THE SONDOR BIOARCHAEOLOGY PROJECT, PERU

Session 1: June 18 – July 15, 2017

Session 2: July 16– August 12, 2017

FIELD SCHOOL DIRECTOR:

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At this time, no credit units are awarded for this field school. Students will receive a certificate of completion at the end of the program. However, students are encouraged to present this syllabus to their advisors and petition their home university for awarding credit units internally. The IFR is standing by to help students with this endeavor.

INTRODUCTION

The Sondor Bioarchaeology Project investigates the enigmatic fate of the Chanka society of ancient Peru. The Chanka emerged in the south-central Andean highlands around 1000 CE. Today, they are well known through Colonial-era documents and oral history as vicious warriors who were ultimately vanquished by the Inca Empire in the early 15th century. But what became of Chanka society after their spectacular defeat? This project, situated at Sondor, the premier Inca-Chanka site in the region, employs the full spectrum of bioarchaeological methods to reveal the biological and social consequences of "growing up Chanka" in the face of Inca imperial conquest.

THE HISTORY OF SONDOR

The history of Sondor begins during an era known as the Late Intermediate Period (1000-1400 CE). This dynamic period in prehistory was characterized by a range of overlapping social, political, and environmental changes. Many of these transformations were spurred by the fragmentation of the twin Wari and Tiwanaku empires. Most notably, during this “dark age,” local people experienced recurring warfare. The most convincing evidence for conflict is the rapid construction of defensible hilltop fortresses. Overlooking *Pacucha*, the largest freshwater laguna in the south-central Andes, one of the

most breathtaking settlements in the region is known as Sondor. This majestic outpost was first occupied by a group of bellicose people known as the Chanka.

The Chanka originally constructed a village on the eastern ridge of Sondor beginning around 1080 CE. The village is a dense complex of circular stone houses; it was home to hundreds of families and several thousand people. There are no nearby water sources, and no evidence of investment in public works or urban planning. The Chanka lived at the village out of sheer necessity. Sondor evinces defensive features including ramparts, walls, ditches, limited access points, lookouts, and weapon caches. Trauma frequencies on human remains from the surrounding area suggest violence directly impacted half the Chanka population; at least a third were cut down by lethal wounds. These signatures suggest serious concerns about community defense in the face of great insecurity.

In the early 15th century, life for people at Sondor changed dramatically as Inca imperial forces arrived from Cuzco. The motive for conquest was clear. As a principle settlement on the Royal Inca Road, Sondor would have been a crucial stop for administrators, bureaucrats, trade caravans, and armies. But securing victory was not easy. For the Inca and the Chanka were major rivals, and fought a war of attrition that lasted generations. Eventually, the Chanka were vanquished by the Cuzco-born Lord Pachacutic and his army. In fact, it was only upon defeating the Chanka that the Inca Empire came to be.

At Sondor, the Inca erected several intrusive buildings on the site's western ridge. Characteristic architecture includes patio enclosures, administrative building complexes, and mummy niches fashioned in finely pillowed Inca masonry. The ground is littered with classic Inca ceramics. Furthermore, in the late 1990's, and again in 2016, Peruvian archaeologists uncovered something unexpected: the skeletal remains of possible *capacochas*: ritually-sacrificed children.

But what became of the Chanka?

After the Inca-Chanka War, historical accounts become murky. Some chroniclers report that all the Chanka were massacred, while others assert that the entire society fled into the Amazon Jungle, never to be heard from again. Somewhat less spectacular accounts suggest that the Chanka willingly accepted Inca colonization and oversight. Still other sources suggest the Chanka were intentionally displaced to distant corners of the Inca Empire, while foreign populations were forcibly resettled to Sondor.

Archaeological evidence suggests the Chanka and the Inca could have co-existed at Sondor for around 150 years. But if so, then what was the nature of this relationship? Was Sondor's twilight characterized by Inca and Chanka cohabitation, or by the replacement (or displacement) of the Chanka by Inca victors?

We can address these issues using a bioarchaeological approach. In this study, we consider human skeletons our primary unit of analysis as they directly represent the congealed life history of a person; recording both the mundane and extraordinary activities of quotidian life—from the foods people ate, to where they migrated, to the diseases they endured and violence they suffered. These behaviors all leave unique, indelible marks on bone amenable to osteological and biogeochemical analysis. This project makes use of several intersecting data sets to reconstruct the experiences of people at Sondor.

ACADEMIC CREDIT UNITS & TRANSCRIPTS

Because of its unique nature, this program does not offer university credits. It is primarily geared towards advanced undergraduates, recent BA recipients, or early-career graduate students who desire full immersion in rural anthropological bioarchaeology, and are enthusiastic about working with our indigenous Quechuan counterparts. The ability to adapt to challenging conditions while conducting significant scientific field research is most beneficial to those who are 1) seeking a semi-independent research project which may form the basis of a thesis or other intellectual product, or 2) are in need of

intensive experience in field and lab research abroad as part of their preparation to apply to graduate or fellowship programs.

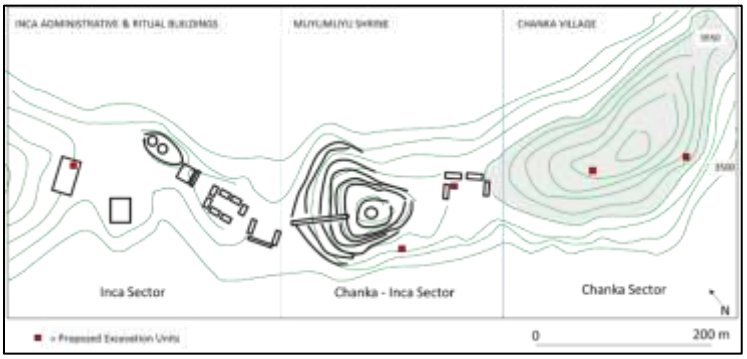
Regardless of academic credits, those who excel in this program go on to matriculate into top professional schools and fully-funded doctoral programs, garner highly-competitive and prestigious fellowships, and publish their scholarship in well-respected and widely-known venues. Project alum from our formative years—a decade ago—now serve at institutions and universities throughout Europe, the United States, and Latin America. These dedicated activists, teachers, and scholars are currently directing their own innovative programs, and training the next generation of promising researchers.

PROJECT GOALS

Students will meet every weekday and divide their time equally between excavations at *Sondor* and detailed analysis of human and artifactual remains at our well-equipped lab facilities.

Phase 1: Excavations Our excavations are aimed at discerning A) how the lives of the Chanka at Sondor were impacted by Inca incursion, and B) how the lives of the Inca where impacted by living in the Chanka heartland. Addressing these questions requires us to recover skeletons that date to the eras both prior to, and after this culture clash. This task is feasible because the site has well-defined sectors.

During our excavations, we will place units in houses and small man-made caves: areas where the dead were buried. Our aim is to exhume, screen, and inventory all human remains and material culture; this is slow, meticulous work. Each unit will consist of 2-3 IFR participants, a unit supervisor, and a local field technician. Because deposits on Sondor are usually less than 50 cm below the surface, excavations will only require two work-weeks (10 days) for each session. In that time, we expect to recover a few dozen individuals and several thousand associated objects (i.e., ceramics, stone and bone tools, etc.).



Sectors at Sondor and proposed areas of excavation

Phase 2: Lab Analysis We will inventory and analyze everything we excavate—bones *and* artifacts—at the Field Research Station in Talavera. This comprehensive examination will employ standard archaeological, osteological and bio-geochemical techniques, and conform to specifications set by the Peruvian Ministry of Culture and the approved codes of ethical conduct established by our discipline.

Our first priority is the bone. Remains will likely be commingled and fragmentary. As such, we use a zonation method to ensure accurate MNI (minimum number of individual) counts. In addition to standard osteometrics, we will collect data on sex, age-at-death, pathological lesions indicative of disease, and trauma (broken bones). When appropriate, we will also record instances of cranial modification and trepanation (cranial surgery). This information will help us build a biological and cultural profile for each skeletal individual. Our other objective is to collect human and animal hard tissue samples for ancient DNA and isotopic analyses. This class of testing allows us to reconstruct ancient kin groups, diets, and migration patterns. Extractions are limited to specific parts of each

skeleton, assuming those elements are in good condition. Teeth which are likely to retain genetic material will be removed for Y-STR and mtDNA amplification. Our isotopic approach centers on drilling dental enamel from the occlusal surface through the cemento-enamel junction. Due to consistent development and eruption rates, the material matrix of teeth can be used to infer diet and residence patterns throughout childhood. In contrast, bone is living tissue that continually regenerates, but at inconsistent rates. We will draw samples from femurii, mandibles, and ribs because these skeletal elements reflect diet and residence trends in the last 10-20, 5-10, and 2-5 years of life, respectively.

DISCLAIMER – PLEASE READ CAREFULLY!

Field conditions are different than those you experience in your home or university. Bioarchaeology in the Andes is cold, physically exhausting, dirty, and tedious work. An important part of any field-based project is learning to deal with the circumstances at hand, and to make the best of a given situation with the tools available. This is not a summer vacation. We expect all members of our project to be patient, upbeat, flexible, and prepared.

If you have any medical concerns, please consult with your doctor. For all other concerns, please consult with the project director – as appropriate.

COURSE OBJECTIVES

This course is designed to expose students to the broad range of anthropologically informed research. Team members will participate in excavations and laboratory analyses and learn how bioarchaeological data is collected and processed. Participants will learn how to interpret multiple data sets and test working hypotheses. By the end of the session, participants should be able to dig a unit and engage in comprehensive skeletal analysis.

Apurimac is located in the heart of the Andes

To achieve these objectives, this course has two primary goals:

(1) Provide a practical working knowledge of **bioarchaeological field methods**, including excavation, laboratory analysis, cataloging, and conservation;

(2) Introduce the **intellectual challenges of bioarchaeological research**, including research design, the interpretation of data, and the continual refinement of hypotheses and field strategies with regard to information recovered in the field.

COURSE PREREQUISITES

There are no prerequisites for this hands-on, experiential learning course. Team members will learn onsite how to conduct bioarchaeological research. Field and Lab work of this type involves physical labor and rustic living conditions, and thus requires a measure of patience and professionalism that is distinct from a typical university learning environment. Participants are required to come equipped with sufficient enthusiasm, a positive and entrepreneurial spirit, and adequate understanding of the challenges involved in this type of endeavor.

COURSE SCHEDULE

For both lab and fieldwork, all participants follow the same daily schedule Monday through Friday. Lectures will be held Monday, Wednesday, and Friday mornings. All lectures will be given by the Project Director, Staff, and Visiting Scholars. Lab and field work will take place between 9 am and 3pm, with a 30

minute lunch break at noon. We process data until dinner, which is served at 7 pm. After dinner is free time. Socializing, reading, music, movies, table games, and bonfires are the main options for after-dinner entertainment. Weekends are for everyone's personal time. You may tour archaeological, historical, and natural sites in the valley. You can also visit the Sunday market, the third largest in the Andes

GENERAL EXPECTATIONS

You have been accepted into this program because of your aim to contribute to bioarchaeological scholarship. Expectations are high. Those who do not meet their full potential will be put on notice. Further disruptive conduct or behavioral problems will results in expulsion. No refund is provided.

***Ability to work in a team and maintain a positive attitude*.** You will be part of a team in the lab and in the field, working with professionals expect you to work together as a unit. Excessive complaining, bad attitudes, tantrums, freak-outs, sluggish enthusiasm, and anger management problems are not tolerated. Bioarchaeology is not easy; be prepared for frustration, tedious assignments, and delays.

Record Keeping. Accurate and complete records must be kept for all materials. You are the first person in centuries to see and study the remains. Reliable registry and observation at every step of the process is the only way of saving this data for future analysis and interpretation. It is important to know what you saw and thought at the time, even if these remarks turn out to be off base later on.

LEARNING OUTCOMES

Upon successful completion of the session, you will have the ability to:

- Learn how bioarchaeological data is collected in the field and the laboratory
- Develop the practical and analytical skills necessary for the interpretation of distinct data sets
- Apply standard excavation methods to bioarchaeological contexts
- Use standard recording techniques to document excavation results
- Undertake preliminary processing of bioarchaeological remains and artifacts
- Undertake preliminary skeletal analysis of human remains

GRADING MATRIX

35%: ACTIVE PARTICIPATION IN LECTURES, FIELDWORK & LAB WORK: You are expected to participate in all lectures, in excavation and mapping activities, and in all parts of lab training and analyses. Note that you will be part of a team and we expect you to work together. Bioarchaeology is hard work; you should expect meticulous assignments, slow, measured progress, and possible delays.

35%: DATA COLLECTION AND RECORDING: You must keep a detailed notebook that will be submitted and evaluated at the end of the course. Accurate and complete records must be kept for all materials. Your analytic and cataloguing skills will be assessed by lab supervisors. Records should be complete, detailed, and comprehensive; figures, maps, and photographs must not be fuzzy.

5% INTRO QUIZ (Day 2): This quiz will test your knowledge and understanding regarding Peruvian culture and gauge your understanding of project rules, expectations, and codes of conduct.

10%: OSTEOLOGY QUIZ (one-hour long): This quiz will cover basic human osteology and skeletal element identification. You will be required to determine the age and sex for diagnostic bones and will be asked to identify skeletal markers which inform on disease and trauma.

10%: BIOARCHAEOLOGY QUIZ (one-hour long): This quiz will cover how key methods can answer questions of anthropological significance. You will choose one domain (burial excavation, skeletal study, or mortuary analysis) to frame a discussion on approaches and limitations in data collection, and how variable patterning may support or disprove particular research hypotheses.

5% COMMUNITY SERVICE PROJECT: At the end of Week 3, we will help refurbish some wonderful, but dilapidated community museums. This is a tangible way we support the local community.

COORDINATION: Because we are running 2 sessions, our work is divided into two-week modules: a lab module (A) and a field module (B). We must adhere to a mirrored module plan (1: A →B; 2: B→A) to maintain ongoing excavation integrity and deter site looting. Regardless of your session, You will arrive in Andahuaylas on a Sunday and get settled and acclimated. Orientation and introductory lectures will begin on Monday. Session 1 begins Bioarchaeological Lab Analysis on Tuesday, while Session 2 begins Field Work at Sondor on Wednesday. The lecture schedule (Weeks 1, 2, 3, 4) will remain unchanged.

Module A: Field Work at Sondor
Our excavations at Sondor will focus on the systematic excavation of domestic and mortuary contexts.
7 am – 8:30 am : Breakfast and Morning Lectures on M, W, F 9 am – 3 pm: Fieldwork (Excavation) 4 pm – 6 pm: Field Tutorials and Data Analysis
WEEK 1 LECTURES: CULTURE AND HISTORY OF THE ANDES Monday: Geography and Chronology in the Andes Wednesday: Identifying Conquest and Colonization in the Archaeological Record Friday: The Chanka Confederation, Inca Incursion, and Spanish Conquest *Readings: Arkush and Tung, Bauer and Kellett., Sarmiento de Gamboa, Julien, Berg*
WEEK 2 LECTURES: HUMAN SKELTAL ANATOMY AND OSTEOLOGY Monday: The Skull and Teeth Wednesday: Bones of the Abdomen and Thorax Friday: Arms, Legs, and other Appendages *Readings: White and Folkens*
Module B: Bioarchaeological Lab Analysis in Talavera *Our main task is the analysis of thousands of bones –many of them fragmentary—representing several hundred skeletal individuals. We will also collect samples for stable and radiogenic isotope analysis, ancient DNA, archaeometric dating, and x-ray fluorescence elemental analyses.*
7 am – 8:45 am: Breakfast and Morning Lectures on M, W, F 9 am – 3 pm: Laboratory Work 4 pm – 6 pm: Lab Tutorials and Data Management
WEEK 3 LECTURES: BIOARCHAEOLOGICAL METHOD AND THEORY Monday: Age, Sex and Stature Determination in Paleodemography Wednesday: Paleopathological Assessment of Disease and Trauma Friday: Anthropogenic Manipulation: Cranial Modification and Trepanation *Readings: Buikstra and Ubelaker, Walker, Lovell, Baca et al., Johnson*
WEEK 4 LECTURES: THE BODY AS MATERIAL CULTURAL Monday: Isotopic and Compositional/Elemental Approaches Wednesday: The Bioarcheology of Colonization: Migration, Diet, Health, and Violence Friday: Reconstructing Life and Death through Osteobiography and Archaeothanatology *Readings: Turner et al., Hoshower et. al; Sandoval et. al, Kurin*

TRAVEL AND MEETING POINT

You are responsible for making your own travel arrangements. Students will be met by project staff at the Ayacucho airport (AYP) when flights arrive (presently, there are two daily flights from Lima to Ayacucho) on the first day of the field school (June 18 for Session I, July 16 for Session II). Please let the project director on which flight you will be. Students will be met at the arrival area – look for a project

staff member holding the sign "IFR Field School". Ayacucho is served daily by domestic flights from Lima. Students are encouraged to buy one ticket from their departure home airport to Ayacucho as this will be the cheapest ticket available. There are many buses between Lima to Ayacucho and the trip takes about 12 hours. However, most of the road is a winding single lane highway and prone to accidents. We encourage students not to take the bus to and from Ayacucho but use flights.

We will meet you outside the Ayacucho airport, immediately after you exit baggage claim. *The airport is the designated meeting point*. From there chartered mini-bus will depart for Andahuaylas Province, about 4-5 hours away. If you are at all prone to motion sickness, stock up on Dramamine (called *gravol* in Peru). At the end of your session, on July 15 and August 12 at 6 am the mini-bus will return participants to Ayacucho.

→ *Send your itinerary an a passport-style selfie to Dr. Kurin ASAP*

In the unlikely event of an emergency, you will take a taxi from the Ayacucho airport to *Hotel San Fransisco De Paula* (Jiron Callao 290) [hee-rohn kah-yow dos-cientos-noventa], near the Plaza Mayor in Ayacucho. From there, contact Dr. Kurin. Please note that you will not be reimbursed for any expenses if you fail to reach the meeting place at the scheduled arrival time (excluding airline delays, which are fairly common), or otherwise fail to meet staff due to your own actions.

→ *If you have flight connection/ cancellation issues, call, text, Fbook, or email Dr. Kurin ASAP*

ACCOMMODATIONS AT THE FIELD STATION

Once in Andahuaylas, you will stay in our rustic Field Research Station in the town of Talavera (pop. 4,000). Conditions are basic and participants share accommodations. There is no central heat; it is always chilly indoors, so bring warm clothes. There is running water, but we do not guarantee that it will be plentiful, potable, or hot. Rolling blackouts may also occur. There are common areas for socializing and lab work. Modest amenities include electric showers, flush toilets, charcoal grill, guinea pig hutch, common kitchen, table games, fire pit, and lending library. Bedrooms are monastic and consist of bunks configured as doubles or triples. The project will provide you with a simple mattress and some warm llama wool and fleece blankets. *Bring earplugs and a sleeping mask if you are a light sleeper. You should bring a towel, a bed sheet, a sleeping bag and a crash pad for added comfort and a combination lock to further secure any personal items.* Nurse Olga's mini-clinic is on the third floor.

In the lab, most people work in jeans, cargo pants, sweatpants, or other comfortable clothes. Bring a long sleeve shirt and sweater or jacket. You may want a warm hat, fingerless gloves, and a thermos for tea or coffee. Plan accordingly if you enjoy listening to music while you work.

A note about water and plumbing: To prevent an overflow, never put toilet paper, tampons, or anything else into flushable toilet basins. Everything except natural waste ***must*** go in the trash. You will get accustomed to this practice in short order. The showers are heated through coils in the head; lower water pressure causes hotter. Showers longer than ~5 minutes may cause a short circuit. There is also a solar-heated camping-style shower bag, or you can heat up a pot of water and sponge-bath.

Before you leave the project: Return *any and all* borrowed items. Clean your room: get rid of trash, flip the mattress and fold all blankets. Help tidy up common areas. Report any damages to Dr. Kurin.

FIELD CONDITIONS IN ANDAHUAYLAS

Andahuaylas is characterized by high altitude (10,000 feet) mountain valleys in a low-humidity, semi-arid setting at a subtropical latitude. It is extremely bright and sunny during the day with temperatures around 70 degrees Fahrenheit, but the wind picks up and the temperature plummets to the 40s at night. While excavating, you will be outdoors and in the sun. Think dirt and sweat. Biting flies are present in

the area, and you could get scratches or blisters. You may be expected to walk several kilometers on any given weekday, carrying field gear, human remains, or other artifacts. There are no formal bathrooms at the site, so you should prepare yourself accordingly.

You must be aware of all the potential risks involved in archaeological field work in the Andes

Common occurrences

- Skin injuries (chafing, scratches, punctures)
- Fly bites, bee stings
- Exhaustion & general muscle fatigue
- Blisters on hands and feet
- Sunburn and mild dehydration
- Minor infections and diarrhea

Rare occurrences

- Sprained, luxed, or broken bones
- Long-lasting or serious GI problems
- Vehicular accidents
- Snake or spider bite
- Infectious disease
- interpersonal violence

STAYING HEALTHY

Students and staff are expected to maintain a reasonable level of hygiene that befits communal living. Also, while precautions are taken, during your travels, you should expect mild bouts of stomach upset and possibly diarrhea. Over-the-counter remedies are adequate for most. For more serious infections, your medical provider may prescribe an antibiotic (i.e., Amoxilcilin, Erythromyacen) or something stronger (i.e., Metronidazole or Flagil).

The Field Station has a registered ER nurse on call 24/7 should you come down with something. If you have any conditions that require medications or treatments, or if a lack of treatment could result in you hurting yourself or others, you **must** inform Dr. Kurin in writing. If you have any special health needs, talk with your doctor. *You are ultimately responsible for your health status and treatment options.* While in Peru, you must monitor your wellbeing and decide whether or not your condition merits specialized care. You will be responsible for any medical costs. Doctors in Andahuaylas expect to be paid by you, in cash. Check your usual provider's insurance requirements and bring your IFR-sponsored insurance card too. Understand their procedures for mitigating disasters abroad. For life-threatening emergencies, we will consult with medical professionals and may have to medevac you to Cuzco, Lima, or the USA.

The Center for Disease Control (CDC) recommends additional vaccines for travel to Peru. Visit your doctor for advice and immunizations. You should obtain all vaccinations at least 4-6 weeks before your trip to allow time for them to take effect. Some health insurance plans cover the cost of immunizations.

→ *The CDC minimally recommends vaccinations against:* **Typhoid** and **Hepatitis A**
→ *Endemic malaria, yellow fever, and zika are extremely rare at high altitude*
→ *You **must** inform project staff if you have previously contracted **dengue fever***

MEALS

We provide plenty of basic, but nutritious food Monday through Friday. Breakfast consists of coffee, tea, evaporated milk, fruit, cereal, fresh baked bread, jams, butter, and oatmeal. Lunch consists of sandwiches with cookies and fruit. Dinners are on a set schedule. The main course will rotate, but is drawn from Peruvian highland cuisine which is heavily based on rice, corn, potatoes, legumes, pasta, and some animal protein such as eggs and chicken. The project will provide an abundant supply of purified drinking water. Electric kettles are used to boil water. Soft drinks, ramen noodles, and snacks can be purchased at local bodegas. Fresh juice and produce is available at the market. Those with specialized diets will find their options very limited and should be prepared to bring their own food down, or purchase items locally to supplement their diet.

→ *We can't accommodate strict vegetarian, vegan, gluten-free, kosher or other specialty diets*
→ *You are responsible for all meals on Saturday and Sunday.*

The Field Station charcoal grill and kitchen is available should you decide to cook at home. There is a stove, storage shelves, gadgets, and a small refrigerator available use. You are required to wash your own dishes, flatware, and coffee/tea mugs.

WHAT TO BRING:
Consider that anything you bring down could be LOST, BROKEN, and STOLEN, so plan accordingly.

- If you bring a tablet or laptop, back-up all your files.
- If you bring a digital camera, download your photos before you come to Peru.
- Don't bring expensive jewelry or ostentatious accessories.
- Check if your insurance company covers loss or theft of property.
- Make copies of your passport and leave one with a trusted relative.

Clothing and Sleeping Bring enough clothes so that you can go one week without laundry. Try to pack as light as possible. If you won't wear it more than 3 times, don't bring it. Think layers; prepare for the cold.

Required Gear:

o 1 pair jeans/ work pants	o underwear/bra/etc.	o Hiking shoes
o 1 pair comfy pants	o Warm socks	o House shoes
o 2 tanks/t-shirts	o Brimmed hat/ baseball cap	o Towel and bed sheets
o 2 long sleeve shirts	o Warm hat and gloves	o Eye-mask and earplugs
o 1 sweater or sweatshirt	o Warm/down fleece/jacket	o Backpack
o 2 long johns	o Sleeping bag & crash pad	o Flashlight/ headlamp

Recommended Gear:

o Water bottle	o Extra batteries	o Personal thermos/mug
o Sunglasses	o Transformer	o Rain poncho
o tablet	o Duct tape	o A bathing suit
o music player	o Pocketknife	o Bandana
o Digital Camera	o USB memory sticks	o Your favorite snacks

Suggested Toiletry/First Aid Gear:
You may choose to bring all basic toiletries and supplies with you (i.e. prescription drugs, over-the counter medications, contact lens solutions, tampons, sunscreen, etc.) as brands sold in Peru are often different, and you can't always get what you want.

o Hair brush	o Tampons/Pads	o Pepto Bismol/Immodium
o Toothbrush & Floss	o Hand Sanitizer	o Travel Pack Tissues
o Toothpaste	o Eyeglasses/contacts	o Bug Spray 100% Deet
o Sunscreen	o Tylenol/Asprin, etc.	o Baby Wipes
o Shampoo	o Anti-itch cream	o Neosporin
o Deodorant	o Dr. Scholl's Moleskin	o Anti-biotics

Suggested Bioarchaeological Equipment -- *Store gear in a plastic art supply storage box/tackle box*

□ Wide & fine paint brushes	□ Field Notebook	□ Fine/ extra fine Sharpies
□ Engineers' ruler (metric)	□ Mechanical pencils	□ Storage Clipboard
□ Sliding caliper	□ Clear nail polish	□ Sample bags
□ Nitrile Gloves	□ Disposable face masks	□ Eye protection
□ Toothbrushes	□ Bamboo tools/skewers	□ Magnifying glass

□ Jeweler's loupe	□ Bulb Syringe	□ Photo scale
□ Marshalltown Trowel	□ Line Level	□ Folding metric ruler
□ Q-tips/cotton	□ mm graph paper	□ small dissecting kit
□ Post-it notes	□ duct tape	□ kneeling/knee pads
□ Aluminum foil	□ flex grip work gloves	□ metric measuring tape

REQUIRED TEXTBOOKS:

Desk copies are available at the Field Station

White, TD and PA Folkens. 2005. The human bone manual. Academic Press, 2005.

OR WHITE'S HUMAN OSTEOLOGY

Buikstra, JE and DH Ubelaker, D. H. 1994. Standards for data collection from human skeletal remains. Fayetteville: Arkansas Archeological Survey.

REQUIRED READINGS:

Readings are available to students as PDF files

Arkush EN and TA Tung. 2013. Patterns of war in the Andes from the Archaic to the Late Horizon: Insights from settlement patterns and cranial trauma. Journal of Archaeological Research 21: 307-369.

Baca, M; K Doan, M Sobcyzk, A Stankovic, P Weglenski. 2012. Ancient DNA reveals kinship burial patterns of a pre-Columbian Andean community. BMC Genetics. 13(30). doi:10.1186/1471-2156-13-30

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Hoshower et. al. 1995. Artificial cranial deformation at the Omo 10 site: A Tiwanaku complex from the Moquegua Valley, Peru. Latin American Antiquity. 6(2):145-164

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Walker, PL. 2001. A bioarchaeological perspective on the history of violence. Annual Review of Anropology. 30:573-596.

RECOMMENDED READINGS - *subject to change*

Bauer, BS; LC Kellett, MA Silva. 2010. The Chanka, archaeological research in Andahuaylas (Apurimac), Peru. Los Angeles: Cotsen Inst of Archaeology, UCLA.
Moseley, M. 1999. The Incas and their ancestors. Cambridge: Cambridge U Press.
Ortner, DJ. 2003. Identification of pathological conditions in human skeletal remains. Amsterdam: Academic Press.Galloway, A. 1999. Broken bones: anthropological analysis of blunt force trauma. New York: Charles C Thomas Press.
Schreiber, KJ. 1987. Conquest and consolidation: a comparison of Wari and Inca occupations of a highland Peruvian valley. American Antiquity. 52:266-284.
Skar, H. 1982. The warm valley people. Duality and land reform among the Quechua Indians of highland Peru. Oslo Studies in Social Anthropology No. 2. Oslo: Universitetsforlaget.
Tung, TA. 2007. Trauma and violence in the Wari Empire of the Peruvian Andes: warfare, raids, and ritual violence. American J of Physical Anthropology. 133:941-956.