

CONVEGNO

PALEOPATOLOGIA

GIPaleo – Gruppo italiano di Paleopatologia



18-19 giugno 2021

VI MEETING NAZIONALE GRUPPO ITALIANO DI PALEOPATOLOGIA

Segreteria scientifica

Dott. Raffaele Gaeta
Prof. Gino Fornaciari
Prof. Ezio Fulcheri
Dott. Mirko Traversari
Dott. Marta Licata
Dott. Omar Larentis
Dott. Chiara Tesi
Dott. Roberta Fusco
Prof. Fausto Sessa

Segreteria organizzativa

Dott. Marta Licata
Dott. Omar Larentis
Dott. Chiara Tesi
Dott. Roberta Fusco
Dott. Enrica Tonina
Prof. Ilaria Gorini

18 giugno 2021

Apertura lavori
Ore 14:30

I Sessione
Ore 15:15

II Sessione
Ore 17:10

19 giugno 2021

III Sessione
Ore 9:00

IV Sessione
Ore 10:55

Sessione Poster
Ore 14:30

V Sessione
Ore 15:35

VI Sessione
Ore 17:30

Chiusura lavori
Ore 18:45



Proceedings of the VI National Meeting of the Italian Group of Paleopathology (GIPaleo)

LECTURE

Paleopathology and Osteoarchaeology in the province of Varese

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The presence of numerous scientific contributions in the program is certainly demonstrative of the fact that research in the field of paleopathology and anthropology has not stopped since the beginning of Covid-19. Furthermore, the same emergency that we are still partially feeling, has pushed our community scientific research to question itself more intensely in connection to the epidemic relationship and measures that repeatedly led to profound transformations in the societies of the past from different points of view: demographic, economic, social and the history buried under the bioarchaeological strata is today more capable than ever to show this connection.

It can do this by bringing to light the paleodemographic data that is obtained from the study of human remains.

Today we will listen to many paleopathological stories and among these I am very happy to also present ours.

Twenty years ago, the University of Insubria started a collaboration with the Archaeological Superintendence of Lombardy for the study of osteological remains found mostly during emergency archaeology recoveries. These experiences led us to reach those bioarchaeological sites again with the aim of extracting all those cemetery layers that remained there because they were not subjected at that time by building reclamation interventions.

Returning to those sites that in the past brought to light fragmentary anthropological data means allowing oneself the possibility of obtaining new palaeodemographic and palaeopathological data which are decisive for reconstructing the demographic and epidemiological history of the populations of the past.

These new interventions led us to create an operational model that immediately intended to underline the importance of an evident continuity between the archaeological recovery and the anthropological study of the finds through the setting up of physical anthropology and paleopathology laboratories directly on the sites of the finds. All this in harmony with the final design of the projects or the museumization of bioarchaeological sites in their complexity aimed at enhancing cultural tourist routes in the area. In this regard, I would like to thank the community foundation of Varese and the Cariplo foundation for supporting our current initiatives.

These include the project financed by the emblematic provincial tender and which has as its final objective the enhancement of three bio-

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archaeological sites in Valcuvia: the medieval sites of San Biagio in Cittiglio, Sant'Agostino in Caravate, and the modern crypt of the church of the Convent of Azzio.

Today, our Research Centre works in Piedmont in different sites in the province of Vercelli and Alessandria.

Aware of the importance of a physical anthropological approach in the field, our young Centre goes beyond the continental borders to reach Eritrea, the ancient city of Adulis, because it is in dissecting the taphonomic events and the funeral actions that will make it possible to identify the funerary ritual adopted by the ancient populations.

The operational model of paleopathological research, which gradually enriches itself thanks to the multidisciplinary nature of the interventions and thanks to the individual experiences in the field, is thus continuously transferred and adapted to other anthropological contexts that retain potential both in terms of investigative and enhancement of the bioarchaeological heritage. Through the musealization of the sites it is also possible to acquire an attractive force towards all those potentially bioarchaeological areas but which today are in conditions of neglect because they are marginal with respect to the conventionally understood cultural tourist good. And we all know how important it is to transfer the study data even outside the academic context because making this aspect of archaeology, the truly human one, usable too, cannot fail to arouse a strong awareness of our past. We also know how much more we will have to work, following in the footsteps of the professors who started this path, to ensure that the disciplines of paleopathology and physical anthropology arrive within all those degree courses still discovered today by these teachings to heal an important lack: knowing the human past from a physical and pathological point of view allows us to understand the evolutionary path of some pathologies, especially those of infectious nature.

If my title of the speech "Paleopathology and osteoarchaeology in the province of Varese" does not respond to what is being said today, it is because my feeling about paleopathology and osteoarchaeology in the province of Varese is understood as that of carrying out research, what I could feel everywhere, through the operational model, the enthusiasm for paleopathological research and of course the people I am lucky enough to work with.

FIRST SESSION

CHAIRMEN: GINO FORNACIARI (Pisa), LUCA VENTURA (L'Aquila)

Paleo-oncology at the University of Pisa: recent results

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In recent years, the Division of Paleopathology of the University of Pisa has dedicated a line of research to paleo-oncology. The attention was focused on the analysis of numerous skeletal series, which provided evidence of both benign and malignant tumors.

The study of the material from the necropolis of Casal Bertone (Rome), dated back to the first Imperial age (1st-2nd centuries AD), has permitted to diagnose a case of metastatic carcinoma. A male individual aged 50-60 years showed osteolytic and osteoblastic lesions mainly involving the axial bones, in particular the sternum, ribs, spine, shoulder and pelvic girdle. The anatomical distribution and the nature of the lesions, being both destructive and proliferative, suggested a diagnosis of diffuse metastases from a soft tissue primary cancer. Considering the sex of the individual and the macroscopic and radiological features of the tumor, a prostate cancer is the most likely option. The individual was buried close to a *fullonica*, therefore it can be hypothesized that he was employed in such activity. It is not possible to ascertain the impact of environmental conditions on the development of the tumor of this individual; we can only leave as an open question whether the use of dyes and alkaline detergents such as soda or urine, sulfur, and clay for the treatment of fabrics might have favored the onset of the pathology.

Two interesting cases of benign neoplasms come from the cemetery of Pieve di Pava (Siena), dated back to the Medieval period (10th-12th centuries AD). A young male showed a post-mortal breakage of the frontal bone, which highlighted the presence of an oval neoformation in the right frontal sinus. The Cone Beam Computed Tomography study confirmed the presence of a mass measuring 11x4.8 mm, with peripheral radi-

opaque margins and a small central radiolucent area. The histological study allowed to diagnose a case of osteoblastoma, a rare benign tumor consisting of various components of osteogenic mesenchyme producing osteoid and poorly mineralized woven bone trabeculae. This case is the first paleopathological evidence of osteoblastoma of the frontal sinus. Finally, a 40-50 years old woman was affected by several rounded-shaped new bone formations, of which nine localized on the external cranial surface and three on the long bones. The Cone Beam Computed Tomography confirmed that the lesions were composed of compact bone. Macroscopic and radiological features suggested a diagnosis of multiple non-syndromic osteomata. Single cranial osteomata are commonly observed in osteoarchaeological remains, but multiple osteomata are a rare paleopathological condition. Every ancient cases of neoplastic diseases discovered among the osteoarchaeological populations shed new light on our knowledge of their presence and evolution over time. Moreover, the study of paleoncology is of considerable relevance not only for the awareness of the prevalence of tumors in the past, but also for the understanding of current carcinogenesis trends.

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Cancer therapy in the Renaissance: the case of Luigi Carafa, Prince of Stigliano (1511-1576)

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The study of the natural mummy of Luigi Carafa, Prince of Stigliano (1511-1576), revealed a very rare palaeopathological case of colon adenocarcinoma. It's the third malignant soft tissue tumor identified in the mummies preserved in the Basilica of Saint Domenico Maggiore in Naples and the fifth known in the

paleopathological literature worldwide. Autopsy of the mummy showed well-preserved intestinal loops with a tract of enlarged colon with feces. Histological analysis revealed an exceptional morphology, demonstrating an excellent state of preservation of the colon tissue, with mucosa, submucosa, *muscularis propria* and visceral peritoneum with villous adenoma and focal adenocarcinoma. Application of several antibodies were performed on the soft tissue samples of the tumor, to better determine the histological type of the adenocarcinoma. Immunohistochemical analyses allowed to diagnose a well-differentiated colon adenocarcinoma infiltrating the soft tissue (stage T3), which developed on a colonic villous adenoma. The preservation of colon is contrary to al I expectation, considering that the intestines are the most putrescible organs of the body. Toxicological investigation was performed on the soft tissue samples of the tumor, to test the hypothesis of a particular treatment to which the body had been submitted. Toxicological analysis of colon samples by Atomic Absorption Spectroscopy (AAS) revealed very high toxic levels of lead (50 ppm) and copper (53.5 ppm): the normal mean concentration of lead in colon is 0.04 ppm (0.04 median) and 0.12 ppm (0.11 median) for copper. The toxic levels of lead and copper in the gut, with the resulting abatement of intestinal flora can explain the exceptional preservation of the tumour cells. The same analysis conducted on a sample of striated muscle tissue showed levels of lead (3.1 ppm) and copper (1.4 ppm) that were much lower than those of the colon. To reach this degree of gut concentration, the lead and the copper must have been taken in life by mouth or through anal administration with an enema. The use of lead and copper was very diffused in Renaissance pharmacology. In the 16th century, Paracelsus promoted the use of metals as mercury, antimony, gold, copper and lead in the treatment of different diseases. In the writings of Modern age physicians, there is clear evidence of the internal use of lead acetate and copper, considered "astringent" substances to cure the intestinal bleeding and diarrhoea. It is very likely that Luigi Carafa was treated with a similar potion in an advanced stage of the cancer to stop melaena. Luigi Carafa was one of the richest exponents of the Neapolitan nobility of his time. Not surprisingly, he had access to the most innovative therapies related to the use of metals internally. In conclusion, the case of adenocarcinoma in Luigi Carafa open new scenarios about the presence of paracelsian medicine in the Mediterranean Spanish dominions.

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About some cases of teratology from the pathology museum of Palermo

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The Pathology Museum of Palermo houses wet and dry specimens dating back to 1859. The wet specimens are in original jars with original labels. The fixative fluid was not formol, but is highly likely that over the years they have been made refills with formol. The specimens of the collections are around 400. The study of these specimens began recently. Among these some cases of teratology have been selected for the study. One case of cyclopia the most severe expression of holoprosencephaly, characterized by the presence of a single eye located in the middle of the face, and several cases of conjoined twins. These cases show rare fetal malformations which currently are no observable. The possibility to study the ancient wet specimens with modern technique of pathology by conservative approach and with radiological techniques as well allows to improve the knowledge about these malformations. Therefore, the teratological collection from the Pathology Museum of Palermo like all those of Pathology Museums has a high value for the history of medicine and for medical research.

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Strange remains in strange places: diagnostic criteria to identify teratomas

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Teratomas are germ cell neoplasms that develop and differentiate to varying degrees toward mature epithelial tissues type including bone, teeth, hair, gut mucosa, lung and even cerebral tissue. They are diagnosed clinically at all ages and can be found in particular in gonadal sites in female, representing around the 33% of all ovarian tumors.

Teratomas are interesting in paleopathology because they produce elements, specifically bone and teeth, which can be easily misidentified as poorly preserved fetal remains. Therefore, their identification and differential diagnoses with ectopic pregnancy, lithopedion or "stone baby", fetus in fetu or parasitic twin, could be difficult. In this work we analyzed 38 teratomas surgically removed from 1994 to 2009 and studied in the "Pathological Anatomy Unit" of the Hospital "Policlinico San Martino" in Genoa. The patients were all females mostly aged between 20 and 40 years; the tumor was present in the 27% of cases in the right ovary and in the 73% in the left one. Macroscopic examination of hard structures contained in teratomas allowed us to observe both bone and teeth. In particular, 33 teratomas presented dental elements, 5 tumors only bone tissue. Bone is generally of irregular shape and is a patch-work of elements as it fails to mimic embryonic cellular induction. Only in 2 cases we appreciated a structure similar to a little mandible bone. Totally, we analyzed 62 teeth, with a number per teratoma ranged from 1 to 7. Some of them were "free floating", others were encased in the cripts of alveolar-like bone. A dental inventory revealed a wide variety of tooth types. In some cases teratoma teeth are identical to their oral counterparts, both permanent and deciduous. Others teeth suggest intermediate types and could be classified as incisiniform or caniniform, while either premolariform or molariform, sometimes with additional cusps. Other ones present a completely unique and unclassifiable morphology. Moreover, some elements present only corona, others possessed cemento-enamel junctions and a clear delineation between tooth crown and root. Also, dental elements often exhibit improper mineralization, hypoplasias and irregular cementum deposition. In paleopathology teratomas are not frequently documented

within human remains, probably because the difficult precise identification of them, particularly when they are viewed bereft of their soft tissue context. Paleopathological risk is that such remains may be mistaken for fetal parts.

In this study we offer some considerations on the recovery of these rare neoplasms and present some diagnostic criteria to aid paleopathologists in the identification and the analysis of these unusual bone and dental elements.

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“Sarcoma of the forearm” from the pathology museum of Turin: a case report and a warning for the future

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The Pathology Museum of Turin houses dry and wet specimens dating back to the end of XIX century and the beginning of the XX century. Many specimens are in original condition and the presence of the original label helps to obtain information from the autopsy reports still kept at the Institute of Pathology. Most of the specimens show diseases in their natural evolution without the modern therapies. In year 1997 the study and the re-evaluation of these specimens started. Despite many logistical problems this study is still on going. Among these specimens a case of “Sarcoma of the forearm” was been selected due to its particularity. Macroscopically the specimen was a huge mass on a right forearm where the hand was small in size and well preserved. A similar case was studied by Professor Sangalli from Pavia in 1875 as he described in his Pathology Book. The drawing of this case is similar to the wet specimen from Turin, which dates back to 1932. The identification is positive thanks to an article published by Professor Giordano on “La Riforma Medica” which describes the case. The specimen was not an autoptical one, but a surgical one, from a 6 year old girl, who was still alive two years later the surgical intervention. The diagnosis at the time was “fibrosar-

coma of the bone” A diagnostical re-evaluation was performed in year 2000. Histology and immunohistochemistry were carried out. Morphologically there are round small cells with no evidence of nucleoli, no mitosis are observed. Necrosis is present. Immunohistochemistry showed positivity for S100 and Vimentin. X-ray examination of the specimen showed a erosion of the radius, whereas the other bones of the forearm were intact. A preliminary re-evaluated diagnosis was “Ewing sarcoma”, the first case of this sarcoma present in wet specimens. Unfortunately this study remained incomplete and it will remain incomplete forever. Indeed, the specimen was lost during years, probably during a flooding of the Museum. This case report is therefore not only a case report of a probable rare neoplastic entity in historic wet specimen, but a warning too. These specimens are irreplaceable, their loss is a tragic event for pathology research and for the history of medicine as well. Saving them is imperative.

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SECOND SESSION

CHAIRWOMEN: ROSA BOANO (Torino), SIMONA MINOZZI (Pisa)

Plague as a paradigm of epidemic-prone disease: learning from the past to avoid them in the future

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Infectious diseases represent a severe threat for the humankind, in particular those with an epidemic character. Among those, plague has possibly influenced in depth the story of the humans since prehistoric times.

Since 2010, *Yersinia pestis*, the pathogen currently causing plague, was confirmed by phylogenetic studies to have also been the causative agent of the pandemics of the past. Notwithstanding, several questions concerning the routes and modalities of dissemination from rodents to humans and from human to human remained open. With the project MedPlag (ERC-AdG MedPlag, grant agreement no. 324249, PI, BB), we aimed to address these questions by combining ancient DNA, ecological, historical and epidemiological studies. Using high-throughput methods to generate *Y. pestis* ancient genomes, we explored the phylogeny of the bacterium on its historical background (Namouchi et al. 2018, Guellil et al., in prep.). The results appear to be in support of the theory of plague having been introduced from time to time into Western Europe from Eurasia, and re-circulating among humans on trade routes – a theory which is also sustained by a climate study and a study on the Third Pandemic (1894-1940s) in Europe. The latter study proposes also that the current absence of plague from Europe is due to improved and effective hygienic and sanitation measures. This finding is consistent with different studies of MedPlag demonstrating that human ectoparasites may have played a major role in sustaining re-circulation of plague among humans. An additional indirect confirmation of the diffusion of human ectoparasites in past Europe was the recovery of *Borrelia recurrentis* (causing louse-borne relapsing fever) in a 15th century skeleton from Norway. This project testifies that an integrative approach to the study of infectious diseases which involves ancient DNA analyses may be of great importance to better understand the mechanisms underlying epidemic-prone infectious diseases of the past.

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Archaeogenomics in Caravate and Cittiglio (Lombardy): from the excavation of ancient human bones to the study of DNA

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A novel discipline, called archaeogenomics, studies ancient remains through the combined analysis of archaeological/anthropological and genomic data. Italy is particularly rich in ancient human remains dating to different eras and civilizations, in a chronological sequence that is unique worldwide. This national treasure is almost unexplored due to the scarcity of ancient DNA laboratories in Italy and the difficulty of establishing interdisciplinary efforts. The present study merges the expertise of two research groups: 1) the population genomics team at the University of Pavia, which recently set up an ancient DNA Facility 2) the Research Center of Osteoarchaeology and Paleopathology at the University of Insubria, which focuses on anthropological analyses of archaeological excavations in Lombardy.

This pilot project will have a local/national impact by developing a new model to enhance regional and national archaeological resources. Our model is based on an interdisciplinary approach by combining both studies of history/archaeology and technological innovation in life science. Major goals are: (a) excavation interventions, anthropological study of human finds and archaeological restoration; (b) genomic survey of excavated human bone remains. In details, the research program is performing genomic analyses of remains excavated at the archeological sites of Cittiglio and Caravate (Varese, Lombardy). Forty bones have been selected by the research team based on the following criteria: petrous bones, when available, were selected as preferential DNA sources, followed by teeth and long bones; individuals with peculiar anthropological features were primarily selected.

Molecular analyses will be carried out in the ancient DNA Facility at the University of Pavia. DNA will be extracted minimizing contamination risks and genomic libraries for the Next Generation (NG) sequencing will be obtained as in Bioinformatic tools will be applied to the initial outcome of the sequencing (raw reads) to check the presence of endogenous DNA and to obtain shot-gun low-resolution genomes. Finally, these ancient genomes will be compared each other and to a world wide dataset of available genomic data from

Italy, Europe, the Middle East and North Africa in order to highlight genetic affinities and/or peculiarities and to reconstruct the ancestry and genetic affinities of the buried individuals.

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Health condition and social status in the Roman Imperial Age

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Enamel hypoplasia is a developmental defect occurring during dental crown formation and represents episodes of arrested growth in infancy or childhood while the tooth is still developing. Examination of Linear Enamel Hypoplasia (LEH) received significant attention in the paleopathological literature for its relationship with malnutrition and diseases. Analysis of hypoplastic lesions in skeletal remains provides an excellent index to evaluate the health and living conditions in ancient populations.

In this research, the prevalence and distribution of LEH were investigated in the skeletal remains from two large necropolises in Rome (Italy, 1st- 3rd century AD) with the aim to evaluate the relation between social status, health, and nutritional conditions of the Romans during the Imperial Age. Both necropolises, Collatina and Casal Bertone, are located near the ancient centre of Rome and the presence of different typologies of graves, with monumental mausoleums and simple tombs, testifies the presence of stratified social classes.

The skeletal remains of 177 individuals were selected on the basis of their grave typologies and funerary equipment and assigned to low social class or medium-upper social class. LEH was detected in 3,105

permanent teeth and differences were found between anterior and posterior teeth, male and female samples, upper and lower social classes.

Developmental defects were significant more frequent in teeth and in individuals from the lower than the upper class, in both sexes and ages. The mean number of stress episodes for individual and the mean number of lines for tooth were also higher in the lower class.

The age of onset of the stressful events that caused the defect was determined on the basis of the localization of hypoplastic lines on the dental crown. The chronological distribution of the age shows differences among the two social classes and might be related to the different social conditions involved in LEH occurrence. Comparison among the dental categories revealed that the anterior teeth are more affected than the posterior, and canines are more sensitive in terms of registration of defects.

Examination of LEH as stressful indicator, in two subsamples with different subsistence patterns, allowed us to detect differences related to the social status, indicating that the socially advantaged group enjoyed better health in the Roman population during the Imperial Age.

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Funerary rite and body treatment in the ancient town of Adulis, Eritrea

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Adulis was an ancient town located along the south-western coast of the modern day Eritrea. This was a crossroads of the ancient world: a place where people, goods and ideas from different and distant areas came together. Probably, because of a blend of cultural traditions, Adulis developed a unique architectural style for its monuments. In particular, a notable high podium of basalt blocks characterizes the early Christian religious buildings. In Sector 2, the so-called "Altar of the Sun". In 2018 and 2019, two burials were discovered in the proximity of the northern wall of the church. Skeletal sex determination and skeletal age estimation were mainly determined using the methods recommended by the Workshop of European Anthropologists (WEA 1980). Those graves show significant differences in the burial ritual, in the grave structure and in the taphonomic processes. It is arguable that an in-depth study of their archaeological connection with the religious building and their absolute dating probably will prove very useful in the comprehension of the history of the site.

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Burials in the Horn of Africa. New data from the latest archaeological campaign in Adulis, Eritrea

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Adulis was a port town located on the Red Sea Coast in Eritrea. Because of its strategic position, it was one of the most important and flourishing commercial hubs of the Horn in Antiquity. Indeed, it was a point of convergence for long distance maritime routes and African caravan itineraries. During the 2018-2020 archaeological campaigns, several burials related to Islamic ritual were discovered in the so-called "British church". Skeletal sex determination and skeletal age estimation were mainly determined using the methods recommended by the Workshop of European Anthropologists (WEA 1980). The study of Islam in Eritrea is still at an early stage, although the country is known to be one of the earliest African territories featuring Muslim presence during the *Hijra*. Over the last decades, the interest in the Islamic archaeology has been increasing and so has the effort in recording, analysing and discussing Muslim burials. The analysis of those contexts allows us to investigate ritual practices, funerary customs and body treatments within the context of a very complex phenomenon like a Muslim burial could be.

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Third session

CHAIRWOMEN: VALENTINA GIUFFRÀ, GIULIA RICCOMI (Pisa)

The story of the ancient Milanese read in bones and historical texts. The new project of anthropological and paleopathological analysis of the skeletal remains of the Ca' Granda

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The crypt of the Beata Vergine Annunziata, which is a seventeenth-century burial monument for the patients of the “Ca’ Granda” hospital in Milano and a memorial for the patriots of the “Cinque Giornate” during the nineteenth century, has an enormous historical and scientific heritage. In fact, below the church, 14 sepulchral chambers are preserved, of which nine are still full of human remains both in anatomical connection and commingled. Since 2009, the crypt, together with the church above, have been the object of a recovery project by the IRCCS Ca’ Granda Foundation, for the restoration that led, in 2013, to its reopening to the public. At the same time, the University of Milan promoted an anthropological pilot study of samples of the material from the burial ground. This has allowed for the recovery of remains of historical interest and for the study over 50,000 bones (out of the approximately two million present) that narrate the diseases and lives of these populations. In addition, it permitted to understand how the contents of the burial ground represent an important historical heritage of the city. In 2019, a new course of study began in collaboration with other academic departments, internal to the University of Milan. This led to a new inspection of the chambers with their 3D reconstructions, a new archaeological excavation and a new phase of the anthropological study. This, in addition to the anthropological and paleopathological data (with the aid of radiological instrumentation), is providing valuable data on nutrition (study of calculus) and exposure to heavy metals for treatment or occupation (toxicological study). At the same time, a new project was launched to compare the anthropological data with the documentation from the archives. In fact, in Milan, since the Sforza era (1452) a necropsy registry was implemented (called *liber mortuorum*) divided by parish, in which the list of the deceased of the city was recorded, including the date of death, age, occupation and cause of death. The fact that the hospital was built in a parish makes it possible to know the causes of death for all patients. The knowledge from the necropsy registry and hospital archives thus provide the skeletons of the crypt with a documentation which is similar to known reference collections, allowing to compare the data from the archives (frequency of various diseases, accuracy of the diagnosis, efficiency of the necropsy archives) with the anthropological data (diagnosed pathologies). Although, as commingled remains, the association between skeletons and doc-

umentation cannot be assessed with certainty. The purpose of this presentation is therefore to show the preliminary data of the new anthropological study and to provide the first results of the comparison between the records and the paleopathological data.

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“Consuming” the flesh of the saint. The body of Jean Bassand in textual and direct sources

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The account of the *Vita* and miracles of Jean Bassand (c. 1360-1445), the French Celestine monk who reformed the monastery of Santa Maria di Collemaggio in L’Aquila, where he died, appears in various sources, most notably Celestino Telera’s 1648 publication. The author provides an Italian translation of an older Latin version drafted anonymously shortly after Bassand died, published in an edition by the Bollandist and included in the *Acta Sanctorum*. This text was presumably used as a source for the Latin compendium that the Maurist Nicolas Ménard included in his *Martyrology* in 1629. While Ménard is faithful to the older version, Telera embellishes his translation with dates and brief explanations of events to serve his interpretation, including descriptions of the treatment of his body at burial, with quicklime placed inside the casket. The older text simply states that lime must have been used to cover up any bad smells, but Telera specifies that it was employed to “consume” the flesh of the saint quickly: “... si dovette il cadavero ricoprire di viva calce, da cui restasse in breve tempo la carne consumata”.

The discovery of the still-intact body when the coffin was opened eighteen years later makes the miracle

of the imperishability of the flesh – in itself a topos of the recognition of sanctity – even more exhilarating for Telera, who explains in a personal interjection that it happened despite the destructive action of the lime. An account of a similar miracle concerning the body of Francis Xavier was transmitted by Jesuit sources from the late sixteenth century onwards. Medieval sources do not generally document the use of lime for treating the bodies of those with a saintly reputation. Instead, there is a suspicion (sometimes confirmed) that embalming treatments were used. Albeit not regarding a saint, the use of lime is documented in a source referring to the body of Pope Clement VI (1342-1352); it provided rapid excarnation so that he could be reburied elsewhere to respect his testamentary dispositions. This disregarded the *Detestande feritatis*, a bull issued by Pope Boniface VIII in 1299 that outlawed dismembering and defleshing bodies for purposes of transfer. The bull mentions boiling rather than lime – suggesting that it was rare – and orders that flesh be destroyed naturally by temporary interment.

A Canonical Recognition of the body belonged to the Blessed Bassand was started in June 2019. The mummy, still fully dressed, underwent external inspection, X-ray examination, and computed tomography (CT) scanning. The anatomic connection of the body was partially lost, probably due to the need for arranging the mummy in a limited space. Five separated body parts were evident, with skeletonized and sparse vertebrae, and the left foot missing. The skin surface appeared well preserved in the face, frontal aspects of the thorax, hands, legs, and right foot.

Internal organs were easily recognized (right lung with pleural adhesions, pericardium remnants, diaphragm, liver, some intestinal loops). A rodent's nest was found in the pelvis, along with a walnut shell and four metal coins. An additional coin was found inside the skull. Two bulks of impacted feces were found in the perineal region. Neither skin nor bone incisions were noted. These findings are not suggestive of artificial embalming by evisceration. A natural mummification mechanism, possibly obtained by enhanced external dehydration (spontaneously enhanced mummification) appears more likely. In addition to covering bad smells of putrefaction fluids, the referred treatment of the corpse with quicklime may have caused skin dehydration rather than “consuming the flesh”.

The data suggests that Bassand's body was treated in an original way that requires analysis, including a comparative study of the sources with appropriate contextualisation. Further investigations (histology, SEM, microanalysis) are planned in order to better understand the exact preservation mechanism/method.

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The burns present on the mummy of Blessed Egidio da Laurenzana: between legend and scientific evidence

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Studying the relics of saints and blessed has sometimes made it possible to discover aspects of their lives that are not documented in historical and literary sources. In some cases, it has also allowed research data to be compared with legends. The authors illustrate the case study of Blessed Egidio da Laurenzana. In 1917, on the occasion of the celebrations marking the 500th anniversary of the death of Blessed Egidio da Laurenzana (1443-1515), the reliquary containing his remains was opened for examination and to allow their state of conservation to be assessed.

Bernardino di Bello (this was his secular name) entered the local Franciscan monastery when he was 30 years old. His saintly vocation was immediately clear as he had a marked sense of ascetic and contemplative spirituality, and naturally embraced a life punctuated by ecstasy and prayer.

However, according to legend, as well as the accounts of his brothers in the order, he was also plagued by the continuous presence of the devil, who would physically attack him as he prayed at night. The last of these terrible attacks took place in church on Christmas night 1517, when the devil breathed fire on him, burning his left hand, and poured boiling lamp oil over him. He sustained terrible burns, and despite the attentive care of a noblewoman named Donna Lucrezia Trara, a procurator for the friars, who dressed his wounds, he died on January 10th, 1518 after experiencing great suffering. Egidio immediately became a figure of worship in Laurenzana, a small Italian town in the Province of Potenza. His beatification was confirmed in 1880.

The examination of the mummy, by the Anthropology Unit of the G. d'Annunzio di Chieti University of Pescara, revealed that its condition had deteriorated since its previous inspection in 1940. Therefore, before the restoration work could begin, various procedures, including microscopic, microanalytical and radiological studies, had to be carried out. These analyses provided some interesting clues about the blessed's general state of health (stones, arthritis, cleft lip), but above all regarding the causes of his death.

Macroscopically, burn marks were found on the bones of the left shoulder girdle, the base of the skull and the anterior aspect of the bodies of the first thoracic vertebrae. The radiological studies revealed signs of bone necrosis on the left scapula, in the form of hypodense subcircular-shaped areas at whose periphery there were found micro-areas of thickening around areas of necrosis. Finally, scanning electron microscopy and microanalytical analyses of ectopic lamellar bone present on the scapula revealed the presence, on one of its surfaces, of tightly woven textile fibres containing traces of aluminum and copper; the appearance of the other surface was similar to that of skin. The micro-morphological characteristics support the hypothesis that these fibers may be the remains of a dressing. Overall, the results of the analyses indicate that he suffered very serious burns, compatible with third degree lesions, which were treated with bandages impregnated with a therapeutic ointment. The extent and severity of the lesions were such that Blessed Egidio died two weeks after sustaining them.

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Atherosclerosis in the collection of the Morgagni museum of pathological anatomy of Padua

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The Morgagni Museum of Pathological Anatomy of the University of Padua preserves a wide series of pathological specimens, mostly from the second half of the 19th century and the early 20th century. The Museum was recently renewed, as the result of an intervention of enhancement of the museum and cultural heritage of the University of Padua and its Medical School, being also testimony to the history and evolution of human pathology and past population lifestyle.

In the collection of the Morgagni Museum there are several specimens affected by atherosclerotic lesions. Atherosclerosis is characterized by a chronic inflammatory disease in which different factors are involved, such as lipoproteins, immune cells and endothelial damage. The main clinical syndromes related to atherosclerosis are angina pectoris, acute myocardial infarction, transient ischemic attack, cerebral stroke, intermittent claudication, aortic aneurysm and nephrovascular hypertension. Atherosclerosis was believed to be a modern disease, related almost exclusively to age and current lifestyle.

The cases from the Morgagni Museum are therefore useful for studying the presence of the atherosclerosis in a recent past population.

In the collection there were identified six atherosclerotic cases:

- an *atherosclerotic aneurysm of the ascending aorta*: the specimen highlights the left ventricular outflow tract and the aortic root. There is a severe atherosclerosis of the ascending aorta with saccular aneurysm including a large thrombus;
- a *syphilitic aortitis complicated by atherosclerosis*: the finding highlights the left ventricular outflow tract and aortic root. It is possible to note the intima of the ascending aorta with ulcer-calcific atherosclerotic plaques and "tree-bark" whitish areas;
- an *atherosclerotic aneurysm of the abdominal aorta*: abdominal aorta with saccular atherosclerotic aneurysm, proximal to the iliac bifurcation;
- a case of *aortic atherosclerosis*: aorta with severe atherosclerosis complicated by calcification and thrombosis;
- a case of *aortic atherosclerosis*: massive dissemination of atheromatous-calcific plaques;
- a case of *aortic atherosclerosis with parietal thrombi*: widespread presence of plaques along the aortic wall.

Thanks to this collection, it is possible to notice the spread of pathology on an atheromatous basis in the

recent past populations. Moreover, current paleopathological investigations on ancient populations mummified remains also showed traces of atherosclerotic lesions in both sexes and different ages. It is therefore possible to support a ubiquitous diffusion in space and time of this complex multifactorial pathology which has so far considered to be almost an exclusive prerogative of old age and current lifestyle.

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Human remains in museums: bioethical issues

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Many and complex ethical and juridical issues arise about human remains for scientific and not scientific community: can we arbitrarily manipulate an inert subject lifeless for hundreds or thousands of years? Does it justify a moral question on a human remain without identity? How to qualify such remains? Is it possible to recognise human rights after death?

The emblematic interrogative of bioethics “can we do everything that science and technology allows us to do?” is more complex when we face with bodies of the past that are no longer living.

The answer to these questions firstly requires the identification of reasons that can justify an expansion of moral evaluations to what no longer belongs to the living world. By definition, the matter of bioethical analyses is “life sciences” and, therefore, living subjects. While recognizing that the object of evaluation is excluded by the bios, we believe that the complex sym-

bolic, anthropological, psychological and religious values that human remains are able to evoke on individuals and/or communities cannot be ignored or trivialized. On the contrary, these values call for careful reflection and moral responsibilities towards human remains. We also believe that the same cultural dimension of human identity ascribes to the human relationship with a particular meaning that transcends the biological one and the same limits of death, as a purely naturalistic event. Awareness of such a cultural dimension of human identity urges a sense of belonging and a brotherhood that leads us to look at our neighbour with a sense of solidarity and responsibility towards “the other”, even when the other belongs to a distant historical era. The cult of the dead, expressed from earliest times by the various communities, represents a precious testimony of the value and meanings attributed to the remains of the person.

Recognition of the admissibility of the ethical dimension in this area and a certain moral status of the material elements associated to body of the past have serious implications and entail the need to carry out complex assessments and a balance between various issues involving conservation, enhancement and show of human remains.

From the point of view of knowledge, we cannot forget the importance that human remains assume for research on the anatomical and behavioural evolution of man, nor the fundamental role of museums for biological and cultural knowledge of the past. At the same time, we cannot ignore that the collection of human remains in museums was also the result of devastations, looting of tombs, economic transactions and genocides.

The management of these remains therefore requires careful analysis and diversified evaluations based on multiple factors: an adequate consideration of various interests and issues, an intercultural dialogue, sharing choices and a continuous interaction and collaboration between different knowledge and skills.

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FOURTH SESSION

CHIARMEN: ANTONIO FORNACIARI (Pisa), MIRKO TRAVERSARI (Bologna-Ravenna)

Toothpick evidence from the Epigravettian layers of Grotta Paglicci (Puglia, Italy)

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Grotta Paglicci is located on the southern slope of the Gargano Promontory (Apulia, Southern Italy) at an altitude of about 107m above sea level. In the 12m-thick sequence exposed inside the cave findings belonging to Lower-Middle Palaeolithic (Acheulean, Early Mousterian) to the Final Epigravettian were discovered. A large Epigravettian fossil sample, consisting of 64 teeth (of which 23 deciduous and 41 permanent), was found distributed between the layers 1 and 17.

Among these findings, two teeth, a permanent upper right M1 (Pa 157) and a deciduous upper right dM2 (Pa 81), have aroused particular attention. In the area of the cemento-enamel junction (CEJ) of the two teeth, interproximal grooves, bucco-lingually elongated and characterised by the presence of microstriations parallel to their longitudinal axes, were observed. The evidences detected on the teeth were observed under a three-dimensional digital microscope in order to acquire 3D images of the affected surfaces. The locations and shapes of interproximal grooves have led to propose several hypotheses to explain their formation. Virtual models obtained allowed interpreting the grooves as a habitual toothpicking activity, which suggests therapeutic or palliative attempts at relieving sore gums, removing trapped food particules that irritate gums on adjacent teeth. In Paglicci specimens, the orientation of the grooves along the first half of the axis affecting the buccolingual corner suggests the use of an inflexible probe with angles of insertion directed and restricted by the cheek. In particular, on Pa 157, root exposure, porous appearance of the alveolar margins and resorption of the alveolar bone suggest a periodontal condition. In addition, habitual idiopathic picking has been considered as a possible explanation of these findings.

The present study represents the first evidence of interproximal grooves among the large sample of Upper Palaeolithic human remains from Paglicci, confirming the ubiquitous presence of such phenomena among human populations. Interproximal grooves on deciduous teeth have already been detected in other studies, implying a behaviour involving both children and adults.

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A probable case of *thalassemia major* from Alghero, Sardinia: macroscopic and roentgenographic study

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The present study is focused on the macroscopic and roentgenographic skeletal lesions associates with *thalassemia major* in 18 months±6months old child from the medieval cemetery of Alghero, Sardinia. In 2008 archaeological excavations of the former Jesuit College of Alghero brought to light the San Michele medieval cemetery and produced a sample of 600 skeletons with a chronology from 1280 to 1590-1620 ca A.D. and five different phases of use. The incomplete skeleton of the 18 months±6months old child our study focuses on dated from XIV to XV century (second phase of use) is brought to light in the southwest corner of the inner courtyard of the College. The entire skeleton of this child with an estimated age at death of 18 months±6months on the basis of dental development is affected by marrow hyperplasia with resorptive lesions in the axial skeleton and in the ilium, extreme changes due to porotic hyperostosis are present on the incomplete calvarium with marked diploic expansion and hair-on-end appearance in section confirmed by roentgenographic findings. A range of conditions have to be considered for the

nature of the lesions observed, including thalassaemia. The development of extreme bone lesions suggests evidence of a malfunction of the haematopoietic system, most probably as a consequence of thalassaemia and in particular the age-at-death of this individual and the severity of the lesions are explained as either the probable result of *thalassaemia major*.

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Coarse multicystic ossifications in the neck region suggestive for goitre in 16th century skeletal remains from the former church of Santa Maria della Pieve (Cuneo, Italy)

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Goitre is a swelling in the neck resulting from an enlarged thyroid gland due to deficient intake of iodine. This condition has accompanied human history since its dawn and is often endemic in regions far from the sea such as Piedmont. Thyroid tissues do not resist to putrefactive processes however extensive calcifications can persist as documented in the reported case. In 2018, as part of urban works in the city of Cuneo, the remains of the former Church of Santa Maria della Pieve were recovered. The foundation of the church dates to the 13th century. The archaeological excavation has intercepted a significant funeral area that include several cemetery phases related to the different historical periods and 140 primary burials dated from 12th to 16th century have been excavated. The prelim-

inary anthropological data suggests that people of all age classes and both sexes have been buried, including adolescents and children. Although paleopathological studies are still preliminary, at least 3 subjects show coarse bone calcifications near the neck of the individuals. The focus of this work are 3 irregular, spheroidal calcifications detected in the skeleton buried inside the grave T62 (adult male, 168.3 cm ± 3 cm tall). The enlargement of the thyroid gland has been described in Egyptian mummies and observed in tombs paintings while the Chinese physicians were the first to successfully treat patients with goitre by using the thyroid gland of animals. Struma and hyperthyroidism are also well described in the Corpus Hippocraticum. A relevant paleopathological specimen of goitre has been reported in a Sicilian mummy of the 18th century from Comiso with calcifications at the standard X-ray examination of the neck region. Goiter has been used in many cultures to characterize populations in which the phenomenon was particularly widespread and is well documented in figurative arts in particular in Cuneo area. In the English Midlands, the condition was known as Derbyshire Neck. Histopathologically, goitre nodules can undergo to a wide range of degenerative changes including extensive calcifications but mature bone formation is rare. Many pathologic conditions can lead to calcification and ossification of the soft tissues, generally related to inflammatory, disendocrine or paraneoplastic processes; they appear smaller, sparsely distributed and rarely spare the ligamentous structures. The calcifications observed in the subject are quite large and clearly show the imprint of spheroidal or multicystic structures consisting of struma nodules. Furthermore, the sex, the height, the geographical origin of the subject well coincides with a case of inveterate goitre secondary to iodine deficiency. In conclusion, the presented case represents a rare and remarkable skeletal documentation of a rather common pathology that further documents the living conditions and the health of the pre-unitary Piedmontese population

Syphilis and other infections in Modern era Milan: the preliminary results of the pathological analyses on the remains of the Ca' Granda crypt

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The crypt of the *Beata Vergine Annunziata* is located under the *Ospedale Maggiore*, called “Ca’ Granda” by the Milanese and known today as the *Università Degli Studi di Milano*, which was the hospital of the poor of Milan during the Renaissance. Out of the estimated two million bones in the crypt, the majority are commingled, although some maintained anatomical connections. Consequently, the human remains in the crypt represent a tremendous source of scientific and historical knowledge for the reconstruction and understanding of the lives and lifestyles of the populations of Milan of the Modern Age. This presentation will introduce the preliminary pathological results of the first anthropological analyses of the remains, and in particular, infectious diseases. As a result, in addition to cases of osteoarthritis, possible pellagra, scurvy, and anemia, as well as traumatic lesions (both antemortem and perimortem), the patients of the hospital seem to have suffered from various infectious conditions, as evidenced by the presence of cases of syphilis, septic arthritis, dental infections, skeletal indicators of non-specific infections (including in the superior airways) and possible cases of leprosy (the lack of specific markers of the disease found in the crania prevents a certain diagnosis). These results were compared with necropolises of Milan from the same historical epoch for diachronic studies (project MiAntropo). The recognition and diagnosis of these chronic infections permits the understanding of disease burden for the affected individuals, the reconstruction of the health and life histories of the patients of the hospital and provides information on the symptoms and disability that these individuals may have suffered from and the care they may have received.

From excavation to storage. Best practices for recovery, packaging and conservation of human remains

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The information that can be gathered from human remains and, more generally, from the archaeological record, is typically dependent on various factors, such as taphonomy and human-induced modification occurring in the post-excavation phase. The unearthing of the skeleton, the cleaning of the bones, their packaging, transport and storage are mandatory and preliminary steps for an anthropological analysis. Unfortunately, these crucial tasks are not always carried out by people with the required expertise. This happens

despite the fact that the treatment of human remains brings about ethical issues as well; nevertheless, too often, they are manipulated less carefully with respect to other archaeological materials. Therefore, it would be advisable to involve an anthropologist, starting from the early stages. He is the key figure that can also ensure that the adequate procedures are applied to the remains from the beginning, so as to avoid damages to the material. For example, the use of consolidating products and other invasive procedures could spoil irredeemably a subsequent lab analysis. That said, we have to say that the guidelines given by the Soprintendenze ABAP are not always clear and detailed enough to enable people working on the field to avoid mistakes; nevertheless, it should be their duty to keep pace with the best practice. We have selected numerous significant pictures taken in the last twenty years during the work in the Padua Soprintendenza. They depict examples of good and bad practices in the treatment of human remains, ranging from excavation to storage.

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POSTER SESSION

CHAIRWOMEN/CHAIRMAN: C. TESI, R. FUSCO, O. LARENTIS (Varese)

Dental pathology and diet in Medieval population (14th century AD) from Imola

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Dental features are highly indicative of health status and dietary habits of populations of the past. The interpretation of dental diseases contributes to reconstruct past lifeways from human skeletal remains. The

purpose of this work is to define the oral health in relation to diet of a medieval little community of Imola (14th century AD). This archaeological site was discovered in 2009 during road work in the historic centre of the city. The finding refers to the convent and oratory of San Giuliano, whose presence is attested by historical documents. Skeletal remains were found in two adjacent funerary tombs, interpreted as collective burials. The material studied comes from "Grave 1" comprising probably individuals belonging to the same community or family group. The individuals show a highly fragmented and incomplete state of conservation. The MNI assessed was 21 subjects: 13 adults (3 males, 2 females, 8 undetermined) and 8 sub-adults. Oral health analysis was conducted by evaluation of dental-alveolar features: caries, abscesses, *ante mortem* tooth loss, dental calculus, tooth wear, chipping, periodontal diseases and linear enamel hypoplasia. The macroscopic standard methods were used to identify and classify these pathological characteristics. Dental analysis was carried out on 161 teeth: the individuals exhibited a high prevalence of caries, calculus, wear, periodontal disease and linear enamel hypoplasia, low frequencies of *ante mortem* tooth loss, abscesses and chipping. This pattern suggests a diet based on high consumption of carbohydrates complemented by a marginal protein intake. The high frequencies of linear enamel hypoplasia indicate the presence of strong metabolic stresses or malnutrition during early childhood. There are no statistically significant sex differences in the distribution of oral pathologies. However, females show a higher degree of wear than males. The presence of chipping in association with directional wear in some individuals suggests a paramasticatory use of the teeth as tools in daily or work activity (preparation of animal hides or vegetable fibres). This dental disease pattern reflects difficult living conditions probably characterized by poverty and poor hygienic-sanitary status of this community lived in the Middle Ages. The subjects analysed are probably referable to the lower class of population with a monotonous diet based on the consumption of a few species of cultivated cereals. The results of this study provide a contribution to the reconstruction of the lifestyle of a medieval population of Imola.

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Review. Paleopathology of obesity

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Overweight and obesity are defined by the World Health Organization as an abnormal or excessive fat accumulation that presents a risk to health. This condition has affected populations during their whole history but the palaeoepidemiological studies are scarce in the scientific literature. In the palaeopathological investigation, the lack of soft tissue poses serious limitations in the investigation of the prevalence of obesity in the past. If several effects of obesity on health are well known, it is not clear the pathophysiological relationship between obesity and bone. However, several studies have focused on the analysis of specific skeletal disorders related to obesity and overweight. In this study, we conducted a literature research (PubMed, Scopus; Google Scholar) in order to provide a comprehensive overview of the skeletal conditions and pathologies associated with obesity to offer an effective tool for anthropologists and other practitioners in obesity research. The evidence suggests that high body mass index (BMI) is linked with the development of several musculoskeletal disorders as the fat mass (especially visceral abdominal fat) has potential effects on bone homeostasis and on osteoblasts action. Musculoskeletal disorders related to obesity or overweight affect mainly the hip, knee, ankle, feet, shoulder joints, increasing the risk of developing osteoarthritis. Other conditions associated with high BMI are gait disturbance, rheumatoid arthritis, and calcaneal spurs. Instead, the relation between bone mineral density (BMD) and high body weight is still controversial. A number of studies suggest that high body weight is protective of BMD but more recently, it has been demonstrated that obese adults and children seem to be more prone to fractures in specific skeletal regions. Other pathological conditions frequently attested in palaeopathological records could be related to obesity and its comorbidities and therefore can be considered a proxy of high body mass. These conditions include Diffuse Idiopathic Skeletal Hyperostosis (DISH), gout and Hyperostosis Frontalis Interna (HFI).

DISH and gout are connected to sedentary lifestyle and to high caloric diets. HFI is commonly linked with metabolic disorders and its prevalence varies according to adiposity.

The most common chronic condition induced by obesity is Type II diabetes mellitus (T2DM). T2DM influences bone turnover, bone morphology and BMD. There are different types of lesions related to T2DM recognisable from the skeleton that affect especially lower limbs and feet bones.

The findings of this review indicate that the analysis of skeletal disorders and pathologies clinically associated with obesity could provide new means for the identification of overweight and obesity in past population, leading to a new and detailed interpretation of archaeological cases and past human behaviours.

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A skull in the cellar. Forensic investigation on the calvarium of a newborn found during building restoration

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The manager of a construction company went to the police and reported having found a human skull in an underground room used as a cellar in a building under renovation. On behalf of the judges, we carried out a series of photographic surveys and measurements on the confiscated skull.

Numerous craniometric measurements were made. It was a newborn skull, there were no secondary sexual characteristics (evident in the skulls of adult subjects) which allow diagnosis of sex.

The skull was incomplete due to the absence of jaw. The specimen was widely dusty, dirty, covered with cobwebs and very small live insects (visible with a

magnifying glass), mites? This indicated that the skull had long been present in that location. There was a 1 cm triangular lesion in the right occipital region. There was a 1 cm right parietal lesion. There were two parieto-occipital breaking points of 2 cm and 4.5 cm. In the left parieto-temporal region up to the occipital bone, continuity solution with irregular edges measuring 8x6 cm. Flaps of dura mater were present.

There were a series of lesions, it was clearly visible and present under the bone, a very well preserved extensive flap of dura mater. The meninge, a particularly perishable structure over time, indicated that the skull was datable with an age of less than 50 years, that is, the newborn lived about 40/50 years ago. It is not possible to establish whether the injuries were the cause of death, or whether they were caused later on the skull.

Six dental gems were highlighted, to establish the age at the time of death by assessing the presence, and the degree of development of the dental gems of the skull and therefore understand if it had belonged to a person born and then died (perhaps in the first months of life), or to a fetus in the gestational age. Based on the Dental Development Scheme (taken from modified Ubelaker), it was possible to date the skull as belonging to an infant, of 6 months (+/- 3 months). The development conditions of the fontanelles, confirm what is indicated, in a more reliable way by the teeth. Traces of cement for construction on the maxillary bone and right temporal bone indicated that the skull had been present on the construction site for some time. A small segment of twine (about 2 cm) was wrapped around the right maxillary arch. This is the most interesting finding. Who wrapped that string around the right jaw of the skull and why? The presence of the small string must not be underestimated, it suggests that the skulls were preserved as an anatomical finding, before being taken to the place where it was found.

Possible pathologies: absence of relevant pathological phenomena. The state of conservation of the seized skull: discrete state of conservation.

In conclusion we established the age of the infant, the age of the skull, the absence of diseases, the state of conservation. We speculated that it had been moved and that it was a piece from a private collection.

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Bioarchaeology at Taormina: a preliminary investigation of Tomb 2 of Villa San Pancrazio

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The historic Villa San Pancrazio, an early XX century building of Taormina, Sicily, contains the remnants of a Roman quarter that was first discovered in 1978. Following the purchase of the building by developers, a new archaeological investigation commenced in 2016 that involved the local Superintendence, the University of Messina, and the National Council for Research of Catania. Structures were identified that spanned the Roman period to the Middle Ages, and a number of burials were also discovered. Among these was Tomb 2, which dates to the early medieval period (IX-X centuries AD) based on archaeological findings. This burial was part of a larger cemetery that included at least sixteen burials, many of which have been investigated by the local Superintendence on multiple occasions spanning a time period from the 1970s to the 1990s. An anthropological investigation of the human remains contained in this tomb allowed an estimate of a minimum number of 12 individuals. This consisted of seven adults, four children, and one infant. Despite poor preservation of the findings, it was possible to identify several signs of pathological changes on the bones. Among the observed dental pathologies were: linear enamel hypoplasia (associated with physiological stress in childhood), heavy tooth wear, and ante-mortem tooth loss. In addition, several skeletal elements showed signs of degenerative diseases, such as spondylosis, Schmorl's nodes, and osteoarthritis of the rib and the shoulder joints. It was also possible to note the presence of congenital disease in the form of spina bifida occulta as well as interesting non-metric features such as one case of humeral foramen. Lastly, traumatic injuries were also recognized: one right femur presented a displaced fracture of the mid-shaft, incorrectly reduced and with a remodeled callus. This must have caused a remarkable shortening of the lower limb of this individual, which in all likelihood led to difficulties in walking.

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Health and Disease in Sicily. A Bioarchaeological Research Project

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Health and diet are fundamental aspects of everyday life in human communities. Interpreting the complex relationships between diet and pathology provides a precious insight into the socio-cultural framework of ancient and historical populations, as well as contemporary life. These health nuances can contribute to the reconstruction of specific historical events documented in the archaeological record. In this respect, the island of Sicily represents a unique resource for bioarchaeological studies, due to the large presence of well-preserved osteological human remains spanning from prehistory to historic times. Due to these different populations that have lived and settled on the island throughout time, this skeletal material is of paramount importance for answering specific questions that can only be addressed through long-term investigation. For instance, using historical data in conjunction with human remains from archaeological excavations can provide the direct primary source of evidence concerning ancient pathologies and their relation to one's everyday diet. Within archaeological science, the multidisciplinary combination of paleopathology, forensic anthropology, and biomolecular analyses has the potential to offer unique insights into health and dietary issues, both at an individual and population level. In particular, stable isotopic analysis has proven to be a valuable quantitative method for estimating the different food sources in an individual's diet. Hence, it is often stated that, "you are what you eat" because the different consumption of food in each past-population's diet is reflected in the isotopic composition of these tissues. Specifically, Carbon and Nitrogen isotopic analysis in bone and tooth collagen and bioapatite has been widely used to address is-

sues of subsistence, social status, and infant weaning patterns. Furthermore, aside from being a direct link to the consumption of food, dietary profiles generated from isotopic analysis can also be employed for investigating ancient diseases and health, identifying periods of nutritional stress, and providing valuable quantitative data that integrate and better explain the disease patterns discovered macroscopically in the skeletal assemblages. Unfortunately, there are very few studies connecting pathology and diet that have been published. What is more, these large-scale studies addressing health are even rarer within the Sicilian context. Therefore, the aim of this project is to investigate Sicilian health and disease from prehistory until the early modern period. This will be achieved from a bioarchaeological perspective, but linking in with other disciplines such as forensic anthropology and archaeology. The project will focus on the health and dietary aspects of human communities through the combined use of paleopathology and biomolecular archaeology. Human skeletal remains will be collected from several sites all over Sicily, and will be analyzed to document and develop a pathological and dietary profile. From a pathological perspective, the individuals will undergo macroscopic examination to record any signs of metabolic, infectious, degenerative and dental diseases. Bone and tooth samples will then be employed for biomolecular analysis. The results will be combined with data from other coeval Sicilian sites to reconstruct the general health status and variation within the wider population, in an attempt to answer the following research questions: whether epidemics and malnutrition episodes can be reflected in human skeletal remains; if and what kind of health and dietary differences between different population groups in terms of ethnicity (locals, Greeks, Romans, etc.), age and sex, and location (urban and rural) exist; and whether specific pathological conditions at the individual level are related to diet and how. This will be the very first attempt to understand the overall presence of disease in a specific area of Italy, and will follow the standards applied for the rest of Europe.

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Case of scoliosis from the medieval site of Alghero Lo Quarter (Sardinia)

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The poster is focused on the case of a moderate scoliosis observed in the column of an adult woman from the medieval cemetery of San Michele in Alghero, Sardinia.

Excavation campaigns from June 2008 to September 2009 in the area of a former Jesuit College in Alghero (Sardinia) between Largo San Francesco and Via Carlo Alberto noted like *Lo Quarter*, the “barrack”, brought to light the presence of a large medieval graveyard comprising approximately 600 skeletons dated from 1280 to 1590-1620 with five different chronological phases. The archaeologists have investigated three different areas of excavation inside the building and one in the inner courtyard.

Our case of study is found inside the building in the east band of Area 1000: the skeleton (US 1081) is an adult female with an estimated age at death between 22-31 years on the basis of dental wear and pubic symphysis. The skeleton presents lateral deviations of the spinal column from the midsagittal plane with two fusion points of the neural arch at the thoracic level and a lateral wedging of three thoracic vertebrae causing a moderate anterior inclination of the column. We have hypothesized a case of moderate scoliosis started at an early age and progressed throughout the growing age of the individual due to specific postures.

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Pathological new bone formation on the tibia of an Etruscan man: differential diagnosis

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Paleopathology studies diseases in individuals of the past; this is a helpful mean to better understand the evolutionary processes and the action of today's diseases.

Paleopathology has advanced a lot in recent years, increasing in rigour both in terminology and diagnosis. To correctly diagnose a pathological condition or an illness, after accurate descriptions scientists eliminate the least likely maladies in favour of those that fit most closely the observed pathological changes.

Here we present a differential analysis of a pathological tibial enlargement on a skeleton from the necropolis of Spina Valle Pega. Spina's harbour, located on the Adriatic coast, near the modern city of Ferrara, belongs to the Etruria Padana. It is a historic unicum, a large commercial port where different cultures, including Etruscan Celts and Greeks, coexisted, as evidenced by the inscriptions and the varied grave goods. The analysed skeletal remains belonged to a male aged over 50 years. This individual presents an evident enlargement in the lower half of the right tibia's diaphysis due to dense sclerosis with severe periosteal new bone formation. The periosteal infection also spread to the right fibula. A transverse section of the tibia shows severe cortical thickening and loss of the medullary cavity by new trabecular bone. No features of acute infections, such as cloacal openings and sequestra, were found in the bone. Evidence of enthesopathies was found in the upper (in particular in the right clavicle) and in the lower limbs. Through the use of macroscopic and radiological techniques, we analyse the skeletons and perform differential analysis to define the origin of the bone neoformation. Analysing lesions and enthesopathies localized in the rest of the preserved bones, we can then trace the lifestyle and activities carried out by the Etruscan man and also the extent to which the pathology had conditioned him.

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FIFTH SESSION

CHAIRMEN: LUCA VENTURA (L'Aquila), RAFFAELE GAETA (Pisa)

Paleopathology of Geridu's medieval ossuary. A preliminary analysis

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The medieval deserted village of Geridu, near Sorso, in the North of Sardinia, is mentioned in historical sources since the XIIth century and reached its maximum development during the XIVth century, when its population was about 1500 people. The village had been deserted before 1427, as the sources suggest, for several reasons, such as fiscal pressure, wars and pestilence.

The village's cemetery, near the church of Saint Andrews, was excavated in 1997-1998. The archaeologists dug 26 burials and discovered an hypogeic structure, most ancient, used in XIVth century as an ossuary.

More than 90 cm of human remains were found, including some portions of skeletons in anatomical connection in the most ancient part of the ossuary.

Therefore, archaeologists hypothesized the use of the structure also as a primary burial place for some individuals, especially for non-adults. In fact, the high presence of all subadult bones, found in the most ancient part of the ossuary, can suggest that some children were buried directly in the ossuary.

Based on pottery found in ossuary's obliteration the structure was closed definitively in the XVth century.

The aim of the anthropological study was to determine the bioarchaeology of Geridu from the commingled bones from the ossuary.

The osteological study focused on adults remains from the most recent part of the ossuary, separated from the first period of use by a layer of lime, and on several portion in connection found in the US 2812, the most ancient stratigraphical unit.

Therefore, 180 commingled bones and 36 parts of in-

dividuals in connection has been analyzed.

The paleopathological aspect seems to be very interesting; it confirms the results of individuals' study from the cemetery burials, in addition to providing new data. The sample contained two cases of DISH, Diffuse Idiopathic Skeletal Hyperostosis, already found in Geridu, several bones affected by infectious diseases, such as a femur with pathological traces of osteomyelitis and a tibia with a probable case of Sclerosing osteomyelitis of Garré.

Furthermore, a probable case of Osteosarcoma has been found, is an adult femur with extensive lithic lesions that have completely altered the proximal bone profile.

For a better diagnosis the bones with traces of pathological lesions were analyzed with XR and Spiral CT scan by a team of Radiology from the University Hospital (A.O.U.) of Sassari.

Despite the impossibility to complete a differential analysis, due to the absence of the rest of the skeleton, the hypotheses advanced seem to be confirmed by a CT scan.

The study, even if incomplete, shows that important information can also be obtained from contexts such as ossuaries, which give a general picture on the state of health of past populations.

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The double graves of the hospital cemetery "Forlì Campus" (17th - 18th centuries) potentially correlated to childbirth deaths: anthropological, palaeopathological and archaeogenetic analyses

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In anticipation of the construction of an energy production unit for the new Forlì University Campus, between October 2013 and January 2014, preventive archaeological investigations were carried out. The analyses identified an area for burial, which historical sources and location attributed to the ancient city hospital. The excavation brought to light 271 single and multiple burials, for a total of 405 individuals recovered, plus 6 burials that were used as an ossuary. Since 1223 the area was part of a complex including the charity hospital *Domus Dei*, probably founded in the thirteenth century. During the analysis of the burials of the hospital cemetery, the presence of 13 double and multiple burials was noted in which the association between a perinatal individual and at least one adult individual was present. With the aim to detect and analyze double burials potentially correlated to childbirth deaths, a multidisciplinary analysis was undertaken, combining anthropology, paleopathology and archaeogenetics. The first step was to identify and exclude from the study the burials that contained a male individual associated with a non-adult in this group of 13. Of these, randomly distributed across the necropolis area, in only five cases the adult individual was recognized as a female and the non-adult individual was found perinatal. In one case, the perinatal individual shows a premature age-at-death not compatible with the term of gestation, in this latter case, the adult female individual is the only one to have evident pathological stigmata. Genetic analyses, based on mitochondrial DNA, were performed on the five burials selected from the anthropological study. No contamination was observed in any of the blank extractions or negative controls included in each reaction, both for extraction and amplification steps. We also detected the absence of a recurrent haplotype, which could be due to contamination by modern exogenous DNA. Among the 10 individuals genotyped, 10 different HVR-I haplotypes and coding region SNPs were identified. No maternal relationship was highlighted within these double burials; in fact, for each tomb tested, the two individuals buried together (adult female and alleged child), showed different polymorphisms in the HVR-I region and also different mutations in the SNPs of the mtDNA coding region. The question behind this study concerned the verification of the hypothesis of a mother-child relationship between the individuals of these burials, as a complement to the research on the spread of the

practice of hospitalization during childbirth. The analysis of ancient DNA in this particular application provides a useful approach to support and complete the interpretation of archaeological and anthropological data. Although the archaeological context was apparently clear, leaving to lean toward a mother-child relationship and to causes of birth-related death, genetic analyses did not confirm these hypotheses.

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A probable case of Skeletal Fluorosis from the medieval church of “Dell’Assunta”, Smarano, Trento, northeastern Italy

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Skeletal Fluorosis (SF) is a chronic bone disease caused by the ingestion of large amounts of fluoride. This anion is responsible for some biochemical changes in the organism that lead to an increased and generalized production of a new, denser, bone tissue. Here we present the case of a male subject, 35 years old, from the medieval cemetery of “Dell’Assunta” church in northeastern Italy. The skeleton was found in an optimal state of preservation and in a good state of representation. Anthropological analysis was performed according to Buikstra and Ubelaker standards for the study of the human remains. Isotopical analysis was also conducted. Paleopathological diagnosis was based on macroscopic, microscopic and radiographic analysis. A visible enthesophyte formation is observed on the acromion of the scapula, on the ischial tuberosity and on the iliac crest. Moreover, are present the ossification of the spinal ligaments and the complete fusion of some spinal portions by thick osteophytes. Finally, ankyloses of some costovertebral joints is oc-

curing. We discuss this case taking into consideration also the territory in which the subject was found.

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Histories of violence from the past: reconstruction of the dynamics of a traumatic event from the cemetery of San Biagio in Cittiglio (Varese)

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Human skeletal remains of archaeological interest occasionally display traces of traumatic injuries, opening a significant field of investigation on the degree of interpersonal violence existing in certain human groups and societies of the past. These lesions can be studied in depth with new diagnostic technologies, allowing anthropologists to reconstruct episodes of past violence and investigate their dynamics. Some investigation techniques, developed in recent years, offer the researchers the opportunity to analyse in detail features not visible to the naked eye, allowing examining the qualitative and quantitative traits of the micro-traces etched in cut marks.

We describe here a case of extensive traumatic lesions observed in a skeleton unearthed during archaeological excavations in the medieval cemetery of San Biagio in Cittiglio (VA). Clear traces of multiple perimortem injuries have been observed in the skull of Tomb 13, which represents an exceptional case of violence in the past of this rural population.

The investigation required a multi-analytical approach, allowing the in-depth evaluation of the cut marks and of microstriations that bear essential information for the interpretation of the lesions.

The main objective was to reconstruct the dynamics of the violent event, biologically kept in bones, applying a modern scientific approach such as the three-dimensional digital microscopy. A second significant objective is to validate the potential of 3D digital microscopy, which is rarely applied in all its possibilities

in the archaeological field, in order to propose an in-depth observational and interpretative methodology that may find application in other osteoarchaeological cases. The efficacy of this tool in cases of traumatic injuries has been confirmed through its specific functions, such as the detailed rendering of the 3D virtual models and the possibility of thorough qualitative and quantitative analyses, capable of providing metric and morphological data that can be compared improving the interpretation of paleo-traumatology studies.

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Anthropological and paleopathological analysis of the human remains from a medieval church in Valcuvia (Varese, Northwester Italy)

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The cemetery area of Sant'Agostino in Caravate (Varese, Italy), was investigated in several archaeological seasons: the first one in 1989, the second one in 2002-2003 and finally in 2018- 2019.

The archaeological investigation brought to light 24 funeral structures of uncertain chronology: 19 primary burials and 5 secondary depositions. In this study were analysed the remains of a minimum number of 42 individuals, 31 adults and 11 sub-adults.

The anthropological analysis has included the evaluation of pathological conditions, nutritional deficiencies, traumas and the development of occupational and musculoskeletal stress markers. Paleopathological diagnosis was carried out with macroscopic, microscopic and radiographic analysis.

We present here the preliminary results of osteoar-

chaeological and paleopathological investigation. The study allowed us to detect some general peculiarities: dental disorders, deficiency states, several traumatic cranial injuries, osteomas and endo-cranial lesions.

Despite the absence of ¹⁴C dating, helpful to clarify the chronology of the burials, this contribution presents a picture of the health status of a northwest Lombardy medieval population.

With further archaeological and anthropological investigations, we will have the opportunity to clarify the dating of the site and, possibly, to verify the presence of other pathological conditions.

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SIXTH SESSION

CHAIRWOMAN/CHAIRMAN: LUISA FERRARI (Asti), MIRKO TRAVERSARI (Bologna-Ravenna)

A possible case of orbital osteomyelitis from a medieval church in Valcuvia (Varese, Northwest Italy)

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As with infections in other body tissues, infections of the bone posed a serious threat to life. Prior to the advent of antibiotics, the mortality from osteomyelitis had been estimated conservatively at approximately 20 percent. It may be assumed that the mortality and morbidity from osteomyelitis was possibly worse in historical times. However, studies on the prevalence of pyogenic or suppurative osteomyelitis in skeletal remains have been fraught with uncertain and conflicting reports. Thus, its paleopathological recognition and analysis in skeletal remains is typically incomplete.

The aim of this paper is to present a case of orbital osteomyelitis in an adult male skeleton, from archaeological excavations of the medieval cemetery of the Church of Sant'Agostino in Caravate (Varese, Northwest Italy).

The remains have been analysed both from a morphological and a radiological point of view. Macroscopically the area next to the left supraorbital notch appears slightly enlarged, with the presence of a cloaca on the

orbital roof. The deposition of new bone in the form of a fine porous mesh is observed on the maxilla.

CT scans show a sequestrum located in the superior portion of the orbit. Inside the cavity, which communicates with the outside through a fistula on the orbital roof.

The morphological and radiological picture suggests a diagnosis of rare chronic orbital osteomyelitis, with only scattered case reports available.

By the clinical cases recorded, literature informs us that these pathological conditions can occur as sequelae to frontal sinusitis, head trauma, postoperative complication following sinus surgery or due to haematogenous spread.

A case of Argyria in the Morgagni Museum of Pathological Anatomy of Padua

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The Morgagni Museum of Pathological Anatomy of the University of Padua, founded by Lodovico Brunetti (1813-1899) in the 1860s, gathers important pathological specimens mainly from the 19th century. Among them, there is a very peculiar preparation: it consists of a dried head representing a case of argyria dating back to 1873. The specimen is preserved in a sealed jar, all the skin has a blue-gray coloration with white-blond hair and beard. The eyes are not preserved, but since the ocular cavities remain open, it is possible to presume that originally there were glass eyes. Two glass sticks are inserted inside the mouth to show that also tongue and gums have the same blue-gray pigmentation as the face. The upper teeth are strongly eroded.

Argyria is a rare disease caused by chronic absorption of products with a high silver content, which surpass body's renal and hepatic excretory capacities, leading to silver granules being deposited in the skin and its appendages, mucosae and internal organs. It is characterized by blue-gray or black staining of the skin and mucous membranes.

Our case was first mentioned in 1862 as a syphilitic man who was treating himself with some caustic silver nitrate, the so called "infernal stone," since 1840s. According to him, this medicament cured the syphilis, but turned him into a "graphite man." The patient died in 1873 of an intestinal infection, most likely related to the prolonged ingestion of the silver nitrate.

This case was described as "spectacular" by Austrian dermatologist Isidor Neumann (1832-1906), who

studied a sample of the tongue of the specimen sent by Brunetti. In fact, Brunetti performed the autopsy on the body of the individual and prepared also a plaster cast of the head along with the sample for Neumann. Thus, we can assume Brunetti was also the one who preserved the original head, taxidermizing it (so-called *stuffed head preparation*) in order to preserve the skin color, because his famous tannisation method would not maintained the original characteristics.

Human taxidermy is quite rare, and it is limited to a few cases in the 19th century. Moreover, there are just a few known human stuffed heads in the world, making the Paduan specimen particularly unique both for the pathology and the technique used for the preparation.

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Methodological approach for lesion's detection in physical anthropology. Challenges and Synergies

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In physical and forensic anthropology the development of new methodologies for more accurate diagnosis of lesions and palaeopathologies is getting more and more debated.

A challenge never taken for granted is to optimize the technological tools usually employed in other fields, like in the clinical one, and to use them revisiting and adapting techniques and applications for their use in biological anthropology.

We have accepted this challenge and for years now we have been developing new research methodologies and investigative strategies to be used in the study of lesions on ancient and forensic human bones. One of the latest developed methodological ap-

proaches concerned the delicate issue of recognizing the damaging times and the nature of the lesions on dry bone. In particular, for this purpose we have analyzed in particular lesions of traumatic nature that showed differences both in the fracture pattern and in the type of damaging agent.

The main definition of timing and types of injury is of fundamental importance in the anthropological context, regardless of the time of the crime scene. For this reason we have examined different individuals using macroscopic, radiological and microscopic techniques developing a new evaluation form and proposed it as a main tool in order to facilitate the recognition and interpretation of traumas and timing of injuries.

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Osteoporosis in paleopathology: an overview. New experimental applications for the analysis of bone mineral density on human skeletal remains

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Osteoporosis is a metabolic bone disorder characterized by a compromised bone strength due to low bone density and microarchitectural deterioration of bone tissue, leading to an increasing risk of fracture, typically occurring at the hip, the wrist, the ribs or at lumbar and thoracic vertebrae. The condition is a multiple-etiological disorder influenced by endogenous and exogenous factors, including senescence, sex, hormonal factors, lifestyle habits, genetics, reproductive and lactation factors and physical activity. Aging is known to be the primary risk factor of osteoporosis, due to decreases in osteoblastic activity and in the intestinal absorption of calcium and other nutrients useful to bone formation.

The study of osteoporosis in ancient populations is a helpful way to understand patterns and prevalence of the disease both in past and present. Diagnostic features of osteoporosis have been found in ancient population starting from the Neolithic Era, when human groups? adopted sedentarism, following agriculture and domestication.

A preliminary diagnosis of osteoporosis in archaeological samples is mainly based on the macroscopic analysis of presence of fractures usually considered as consequence of osteoporosis, specifically located on lumbar and thoracic vertebrae, on the distal epiphysis of the radius (i.e. 'Colle's fracture') and at the femur head. Nevertheless, of the macroscopic analysis can often lead to misinterpretations and to the underestimation of the importance of the general bone density status of an individual; indeed, despite a low bone mineral density status, actual fractures may also never occur without a traumatic episode, thus they cannot be considered as an exclusive diagnostic criteria for osteoporosis in paleopathology.

For these reasons, in the last two decades several biomedical techniques have been tested for bone mineral density evaluation on skeletal samples: dual X-ray absorptiometry (DXA) and radiogrammetry are the most applied. Despite the application of quantitative techniques, many studies have highlighted the absence of a standardized methodology, a diversified panorama of analytical approaches and several methodological limitations. The lack of a reference model for ancient populations should be overcome by the creation of a standardized methodology based on a skeletal collection with known age-at-death and sex. In the last few years, a brand new standardized protocol based on Quantitative Ultrasonometry was successfully applied on skeletal remains, widening the panorama of the diagnostic methodologies for assessing osteopenia and osteoporosis in paleopathology.

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Chronic maxillary sinusitis from Medieval Tuscany (10th-12th centuries AD): a preliminary study

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Chronic maxillary sinusitis is recognized as new bone formation indicating long-term inflammation of the soft tissues of the sinuses whose origin can be either odontogenic or environmental (e.g. due to poor air quality, indoor conditions and allergies). Bone modifications within the sinuses related to chronic inflammatory process are rarely attested in human skeletal remains owing to their incidental discovery, mostly when *post-mortem* breakages occur allowing to observe the internal pneumatic cavities.

As part of a preliminary study, a total of 113 individuals coming from the Medieval rural cemetery of Pieve di Pava (10th-12th centuries AD) situated in Tuscany (central Italy) were examined to investigate the origin of maxillary sinusitis. Both maxillary sinuses were available for examination in 110 individuals and only one sinus in 3 individuals. Eight males and 12 females were affected by maxillary sinusitis (17.7%, N = 113). Osseous alterations, represented by spicules, plaque-like formation and lobules, were bilaterally present in 25% of the male subsample (n = 8) and in 75% of the female subsample (n = 12) with statistically significant difference. Statistical difference was also assessed when compared the frequency of teeth and/or alveoli affected by dentoalveolar diseases between sexes, with males greater influenced than females. In order to investigate the odontogenic role in the onset of chronic inflammation, co-occurrence of maxillary sinusitis and dentoalveolar diseases in the same sinus was observed in more than half of the individuals affected (11 out 20) with no statistical difference between sexes. It can be presumed that absence of statistically sex-related difference is likely due sample size effect; in this respect, future enlargement of the osteological sample might potentially help in clarifying the contribution of dentoalveolar diseases in the expression of maxillary sinusitis.

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The crypt of the church of Santa Maria Maggiore in Vercelli: a multidisciplinary approach to the study of an 18th-19th century funeral context

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In September 2020, an anthropology laboratory was set up at the Church of Santa Maria Maggiore in Vercelli with the aim of studying the entire bioarchaeological context of the funerary crypt located below the church. The crypt, as big as the church above, is characterized by cross vaults in brick and has some interesting tombs related to tomb inscriptions, a noble crypt and at least two ordinary wells for water intake. Another interesting aspect is the presence of five stone hatches with metal rings that allow to go down to a further underground level. The floor, made of beaten earth mixed with rubble, appears raised thus reducing the height extension of the space.

From a bioarchaeological point of view, we find the presence of many human remains buried inside the crypt. The plan was used to map the different bioarchaeological contexts and organize the anthropological activity.

Some skeletons lie inside wooden crates inserted into masonry niches. We observe the presence of many skeletal remains, most of them in non-original position, placed on the floors of other tombs, inside wooden coffins and inside ossuaries with underground chambers.

Given the complexity of the entire context, we have tried to draw up some operational guidelines that are functional to achieving the objectives of bioarchaeological research.

First of all, to analyse all those contexts of the common ossuaries present in the crypt (above the ma-

sonry tombs and inside the reused wooden coffins), which do not require construction, and archaeological interventions to identify the demographic and pathological characteristics of the buried population and to distinguish primary from secondary or tertiary depositions;

To proceed with superficial reconnaissance of the mummies directly in situ identifies a partial biological profile and the type of conservation sample and to analyse entomological finds in the different environments of the context to add investigative elements related to natural mummification processes analyse the mummies under the tomographic and histological profile;

To identify the anthropological and paleopathological characteristics of the buried individuals and to pro-

ceed with the archaeological and anthropological investigation of the ossuary rooms below the crypt floor to identify the original floor of the burial chamber;

To restore the context and taking care of the display of human remains and funerary objects to musealize, to make the bioarchaeological heritage usable in its complexity.

The site of Santa Maria Maggiore allows us to open some reflections on the considerations that we must elaborate when we are interested in such a complex bioarchaeological site, with depositions in a secondary position... but we must also make sure to also enhance the actions desired in the past to musealize the asset in its complexity.