



**BIOARCHAEOLOGY OF CHILDREN – LOST CHURCHES PROJECT  
VICTIMS OF CHANGE  
JUVENILE OSTEOLOGY LABORATORY RESEARCH WORKSHOP**

**July 4 – July 31, 2021**

**Odorheiu Secuiesc, Transylvania, Romania**

**PROJECT DIRECTOR:**

Dr. Jonathan Bethard, PhD  
Assistant Professor  
University of South Florida (USA)  
[jbethard@usf.edu](mailto:jbethard@usf.edu)

**SCIENTIFIC DIRECTOR:**

Dr. Andre Gonciar, PhD  
Director, Archaeologist  
BioArch Canada (CA)  
[archaeology@archaeotek.org](mailto:archaeology@archaeotek.org)

**ARCHAEOLOGY DIRECTOR**

Dr. Zsolt Nyaradi, PhD  
Expert Archaeologist  
Haaz Reszo Muzeum (RO)

**Project Web Site:**

<https://www.archaeotek-archaeology.org/juvenile-osteology-laboratory>

**Project Application Form:**

<https://www.archaeotek-archaeology.org/application-bioarchaeology>

**Academic Credits (3-6 credits) available through University of South Florida - Not Mandatory (additional USF credit tuition applies) - USF Program Brochure – Credit Application Page:**

<https://educationabroad.global.usf.edu/index.cfm?FuseAction=Programs.ViewProgramAngular&id=23628>

**I. Introduction:**

Recent contributions to bioarchaeological scholarship have devoted considerable treatment to the analysis of children's skeletons from both archaeological and contemporary (i.e., forensic) contexts. The aim of this workshop is to provide participants with an intensive review of juvenile osteology and an overview of the ways in which this kind of unique information is interpreted by bioarchaeologists. During the workshop, participants will have the chance to study the growth and development of the human skeleton across various juvenile age cohorts. Most importantly, participants will have the opportunity to gain experience with the analysis of juvenile skeletal remains.

In addition to intensive hands-on laboratory instruction and research, participants will also contribute to numerous seminar discussions and hear lectures on topics related to the bioarchaeology of children. Topical areas to be included involve the following: an overview of the bioarchaeology of children, growth and development, weaning and dietary stress, juvenile trauma and pathology, as well as reconstruction and interpretation of infant mortality. Moreover, seminars and lectures will introduce how novel technological applications (i.e., histology, CT imaging) have been utilized by bioarchaeologists who study juvenile remains.

The exceptionally well preserved skeletal remains that will be investigated during this workshop are excavated from five archaeological sites located in the heart of Transylvania. The juvenile remains that we will study are housed at the Haaz Reszo Museum in Odorheiu Secuiesc, Harghita County. Odorheiu is a very beautiful and lively Szekely city, with a plethora of cultural, gastronomical and social venues. Historical trips to places such as Sighisoara (Dracula's birthplace and an UNESCO heritage site) or Brasov and nearby Bran Castle, and nature hikes through dramatic landscapes of the Eastern Carpathians with all their thermal, mineral and volcanic springs are just a bus or train ride away.

Previous osteological experience is required. To this end, we strongly encourage our participants to attend our [Adult Osteology Workshop](#) (or equivalent).

**Osteology Laboratory Research Workshop**

[www.archaeotek-archaeology.org](http://www.archaeotek-archaeology.org)

[archaeology@archaeotek.org](mailto:archaeology@archaeotek.org)

## II. Archaeological and Historical Contexts

The drastic change during the late 16<sup>th</sup> early-17<sup>th</sup> century both in mortuary treatment/practices and apparent death rate/profile, generating large concentrations of infant burials inside churches that were abandoned shortly after that, seems to indicate that the condition of *infants* (fetal, perinatal, neonatal) as well as *children* has undergone a transformation not only in terms of health but also socially, culturally and spiritually.

Our research collections come from five excavated medieval lost churches around the town of Odorheiu Secuiesc: Bögöz (RO: Mugeni), Kányád (RO: Ulieș), Máréfalva (RO: Satu Mare), and the most important ones in terms of juvenile remains, Telekfalva (RO: Teleac), as well as our on-going “Lost Church” excavation at Patakfalva (RO: Valeni). The state of preservation has allowed us to retrieve over 400 juvenile skeletal remains, ranging from pre-natal to sub-adult.

## III. Course Aims and Outcomes

The goals of this project are twofold. First, we are interested in investigating the above phenomenon, i.e. local expression of the crisis that was redefining from its foundations European identity, and establish the role *children* played in this transition. Second, considering the remarkable state of preservation of the remains and their abundance, we will be testing various 2D and 3D methods, both metric and non-metric, in order - potentially - to validate, improve and/or refine sexing (notoriously difficult for these age cohorts) and aging techniques on complete as well as fragmentary skeletons.

### Project Objectives:

#### *Paleodemography*

1. To create an inventory of all juvenile remains curated in the collections of the Haaz Rezsó Museum
2. To generate age-at-death estimates for each juvenile individual utilizing a combination of available dental and skeletal indicators.
  - a. Dental methods include documenting observations of crown and root mineralization and patterns of tooth eruption (after Al-Qahtani et al. 2010)
  - b. Skeletal methods include documenting patterns of long bone growth and development and/or appearance and growth of secondary ossification centers (after Baker et al. 2005; Scheuer and Black 2000, 2004; Schaefer et al. 2009)
3. To differentiate between non-adult age cohorts and utilize these age categories to investigate specific bioarchaeological questions (after Baker et al. 2005:10).
  - a. Fetal (any individual less than full term) – maternal health, pregnancy stress, mortuary treatment and practices
  - b. Perinatal (time just before and after death) – maternal health, pregnancy stress, mortuary treatment and practices
  - c. Neonatal (newborn in its first month of life) – rates of birth survival, mortuary treatment and practices
  - d. Child (individual over 12 months old and up to puberty) – weaning stress, mortuary treatment and practices

- e. Adolescence (extends throughout the period of skeletal maturation) – growth and development, maturation, mortuary treatment and practices
4. To understand limitations of macroscopic sex estimation methods when working with juvenile remains

#### *Taphonomy*

5. To understand the role of the burial environment on skeletal preservation and recovery of juvenile remains (after Pokines and Symes 2013)
6. Identification of post-mortem alterations on bones
  - a. Identification of funeral practices: post-mortem treatment
  - b. Identification of burial practices: primary vs. secondary burials
  - c. Identification of animal and/or vegetal alterations

#### *Pathology*

7. To record observable skeletal and dental pathologies (see Lewis 2007)

### **IV. Participation Assumptions**

This workshop focuses on extensive skill acquisition rather than academic progression. However, in registering for the course, it is assumed that participants will be engaged, interested, and active in the workshop. All workshop activities are mandatory. A substantial degree of personal responsibility and initiative is expected and required from all participants to complete readings, prepare for discussions, and acquire the skills and knowledge offered in the workshop. All acquired skills and enjoyment of this workshop are directly proportional to the effort and attention participants invest. It is assumed that participants will fully engage in all aspects of the workshop.

One of our goals in teaching an intensive research workshop is to provide our participants with the opportunity to formally submit an original and valid contribution to science. At the end of each workshop, all students and participants will present their research results at the *2021 Eighth International Student Colloquium on Osteology and Bioarchaeology* hosted by the Haáz Rezső Múzeum. Our participants are further encouraged to take their research to the next level and bring their contributions to the podium at the *American Association of Physical Anthropologists*, *American Association of Forensic Sciences*, *Society for American Archaeology*, *Canadian Association of Physical Anthropologists* and *Paleoanthropology Society* meetings and conferences, getting well deserved recognition as co-authors of the various papers. Check out our participants' past contributions on: <http://www.archaeotek-archaeology.org/scientific-contributions>.

Human remains represent a non-renewable resource and will be treated with respect and and dignity at all times. Students will not bring food and/or drinks into the laboratory space. In addition, workshop participants will not utilize photographs of human remains for social media purposes without consent of the project director. In addition, workshop participants are to engage with each other in a professional and courteous manner at all times.

All participants are expected to behave respectfully at all times towards the staff, other participants, and local people. All participants are required to abide by the rules and regulations of the workshop as well as Romanian laws. Likewise, the field school environment should be considered a safe space for people of different backgrounds and belief systems. Disrespectful and/or disruptive behavior will not be tolerated.



## V. Nature of Instructional Activities:

Course material will be presented in lectures, seminars, and hands-on exercises and will run from approximately 8:30AM to 4:30PM Monday to Friday. Typically, mornings will be reserved for lecture and hands-on instruction while afternoons will be dedicated to study time and data collection.

### Required Text:

*Juvenile Osteology: A Laboratory and Field Manual*. 2008. Maureen Schaefer, Sue Black, and Louise Scheuer. Academic Press.

### Suggested Text:

*The Osteology of Infants and Children*. 2005. Brenda J. Baker, Tosha L. Dupra, and Matthew W. Tocheri. Texas A&M University Press.

### Required Readings:

Daily readings will be available electronically via Dropbox. In addition, an electronic library of references will be available for those wishing to expand their personal library.

### Student evaluation:

*Bone Quizzes* (40%): 6 bone quizzes will be administered during the first three weeks of the workshop and will include whole bones and/or fragments.

*Annotated Bibliography* (10%): students will compile an annotated bibliography of 10 sources on a topic related to juvenile osteology or bioarchaeology. The bibliography is usually due the last Tuesday of the Workshop. many students find it helpful to utilize their bibliography research as a foundation for their research presentation.

*Laboratory Projects* (20%): three projects will be assigned to give students practice estimating age-at-death from dental and skeletal indicators, and describing skeletal pathology.

*Research Project* (20%): during the workshop, students will work in groups to complete a research project developed in consultation with the Project Director and Project Assistant. Each group will present their findings on the last day of the workshop.

*Participation* (10%): participation is calculated from overall performance in both laboratory and lecture/seminar contexts. Students are encouraged to actively contribute to seminar discussions, engage their peers in a collegial manner, and present an overall collaborative attitude through the duration of the program. In addition, students will work with the instructor to help facilitate discussion points related to several of the assigned reading(s).

**Credits: 3-6 academic credits can be obtained via University of South Florida (additional USF tuition applies).**

## VI. Additional Weekend Field Trips:

Public transportation in Romania, under normal circumstances, is quite impractical as well as unpredictable, not to mention the great variability in cleanliness. As such, due to the COVID-19 situation, for the safety of our participants, our staff and our hosts, we will ensure our participants get to explore the magic of Transylvania, while limiting as much as possible the potential of getting infected. Consequently, in 2021, the following field day-trips are mandatory:

- **Day Trip #1 (weekend 1):** Szekely Land Day Trip: visit of the Lost Churches sites, including our active site of Patakfalva (Valeni), the Jesus Chapel (the oldest medieval monument around Odorheiu Secuiesc), and the ethnographic museum in Cristuru Secuiesc.
- **Day Trip #2 (weekend 1):** Medieval Saxon Heritage Day Trip: visit of some beautiful Saxon fortified churches (Cata, Homorod, Viscri) and the Rupea Fortress
- **Day Trip #3 (weekend 2):** Brasov Castles Day Trip: visit of Bram Stoker's Bran Castle, Rasnov Fortress, and the amazing Peles Castle, the summer residence of the Romanian kings
- **Day Trip #4 (weekend 2):** Visit of the salt mines of Praid, dubbed by our students "the Mines of Moria".

## VII. Research Team

- Project Director: Dr. Jonathan Bethard (University of South Florida)
- Scientific Director and Project Coordinator: Dr. Andre Gonciar (Director, Bio/Archaeological Techniques and Research Center, BioArch/ArchaeoTek – Canada)
- Archaeology Director: Dr. Zsolt Nyaradi (Expert Archaeologist – Haaz Rezso Museum of History and Ethnography, Odorheiu Secuiesc, Central Transylvania, Romania)

## VIII. Bibliography

- Al-Qahtani, S.J., Hector, M.P., & Liversidge H.M. 2010. The London Atlas of human tooth development and eruption. *American Journal of Physical Anthropology* 142(3): 481-490.
- Baker, B.J, Dupras T.L., & Tocheri M.W. 2005. *The Osteology of Infants and Children*. Texas A&M University Press.
- Halcrow, S.E. & N. Tayles. 2008. The Bioarchaeological Investigation of Childhood and Social Age: Problems and Prospects. *Journal of Archaeological Method and Theory* 15:190-215.
- Lewis, M.E. 2007. *The Bioarchaeology of Children: Perspectives from Biological and Forensic Anthropology*. Cambridge University Press
- Pokines, J.T. & S.A. Symes. 2013. *Manual of Forensic Taphonomy*. CRC Press, Boca Raton, FL.
- Schaefer, M.C., Scheuer, L. & S. Black. 2009. *Juvenile Osteology: A Laboratory and Field Manual*. Elsevier.
- Scheuer, L. & S. Black. 2000. *Developmental Juvenile Osteology*. Academic Press, London.
- Scheuer, L. & S. Black. 2004. *The Juvenile Skeleton*. Academic Press, London.
- White, T. D. and P. A. Folkens. 2012. *Human Osteology*. 3<sup>rd</sup> ed. Academic Press, San Diego.

**Tentative Workshop Schedule**  
*(Subject to Change)*

**Week 1**

	<b>Lecture</b>	<b>Readings</b>	<b>Assessment</b>
<i>Day 1</i>	<b>Welcome and Orientation</b>  <b>(Bio)archaeology of Children</b>  <b>Pelvic Girdle</b>	Scheuer and Black (2004): Chapter 1  Mays et al. (2017) Baxter (2008) Halcrow and Tayles (2011) Lewis (2012)  Scheuer and Black (2004): Chapter 10	Pre-Test
<i>Day 2</i>	<b>Bone Development</b>  <b>The Head and Neck I</b>	Scheuer and Black (2004): Chapter 2  Scheuer and Black (2004): Chapter 10	
<i>Day 3</i>	<b>The Head and Neck II</b>	Scheuer and Black (2004): Chapter 10	
<i>Day 4</i>	<b>The Dentition</b>	Scheuer and Black (2004): Chapter 5	Bone Quiz 1 Lab Project #1 Assigned
<i>Day 5</i>	<b>The Vertebral Column</b>	Scheuer and Black (2004): Chapter 6	Bone Quiz 2
<i>Day 6</i>	<b>Szekler Land Day Trip</b>		
<i>Day 7</i>	<b>Medieval Fortified Saxon Churches Day Trip</b>		

**Week 2**

	<b>Lecture</b>	<b>Readings</b>	<b>Assessment</b>
<i>Day 1</i>	<b>The Thorax</b>  <b>The Pectoral Girdle</b>	Scheuer and Black (2004): Chapter 7  Scheuer and Black (2004): Chapter 8	
<i>Day 2</i>	<b>The Upper Limb</b>	Scheuer and Black (2004): Chapter 9	
<i>Day 3</i>	<b>The Lower Limb</b>	Scheuer and Black (2004): Chapter 11	
<i>Day 4</i>	<b>Hand and Foot</b>	Scheuer and Black (2004): Chapter 9 and Chapter 11	Bone Quiz 3 Lab Project #2 Assigned
<i>Day 5</i>	<b>Juvenile Skeletal Age Estimation</b>	Algee-Hewitt (2013) AlQahtani et al. (2010) Cardoso et al. (2013) Shirley and Jantz (2010) Shirley and Jantz (2011)	Bone Quiz 4
<i>Day 6</i>	<b>Brasov Castles Day Trip</b>		
<i>Day 7</i>	<b>Salt Mines of Praid Day Trip</b>		

**Week 3**

	<b>Lecture</b>	<b>Readings</b>	<b>Assessment</b>
<i>Day 1</i>	<b>Reconstruction of Non-Adult Mortality</b>	Gilmore and Halcrow (2014) Lewis and Gowland (2007) Halcrow et al. (2008) Robbins (2011)	Lab Project #3 Assigned
<i>Day 2</i>	<b>Juvenile Paleopathology</b>	Bennike et al. (2005) Djurcic et al. (2005) Giuffra et al. (2013) Ortner (2011) Richards and Anton (1991) Smith (2013) Wood et al. (1992)	
<i>Day 3</i>	<b>Skeletal Trauma Analysis</b>  <b>Juvenile Skeletal Trauma</b>	Berryman et al. (2013) Kroman and Symes (2013)  Glencross and Stuart-Macadam (2000) Mays (2014) Walker et al. (1997) Wheeler et al. (2013)	
<i>Day 4</i>	<b>Bone Healing and Interpretation</b>	Andrushko and Verano (2008) Cunha and Pinheiro (2009) Merbs (2012)	Bone Quiz 5
<i>Day 5</i>	<b>Taphonomy</b>	Guy et al. (1997) Gifford (1981) Marden et al. (2013)	Bone Quiz 6
<i>Day 6-7</i>	<b>(Free)</b>		

**Week 4**

	<b>Lecture</b>	<b>Readings</b>	<b>Assessment</b>
<i>Day 1</i>	<b>Applications of Stable Isotope Analysis to Juvenile Bioarchaeological Questions</b>	Andrushko et al. (2011) Dupras et al. (2001) Tsutaya and Yoneda (2013) Tung and Knudson (2010) Tykot (2006) Howcraft et al. (2014)	
<i>Day 2</i>	<b>Case Studies in Juvenile Bioarcheology</b>	Cruz and Codinha (2010) Finlay (2000) Gaither and Murphy (2011) Lewis (2011)	Annotated bibliography due
<i>Day 3</i>	<b>Case Studies in Juvenile Bioarcheology</b>	Geber (2014) Smith et al. (2011) Thomas et al. (2011) Wheeler et al. (2012)	
<i>Day 4</i>	<b>Wrap-Up/Workshop Summary</b>		
<i>Day 5</i>	<b>2020 Eighth International Student Colloquium on Osteology and Bioarchaeology Project Podium Presentations</b>		