necropolis; diffusion of the research; Site Museum*

### **TREPHINATION – LOOKING FOR THE DETAIL**

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New technical achievements – like secondary scanning microscope enlargements or Micro-computer Tomography for larger objects – enable us to look for details on skulls without destroying them. These techniques were used for investigating the trepanation holes found within the Celtic population from Dürrenberg (400 BC). The aim was to find a non-destructive way of visualizing details. The Celts at Dürrenberg used different techniques for opening the skulls. Boring with a trepan, scraping, cutting and boring with a pointed instrument were frequently combined during one operation. Traces of this surgery are visible on various skulls; some show signs of healing, others do not. A sequence of detailed secondary scanning microscope enlargements was taken by a special SEM of the Vienna Institute for Archaeological Science (VIAS), Microcomputer tomography from the Department of Anthropology at the University of Vienna, in order to avoid histological cuts. One aim of the project is to estimate the stage of healing; another question concerns the specific instruments that were used. The information derived from the results should help archaeologists to find the operation tools within the site. Results and limits of this investigation will be presented.

*Key words: trephination; scanning electron microscope; micro computer tomography; cut marks*

### **POSTER PRESENTATIONS**

#### **DESCRIPTION OF DENTAL AND BONE LESIONS IN A SKULL OF A GIANT BEAR**

*Arctotherium angustidens* (URSIDAE, MAMMALIA)

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*Arctotherium* is recorded in South America from the Ensenadan (Early to Middle Pleistocene; ca. 1.7 Ma. BP) to Lujanian (Middle Pleistocene to Early Holocene, ca. 11,350

YBP). Although the dietary differences among each of the five species are not determined yet, morphology indicates that they were omnivores but with a predominance of animal origin items. Among them, probably the bone and flesh of large and mega herbivores constituted the main part of their diet. For the first time we are conducting morphogeometric, biomechanical and paleopathological studies in order to understand dietary habits. That is why we describe here paleopathology observed on the skull and teeth of a young female of *Arctotherium angustidens* (MLP-82-X-22-1) from “las toscas del Río de La Plata” Punta Piedras, Buenos Aires province, Argentina. The lesions include broken teeth, a foreign bone fragment incrustated mesially to the right P4 and the antemortem loss of the opposite P4 and consequent development of an oro-nasal fistulae at alveolus level that presents signs of osteolysis and osteogenesis. This implies that *A. angustidens* was the most carnivorous species of the five that inhabited South America during the Pleistocene and that this bear was the most powerful land mammal predator that ever existed in South America. This does not imply that active hunting was the unique strategy for feeding, since its large size and great power may have permitted the bear to fight for prey hunted by other Pleistocene carnivores such as the Saber-tooth Cat.

*Key words: Arctotherium, Pleistocene, diet, South America, dental pathology*

#### **CASE STUDY: POSSIBLE KLIPPEL FEIL IN THE SKELETON OF A MIXTEC YOUNG FROM POSTCLASSIC, OAXACA**

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We will present here the results of a study made of a skeleton in an excellent state of preservation of a young woman recovered from a burial in an archaeological dig in the Mixteca Alta of Oaxaca. The individual had a series of alterations in the spine, such as occipitalization of C1, C2-C3 fusion and early sacralization of L5 which are often associated with Klippel Feil. Therefore, a thorough paleopathological, macroscopic and radiographic analysis was conducted to achieve a differential diagnosis. We present the analysis and discussion of these results, and some inferences about the implications of these disease lesions in the daily life of the case study.

*Key words: Klippel Feil; health; postclassic Oaxaca*

#### **HEALTH AND ILLNESS: THE LATE PREHISTORIC POPULATION FROM THE NORTHERN SECTOR OF THE CALCHAQUI VALLEY, SALTA PROVINCE, ARGENTINA**

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The population that lived in the northern portion of the Calchaquí Valley during the late period of Regional Developments (ca. 110-1400dC) was determinate from skeletal samples of sites: Fuerte Alto, Payogasta, La Poma, La Paya, Tacuil and Luracatao. The samples were recovered from systematic and asystematic archaeological excavations, and gathered by the Ethnographic Museum Juan B. Ambrosetti (Facultad de Filosofía y Letras, Buenos Aires University), between 1907 and 1912. It includes skulls exclusively, mostly from adults and mature individuals of both sexes. All of them present tabular erect artificial cranial deformation and, in some cases, tabular oblique (*sensu* Imbelloni). To evaluate the nutritional state of the population, the adequate development of sexual dimorphism was considered as indicator of general growth and the presence of porotic hyperostosis /cribra orbitalia, as indicators of acute privation. The sexual dimorphism was evaluated according to its acts as a discriminant factor in

the metric variables of the cranium (considered according to the Convention of Monaco, 1908). The hyperostosis/cribra was evaluated visually for its absence/presence and whether it was active or healed. A normal growth could be determined according to sexual dimorphism of similar magnitude to that evaluated in other populations. As regards the specific indicator, we found a high percentage (58%) of healed hyperostosis/cribra. These indicators are evaluated, considering the diet of these populations (as evidenced by archaeological records) and the alimentary means of the group.

*Key words: Calchaquí Valley; regional developments; health; diet; anemia*

### **FIRST PALEOPARASITOLOGICAL RESULTS FROM LATE HOLOCENE IN PATAGONIA (ARGENTINA)**

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Paleoparasitological studies on sediments from archaeological sites with human occupation provide evidence of possible parasitosis to which men and animals could be exposed in the past. In Patagonia there are numerous rock caves and eaves that have been occupied alternatively both by humans and animals. In this study, 4 samples of coprolites collected from the archaeological sites Cerro Casa de Piedra 7 (CCP7) and Cerro Casa de Piedra 5 (CCP5), located in Parque Nacional Perito Moreno, Santa Cruz Province, Argentina, previously attributed to humans, were examined. Samples correspond to layer 1 from CCP7, and to layer 2 from CCP5, dated at 3480 and 2740 years BP, respectively. They were rehydrated with a trissodium phosphate solution and 10% acetic formalin, homogenized and allowed to spontaneously sediment, from both the surface and the interior of each coprolite. Microscopic observations were made and the eggs of parasites were measured and photographed. Results obtained showed the presence of eggs of *Calodium* sp. and probably of trichostrongilids (Nematoda), oocysts of *Eimeria macusaniensis* (Coccidia), eggs of taenids (Cestoda) and Acanthocephala. Although it could not be given the generic filiation of some parasites, the presence of eggs of tapeworms represents the first record for Late Holocene in Patagonia and shows that parasitism by cestodes existed in the region in pre-Columbian times. The presence of *E. macusaniensis* suggests the human consumption of camelids. The results indicate that in the Late Holocene zoonoses between humans and other vertebrates may have been a characteristic of the inhabitants of Patagonia.

*Key words: paleoparasitology; coprolites; humans; Patagonia; Late Holocene*

### **MULTIPLE PATHOLOGY AND TREPANATION ON THE NORTHERN COAST OF SANTA CRUZ, ARGENTINA**

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Paleopathological analysis contributes to the knowledge of health and disease patterns of prehistoric groups. The purpose of this study is to describe the lesions present in a skeleton recovered from an archaeological rescue excavation in the North Coast of Santa Cruz (Argentina). We discuss the probable cause of pathological conditions as well as the evidence of therapeutic procedures. The skeletal remains come from a “chenque” primary individual burial at Site Carsa (Puerto Deseado), classified as a shellmound. The remains belong to an adult, with a chronological age of approximately 23 years, male, with a height estimated in 1.66 m. Macroscopic, radiographic and tomographic analyses were performed on the material. The skeleton shows injuries in the facial region, affecting the left sphenoid, frontal and maxillary sinuses, attributable to fibrous dysplasia. Both femurs, skull, jaw and ribs have lytic-proliferative lesions attributable to a nonspecific osteomyelitis or a kind of pathological treponematosis. Another unusual feature observed is the existence of a hole that goes through the cranial diploe; this hole is probably intentional (trepanation) and could be inferred as a therapeutic procedure

linked to some of the pathologies listed above. The importance of this finding in the Northern Coast of Santa Cruz is remarkable because there were not many skeletal remains found in this region and the particular characteristics of the human remains analyzed here offer meaningful information about health and disease in the extinct populations of the area.

*Key words: infection; trepanation; fibrous dysplasia; Santa Cruz*

## **DENTAL PATHOLOGY IN THE ANTHROPOLOGY COLLECTION OF THE MUSEUM OF NATURAL SCIENCES, ZOOBOTANIC FOUNDATION, STATE OF RIO GRANDE DO SUL, BRAZIL**

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The anthropology collection of the Museum of Natural Sciences of the Zoobotanic Foundation of the State of Rio Grande do Sul (MCN-FZB/RS) is the only reference of human skeletal series for morphological and pathological studies in Brazil. The Collection was assembled of exhumed skeletons between 1985 and 1992 from Santa Casa de Misericórdia Cemetery, Porto Alegre City. It includes 86 complete, or almost complete, identified individuals who died between the decades of 1960 and 1980 and it also includes data, such as age, sex, *causae mortis*, birth place and occupation. There is a handbook with laboratory examinations, diagnosis and treatment for some individuals. The collection is composed of 51 male individuals (neonates to 90 years old) and 35 female ones (10 to 94 years old). Dental pathologies were analyzed and x-rayed; nonparametric statistical tests for the Mann-Whitney Test were also applied; Wilcoxon W and Kruskal-Wallis Tests (NPar Test) were applied in 6 of them: caries, dental calculus, abrasion, periapical lesion, periodontal lesion and enamel hypoplasia, compared to sex and age. Caries and calculus were the most frequent pathologies found in the results. The statistical tests showed through multiple comparisons between pathologies and ages that there is an important difference to the appearance of calculus and enamel hypoplasia, concluding that this is not related to those pathologies, but there is an increase of caries and periapical lesions with increased age. Dental calculus acts mainly from the second to the fifth decade of adults' lives. In relation to the sex, the pathologies were higher in males (66%); the decade of life that

showed more pathology in relation to their ages was the fourth, with 32% of the individuals affected. The results are in accordance to the sampling collection.

*Key words: skeletal series; dental pathology*

### **UNUSUAL MANIFESTATION OF STAFNE'S BONE DEFECT OF THE MANDIBLE**

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There has been confusion as to the etiology of "Stafne's Bone Cavity" (SBC) since Stafne reported the first case in 1942 (1) and hypothesized it as a congenital anomaly, but this view is not widely accepted, as SBC is not observed in children. Salivary gland tissue was found within these defects, therefore, intrusion and/or pressure from the surrounding salivary glandular tissue is currently considered to cause this condition (2). Clinically, the SBC has no symptoms and is observed in panoramic radiography as a cyst-like oval radiolucent image with peripheral cortical bone thickening, in the vicinity of the gonial angle, inferior to the mandibular canal. The following bilateral bony lesions were found in the mandible of a 50-60 year old male skeleton excavated from the cemetery of Assos, in Turkey. The tentative diagnosis was that the cavity on the left medial mandibular ramus was a SBC, and the bony growth in a similar location on the right was an exostosis or an osteoma. The mandible was imaged by computerized tomography (CT) and a 3D image of the mandible was constructed by manipulating CT images with the "Amira 4" software. This revealed that the intra-bony segment of the bony protrusion on the right had a similar configuration to the depression on the left. The final diagnosis is that these two lesions are related, and initially both were SBCs. At a later stage, the submandibular gland tissue within the right lesion under-went fibrosis due to chronic mechanical irritation, followed by calcification. This calcification extended beyond the medial border of the mandible into the adjacent salivary glandular tissue, giving rise to the bony protrusion. This case confirms the etiology of SBC, as due to the intrusion or pressure from the surrounding major salivary gland tissue on the mandible.

*Key words: mandible; cyst; osteoma*

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### **PATHOLOGICAL EVIDENCE IN A PLEISTOCENE GLYPTODONT FROM CORDOBA STATE, ARGENTINA**

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The existence of some osseous pathologies in South-American Pleistocene megamammals is well known; nevertheless research about the glyptodonts shell's lesions is scarce. This research refers to some diseases found in a *Neosclerocalyptus* sp. Paula Couto, 1957 (Glyptodontidae, Hoplophorinae) specimen found within late Pleistocene epoch loessic ground, in Corral de Bustos town, state of Cordoba. The fossil was recovered by personnel of the MCNC (Natural Science Museum of Cordoba) in 1982. Then, twenty five years later, because of the reevaluation of its collection, the fossil specimens were reviewed under a deep research. Most of

them were dorso-caudal shell traces (MCNC-PV-72-1) and from the full caudal tube (MCNC-PV-72-2). The researched pathologies occur as perforations or punctuations within 1mm diameter. Their density is non-fixed and achieves concave surfaces that partially and even totally occlude the osteoderm ornamentation, giving them a spongy texture. The bumped surfaces are placed surrounding the shell's caudal edge, affecting the margin plaques, decreasing to scatter towards the dorsal area. These holes are also found as slots within some hurt areas reaching up to 3.5 mm deep, always axially arranged. The caudal tube mainly reveals its porosities over the central area, increasing their density towards the proximal end. These lesions are considered as infectious pathologies. The ulterior shell area placing coincides with the caudal fenders lesions possibly produced because of intraspecific fights. Due to this, these pathologies are suspected of having a traumatic origin.

*Keywords: glyptodont; Neosclerocalyptus; osteoderm*

### **FUNCTIONAL STRESS MARKERS IN ARCHAEOLOGICAL POPULATIONS FROM SOUTHERN SIERRAS PAMPEANAS (CÓRDOBA PROVINCE, ARGENTINA) DURING LATE HOLOCENE**

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In this study, functional stress markers associated with osteoarthritis (osteophytes, porosity, eburnation) are analyzed in order to infer patterns related to habitual activities developed by individuals who inhabited different environments in the southern region of Sierras Pampeanas during late Holocene. Also, the degree and extension of these markers are considered. The sample is composed of 32 young and middle adult individuals (18 males and 14 females) from 23 archaeological sites. Based on eight radiocarbon dates and archaeological data, these sites are chronologically associated with the late Holocene. Functional stress markers were registered by coding types of lesions, degree of development and extension, and by identifying their presence in different anatomical parts. *Chi-square* statistical test was applied in order to test the possible existence of significant differences concerning sex, age and chronology of individuals. Results would be indicating that a) neoformations, Schmorl nodes and porosity's degree and extension are similar in vertebral columns of both sexes; b) in the appendicular skeleton osteophytes are less frequent than in the column, with a low predominance among female individuals; c) porosity and eburnation almost exclusively affect upper limbs in both sexes, in a barely discernible degree. As a consequence, it can be said that habitual activities generally involve a moderate stress level, especially in the vertebral column and may be related to weight loading. And, even though task division cannot be assured, there are sex differences, for instance in the greater use of upper limbs among females.

*Key words: osteoarthritis; functional stress; southern region of Sierras Pampeanas*

## **GENETIC EVIDENCE OF INFECTION BY HELICOBACTER PYLORI IN PRECOLUMBIAN CHILEAN MUMMIES AND ANALYSES OF GENETIC DIVERGENCE BETWEEN ASSOCIATED STRAIN AND CURRENT CHILEAN POPULATIONS**

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The following project searches evidence that supports the hypothesis of the infection by *H. pylori* in human populations before European contact and that allows us to infer their genealogic origin and pathogenicity in mixed populations from Chile. For this, a paleopathological approximation will be used by the study of mummified tissue samples of prehistoric individuals from north Chile, and from a genetic viewpoint by the comparative analyses of strains of human populations from the metropolitan region and Asiatic strains. For the prehistoric sample, three adult mummies from the Chilean Great North will be used and the current samples will be obtained from gastric biopsies of patients from the metropolitan region. DNA will be extracted and identification of *H. pylori* by specific primers to the *vacA* gen will be made. Finally, the characterization of molecular divergence between ancient and current strains will be made. If *H. pylori* is detected in pre-Columbian mummies, it will contribute significant evidence about the infection by the bacteria in human populations before the European contact. Moreover, the analyses of bigger genetic fragments will allow observation if the strain presents homologies with some Asiatic type and if the pathogenicity gene had been present in the antique strains. In addition, the comparison with current recombinant strains could present an opportunity to infer the genealogy and evolution of the infection in mixed populations.

*Key words: H. pylori; mummies; current human populations; gen vacA; molecular divergence*

## **THE CEMETERY OF THE OLD SALESIAN MISION “LA CANDELARIA” (TIERRA DEL FUEGO, ARGENTINA)**

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The Native-European contact process in Tierra del Fuego constitutes a complex phenomenon temporally as well spatially. In 2005, we started studying the health-illness process in the north of the Great Island of Tierra del Fuego at the end of the 19<sup>th</sup> and beginning of the 20<sup>th</sup> century, specifically in the Salesian Mission “La Candelaria (Rio Grande, Tierra del Fuego, Argentina). The first analyses from historic documents conducted by Casali (2008) suggested that tuberculosis was the main cause of death among natives and allows generating expectations about diet, activity, health and mobility. The aim of this work is to present the bioarchaeological and paleopathological results obtained from human bone remains of the nine individuals recovered in the fieldwork of 2009 in the sector “superficie 1” of the salesian cemetery of “La Candelaria” and the two individuals recovered in earlier fieldwork. Moreover, some polinologic

results obtained from sediment samples of abdominal cavities are presented. The results of stable isotopes in two individuals agreed with the values available from native populations of pre contact periods in the north of Tierra del Fuego. The paleopathological results showed lesions attributed to unspecific infectious processes (periostitis) and systemic stress indicators (Harris´ lines, trabecular bone alterations, hypoplasia of dental enamel, hyperostosis porotica, and cribra orbitalia), possibly as a result of nutritional or metabolic disorders. Also, osteoarticular lesions were noted, principally in the axial skeleton. Lesions of specific infections, as tuberculosis and other respiratory pathologies, were not found.

*Key words: Salesian Mission; Native-European Contact; Tierra del Fuego*

### **SKULL BASE DISTURBANCES IN SUBADULT INDIVIDUALS FROM A CONTEMPORARY OSTEOLOGICAL COLLECTION**

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The cranial base develops from numerous ossification centers that fuse during the first years of life. In skeletal remains of individuals less than 2 years old with normal growth, different bones that will give rise to the cranial base, particularly to the occipital and sphenoid, can be observed. This paper intends to communicate the discovery of a series of skull base abnormalities in subadult individuals from Prof. Dr. Romulo Lambre´s Osteological Collection. We observed 151 skeletons of subadults (from unborn to 2 years) from La Plata City Cemetery who died between 1963 and 2000 and we found 7 individuals, aged between non-born to 4 months of age, with various developmental defects in the skull base: nonpathological variety in the form of basioccipital early fusions and malformations. We believe that the interpretation of findings from skeletal remains, the recognition of normal variants and pathologies in the development contributes to the reconstruction of the particular individual and community level.

*Key words: skull base; occipital; sphenoid; subadult; bone collection*

### **PALEOPARASITOLOGICAL, PALEOGENETIC AND ARCHAEOBOTANIC ANALYSIS FROM 18TH CENTURY COPROLITES OF THE CHURCH LA CONCEPCIÓN, SANTA CRUZ DE TENERIFE, CANARY ISLANDS, SPAIN**

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In this study we present the results of the paleoparasitological, paleogenetic and archaeobotanic analysis of a coprolite recovered during the excavation of the church “La Concepción”, in Santa Cruz de Tenerife. Since its foundation at the beginnings of the 16th century until the end of the 18th century, the dead were buried in this place following Catholic

liturgy. The coprolite belongs to a young female who died towards the end of the 18th century. Besides numerous silicified remains belonging to crops, seeds and fruits of the Moraceae family, several eggs of *Ascaris lumbricoides* were also identified in the coprolite. The paleogenetic analysis of the sample origin was defined based on mitochondrial human DNA and nad1, cox1; and 18S RNA *Ascaris* sp. genes were analyzed. The results confirmed *Ascaris* infection, as well as the European human origin of the sample. This finding contributes to our knowledge about health status of the 18th century European population and it is the first interdisciplinary paleoanalysis performed in Canary Islands.

*Key words: paleoparasitology; coprolites; Ascaris eggs; ancient diseases*

### **PALEOPATHOLOGICAL ANALYSIS OF HUMAN BONE REMAINS FROM THE ARCHAEOLOGICAL SITE FINCA ELIAS 1 (TUCUMÁN, ARGENTINA)**

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The aim of this paper is the analysis of human skeletal remains from a primary burial, discovered near the town of Alberdi, southern Tucumán province. The burial is associated with a formative context (*ca. 2400-1200 BP*). The archaeological works in the Tucumán foothills have been scarce, especially those that address the study of human skeletal remains. The research is part of osteobiography since the remains are those of a single individual, which is presented incomplete, with an estimated age of 30 years. The analysis involves a gross inspection of the bones in order to estimate possible diseases associated with them. The results produced evidence of degenerative bone disease affecting the spine and lower extremities. The most affected part of the column is the thoracic region with the presence of marginal osteophytes in the vertebral body and the facet joints of transverse processes, as well as collapse and fusion of vertebrae. In the lower extremities we find eburnation of metatarsal bones facet joints and phalanges with deformed epiphyses. We believe that the observed changes in the vertebrae are not linked directly to an osteoarthritis product of aging but a functional stress due to repetitive mechanical activities affecting bones and joints, accelerating the degenerative processes.

*Key words: osteobiography; pathologies; lifestyle; prehispanic; Argentine Northwestern*

### **INTERPERSONAL VIOLENCE IN NORTHERN PATAGONIA (ARGENTINA): METHODOLOGY PROPOSED**

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In this presentation, the pattern of violence inflicted in northeastern Patagonia during the Late Holocene is showed. It also emphasizes the usefulness of the methodology applied. The lines proposed are: frequency, type and distribution by sex and age of lesions, macro and microscopic analysis of marks on bones in both archaeological and experimental contexts; types of devices capable of causing lesions in archaeological contexts and indirect indicators (iconography and fortifications). A sample of 417 skulls of the lower valleys of the Negro and Chubut rivers was analyzed. The signs of violence are significantly higher in the Negro river. Taphonomic evaluation allows us to infer that this result is not biased by differences in preservation, since the sample of Chubut is better preserved. Also, the later sub-sample of Negro river is the one that most frequently presents injuries. This sample did not show significant differences between sexes, while in the Chubut one there were no identified female skulls with evidence of violence. On the other hand, an experimental program was implemented. Skulls of

pigs as human analogues were used, which were impacted with original swords in order to compare the lesions produced with a recurrent type in late archaeological samples (linear depressions). The macroscopic approach suggests that the archaeological linear depressions could be a product of this type of weapon, used since the beginning of Spanish-Indian contact. The exploration of the regional lithic technology suggests that such injuries would not have been generated with these artifacts, supporting the results obtained in the experimentation. The inference of patterns through signals bone, often ambiguous, requires the implementation of programs which consider multiple lines of independent evidence. The implementation of such a methodology resulted to be very useful.

*Key words: interpersonal violence; northeastern Patagonia; late Holocene; multiple lines of evidence; hunter-gatherers*

### **OSTEOMYELITIC PROCESS IN A CLAVICLE**

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In 2007 we were able to study a large collection of human remains recovered in an archaeological context in the Cerro Lutz site. The site, excavated by Loponte, Acosta and collaborators, is located on a ridge associated with an ancient bed of the Martínez stream in the southern sector of the wetlands of the lower Paraná River in Argentina, near the city of Villa Paranacito, in the province of Entre Ríos. The remains offer many interesting samples of physiological and pathological markers, both skeletal and dental, that can be related to styles of life. We present here a more detailed analysis of a pathological marker in the right clavicle of a male specimen that would have been about 34 years old at the time of its death and for which the dating is 730±70 years C14 AP (LP – 1711). The specimen exhibits a cavitated lesion opened to the inferior face of the bone, next to internal epiphysis, with irregular edges, 1.2 cm. in diameter. On the cross section, the pathological finding shows rough internal surface and sclerotic edges. Radiographic, macroscopic and histologic examinations were performed.

*Key words: clavicle; osteomyelitis; adult male; hunters and collectors; methods*

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### **PAGET'S DISEASE IN A PRE-HISPANIC TIBIA IS CONFIRMED BY HISTOLOGICAL SECTIONS**

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In 1947, in the “Cerro Grande” of Los Marinos island, Rio Paraná, Argentina, a pre-hispanic pagetic tibia was recovered. Radiographic, CT scan, macroscopic and histologic examinations were performed. Differential diagnosis is considered, and present-day etiological theories (viral, genetics) are discussed. New fields of paleopathological analysis could allow the

study of biological relationships between different populations that lived along the Southern Paraná River.

*Key words: Paget's disease of bone; paleopathology; pre-hispanic period; histological sections; Southern Paraná River*

### **OSTEOLOGICAL EVIDENCE OF INTERPERSONAL VIOLENCE AT CAÑADÓN LEONA 5 (MAGALLANES, CHILE) DURING THE LATE HOLOCENE**

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Cañadón Leona 5 is an archaeological site located on the eastern margin of Laguna Blanca, about 10 km from the Magellan Strait, Magallanes province, República de Chile. The rockshelter was first excavated by the American archaeologist Junius Bird in one field season (1935-1936), recovering two human burials and a number of other archaeological evidence (Bird 1988). Burial 2 is composed of 8 individuals (2 subadults and 6 adults), currently housed at the Anthropology Division, American Museum of Natural History, New York. In this assemblage, two calvaria with compressive trauma were found. Individual CL.2.1 (99.1/770; male, 33-37 years old at age of death) exhibits a circular perforation on left parietal bone, with both external and internal table compromised and some rim remodeling. Individual CL.3 (99.1/771; female, 35-40 years old at age of death) shows a remodeled subcircular open depression on the right parietal and an associated fracture also compromising the parietal. In both cases it is inferred that these unhealed lesions were related to the circumstances of death. As a working hypothesis, we postulate a relationship between cranial trauma and interpersonal violence in a context of increasing territorial competence between neighboring hunter-gatherer groups at a time (*ca.* 2300 AP.; Prieto *et al.* 1988) for which a significant increase in population density can be inferred by means of independent archaeological evidence.

*Key words: hunter-gatherer; region of Magallanes; cranial injury; interpersonal violence; late Holocene*

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### **PROBABLE PERIMORTEM TRAUMA AND INFECTIOUS LESIONS IN A COMPLEX MULTIPLE BURIAL PROCEEDING FROM CHENQUE I SITE**

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Palaeopathological lesions observed in burial # 16 from Chenque I site (Lihué Calel National Park, La Pampa province, Argentina) is described and discussed. This site is a cemetery recurrently used by hunters-gatherers during the late final Holocene. The Minimum Number of Individuals estimated up to the moment is 216 for the excavated portion of the site (about 25 %). Burial # 16 is a funeral package that consisted of five primary subadults of both sexes and between birth and one year-old, closely associated with a 30-39 year-old male that

presents dismemberments in several anatomical portions (three sections of the vertebral column and the disarticulation of upper and lower limbs), following a mortuary practice named *disposition*. A layer of 227 beads forming part of the bundle of the package was also identified. This poster focuses on the analysis of the subadults, several of which present two distinctive characteristics. On the one hand, they show different degrees of periostitis, which is especially important because the prevalence of this pathology in the rest of the individuals of the site is extremely low. On the other, evidence of possible perimortem trauma in several subadult skulls, in the form of depressions and osseous subcircular fractures, with secondary derivative lines, was also identified. As the probable existence of practices of infanticide in the site was previously suggested, one of the possible interpretations would be that the deaths of these subadults were intentional in order to include them in the mortuary package of the adult.

*Key words: Chenque I site; cemetery; hunter-gatherers; periostitis; trauma*

### **NOTE ON PATHOLOGIES IN POPULATIONS OF MENDOZA (ARGENTINA) DURING THE COLONY: OSTEOARTHRITIS**

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The objective of this article is to show the results of discussions about the incidence of osteoarthritis in a sample of 10 individuals reclaimed in different colonial temples from Mendoza city. We analyze the predominance and the distribution of this pathology according to sex and age. This information is analyzed within burial contexts because bioarchaeological studies in these places are connected to the church and are in their initial phase in the region. We hope to make a contribution to the characterization of the health state of the society between 1561 (year of foundation of the city) to XIX century. The results show a distribution of this pathology in adult individuals specially, whereas the subadults do not display signs of it.

*Key words: bioarchaeology; Colonial temples; osteoarthritis; Mendoza*

### **BIOARCHAEOLOGY OF THE SITE ARQ 43, SAN JUAN PROVINCE, ARGENTINA**

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In this paper we present the finding of human bone remains belonging to the Arq 43 site of Gualcamayo, San Juan province, rescued in succeeding campaigns executed between the years 2007 and 2008. Such remains can be ascribed chronologically to the Late Period (1200-1450 AD), although no absolute dating that allows a more accurate definition of age has been made. The site consists of 14 primary and 4 secondary burials. The total of individuals counted is 18, being their sample composition: 3 infants, 6 young adults (3 females and 2 males), 2 older male adults and 2 adults with no established age. As regards pathologies related to nutrition, two individuals present porotic hyperostosis in ocular orbits. On the other hand, Schmorl's nodes and non specific infections on diverse skeletal parts could be observed. As regards trauma, two fractures were found, one in a forearm and another in a hand and a cranial injury, probably produced by some weapon. About oral health, a strong dental wear has been found in almost all

the pieces, even in juvenile individuals; such as caries presence in 3 individuals, or abscesses presence in another 4. In this site, two particular characteristics were found: on the one hand, several of the individuals studied present a fused and curved sternum, some of them with foramen; on the other hand, the conditions of aridity in the site has allowed the preservation of the calcified thyroid cartilage in some individuals, pointing to the advanced age of these individuals.

*Key words: San Juan; Late Period; oral health; nutritional bioindicators*

### **ACAUÃ: USING TOMOGRAPHIC IMAGES TO STUDY A MUMMIFIED BODY OF A HORTICULTURALIST BRAZILIAN GROUP**

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30 years ago a partially mummified body of a child was found in the Lapa do Gentio II, at Minas Gerais, Brazil. The mummy was associated with a horticulturist occupation. This rare finding and associated artifacts justified its preservation for museological purposes. Exploratory analysis of the abdominal content leads to the first finding of parasite eggs in coprolites *in situ* for a Brazilian team. The team of parasitologists of Fiocruz published it in the seventies. In the last year the study of CT scanning images of that mummified body brought new interesting findings. Confirming age, suggesting the sex was female, confirming the presence of Harris lines, and helping to understand taphonomic changes and associated artifacts, the recent analysis was based in much more detailed images and 3D reconstructions, a modern and powerful resource for bioarchaeology. The masses of coprolites that provided the first important paleoparasitological findings in Brazil were also finally demonstrated in the colon content.

*Key words: Acauã; horticulturalist Brazilian group; tomographic images; mummified body*

### **ORAL PATHOLOGIES ON HUMAN SKULLS OF PATAGONIA NORTHEAST (REPÚBLICA ARGENTINA)**

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The aim of this paper is to contribute to the discussion of the model of economic intensification and expansion of the diet of hunter-gatherer populations of northeastern Patagonia that was proposed previously by different authors using bioarchaeological evidence. Currently, the prevalence of various dental and periodontal indicators (caries, abscesses and loss of teeth antemortem, periodontitis, displacement of teeth and alveolar labiation edge) is under study in late diachronic samples consisting of skulls of the study area. The samples selected for this study come from the lower valley of the Black River and belong to the collections deposited in the Anthropology Division of the Faculty of Natural Sciences and Museum of the Universidad Nacional de La Plata. The skulls (n = 221) are mostly (212/221) of adult individuals, of whom 100 are female, 98 male and 23 undetermined. This sample was chosen because of the deep temporal sequence in a micro-regional area, with a chronological range which includes the last 3000 years radiocarbon AP. Because the objective of this project is to evaluate the existence of temporal trends in the manifestation of the various indicators of interest, the total sample was

subdivided into subsamples diachronically established on the basis of the type of artificial cranial deformation, a feature that is an efficient chronological indicator in Pampa and Patagonia. In this paper we present preliminary results of the studies currently underway, which will be discussed in function of the working assumptions contained in the economic enhancement model mentioned above. In addition, we will establish comparisons with prevalence values obtained for the same indicators in previous studies carried out on samples of the Late Holocene in the southeastern Pampas, an area that has close ties with the biological and cultural Northeastern Patagonia during the Late Holocene.

*Key words: Patagonia northeast; hunter gatherers; oral pathologies; southeast Pampa*

### **TEMPORAL TRENDS IN DENTAL CARIES AND WEAR IN HUMAN POPULATIONS OF NEUQUEN (PATAGONIA, ARGENTINA) DURING THE LATE HOLOCENE**

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The aim of this paper is to explore temporal trends in the frequency of caries and degree of dental wear on the human groups that inhabited the province of Neuquén in the Late Holocene. We analyzed the permanent teeth of a sample of 31 adult individuals of both sexes from various archaeological sites in the region. Based on the chronology obtained by radiocarbon dating, the samples were divided into three time periods (4000-3000, 1000-400 and >400 years BP). The results show a high degree of wear, both in anterior and molar pieces in the earlier period. This is consistent with the highest percentage of individuals with exposed pulp cavity (33%). The group also has the highest percentage of individuals with abscesses (27% against 12.5% for the subsequent periods), which might be expected, since most pulpal exposure favors the entry of foreign matter that may increase the possibility of infection. Moreover, it was noted that the group from the period >400 AP had the highest percentage of individuals with caries (75%), mostly of the occlusal type. In summary, there is a temporal trend towards reducing wear and increasing dental carious lesions. These results are discussed in relation to differences in the type of food consumed and the technology (pottery, mortars) used for processing them.

*Key words: northern Patagonia; oral health; dental wear; diet; late Holocene*

### **HTLV IN PRE-COLUMBIAN MUMMIES IN BOLIVIA**

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**Introduction:** The prevalence of HTLV-1 and 2 among contemporary Amerindians has raised the hypothesis of their spread from Africa to the New World following ancestral human migrations. Concerning HTLV-1, other routes, specially the African slave trade for centuries, are noted. The complete scenario about the forces that drive the worldwide distribution of HTLV is still incomplete. Here we present, for the first time, biological evidence of the presence of HTLV-2 in a human remain from Tiwanaku archaeological site from Bolivia (1.750BP) and the recovery of ancient DNA (aDNA) sequence corresponding to the segment of *tax* gene virus type 2. Moreover, we also recovered the segment of *tax* gene type 1 from human teeth obtained in a Chuquisaca archaeological site, Bolivia (800-1200DC).

**Methodology and Results:** The samples were processed following all recommendations concerning aDNA manipulation in order to avoid contemporary contamination. Initially, aDNA hybridization screening of 29 naturally mummified human tissues from Bolivian archaeological sites, using *tax* and LTR HTLV as probes, identified two positive samples. A second hybridization using HTLV-1 and 2 specific probes confirmed positiveness to HTLV-1 and HTLV-2. PCR targeting *tax* gene was applied, and the 219 bp amplicon was sequenced, revealing the presence of HTLV-1 virus in sample 1710, from Chuquisaca, and HTLV-2 in sample 1590 from Tiwanaku. The sequence analysis of the human mitochondrial DNA HVS-I region characterized the 1590 sample as belonging to haplogroup D, one of the major Amerindian haplogroups.

**Discussion and Conclusion:** A controversial paleogenetic study with Chilean mummies from pre-Columbian times had demonstrated the antiquity (1500 ya) of human HTLV-1 infection in South America. Here we have new evidence corroborating their findings. Moreover, supporting the epidemiological hypothesis and linking the virus out of Africa following the ancient human migrations, the ancestral presence of HTLV-2 in Amerindians is demonstrated.

*Key words: mummy; Bolivia; HTLV-2; HTLV-1; Tiwanaku; human mtDNA*

## **METHODOLOGICAL PROPOSAL FOR THE STUDY OF MICROFOSSILS IN COPROLITES**

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The study of microfossils contained in coprolites allows an approach to diverse ecological and cultural aspects, such as diet, parasitism, health, environment, seasonality in the use of the resources and domestication. Due to the difficulty of obtaining coprolite samples in some archaeological contexts, it is important to optimize the microfossils extraction in order to obtain the greatest possible quantity of inclusions without preventing the development of other studies. In this work, a methodological proposal to recover the pollen content in samples already processed for palaeoparasitological analyses is presented. Presumably human coprolites were studied, from the site Cerro Casa de Piedra 7 (47°57,322'S; 72°5,680'W), Parque Nacional Perito Moreno, Santa Cruz, dated 6150±105, 8920±200 and 10530±620 years BP. For the palynological analysis, remnant sediments from the palaeoparasitological studies, belonging to the internal and external fraction of every coprolite were used. Firstly, to every fraction, a tablet of spores of *Lycopodium clavatum* (as a foreign marker and for calculating the pollen concentration) was added. Then, every fraction was dried off, weighed, re-suspended with distilled water and finally, acetylated. This procedure turned out to be suitable since 22 pollen types, spores, diatoms, coal particles and plant tissues could be recovered and identified. Beyond the utility of this methodological proposal, it is convenient to previously observe the macroscopic composition of the sample to be analyzed in order to decide the steps to be applied in the processing.

*Key words: microfossils; coprolites; palynology; palaeoparasitology; methodology*

**INTERPERSONAL VIOLENCE IN QUEBRADA DEL TORO (SALTA, ARGENTINA)**PLISCHUK, MARCOS<sup>1</sup>; DE FEO, MARÍA EUGENIA<sup>2</sup> & DESANTOLO, BÁRBARA<sup>3</sup><sup>1</sup>Facultad de Ciencias Médicas, Universidad Nacional de La Plata, La Plata, Argentina Calle 60 y 120. - marcosplischuk@yahoo.com.ar<sup>2</sup>Museo de Ciencias Naturales La Plata - eugeniadefeo@yahoo.com.ar<sup>3</sup>Facultad de Ciencias Médicas. Universidad Nacional de La Plata. Cátedra de Citología, Histología y Embriología - barbaradesantolo@fcnym.unlp.edu.ar

Bioarchaeology has been providing information about episodes of interpersonal violence among prehistoric human groups. This study aims to present new evidence on this phenomenon for the area of the Quebrada del Toro (Dto. Rosario de Lerma, Salta, Argentina). The analyzed skeletal material comes from the structure n° 3 of the Tres Cruces site, chronologically located in the Formative period (400-900 AD). This is an adult male individual found in a multiple burial, estimated to be 35-45 years of age. It shows signs of cranial deformation, a groove running along the lambdoid suture that cannot be ascribable to any of the classification types. It also presents evidence of two traumatic episodes in its skeleton, from which one can infer interpersonal violence situations. Within the right parietal there is a direct trauma depression; it has a circular edge and has been caused by a blunt object with a low impact velocity. A complete regeneration of compact bone can be observed, but the injury can be clearly delineated. This lesion has the same characteristics as those described for the site Las Pirguas (Salta), which chronology and ceramics associated contexts are also similar. The second consists of a drilling trauma including a projectile point in the 4th lumbar vertebra, with no sign of bone regeneration. The temporal distance between traumatic events suggests an effective care of the individual. Even though this is the first identified case showing trauma attributable to social tension in this period, the projectile point embedded in the bone is evidence that permits the inference of a violent situation. Finally, we believe that this information, together with that from the burial context analysis, can offer a framework to analyze the social complexity of the prehistoric people of the area in question.

*Key words: trauma; burial; violence; “formative superior” period*

**EXTERNAL AUDITORY EXOSTOSIS “AT THE END OF THE WORLD”: THE SOUTHERNMOST EVIDENCE ACCORDING TO THE LATITUDINAL HYPOTHESIS**PONCE, PAOLA<sup>1</sup>; GHIDINI, GABRIELA<sup>2</sup> & GONZÁLEZ-JOSÉ, ROLANDO<sup>3</sup><sup>1</sup>Department of Archaeology, University of Durham, Science Site, South Road, Durham DH1 3LE, UK. - paolavponce@hotmail.com<sup>2</sup>Equipo Argentino de Antropología Forense<sup>3</sup>Centro Nacional Patagónico, Consejo Nacional de Investigaciones Científicas y Técnicas

External auditory exostosis (EAE) is a bony anomaly of the external auricular canal associated with prolonged exposure to cold water. According to the latitudinal hypothesis proposed by Kennedy (1986) the prevalence of this anomaly falls as the latitude increases north and south above the 45° because of the risk of suffering from hypothermia while swimming in very cold waters. As according to this author no previous anthropological evidence of EAE was found for populations living beyond this latitude in the southern hemisphere, the aim of this paper is to examine the evidence for EAE in the southernmost ethnographic groups who ever inhabited the world, the island of Tierra del Fuego. For this purpose, 108 crania of adult males and females were analysed. They belonged to the Selk'nam and Haushs or “terrestrial Fuegians” whose main subsistence economy was based on hunting and gathering terrestrial products and

the Yamanas and Alacalufs or “marine Fuegians” who practiced an economy of hunting and fishing marine resources. It was found that 6 out of 108 crania (5.5%) exhibited EAE from which one belonged to a male, 1.8% (1/56) and five to females, 9.6% (5/52). One cranium 1.9% (5/53) belonging to a “terrestrial Fuegian” exhibited EAE compared with five crania 9.1% (5/55) belonging to “marine Fuegians”. The evidence suggests that EAE might be associated with the exploitation of marine resources although the prevalence differences between both groups were not statistically significant  $2.670$  ( $df=1$ )  $0.206$   $p>0.05$ . Future analyses involving other sources of information along with a larger number of individuals are necessary to confirm this hypothesis. In conclusion, in accordance with the hypothesis proposed by Kennedy (1986) the prevalence of EAE was as expected for the latitude in which the island of Tierra del Fuego is located where the weather is known for its harshness and hostility.

*Key words: auricular exostosis; auditory exostosis; hunter-gatherers; Amerindians; Tierra del Fuego*

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### **A POSSIBLE CASE OF MULTICENTRIC OSTEOSARCOMA IN AN INDIVIDUAL FROM 19TH CENTURY WOLVERHAMPTON, ENGLAND**

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Osteosarcoma is a rare type of malignant and aggressive neoplasm from which patients very rarely survive. It tends to affect mainly adolescents and young adults although it can develop at any age. According to Resnick et al (2002), it can metastasize from a primary site in one location to other bones and soft tissues (unicentric osteosarcoma) but some cases have multifocal, bone-forming lesions (multicentric osteosarcoma). In the latter, two variants can be present, synchronous multicentric, that results from bone-forming lesions that develop simultaneously at multiple sites or metachronous multicentric, that results from lesions that arise independently but at different times. Distinguishing between these two types of multifocal osteosarcoma is challenging in a clinical context and the criteria for doing so are unlikely to be met in bioarchaeology. The objective of the present study is to report on a possible case of multicentric osteosarcoma in a male individual (HB39) of at least 45+ years of age excavated from an early-nineteenth century cemetery site in Wolverhampton, England. The axial and appendicular skeleton exhibited a combination of lytic and blastic lesions. The former penetrate the cortical bone forming clusters of pores that vary in size and the latter represented by aggressive bony outgrowths and sunburst lesions. The variation in the size of the osteoblastic lesions argues against synchronous multicentric osteosarcoma and while it is conceivable that the lesions could have started at the same time but developed at different rates, this seems unlikely. The adult age of this individual also argues against the synchronous variant of multicentric osteosarcoma. The evidence is also insufficient to distinguish between, metachronous multicentric and metastatic unicentric osteosarcoma. Since there is no clinical history or data belonging to this individual, the wisest option is to keep the diagnosis less specific as multicentric osteosarcoma without distinguishing between synchronous or

metachronous multicentric osteosarcoma. The individual also showed pathognomonic signs of diffuse idiopathic skeletal hyperostosis (DISH) whose diagnosis is also discussed.

*Key words: neoplasm; multicentric osteosarcoma; DISH*

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### **PALEOPATHOLOGY OF CHILDREN AND SKELETAL REPRESENTATIVENESS: THE SAMBAQUI DE CABEÇUDA SERIES EXAMPLE**

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Skeletal representativeness of immature individuals is an important issue regarding childhood health studies. A detailed analysis of the Sambaqui de Cabeçuda osteological collection – a large prehistoric shellmound in the Brazilian south coast - is in progress centered in the evaluation of quantity and integrity of immature skeletal remains. Preliminary results from two distinct occupational areas and 25 immature individuals observed indicate poor representativeness of most skeletal parts in individuals below 10 years old. We discuss the difficulties and possibilities of paleopathological investigations considering the limitations imposed by poor skeletal representation.

*Key words: childhood; paleopathology; Sambaqui; shellmound; Brazil*

### **BIOARCHAEOLOGICAL INDICATORS OF INTERPERSONAL VIOLENCE IN QUEBRADA DE HUMAHUACA AND VALLES CALCHAQUI CA. 1000-1430 A.D.**

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Our aim is to evaluate the available bioarchaeological evidence to study the existence, intensity and kind of violent conflict present in populations that inhabited Northwest Argentina (NOA) ca. 1000-1430 A.D. We are interested in discussing the possible situations of interpersonal violence, the kind of lesions and their incidence on health status and lifestyle, considering current perspectives on Southern Andean populations that posit a scenario of real, symbolic and ritualized violence for the region. It is also important to consider the possibility of an ancestor cult, which throughout the Andes constitutes a source of osseous remains manipulation, especially crania. We present the results of the analysis of 420 crania from different archaeological localities from Quebrada de Humahuaca, Calchaqui Valley and Puna of Salta, adding information of other investigations from the region. Antemortem and perimortem fractures were taken as direct indicators of violence and trophy skulls; isolated crania and bodies without skulls were taken as indirect evidence. Low frequencies of interpersonal violence were observed, even more when compared with samples from previous temporal periods from the same region.

*Key words: bioarchaeology; conflict; NOA; trauma; health status*

### **POSSIBLE NON-INTENTIONAL CRANIAL DEFORMATION IN A SKELETON FROM THE COAST OF SANTA CRUZ (ARGENTINA)**

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One of the multiple causes of the alterations of bone morphology is the action of mechanical loads as consequences of pathological deficiencies or as the result of physical activities. Normally, these kinds of lesions affect the appendicular and axial skeleton (particularly vertebrae). However, non-intentional cranial deformations derived from mechanical loads are not frequently observed in archaeological and current remains. In this work we present a case of possible non-intentional cranial deformation as the result of mechanical muscular loads, in a human skeleton recovered in an archaeological rescue from Rincón del Buque, in the Atlantic coast of Santa Cruz Province, Argentina (830 ± 42 years AP AA74919, NSF-Arizona AMS Laboratory). This fieldwork was part of the Research Grant “Variability of archaeological and bioanthropological record of the meridional Atlantic coast of Patagonia (PIP5576)”. The remains correspond to a male individual of 35-40 years old. A deformation of the morphology of the occipital bone was observed, resulting in an asymmetry and reduction of anteroposterior length of the skull. Probably associated with this lesion, marginal slight to several osteophytosis in all vertebrae, central Schmorl’s nodes and scoliosis in dorsal and lumbar spine were observed. Moreover, moderate osteoarticular lesions were found in several bones of the right upper limb. All these lesions could be related to the workload activity of the studied individual. Finally, three rib healed fractures were noted. The non-intentional cranial deformation observed represents a casuistic antecedent due to the scarce clinical and archaeological documentation.

*Key words: cranial deformation; osteoarthritis; mechanical loads; Santa Cruz (Argentina)*

### **THE SISTERS OF THE END OF THE WORLD: THE HEALTH OF THE SALESIAN SISTERS IN THE MISSION “LA CANDELARIA” (TIERRA DEL FUEGO- ARGENTINA)**

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The aim of this work is to study the human bone remains of two salesian nuns who lived in “La Candelaria” mission of Tierra del Fuego (Argentina). We are interested in the relationship of the religious and natives' health as evidence of the final period of Native-European contact in Tierra del Fuego. Chronicles show high percentages of respiratory illnesses in the mission (tuberculosis and pneumonia) as the cause of death of natives Selk’nam. The sisters worked in manual labors, teaching sewing to the native women. The human bone remains of Sister Antonietta Tapparelo and Sister Maria Rodas were recovered from the mission’s cemetery. Both Tapparelo and Rodas died of acute unknown illnesses, according to their biographies. The remains were studied, looking for pathological signs evaluating the illnesses suffered by these two salesian religious women and the possible relationship with the pathologies reported from aboriginal population. Slight to severe osteoarthritis was found in vertebral bodies and hands, possibly as a result of the activities of the nuns in the missions of Tierra del

Fuego. Sister Tapparello suffered a vertebral ligaments fusion compatible with DISH and cervical ankylosis, which could have produced reduction of mobility. No lesions compatible with infectious diseases were found and no signs of nutritional-metabolic stress were observed in bones and radiographies. These are possibly differences with the native population in the mission, who until now, have shown high prevalence of systemic stress and unspecific infections.

*Key words: Salesian Mission; Tierra del Fuego; Native-European contact*

### **FOOD REMAINS, PARASITOLOGICAL INFECTIONS AND EVIDENCE OF THE USE OF MEDICINAL PLANTS IN PREHISTORIC GROUPS OF AMERICAS**

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The study of food remains in coprolites may assist archaeology, anthropology and paleoepidemiology in helping to identify the zoological origin of coprolites and determining cases of false parasitism. It is also possible to identify food habits of prehistoric human populations and changes in cultural and biological behavior. The association of these studies with paleoparasitological data provides valuable information about their life style and health. Coprolite samples from three different regions of Americas are being analyzed: 42 samples from Parque Nacional Serra da Capivara (northeast of Brazil), 12 from Antelope Cave, southwest USA, and 13 from the sambaqui Cubatão I, southern Brazil. All of them are hunter-gatherer groups, but the first two were in use of ceramics and agriculture; sambaqui people based their subsistence in fishing. The preliminary results of Serra da Capivara samples revealed the presence of plants with anti-helminthic properties and generate discussion about the negative results for parasites in these samples. Antelope Cave samples revealed microfossils to be compared with the preliminary results of parasites. Samples from Cubatão I are a methodological challenge as all archaeological material are poorly preserved.

Supported by CNPq/FAPERJ/CAPES.

*Key words: paleodiet; coprolites; food remains; anti-helminthic; paleoparasitology*

### **SCURVY IN A LATE BYZANTINE POPULATION FROM KADIKALESI/ANAIA (KUSADASI, TURKEY)**

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Kadykalesi/Anaia is a Byzantine castle located near Kuşadası (Izmir) on the west coast of Turkey. Skeletal remains of 54 individuals, dated to Late Byzantine period, have so far been recovered from the castle ground. There are 28 sub-adults under the age of 15 (52%) and the rest (26) are adults (48%). Porotic and proliferative bone lesions on the endocranial surface of the skulls, sphenoid bones, mandibles, maxillas and periosteal reactions on the long bones were observed on some subadult skeletons. Porotic bone lesions on the endocranial surface of the skulls, ossified haematomas and periostitic bone changes on long bones and periodontal disease were observed on some adult skeletons. Periosteal reactions on the endocranial surface of the skulls were observed in 37 %, and periostitic bone changes in 26% of the individuals examined.

This presentation discusses scurvy as a probable cause for the skeletal changes in infants as well as in adults.

*Key words: scurvy; endocranial lesions; periosteal reactions; Byzantine; Turkey*

**PALYNOLOGICAL AND PALAEOPARASITOLOGICAL STUDY OF HOLOCENE CAMELID COPROLITES FROM THE SITE CASA DE PIEDRA 7, SANTA CRUZ**

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The copropalynology is a branch that studies pollen and spore grains in animal feces; it offers information for the reconstruction of palaeodiets, palaeoenvironments and seasonality in the use of resources. The association with palaeoparasitological studies increases the resolution of these ecological aspects and of those referred to health related to the availability of plant resources and to the enteroparasites found in the same coprolites. The aim of this study is to evaluate the conservation of parasitic remains after the processing of coprolites with techniques of pollen extraction in order to standardize a unique protocol for the recovery of inclusions. In order to accomplish the study, palynological and palaeoparasitological analyses of coprolites from the site Cerro Casa de Piedra 7 (CCP7), located at 47°57'S, 72°05'W, province of Santa Cruz, were carried out. Fifteen coprolites compatible with those of camelids, belonging to seven archaeological layers dated by C14 between 5610±110 and 9640±190 years BP were studied. The external part (sub-sample E) of every coprolite was separated from the internal one (sub-sample I) and the extraction of pollen grains and parasites by means of acetolysis was performed. Pollen and parasites from every sub-sample were identified and the total number was determined. The most abundantly found pollen types were shrubby taxa: *Empetrum*, Asteraceae y *Nassauvia*; herbaceous: Caryophyllaceae and Poaceae, and arboreal: *Nothofagus*. As for the palaeoparasitological study the results showed a good conservation state of the parasitic remains, and the presence of eggs of tricostrongilid nematodes like *Nematodirus* sp., eggs of nematodes of the genus *Calodium* and *Eucoleus*; and oocysts of *Eimeria macusaniensis* were observed.

*Key words: coprolites; camelids; pollen; parasites; CCP7*

**A POSSIBLE CASE OF A METASTATIC CARCINOMA IN A SKELETON FROM 15th-20<sup>th</sup> CENTURY COIMBRA (PORTUGAL)**

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This presentation discusses the differential diagnosis of unusual and distinct pathological changes in the skeletal remains of a +40 year old female from 15th-20th century Coimbra (Portugal). The most affected area seems to have been the skull, but multiple lesions, lytic and/or blastic, have been found throughout the post-cranial skeleton, more specifically, in the scapulae, clavicles, humerus, sternum, ribs, sacrum, innominates, and femurs. The differential diagnosis of the lesions gave rise to several possible pathological conditions, namely,

Langerhans cell histiocytosis (granulomatosis), multiple myeloma and metastatic carcinoma. Various macroscopic and radiological aspects lead us to consider metastatic carcinoma as the most probable diagnosis. Despite the argumentative identity of the possible primary lesion, age, sex and the mixed nature of the osseous response are consistent with breast cancer but do not exclude other carcinomas, namely lung cancer. With temporal and regional differences emerging in the frequency of malignant tumors, the identification of new cases becomes important, particularly from geographic areas where few cases have been reported. In fact, the present report adds to the only case of metastatic carcinoma detected in non-identified Portuguese human skeletal remains until now.

*Key words: cancer; malignant tumour; metastases; Coimbra; Portugal*

### **IHHH, BONES – COOL, BONES: A PEDAGOGICAL APPROACH TO MODERN PHYSICAL ANTHROPOLOGY FOR THE GENERAL PUBLIC, USING THE SKELETONS FROM HALLEIN DÜRRNBERG, AUSTRIA**

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Handling bones in a pedagogical project may cause a lot of damage to fragile bones from archaeological sites and, moreover, would be considered unethical by some/many people. Nonetheless, the work of physical anthropologists is fascinating for the general public. Consequently, our aim in a hands-on project for the Keltenmuseum Hallein was to find a way of replacing the original Celtic human remains from Hallein Dürrnberg, Salzburg, without loss of information. The remains derive from one of the biggest Celtic sites. The prehistoric people were rich salt miners; the whole region uses these archaeological findings as a tourist attraction nowadays. For the pedagogical approach 10 individuals from newborn to very old in diverse stages of preservation were chosen. The remains were photographed in anatomical position, ready for analysis. Special details like tooth abrasion, dental eruption or dental growth, arthritis and pelvic features for sexing the individual were particularly accentuated. These 1:1 pictures represent the individuals which have to be investigated. A rough age and sex estimation is possible at least from some pictures. Some casts of pathologies – a callus on the ulna, a vertebra with osteophytes and a healed trephination, as well as a femur of a nine year old and from a newborn – were made directly from the originals to get some hands-on experience very similar to the “real” bones. However, mostly we work with commercially available plastic bones. Hands-on, e.g. for anatomical sorting out of the bones and for body height measurements, as well as questionnaires about aging, sexing and looking for general pathologies, makes the participants feel like they are in an anthropological lab. In addition, we use show cases for presenting original bones and specific details, thus meeting the demand/expectation to see the original skeletons from individuals living in this region 2400 years ago.

*Key words: pedagogical project, physical anthropology, palaeopathology*

## MYCOLOGICAL ANALYSIS OF SOILS OF AN ARCHAEOLOGICAL SITE IN CALCHAQUÍ VALLEY, SALTA, ARGENTINA

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Knowledge based on the fungi can be traced back to prehistoric times, either as food or culturally related to magic religious rituals. The advancement of current knowledge in mycology and multidisciplinary work, allowed the work with different areas of science. The kingdom Fungi is made up of about 200,000 species of great environmental diversity, changing their morphology and physiological behavior according to nutritional factors, temperature or pH. Many mycoses are occupational, like histoplasmosis of miners, the sporotrichosis of florists and potters and the Coccidioidomycosis of the archaeologists. *Coccidioides immitis* is a dimorphic fungus that grows in arid climates and alkaline soils. In Argentina, the endemic area covers from south of Salta to north of Rio Negro. This fungus enters the body through the respiratory tract and locates in the lungs. Our goal in this paper is to present the results of the analysis of 5 soil samples from an archaeological site in Calchaqui Valley, Salta, isolate and characterize the fungal flora and to determine the presence of *Coccidioides immitis*. The culture was negative for *Coccidioides*, but other strains were found that cause conjunctivitis, involvement of superficial tissues and colonization of the nasal mucosa. In this paper, archaeological work is considered a risky activity, so it is important to highlight the need and importance for prophylactic measures such as use of chinstrap, gloves and goggles.

*Key words: Coccidioides immitis; opportunistic fungi; archaeological risk; Calchaqui Valley; prophylaxis*

### AUTHOR INDEX

LAST NAME	FIRST NAME	PAGE OF ABSTRACT
Acosta	Walter Gustavo	35
Afonso Vargas	J.A.	42
Alfaro Castro	Martha Elena	21, 36
Almeida	Miguel	28
Alvarez	Adriana	22
Alves Cardoso	Francisca	33
Amorosi	Tom	45
Aranda	Claudia	22, 45
Araujo	Adauto	13, 13, 14, 15, 15, 16, 42, 47, 54
Arnay De La Rosa	M.	42

<b>LAST NAME</b>	<b>FIRST NAME</b>	<b>PAGE OF ABSTRACT</b>
Arrieta	Mario	18
Aschero	Carlos	37
Assis	Sandra	33
Baffi	Elvira Inés	22, 36
Barboza	Carolina	29
Beltrame	M. Ornela	37
Bernal	Valeria	48
Berón	Monica	45
Bordach	Asunción	18
Brunás	Oscar. M.	44, 44
Buckberry	Jo	51
Buikstra	Jane	20
Burry	Lidia Susana	41, 49, 55
Campos	Guillermo	46
Capeletti	Luis	57
Carbonetti	Adrian	23
Casali	Romina	23
Castro	Alicia	37
Chame	Marcia	13, 13
Chiavazza	Horacio	46
Civalero	M. Teresa	37
Constantinescu	Florence	20
Cook	Della Collins	18
De Castro Faria	Luis Octavio	32
De Feo	María Eugenia	50
Della Negra	Claudia	48
Demamann	Maria Da Gloria	38
Desántolo	Bárbara	37, 42, 50
Dias Jr	Ondemar F.	16
Dias	George	39
Drube	Hilton	19
Druetta	H. Santiago	39
Durán	Víctor	46
Fabra	Mariana	22, 40
Fernandez Davila	Enrique	36
Ferreira	Luiz Fernando	13, 13
Ferreira	Maria Teresa	27, 28
Flensborg	Gustavo Ariel	19, 22
Flores Carrasco	Sergio	41
Frías Villarroel	Liesbeth	23, 41
Fugassa	Martín H.	11, 12, 15, 23, 37, 49, 55
García Guraieb	Solana	22, 24
García Laborde	Pamela	41
García Mancuso	Rocío	39, 42
Gheggi	Soledad	22, 52
Ghidini	Gabriela	50
Gijón Botella	Herminia	14, 42
Gomez Serafín	Susana	21

<b>LAST NAME</b>	<b>FIRST NAME</b>	<b>PAGE OF ABSTRACT</b>
González Baroni	Lucia Guadalupe	43
Gonzalez Toledo	Eduardo	37
Gonzalez	Pedro	30
González-José	Rolando	50
Goñi	Rafael A.	12
Gordón	Florencia	22, 43
Guerrero	Fausto	57
Guichón	Ricardo Anibal	20, 22, 23, 27, 41, 53
Ibañez	Alejandra	41, 53
Iglesias	María Teresa	24, 26, 57
Knopp	Florian	56
Kolp-Godoy	Maria	21
Kozameh	Livia F.	44, 44
Kucera	Matthias	35
Lara Fontenelle Picaluga	Renata	25
Leles De Souza	Daniela	15, 15, 16, 42
L'Heureux	Gabriela Lorena	45
Luna	Leandro	22, 45
Makowski	Krzysztof	21
Malerba Sene	Glauca Aparecida	47
Mansegosa	Daniela Alit	46
Martins	Maria Do Rosario	25
Massa	María Victoria	24, 26, 57
Massone	Mauricio	20
Matos	Vítor	25, 28
Mayo Iñiguez	Alena	14, 15, 15, 16, 42, 48
Mazzanti	Carolina	46
Mendonça De Souza	Sheila	27, 47
Mendonça	Oswaldo	18
Menéndez	Lumila	47
Miranda	Maria Arminda	25
Moraga Vergara	Mauricio	41
Neves	Maria João	27, 28
Novellino	Paula Silvana	22, 46, 48
Ogden	Alan	51
Orellana Halkyer	Nancy Carolina	29, 48
Ortner	Donald	51
Otsuki	Koko	48
Palacio	Patricia Irene	41, 49
Palma	Malaga Martha Rosa	21
Paulo Vicente	Ana Carolina	15, 16, 29, 42, 48
Píccoli	Carolina	29
Piedade	Laura	48
Plischuk	Marcos	22, 30, 37, 42, 50
Ponce	Paola V.	22, 30, 50, 51
Prieto	Alfredo	20
Reis De Castro	Verónica	52
Requejo	Jorge Alberto	31

<b>FIRST NAME</b>	<b>LAST NAME</b>	<b>PAGE OF ABSTRACT</b>
Ribeiro Da Silva	Laura Da Piedade	16, 47
Rindel	Diego D.	12
Rodrigues Carvalho	Claudia	25, 31, 32, 52
Roldán	Carlos E.	17
Roldán	Jimena	17
Salceda	Susana	19, 30, 37
Saldanha	Bruna Montenegro	13
Salega	Soledad	40
Salles	Adilson Dias	25, 32, 52
Sampietro Vattuone	M. Marta	17
Santos	Ana Luísa	25, 33
Sardella	Norma H.	12, 37
Scabuzzo	Clara	22
Segura	Mariana	41
Seldes	Veronica	22, 52
Sianto	Luciana	13, 13, 54
Silva	Ana Maria	55
Soibelzon	L.H.	35
Solokar	K.	39
Suby	Jorge Alejandro	20, 22, 33, 41, 53, 53
Teixeira Dos Santos	Isabel	13, 13, 54
Tessarolo	Bernardo	47
Togo	José	19
Tonomura	Elise Tchic	32
Üstündağ	Handan	39, 54
Valdirene Dos Santos	Lima	16
Valladares Domínguez	Katya Benilde	34, 34
Vega Dulanto	María Del Carmen	21
Velázquez	Nadia Jimena	55
Vieira De Souza	Mônica	13, 13, 54
Villotte	Sébastien	33
Viola	Bence	35
Wasterlain	Sofia	27, 55
Watson	Lucia	21, 34
Wilbur	A. K.	20
Wiltschke-Schrotta	Karin	35, 56
Zamagna	Liliana	24, 26, 57