

**GIBEON REVISITED:  
AN INTEGRATED APPROACH TO A BIOARCHAEOLOGICAL COLLECTION**

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## **ABSTRACT**

The Penn Museum contains a set of previously unstudied skeletal remains from a site called Gibeon, located near the modern Palestinian village, al-Jib. I analyzed these remains over a year and a half, using two main frameworks. The first, and primary framework centered on the collection of the bones and their subsequent history within the Penn Museum, attempting to explore why they were brought here and were never analyzed. I addressed this through as complete of a basic osteological analysis as possible, given the state of the collection. This framework also joins the discussion on how museums choose to collect, store, and exchange skeletal material, a topic that remains highly relevant to the ethics of bioarchaeology and museum practice. The second principal framework lies in the geopolitical context of the excavation at Gibeon and what can a study of the human remains can draw from and contribute to the archaeology of Israel and Palestine. Through this framework, I discuss how interpretations of the past, such as the site of Gibeon, figure into contemporary discussions on the politics of archeology. Overall, my project identified the gaps in the archive of Gibeon's human remains and begins to build into these gaps.

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## 1. INTRODUCTION

I came to anthropology through the subfield of physical anthropology, specifically osteological work, enthusiastically diving into learning about that type of research. However, as my knowledge about anthropology in general has expanded, I have realized that the sort of research or questions I am interested in cannot always be neatly siphoned into one subfield of the broad scope of anthropology. As I neared the start of my junior year, I realized I wanted to undertake a research project that would allow me to ask questions not limited to physical anthropology and osteology, but have some sort of outcome beyond this scope, relating data about bones to a broader theoretical context. Ideally, I wanted to engage in a research project which would bridge the past (in utilizing bioarchaeological specimens) to a relevant modern discussion either about the area the specimens are from, or about how the material itself is collected, housed, and presented—or both, as these are mutually exclusive topics of discussion. This desire has led me to focus on a small, specific set of skeletal remains in the physical anthropology section at the Penn Museum.

In one of the Penn Museum's physical anthropology storage rooms, there are six medium-sized containers of skeletal remains, labeled as "el-Jib." The boxes have numbers labeled on them, but from a cursory investigation, the numbers don't correspond to specific skeletal elements, individuals, or anything in the Museum catalogues. The bones have never been cleaned, being still covered in the original dirt from the ground they were excavated from. They are unfamiliar bones, not part of any collection I have handled while working in the physical anthropology section. After speaking with curator and keeper of the collection Dr. Janet Monge and graduate student Paul Wolff Mitchell about these bones, I learn that they are from a site called Gibeon, which is located on the edge of the modern Palestinian village of al-Jib (the boxes

are labeled “el-Jib,” though the village is usually written as al-Jib or Al Jib), 10 km north of Jerusalem (Jerusalem Media & Communication Centre, 1999). The Penn Museum sponsored an excavation of the site of Gibeon from 1956 to 1962, led by the Biblical archaeologist James B. Pritchard (Penn Museum 1999), who was employed at the Penn Museum at the time of the site’s excavation. The bulk of what was excavated was non-biological archaeological material, and many of these objects were processed, catalogued, and are on display today in the Penn Museum’s Canaan and Ancient Israel Gallery. However, I quickly learn that the bones were never analyzed, or even cleaned and properly catalogued. In fact, I learn that they were “lost” within the museum for a long time in the 1970s and 1980s and were only reconfirmed as being from Gibeon in 2014.

No provenience information is immediately available to me apart from the site; i.e. the *in-situ* location, where the bones were specifically found and what other archaeological material was with them. I wonder whether this information existed initially and whether it may be lying in some form of buried archive. The visible absence of information about the bones, markedly different from other skeletal collections excavated by museum, raises many questions for me. What does the presence of these skeletal remains mean? Can they be integrated with the other archaeological work done at Gibeon, if they are, in fact, from the Gibeon site? Why were they collected and brought here? Why haven't these been examined before, i.e. what does it say that the archaeological material seems to have been prioritized over the skeletal material? How can these remains inform multiple people with an academic interest in this the area of the site, such as Near East scholars, Biblical scholars, physical anthropologists, archivists, and archaeologists? As I consider my initial questions, I look more into the site and its context within a historical framework, realizing the potential that this small collection has for continuing a larger discussion

about the importance of “biographies” of physical remains. More questions come up for me as I think about the excavation context and the many discourses surrounding its geography in the Middle East—primarily, the value of this collection given that this is an area that is difficult to access for archaeologists and citizens alike today, being located in the West Bank, and the claims that have been and might be made about these skeletal remains.

Above I have outlined several questions that I preliminarily formed about this material, and there are certainly more I could ask. Many of these questions overlap, although given the many threads that seem to be at work with the facets of the collection, I do not think it is necessary or useful to try and compact these threads into one broad question. My purpose is not to find a single answer or interpretation, but rather offer these questions and form possible interpretive frameworks for the many threads of my research. I have narrowed my questions down to form two overarching frameworks, in order to more efficiently explain why I am interested in these particular skeletal remains and to guide my research.

The first, and primary framework centers on the collection of the bones and their subsequent history within the Penn Museum, attempting to address that they were brought here and were never analyzed. I will address this through as complete of a basic osteological analysis as possible. This framework also intersects with how the Penn Museum chose to collect, store, and/or exchange this skeletal material, a topic that remains highly relevant to the ethics of bioarchaeology and museum practice. The second principal framework lies in the geopolitical context of the excavation and what can a study of them can draw from and contribute to the archaeology of Israel and Palestine. Through this framework, I hope to use an anthropological lens to discuss how interpretations of the past, such as the site of Gibeon, figures into the contemporary discussions on the politics of archeology in Israel, Palestine, and Jordan. Overall,

this project is particularly engaging to me for its necessary crossing of the lines between many tenets of anthropology: physical anthropology, archaeology and bioarchaeology, archival and literature research, and museum practice. The intended outcome for my research project is primarily that it successfully engages in cross-disciplinary research methods in order to expand and enrich the context of the collection.

## 2. BACKGROUND

### 2.1 Biblical History of Gibeon

The significance of the site of Gibeon can in large part be traced to its biblical history. The city of Gibeon and its inhabitants—“Gibeonites”—figure prominently in narratives of the Hebrew Bible as well as several secondary contexts, lists, and prophetic texts (Na’Aman, 2009). Gibeon was founded as a Canaanite city; the Gibeonites are considered Hivites, a pre-Israelite group of descendants of Canaan, son of Ham (Day, 2007). According to the biblical narrative, Gibeon became incorporated as an Israelite City. The first, and perhaps most famous biblical narrative involving Gibeon involves a treaty made between the Gibeonites and Joshua, leader of the Israelite tribes after Moses’ death (Joshua 9, New King James Version). Joshua and the Israelites were in the midst of conquering the lands of Canaan, and had just destroyed the Canaanite cities, Jericho and Ai. Fearing for the lives of the Gibeonites, ambassadors from Gibeon approached Joshua, under the guise that they were from faraway lands. As the narrative details: “But when the inhabitants of Gibeon heard what Joshua had done to Jericho and Ai, they worked craftily, and went and pretended to be ambassadors [...] And they went to Joshua, to the camp at Gilgal, and said to him and to the men of Israel, ‘We have come from a far country; now therefore, make a covenant with us’” (Joshua 9:3-4, 6, NKJV). Joshua makes peace with the Gibeonites, and Gibeon is incorporated as a city of Israel. Joshua discovers that the Gibeonites in fact are not from a far land but are neighbors; he curses the Gibeonites but allows them to live, as long as they serve him as woodcutters and water carriers (Joshua 9:22-23, NKJV).

In Chapter 10 of the Book of Joshua, the Amorite king of Jerusalem hears of Joshua’s destruction of Jericho and Ai, as well as the treaty between the Gibeonites and Joshua. He fears Gibeon, because “Gibeon *was* a great city, like one of the royal cities, and because it *was* greater

than Ai, and all its men *were* mighty” (Joshua 10:2, NKJV). The king of Jerusalem, along with four other nearby Amorite kings, gather their armies and lay siege on Gibeon. The Gibeonites appeal to Joshua and the Israelites for aid: ““Do not forsake your servants; come up to us quickly, save us and help us, for all the kings of the Amorites who dwell in the mountains have gathered together against us”” (Joshua 10:6, NKJV). Joshua gathers his warriors and moves to fight against the Amorite armies. Speaking to the Lord, Joshua says, ““Sun, stand still over Gibeon; / And Moon, in the Valley of Aijalon”” (Joshua 10:12, NKJV) The passage continues, “So the sun stood still, / And the moon stopped, / Till the people had revenge / Upon their enemies” (Joshua 10:13, NKJV). In this spectacular scene, the sun stands still for a day, while Joshua’s army defeats the Amorite armies amid miraculous circumstances. The description of Gibeon as the place where “the sun stood still” figures prominently into the deep interest in the biblical context of the site.

While Joshua 9 and 10 offer the introduction to the city of Gibeon, the city also reoccurs prominently in later biblical chapters. In Joshua 21, the city is given to the Levites (the tribes descended from Levi, son of Jacob) along with 47 others scattered across the Promised Land in lieu of official territorial land. In 1 Chronicles 21, Jeiel, an ancestor of King Saul, is named as the “father of Gibeon” (1 Chronicles 9:35, NKJV). According to the Hebrew Bible, King Saul is the first king of the United Monarchy of Israel and Judah, and his treatment of the Gibeonites is detailed in 2 Samuel 21: “Now the Gibeonites *were* not of the children of Israel, but of the remnant of the Amorites; the children of Israel had sworn protection to them, but Saul had sought to kill them in his zeal for the children of Israel and Judah” (2 Samuel 21:1-2, NKJV). While Saul’s massacre of the Gibeonites is described, the actual event is never recorded biblically. King Saul later launches an attack on the Philistines, an ancient people said to be

descended from the son of Egypt, that frequently are described as having conflict with the Israelites. King Saul died by suicide during the battle against the Philistines to avoid capture, and his son-in-law, David, succeeded him as King of Israel and Judah. The pool of Gibeon is mentioned in 2 Samuel 2:13 as a site of fighting and would become the area David went on to conquer the Philistines (2 Samuel 5, 1 Chronicles 14).

Later on, during the reign of David, a drought fell upon Israel: “Now there was a famine in the days of David for three years, year after year; and David inquired of the Lord. And the Lord answered, ‘*It is* because of Saul and *his* bloodthirsty house, because he killed the Gibeonites.’ So the king called the Gibeonites and spoke to them” (2 Samuel 21:1-2, NKJV). David asks the Gibeonites what he can do to atone for Saul’s actions, and the Gibeonites ask to kill seven of Saul’s male descendants as retribution. David hands over two of Saul’s sons, and five of his grandsons, who are hanged by the Gibeonites (2 Samuel 21:5-9, NKJV). The details of Saul’s massacre and David’s atonement in 2 Samuels 21 is the most significant presence of Gibeon following Joshua’s treaty and defense of the city in the Joshua 9 and 10. There are further mentions of Gibeon throughout the Hebrew Bible; King Solomon, David’s son, offered “a thousand burnt offerings” at the altar of Gibeon, as the city was “the great high place” (1 Kings 3:4, NKJV). The Lord is described as appearing the Solomon on this occasion granting him wisdom (1 Kings 3:5, 10-14). The false prophet Hananiah is describes as being from Gibeon (Jeremiah 28:1). After King Solomon’s death, the Hebrew Bible (2 Chronicles) depicts the United Monarchy of Israel and Judah splitting into the northern Kingdom of Israel and the southern Kingdom of Judah, the latter of which encompassed Gibeon (Day 2007). The revolt of siege of Jerusalem by King Nebuchadnezzar of Babylon resulted in the end of the Kingdom of Gibeon came to be associated as part of the mountainous region called Judea—named after the

tribe and Kingdom of Judah (Nehemiah 3:7, NKJV). The mention of Gibeon in Nehemiah 3:7 is the last biblical account of the city chronologically, as the Book of Nehemiah is the last chapter of the historical narrative of the Hebrew Bible. However, the accounts involving Gibeon are not presented chronologically; 2 Samuel details both Saul’s killing of Gibeonites and the much later drought of Israel, and Jeremiah 41, which mentions events near the pool at Gibeon is presented after Nehemiah (Jeremiah 41:12, NKJV).

The biblical history of Gibeon provides a framework for interest in the site, and Gibeon’s place within the Hebrew bible is integral to understanding the broader context of the city’s history. The recording of Gibeon as a Canaanite and Israelite city in the Hebrew Bible understandably generated a lot of archaeological interest. The city served as the setting of several significant biblical narratives and events, surrounding central figures in Judaism—Joshua, David, Solomon. While the above discussion has presented the instances in which Gibeon appears biblically, a discussion broader significance of these events in the political and religious history of early Israel (as recorded biblically) is beyond the scope of this project. For further discussions on Gibeon’s role in terms of its biblical history, refer to texts such as *Gibeon and Israel; the role of Gibeon and the Gibeonites in the political and religious history of early Israel* (Blenkinsopp, 1972), “Gibeon and the Gibeonites in the Old Testament” (Day, 2007), and “The Sanctuary of the Gibeonites Revisited” (Na’Aman, 2009).

## **2.2 Extra-Biblical History of Gibeon**

Scholars that accept the historicity of biblical narratives—i.e., accept that some form of the narrative historically occurred—have long debated over when specifically biblical events occurred, as the dates and lengths of time given in the Hebrew Bible have been contested. For

example, the dates of hallmark biblical events such as the exodus of the Israelites from Egypt, the conquest of Canaan by Joshua, the divvying of the land among tribes, and the account of judges (Book of Judges) are contested among such scholars (Schaaf 2012). There are two main schools of thought; the early school of thought dates the conquest of Canaan as beginning in the latter part of the 15<sup>th</sup> century BCE (1450-1401 BCE), while the late school dates the conquest to the 13<sup>th</sup> century BCE, roughly contemporaneous with Pharaoh Merneptah's reign between 1213-1203 BCE. (Schaaf 2012). Both school of thought base their dates on accounts given in 1 Kings: "And it came to pass in the four hundred and eightieth year after the children of Israel had come out of the land of Egypt, in the fourth year of Solomon's reign over Israel, in the month of Ziv, which *is* the second month, that he began to build the house of the Lord" (1 Kings 6:1, NKJV) and Judges: "While Israel dwelt in Heshbon and its villages, in Aroer and its villages, and in all the cities along the banks of the Arnon, for three hundred years, why did you not recover *them* within that time?" (Judges 11:26, NKJV). The earlier school takes the given years and passage of time literally, while the later school takes the passage of time as symbolic in 1 Kings 6 and overstated in Judges 11 (Schaaf, 2012).

Many other dates of important periods in the Hebrew Bible are cross-referenced with Egyptian records, such as pharaoh Shoshenq I (called Shishak in 1 Kings and 2 Chronicles) campaign against King Rehoboam and the Kingdom of Judah and sacking of Jerusalem in the 10<sup>th</sup> Century BCE (945-924 BCE). Shoshenq's invasion of Canaanite cities was recorded with a list of the cities on the walls of the Amun temple at Karnak in Thebes; the list of cities includes Gibeon and is the earliest known extra-biblical written mention of the city (Blenkinsopp, 1972). The dates given in the Hebrew Bible and their cross-references in extra-biblical records led scholars to conclude that the majority of major biblical events occurred in the geographical area

of Palestine in the Late Bronze Age. Still, such dates based on written records were considered unreliable by many other scholars, leading archaeology to fill the gap (Fritz, 1994). Though the geographical area of Palestine has been home to human populations for over a million years, its transformation as depicted through biblical narratives became the focus of much of the intense archaeological interest in the area, in order to confirm sites as biblical (Schaaf, 2012).

In the late 19<sup>th</sup> century, as scientific excavations in Palestine began (Pritchard, 1957), the push to confirm the identity of specific sites as those named throughout biblical passages engendered a subfield of archaeology, called biblical archaeology, or the “archaeology of Palestine.” Biblical archaeology is occupied with the investigation and recovery of material remains that can explain the times and descriptions of the Bible, including the Hebrew Bible (Old Testament) and the New Testament, considered to cover a time period between 2000 BCE and 100 CE (Fritz, 1994). Biblical archaeology was founded on the tenet that archaeology was a mechanism through which the veracity of biblical stories could be proved. The relevant geographical areas to biblical archaeology are the territories serving as the setting to the biblical stories, east and west of the Jordan River (Schaaf, 2012). This area has been biblically and extra-biblically referred to as The Holy Land, the Levant, Canaan, Israel, the United Kingdom of Israel and Judah, Judea, Syria-Palestine, and Palestine, among many other names. Today, the entire geographical area is referred to as the Jordan Valley, which typically covers the political entities of Israel, the West Bank (Palestine), and Jordan (Schaaf, 2012). For clarity, I will use “Palestine” to refer to the geographical and historical area of the Jordan Valley that biblical archaeology is concerned with.

As mentioned, the earliest extra-biblical naming of Gibeon as a Canaanite city occurred in Egypt, around 945-924 BCE (Blenkinsopp, 1972). However, the name “Gibeon” disappeared

from the biblical record after the Book of Nehemiah. As the control of region of Palestine shifted chronologically from the Kingdom of Israel to the empires of Assyria, Babylon, Persia, Hellenistic Greece, Rome, the Islamic Caliphate, and the Ottomans, the shifting population demographics likely led to physical ruin and name changes of the city of Gibeon (Jacobson, 1999). A Palestinian village in the Western Highlands of the Jordan Valley with the Arabic name al-Jib was first identified as the site of the ancient city of Gibeon by the 10<sup>th</sup>-century lexicographer, David ben Abraham al-Fasi (al-Fasi, 1936). A linguistic change of the name from “Gibeon” to “al-Jib” was also noted in the Hebrew Lexicon compiled by Wilhelm Gesenius and Frants Buhl (Skoss, 1936). Other early sources which mention the city of al-Jib and/or Gibeon include records from 1152 CE of the Church of the Holy Sepulchre in Jerusalem (de Rozière, 1849), Ibn Shaddād’s (1145-1234 AD) account of Saladin stopping at al-Jib after the fall of Jerusalem (Shaddād et al, 1897), and geographer Yākūt in 1225 CE. (Le Strange, 1890). Yākūt mentions two fortresses close together at al-Jib: “A place in the Filastīn Province, lying between Jerusalem and Nābulus. There are here two fortresses, called Upper and Lower Al Jīb, and they stand close one to the other” (Le Strange, 1890, 464). Al-Jib appears as “Jib” in 1596 tax records of the waqf of Mamluk Sultan Inan in Egypt, with a population of 103 Muslim households (Hütteroth & Abdulfattah, 1977). Throughout these historical records, the village’s name of “al-Jib” is alternately as al-Jīb “Al Jib,” “Al Jīb,” and “el-Jib;” for continuity, I will use al-Jib unless directly quoting another source.

The earliest scientific identification of al-Jib with the site of Gibeon is generally considered to have begun with the 1841 publication of Biblical Literature Professor Edward Robinson of the Union Theological Seminary in New York (Stern, 1993). In 1838, Edward Robinson embarked on a trip with Eli Smith to research biblical geography in Palestine.

Robinson writes “Gibeon” and “el-Jib” as synonymous sites, with the later village of al-Jib built next to and on top of the ancient city of Gibeon: “[el-Jîb] is of moderate size; but we did not learn the number of souls. The houses stand very irregularly and unevenly, sometimes almost one above another. They seem to be chiefly rooms in massive old ruins, which have fallen down in every direction [...] It is not difficult to recognize in el-Jîb and its rocky eminence the ancient Gibeon of the Scriptures” (Robinson, 1841, 136-137). Robinson goes on to describe the biblical narratives of Gibeon, and states that the Arabic “Jîb” is an abridged form of the Hebrew Gibeon. He also writes that after the instances of 13<sup>th</sup> and 16<sup>th</sup> century records, the city “seems to have been overlooked by most travelers” until the end of the 18<sup>th</sup> century (Robinson, 1841, 139). Robinson, a scholar and explorer, is often also credited as an early Biblical archaeologist, for his many surveys of ancient, assumedly biblical cities. In 1863, French explorer Victor Guérin determined al-Jib to have a population of 500 (Guérin, 1868), and an 1870 Ottoman population count of the village listed 219 men and 65 households, as well as labeling al-Jib as within the district of Jerusalem (Deutscher Verein zur Erforschung Palästinas, 1882), although neither source lists the name “Gibeon” alongside the village of al-Jib.

After these early publications detailing the visible remnants of the city Gibeon, the majority of 19<sup>th</sup> and early 20<sup>th</sup> century publications on the geography and archaeology Gibeon (al-Jib) were done by the Palestine Exploration Fund (PEF). The PEF is a British society that was established in 1865 to study the area of the Levant, or Palestine. A survey team of the PEF visited Gibeon (al-Jib), and recorded thirty-four burial caves, dating them to the Roman Period, or late Iron Age (Eshel 1987). An 1881 publication by the surveyors, *The survey of Western Palestine: memoirs of the topography, orography, hydrography, and archaeology*, describes the geography of al-Jib and identifies the village with the site of Gibeon:

“The village stands on the end of a hill, rising 300 feet above the valley [...] The hill is thus isolate, and a position naturally of great strength [...] The village is of moderate size, the houses of stone, with a central tower, and massive foundations exist among the modern buildings [...] There are many springs on the south and west, and saves in the southern side of the hill. Olives, figs, pears, apples, and vines are cultivated around the village and in the plain; there are also extensive corn-fields in the low ground. El Jīb is the ancient Gibeon [...] Three ancient roads join at el Jīb, coming from the maritime plain. The site seems to have been known in the Middle Ages, and to have been then called Gran David (Benjamin of Tudela)” (Conder et al., 1881, p. 10).

As in much older biblical and extra-biblical sources, this publication describes land around Gibeon as fertile and flat with numerous springs, lending to a prosperous economy for both the ancient city and the modern village. A little over a decade after this publication, the population of al-Jib was reported as 567, further emphasizing the shift from the “great” biblical city and the modern village (Deutscher Verein zur Erforschung Palästinas, 1896). The site of Gibeon continued to fascinate Biblical archaeologists in and outside of the Palestine Exploration Fund; while the archaeological structures visible at al-Jib were heavily identified as Gibeon due to the location and nominal similarity, no excavation of the site had yet occurred to securely confirm both the identity and date of the site.

### **2.3 Excavation History of the Excavation**

James Bennett Pritchard (1909-1997), the eventual excavator of Gibeon, was born in Louisville, Kentucky. He attended Asbury College in Wilmore, Kentucky for a bachelor’s degree in philosophy, afterwards beginning a Bachelor of Divinity in Drew College, New Jersey. Partway through his divinity studies, Pritchard’s enormous interest in the lands and people described in the Bible directed him to participate in an archaeological expedition to Bethel, as his own expense. Pritchard returned from the expedition to complete his degree, moving on to serve as a pastor in Philadelphia. However, Pritchard felt he had been forever changed by his

experience at Bethel and, despite his lack of a complete formal training in the techniques of the field, was drawn back to Biblical archaeology, saying that “after Bethel, my career was in ruins” (Penn Almanac, 1997). Pritchard returned to Philadelphia and the University of Pennsylvania to earn a doctorate in Oriental studies, which he completed in 1942. From 1942 to 1954 he served as professor of Old Testament Literature at Crozer Seminary School in Chester, Pennsylvania; during this time, Pritchard also working as a research associate for the University Museum (now the Penn Museum of Anthropology and Archaeology) in 1950. In 1954, he began teaching at the Church Divinity School of the Pacific in Berkeley, California, while maintaining his relationship with the University Museum (Penn Almanac, 1997).

In 1955, sponsored by the Church Divinity School and the University Museum, Pritchard traveled to the area of Palestine in search of a site for excavation. By this point, many cities named in biblical narratives had been excavated, to prove both their identity and the events laid out in such narratives. Pritchard was searching for cities that were named biblically, but which had not been excavated and officially confirmed in a particularly geographical location. The city of Gibeon, mentioned biblically 43 times, drew his attention, as it had not been previously excavated. Pritchard was familiar with Edward Robinson’s 1838 travels to Palestine, where Robinson determined that the Arab village of al-Jib eight miles north of Jerusalem was the site of Gibeon, due to the location, the similarity of the names, and the presence of old structures near the village (Robinson, 1841). American and French scholars continued to believe that the site at al-Jib was Gibeon. However, Pritchard also was aware of challenges to this predominant identification. Namely, two scholars argued that al-Jib was the site of the biblical city Beeroth. Albrecht Alt, a German biblical scholar, had proposed this from the early 20<sup>th</sup> century up to

1953, and his identification was agreed upon by Martin Noth, a geographer of ancient Palestine (Pritchard, 1957).

Pritchard was intrigued by the argument over the identity of the ruins at al-Jib and held a particular interest in Gibeon because of the spectacular biblical events involving the city. During his exploration for a potential excavation site visited the village, which at the time was in the borders and under the control of Jordan (Pritchard, 1957). He visited the mound next to the village, describing it as “rising more than 50 meters above the plain and extending over an area of more than 16 acres” and that it “must have been a strategic and important site in antiquity” (Pritchard, 1957, p. 4). Pritchard visited al-Jib five times over the year of 1955, finding rock-cut Roman Age tombs in the hill that had been long opened and emptied of any objects; thirty-four of these were the tombs listed by the Palestine Exploration Fund in *The survey of Western Palestine* (Conder et al., 1881). Pritchard suspected that there were many more unopened tombs that could be excavated. He and his team also found pottery sherds they identified as Israelite scattered on top of the mound. The existence of tombs and pottery likely from biblical times provided the physical evidence needed for a sponsorship of excavation (Pritchard, 1957).

The University Museum (now Penn Museum) sponsored an exploratory excavation at al-Jib in 1956, supplying funds through a grant from the Pew Foundation. The Church Divinity School of the Pacific, where Pritchard taught, also was a sponsor, with three other staff members participating in the excavation. The Bates and Rogers Foundation and Margaret G. Rogers provided funding for surveying equipment, while the American School of Oriental Research (now the Albright Institute of Archaeological Research) in Jerusalem lent archaeological equipment and provided work spaces and housing for the team. Nine people served as the scientific staff for the 1956 exploratory excavation of al-Jib; Pritchard was the director of the

campaign. The work staff of 70, who carried out much of the physical excavation, was mainly local Palestinian men. Seven men on the work staff were from Jericho and had worked on the excavations at the city, and so were trained in working with trowels and brushes. The remainder of the work staff were men from al-Jib. Pritchard's team, with the assistance of the Department of Antiquities in Jerusalem and the head of the village of al-Jib, made agreements with landowners to rent land and compensate them for trees and vines destroyed during excavation (Pritchard, 1957).

The first season of excavation at al-Jib in 1956 lasted ten weeks, six days a week, from June 18 to August 24. In his publications, Pritchard remarks that the only interruptions were a Muslim holiday and a one-day general strike as Jordan demonstrated support for Egypt during the Suez crisis (Pritchard, 1957). Pritchard also comments on the proximity of al-Jib to a military line, with the Jordan-Israel border three miles to the south: "in a time of tension and uncertainty, every precaution was taken to safeguard our records. At the close of each day, pottery, small finds, and records were taken to Jerusalem for safe keeping. On days when we were apprehensive at the sound of mortar and machine gun fire along the border we were particularly grateful for the interest and advice of Major Ali Matlaq, commander of the National Guard on that segment of Jordan's frontier" (Pritchard, 1957, p. 7). Thus, the recording of excavation work was done at ASOR in Jerusalem because it was a "safer place for finds than the tent at el-Jib" (Pritchard, 1957, 6). One of the earliest major features excavated and explored at the site was a massive tunnel with several offshoots, which Pritchard believed was concordant with a defensive city like Gibeon. Another feature examined early on was what Pritchard believed was a rock-cut cistern (water reservoir), that was uncovered around the area of the upper tunnel opening. The pool was filled with debris, including mud, stones, and pottery sherds. This assortment of pottery

fragments, which were salvaged, would prove to be Pritchard's most crucial find of the season (Pritchard, 1957).

Among 35,000 pottery fragments was what seemed to be a jar handle inscribed with the letters "GB'N" in Hebrew script of the 8<sup>th</sup> and 7<sup>th</sup> centuries BCE, as well as two more illegible letters. Pritchard believed that the letters spelled Gibeon, confirming the identity of the site at al-Jib. More well-preserved handles were found a few days later with the same inscriptions, and the additional letters appeared to be names. Overall, four jar handles with "GB'N" inscribed on them in Hebrew were found. Pritchard notes that at the time, few other records of written city names had been found, and was confident that the inscriptions identified Gibeon, perhaps better than any other site in Palestine (Pritchard, 1957). The rock-cut pool and what seemed to be defense fortifications such as the tunnel and heavy city wall further solidified Pritchard's identification of the site, as these physical details were congruent with biblical descriptions of Gibeon. (Pritchard, 1962, Na'Aman, 2009). In addition to the inscriptions of names, other handles appeared to have dates inscribed, indicating when they were made. These inscriptions had appeared at other sites, and generally named a king; archaeologists concluded this indicated the king ruling when the handle was made and was a means of dating the pottery and periods of use at a site (Pritchard, 1957).

In addition to the pottery evidencing Israelite occupation, Pritchard's team also found evidence of Roman occupation at al-Jib during the initial field season. This evidence included Roman walls associated with a cluster of Roman coins, which could be readily dated to 103-76 BCE. Pritchard notes in his publications that it seemed the earlier city wall had fallen to ruin during the assumedly "more tranquil" period of Roman occupation. A Roman water reservoir, larger than the older rock-cut pool, was also excavated. This reservoir had been proposed as the

biblical “pool at Gibeon” by earlier explorers (Pritchard, 1957), but Pritchard maintained it was Roman due to Roman-type pottery embedded in the plaster of its walls. Pritchard’s team continued to excavate, and by the end of the season had determined several periods of occupation for the site, based on the types of material (namely, pottery) found in layers. He states the earliest period of occupation at Gibeon as the Early Bronze Age, going back to around 3000 BCE. Other periods of use and dates the team established were the Middle Bronze Age (beginning 1800 BCE), Iron I Age (1200-900BCE), Iron II Age (800-600 BCE), and Roman occupation going back to at least 100 BCE (a period now called Hellenistic). However, Pritchard’s first publication on Gibeon (1957) points out that they did not find evidence for the Late Bronze Age, the period of special interest as the time of the events in the Book of Joshua involving Gibeon. However, Pritchard concedes that this was likely because the site is so large and their sample thus far small (Pritchard, 1957).

Pritchard directed a second excavation at Gibeon in 1957, beginning on July 22, with that primary objective of fully excavating the rock-cut pool, which had been partially excavated the year prior. Material was found quickly, including 52 additional inscribed handles supposedly naming the city of Gibeon. The handles did present the largest number of Hebrew inscriptions to appear at any excavated Palestinian site since 1910. Because of the massive amount of material being recovered from the pool, what was essentially trash, Pritchard hired additional staff to help with cataloguing and documenting the excavation. This included a cataloguer from the British School of Archaeology, a surveyor and a photographer from Jerusalem, and two foreign scholars working at institutions in Jerusalem. In Pritchard’s University Museum Bulletin publication on this season of excavation (1958), he discusses the team’s exploration into why the jar handles seemed to be labeled with the city name. He concedes the “remote possibility” that the jars were

brought from a nearby site, the true location of Gibeon, but deems this impossible after finding the additional handles (Pritchard, 1958, p. 17). These additional handles had “*gdr*” inscribed following “GB’N,” and followed by names in Hebrew—Hananiah Nera, Azaria, Amaria, which all appear biblically. Through citations of “*gdr*” in the Bible, Pritchard translates the inscriptions as “Gibeon, the walled vineyards of Hananiah Nera/Azaria/Amaria” (Pritchard, 1958, p. 17).

While no whole jars belonging to the handle fragments were found, Pritchard’s team concluded that they were vessels for liquid, such as water, oil, or wine. Additional clay stoppers found and the alignments of “*gdr*” with vineyard suggested that they held wine, and the inscription of the Gibeon on the handles indicated they were for export, and Gibeon was likely a city engaged in trade and commerce. Pritchard remarks that Gibeon as a successful producer of wine makes sense as grapes continued to be grown in the region at the time of his excavation (Pritchard, 1958). The rest of his publication details the pool and Gibeon’s water system, with Pritchard dating the fill to around 600 BCE based on the material. He proposes that a conqueror of the city likely filled the pool, and later settlers decided to use it as a trash heap rather than dig out the debris (Pritchard, 1958).

Pritchard returned for excavation seasons at Gibeon for three more summer excavation seasons, in 1959, 1960, and 1962. While the thirty-four opened and empty Roman Age tombs were among the earliest parts of the site explored in 1956, no intact tombs with human remains and artifacts had been found. Additionally, by the end of the 1959 field season, Pritchard’s team had not yet found evidence of Late Bronze Age period occupation, a discrepancy with the biblical record. As the Book of Joshua describes a “great” city of Gibeon, the city would have needed substantial occupation in the periods leading up to the Israelites conquering Canaan. It was not until the 1960 field season that intact tombs with artifacts and human remains were

discovered; specifically, the site's Bronze Age necropolis (cemetery) on the west side of the hill was uncovered and excavated. A local Arab woman had her grandson bring well-preserved jars to the excavators, who, knowing the pattern of the jars to be typical of the late Bronze Age and likely from a tomb due to their intact preservation, met with the woman. She showed the team the tombs in her garden and field, some of which had already been opened and excavated years prior. The excavators continued clearing the tombs that season and were able to uncover eighteen shaft tombs by the end of the field season, after working on them for about a month. Almost all of them were filled with soil that had washed in from above, but one tomb was well-sealed (Tomb 15). The soil fill had been caused by the collapsing of the soft limestone of the tombs. Pritchard's team was still able to dig and extract artifacts from these largely inaccessible tombs, dating them according to pottery style. Overall, during the 1960 season, eighteen of the shaft tombs were labeled (T10-T22A), and 15 groups of pottery, other artifacts, and skeletal material were recorded (Pritchard, 1962, 1963). Pritchard's team excavated the remainder of the Bronze Age cemetery in 1962, recovering artifacts and/or human remains from thirty-seven additional tombs (T30-T61) (Pritchard, 1963). Further information about the physical tombs themselves, and the mortuary context of the human remains, is detailed in Section 2.3.

The official archaeological periods which are referenced in terms of Gibeon's occupation are defined thus by Pritchard (1963, p. xi):

- Early Bronze (3100-2100 BCE)
- Middle Bronze I (2100-1900 BCE)
- Middle Bronze II (1900-1550 BCE)
- Late Bronze (1550-1200 BCE)
- Iron I (1900-900 BCE)
- Iron II (900-550 BCE)
- Persian (550-330 BCE)
- Hellenistic (330-100 BCE)
- Roman (100 BCE-300 CE)

Pritchard and his team dated sediment layers primarily using ceramic chronology; that is, matching the pottery forms found within particular layers to known ones within a chronological order, a chronology based off of the material found at other sites of similar ancient periods of occupation, like Jericho. This method of relative dating based on pottery and ceramic findings was formed by Sir William Matthews Petrie, considered the father of Palestine archaeology due to leading the first scientific excavation within Palestine (Pritchard, 1957). Petrie termed it a Sequence Dating System; today, it is usually referred to as seriation (Gerstenblith, 1980). Gibeon's tombs were perhaps the largest source of more-intact material demonstrating the chronology, although many of the tombs, in particular the Iron Age and Roman Age ones, had been all but ransacked and emptied prior to systematic excavation, excluding some human remains (Eschel, 1987). The Bronze Age cemetery at Gibeon on the west side of the hill held the most fruitful tombs for the excavators, both in terms of artifacts and human remains. The Bronze Age occupation of the site was also of particular interest; the overall beginning of the Middle Bronze Age in Syria-Palestine was seminal in forming "Canaanite" culture that would flourish and dominate the Middle and Late Bronze Ages (Gerstenblith, 1980, Schiff, 2012). As the period thought to be immediately before the time of Israelites, the Bronze Age, particularly the Middle (I & II) and Late Bronze Ages, held significance for Pritchard. If the site could be demonstrated to have had significant occupancy in the Middle and Late Bronze Ages, Gibeon's status as a grand city in the stories of Joshua would prevail (Pritchard, 1962).

The rich amount of material found in the more well-preserved tombs indicated to Pritchard that Gibeon was indeed populated during the time period just before Joshua (Pritchard, 1962). This was particularly important in the context of two other nearby biblical sites, Jericho and Ai, which when excavated had both found to have little evidence of Late Bronze Age

occupation. Pritchard writes, “With such negative results from the excavation of two of the three cities mentioned prominently in the accounts of Joshua's conquest, the appearance at Gibeon of remains from this crucial period of Israel's history is of considerable significance for a reappraisal of the historical value of the narratives preserved in the first part of the Book of Joshua” (Pritchard, 1962, p. 137). The Bronze Age necropolis became a central component of the site in legitimizing both its identity, and the veracity of the biblical narratives of which Gibeon was the setting. For this reason, the Bronze Age cemetery was excavated and reported upon with particular attention, with Pritchard publishing an entire book on the contents of the cemetery’s tombs, *The Bronze Age cemetery at Gibeon* (1963).

The excavations at Gibeon ended in 1962; there were five total seasons of excavation—1956, 1957, 1959, 1960, and 1962. Every season occurred during summer months, from June to August, due to the season availability of academics (Pritchard, 1962). Pritchard’s team was only able to excavate a small portion of the entire sixteen-acre mound at Gibeon during the five seasons, but also excavated three large fields and two small trenches; Pritchard presents the areas excavated as representative of six cities that stood at the site over its period of occupation (Lapp, 1968). At the end of the excavation seasons, the areas opened by the team were largely filled back in after objects were recovered and the sites were photographed, to allow the village of al-Jib to continue living as similarly as they had prior to the excavation. Over the first four seasons of excavation, thirty-two people were employed as staff members on the project, three-fourths of whom taught in or were students of the languages, history, or literature of ancient Palestine. As is the case with many archaeological projects, these staff members provided their services without monetary pay, in exchange for room and board, transportation for experienced field workers, and the experience of field archaeology itself (p. 8). More than one-hundred and fifty local men were

employed as laborers on the excavation, paid “a wage that is incredibly small by western standards” (Pritchard, 1963, p. x). Pritchard dedicates his 1963 book, *Gibeon: where the sun stood still*, to these men on al-Jib.

### 2.3 Mortuary Context of Gibeon

Pritchard writes heavily in his publications about the burial practices and tombs at Gibeon. He summarizes the chronological burial practices at the site as follows:

“Customs in burial practices exhibit some important changes over the long period for which we have evidence at el-Jib. The practice of the Early Bronze Age people in burying their dead in rock-cut caves in the side of the hill was abandoned at the beginning of the Middle Bronze period, when shaft tombs were first constructed. This distinctive type of tomb architecture continued through the Middle Bronze II period, when the endowment of the dead seems to have become the more elaborate, and throughout the Late Bronze Age. The Iron Age peoples again make use of caves in the scarp of the natural hill as places for burials and placed there the traditional funerary equipment. The one large tomb with such a high proportion of lamps belonging to the Iron Age is noteworthy. In the Roman period the monumental tomb becomes common. It is a large room, often with space for many burials and elaborate wall decoration” (Pritchard, 1962, p. x).

The Bronze Age cemetery, which proved to be the most resourceful in terms of objects recovered, is detailed in *The Bronze Age Cemetery at Gibeon* (Pritchard, 1963). It claims to be a complete catalogue of the contents of the tombs that were excavated, fifty-five total (numbering from T10A-T64A). These tombs are all shaft tombs, varying in size but not layout. They are cylindrical, 1.13 meters in diameter, and cut into rock at depths ranging from 1 meter to 4 meters, the average depth being 1.76 meters. The bottom of the shaft contains a doorway cut into the side, opening into the tomb’s chamber. The tomb chambers average a height of 1.05 meters and vary in floor area size. Many connections were cut between the chambers of two tombs. The upper doorway of each tomb, a flat, large stone, closed the burial chamber after the body and objects had been placed. On top of the doorway, chips of limestone and *huwwar* (decomposed

limestone) were packed in the shaft to seal the chamber off (Pritchard 1963, p. 4). An additional tomb, T3, is detailed in the 1963 catalogue, as it contained Bronze and Iron Age material, but this tomb was a cave cut into the hill's east side, not part of the cemetery. It had also previously been excavated in 1950 by the Department of Antiquities of Jordan, who continued to assist Pritchard's team during their excavation seasons. All the Bronze Age shaft tombs were excavated in the 1960 and 1962 field seasons (Pritchard, 1963).

The tombs had largely been disturbed by the time of excavation; there was evidence the area was used as a quarry after its use as a cemetery, and during the quarrying process, many tombs were completely or nearly destroyed. Other tombs were recently looted, evidenced by breaks into the tombs. Still other tombs were filled with silt or the collapsed shafts, dislocating the tomb goods and skeletal remains from their original positions. Pritchard classifies the pottery of the tomb based on specific schemes for each period of use—Middle Bronze I, Middle Bronze II, Late Bronze Age—devised and used at similar sites (Pritchard, 1963). Pritchard includes a summary chart for each tomb, listing the tomb number, shaft diameter, shaft depth, the height and width of the shaft-chamber doorway, the maximum height of the chamber, the number of human skulls or “frag.” (presumably fragments), number of scarabs, number of other catalog objects, the present location of the material from the tomb, and the periods of use of the tomb (Pritchard, 1963, p. 2-3). Pritchard lists “periods” of use because many of the tombs had been used multiple times through the Bronze Age, with the older material cleared aside for new material. This was a common practice among Bronze Age cities (Pritchard, 1963). For the focus of my project, I focused primarily on three of Pritchard's records: the number of human skulls recorded, the current location of the material, and the periods of use of the tomb.

This 1963 catalogue provides a very basic idea of how many individuals were found while excavating the tombs. It also details a minimal amount of faunal (animal) remains found in some tombs; these were examined and identified by Milton Hildebrand, Associate Professor of Zoology at UC Davis. The only identification Pritchard provides per tomb for the human remains is the number of “skulls;” since there was no skilled bioarchaeologist on the excavation (a practice that would not become usual for a few decades), Pritchard’s team was most likely using skulls as the easiest means of identifying an individual. However, in the catalogue, the number of skulls is not differentiated into whole or fragmented skulls, nor qualified in terms of associated postcranial remains. No total of the number of individuals excavated is published, likely because Pritchard and his team were unsure of this number, especially in instances of particularly fragmented remains or tombs filled with remains from many periods of use. Additionally, beyond the tomb number, the skulls are not given any other number in the catalogue or published elsewhere to associate them with particular artifacts. Pritchard does give a short paragraph description for each tomb, detailing where skulls or skeletons were generally found (directionally, and in what layer). However, even in instances where objects are described in specific association with remains, the skeletal remains are not given numbers that associate with the objects, likely because the remains were never initially catalogued, while thousands of objects from the tombs were (Boulis, 2018).

One of the best examples of an association is a description of one of the remains from Tomb 15, the most well-preserved tomb from which the most skeletons were recovered: “Although the skeleton which was found on the bed of Phase III was partly disturbed in its position, enough of the skeletal remains were in positions to suggest that the burial had taken place with the skeleton articulated. A dagger (Fig. 24:92) was found neatly poised across the

spine of the skeleton (Pritchard, 1963, p. 23). Many other descriptions of human remains detail only “bones” in embedded in fill, and even this more specific description ultimately fails to provide a specific context for the individual, as they are not catalogued under a number associating with the dagger’s catalogue number. Given this limited information, what is particularly unclear to me whether all of the skeletal remains recovered were brought back, and what the original context and associations (i.e. provenience, or in situ location) of these remains were

Pritchard labels the contents of the Bronze Age tombs as being brought to the Penn Museum (Philadelphia University Museum at the time of excavation), the “National Museum” in Amman, or (at the time) ASOR in Jerusalem. The material sent to ASOR was all ceramic; the material sent to Amman was from seventeen tombs and had been claimed by the Jordanian government (Pritchard, 1963). It is not clear what museum the “National Museum” correlates to since no museum exists by this specific name; it could refer to the Jordan Archaeological Museum (established 1951) in Amman. What is clear is that a portion of the human remains from these Bronze Age tombs were brought to the Penn Museum, and a portion of this collection is what is likely present today, the remains I am analyzing. How Pritchard deals with them in his publication on the tombs is of great relevance to my analysis of them, in attempting to fill in their missing archive.

#### **2.4 Pritchard’s Publications on Gibeon and Criticisms**

Pritchard’s publications of his team’s excavations at Gibeon were primarily done between 1957 and 1964. His shorter publications include reports for the University Museum Bulletin, a publication no longer in print. The two publications for the Bulletin include

“Discovery of the Biblical Gibeon” (1957) and “A second excavation at Gibeon” (1957). Other shorter publications by Pritchard on the site of Gibeon include several pieces for the Museum’s magazine, *Expedition*, still printing today. These include “The Wine Industry at Gibeon” (1959), “The Bible Reports on Gibeon” (1961), and “Civil Defense at Gibeon” (1962). These pieces focused intently on wine production, the biblical mentions of Gibeon, and the evidence for the city’s defense structures, respectively. Pritchard published four technical books through the University Museum monographs: *Hebrew inscriptions and monographs* (1959), *The water system of Gibeon* (1961), *The Bronze Age cemetery at Gibeon* (1963), and *Winery, defenses, and soundings at Gibeon* (1964). The publication on the Bronze Age cemetery constitutes a standard catalogue of the site’s Bronze Age tombs and the objects found in them. Pritchard also published a book, *Gibeon: where the sun stood still* (1962), which was written for “the general reader who is concerned with the contribution that archaeology has made to the biblical history of the site” (Pritchard, 1962, p. viii). It was the first book-length publication of the excavation’s data, focusing on the first four seasons of excavation, and largely contained previously unpublished material as well as results of intensive study. Pritchard notes that as such, the book is also for archaeologist and biblical historians in addition to the general public (Pritchard, 1962, p. viii).

As the first academic material published on scientific excavations at Gibeon, Pritchard’s work understandably received much attention, including criticism. Roland de Vaux, who assisted with Pritchard with dating material from the Gibeon, reviewed *Gibeon: where the sun stood still* in 1963. He praises the book, writing that the book is filled with beautiful photographs and will be well received by the public, but is also a serious work, in which specialists in the field will discover the findings of the dig while awaiting the completion of the technical reports that will allow the specialists to verify their interpretations (de Vaux, 1963, p. 25). De Vaux wrote another

review in 1966, of both *The Bronze Age cemetery at Gibeon* (Pritchard, 1963) and *Winery, defenses, and soundings* (Pritchard, 1964). This review is less gracious towards Pritchard's publications, detailing that Pritchard presents more modestly than in his book for the public his hypothesis as the one that best explains the ensemble of archaeological findings, and that having studied the final publication, de Vaux now has certain reservations (de Vaux, 1966, p. 132). He specifically critiques Pritchard's interpretation of an Iron Age winery at the site, in regard to the debris found in supposed wine cellars not corresponding to their actual destination. He deems the excavations restricted and insufficient and is critical of Pritchard's rapid processing and publication of the excavation findings. De Vaux writes that rapid publication of an excavation is a rare thing and not to be congratulated, but also quickness need not afford such inexactitudes and negligence as Pritchard does. De Vaux comments there are other markers of Pritchard's haste, and is frustrated the technical monograph reminds him numerous times of the details in a previous novel written for the general public (de Vaux, 1966, p. 134).

Paul Lapp's book review of Pritchard (1968) agrees with de Vaux's critiques. De Vaux and Lapp two both describe that there is no evidence for wine cellars, that they are ordinary silos appearing in many Iron Age sites, and the identification of the isolated, inscribed handles as belonging to wine jars is contestable. Additionally, Lapp further discusses the inconsistencies and vagueness of Pritchard's descriptions of the types and dates of pottery found in the supposed wine cellars, specifically Pritchard's failure to stratigraphically associate a single funnel with the inscribed jar handles. Lapp describes Pritchard's process of dating this material, especially the jar handles, as "quick," and "imprecise" (1968, p. 392). Lapp concludes that there is "no incontestable evidence for a wine industry at el-Jib" (p. 392) and that much of the excavation process was done arbitrarily: "Even though the material was arbitrarily excavated, it is still a

disappointment that the final publication is now complete with any word on the promised study of the pottery from the inscribed handle context” (p. 392). Lapp describes Pritchard’s failure to isolate the deposits of inscribed handles stratigraphically dismantles any case for a wine industry, and the lack of any secure association between the handles and the funnel weakens part of the identification of al-Jib with Gibeon. Lapp continues on to describe Pritchard’s analysis of the defense system as similarly inadequate in terms of the amount and quality of evidence of defenses. Lapp concludes his criticism by stating that “[Pritchard] has not excavated stratigraphically, has failed to utilize pottery as a precise chronological tool, and has neglected to publish (or even save) vast quantities of material of considerable importance for the archaeological and history of Palestine.

K. Galling (1965) has similar critiques of Pritchard’s publications, reviewing three of the monographs as well as Pritchard’s popular book. Overall, Galling states that Pritchard has dug too hastily and has not finished the job, and his determinations of time periods are unsatisfactory (1965, p. 63). In particular, he is not convinced that the inscribed jar handles sufficiently identify the site as Gibeon and has an entirely different theory on the identity of the site based on both archaeological and textual grounds. He writes that Pritchard is convinced the findings of the excavation are a clear reference to the biblical literature. Galling similarly is able to "build a bridge between the biblical literary references and the remains left in eg-gib" so that, more precisely, "actual words in the Hebrew Bible correspond, letter for letter, to words excavated from the earth" rather than to a walled vineyard, as Pritchard concluded (p. 22). Galling proposes a different use altogether for the jars, as containers for oil rather than wine. Based on Pritchard’s seemingly hasty date association and incorrect biblical interpretation of the Hebrew fragment,

Galling concludes that the carved inscriptions of “GB`N” do not provide compelling evidence that el-Jib is identical to Gibeon (p. 245).

Pritchard does concede in his own work that much of the work was left unfinished, due to the massive size of the site (1962). However, the rapidity of the time from excavation to publication raises many questions, especially regarding the attention given the human remains. Though none of the critiques focused on the human remains or tombs, the interpretation that Pritchard oversaw a rushed and haphazard excavation process has implications for the largely absent archive of the remains. Pritchard’s lack of training as an archaeologist also becoming glaringly apparent, let alone experienced in analyzing human remains. Pritchard’s concerns with the al-Jib site lay in its identification as the biblical Gibeon, and this preoccupation certainly had implications on how the human remains, material seen as irrelevant to that identification, were considered during the excavation. I kept in this in mind as I crafted my analytic approach to the remains, allowing the apparent inattention of the excavators to inform my attention to the human remains from al-Jib, which continues to be identified with Gibeon.

### **3. METHODOLOGY**

#### **3.1 Methodology: Three Components**

The methodology for my thesis has three main components. The first component is working with the bones and performing a basic osteological examination of them to produce an osteological report. The second is integrating this osteological data with any available archival records and other museum data for the el-Jib/Gibeon expedition, in order to complete the picture of the bones as much as possible and finish an archaeological research project in the making since 1956. The third component is doing a literature review of the material published about Gibeon, the politics of archaeology in the Israel-Palestine-Jordan region, in order to be able to discuss the relevancy of my osteological work to the site's geopolitical context. Specifically, Gibeon will be demonstrated as an example in the dialogue of political archaeology and the use of biblical texts in archaeology of Palestine.

The largest component of this project is the osteological analysis. The preliminary step to completing this was an assessment of the completeness of skeletal material, to determine what specific osteological analysis I could do. Throughout this portion of the research, I was advised by Dr. Janet Monge, the curator and keeper of Physical Anthropology at the Penn Museum, as well as Paul Wolff Mitchell, a graduate student in Anthropology.

Accurately establishing a date for the bones was crucial to confirm their place in the time sequence of Gibeon. As stated, Pritchard dated the contents of all of Gibeon's tombs to be from the Bronze Age, based on established ceramic sequences from other Middle Eastern sites. However, the exact Bronze Age data for these remains could be confirmed by radiocarbon dating. Early on in my research process, I sent two samples from the collection to a laboratory

for radiocarbon dating. The results of this dating analysis are presented and discussed in Section 4.5.

My initial assessments of the collection included documentation of the bones, both written and photographed. Written documentation includes noting what skeletal elements are present, the original labels and groupings of material in storage, and the condition of each skeletal element (whole, partial, or fragmentary). Each skeletal element was documented using photographs. While I had initially intended to clean the bones, I ultimately decided against it, in order to preserve the sediment with the bones it is adhered to, for any future analysis. The sediment on the skeletal elements impacted analysis in a few instances; the overall fragmentary nature of the collection was more constrictive in terms of secure identification and analysis. After documentation, based on what bones were present, once I had reconstructed as many skeletal elements as possible, I reexamined the collection to establish the minimum number of individuals (MNI). Most of the elements in the collection are cranial, which quite clearly marks different individuals, and is often the metric used by archaeologists not trained in bioarchaeology. However, there are a few postcranial elements as well, but because there is no specific association recorded in the site reports between any cranial and postcranial remains, I could not securely associate the few postcranial remains with cranial remains.

I then collected standard morphological, metric, and nonmetric data typically gathered during osteological analysis, including cranial measurements, age estimation from suture closure and dentition, sex estimation, evidence of paleopathology, and evidence of trauma. In the catalogue of the collection, all of this data is reported, as well as more general information, such as skeletal elements present, teeth present, preservation status, whether I reconstructed the skeletal element, general morphological age, any instances of nonmetric traits, and any other

relevant notes for each individual. The specific methodology for the osteological data collection and analysis is described in Section 4.1, and the catalogue for the human remains is presented in 4.2.

As stated above, my second major undertaking was integrating the osteological data with the archival records of Gibeon as well as the remains' documented history within the Penn Museum, including their collection and use or disuse. This involved regular visits to the Penn Museum Archives and meetings with head archivist Alessandro Pezzati, in order to look at the field notes, correspondence, and other documentation of the excavation. My most important objective was to compare the number and type of bones given in the field records and reports to the number and type physically present in the Gibeon skeletal collection. Both of the goals of this component are linked with the osteological analysis, and, particularly the second, with a discussion of the historical and geopolitical relevancy of this research.

My first goal was to explore how these skeletons might have figured into the excavation and research questions of Pritchard and his colleagues. I asked whether the skeletons were perhaps irrelevant to the questions he was seeking to answer on this excavation, which may explain why they were never studied. The second goal of this component was a larger discussion about how museums handle bioarchaeological specimens. This involved learning as much as I can about the history and movement of the collection within the Penn Museum over the past 70 years with the limited records available. I met with Museum Registrar, Chrisso Boulis, to try and accumulate all the available catalogue information about Gibeon pertaining specifically to the skeletal material. I also spoke with curators of the Near East Section at the Penn Museum to determine if any skeletal remains from Gibeon possibly remained in storage.

The third component of this project is a literature review, covering the political history of Biblical archaeology and archaeology in Israel/Palestine/Jordan. I use Gibeon as an example through which to discuss this theoretical and political threads. I am aware of my position coming into this project as having experience and knowledge primarily situated in biological and cultural anthropology, and less so archaeology. I aimed to mitigate this disparity through reading on Israeli archaeology, and archaeological theory as it more generally relates to my questions. Additionally, knowledge about museum collection, curation and representation, and repatriation is valuable to my research, especially as the laws and practices regarding ancient Israeli remains have changed since these specimens were excavated (Nagar, 2011). Subsequently, this reading informed this third component, concerning broader context in which my project is situated and to which it has relevance.

This research primarily took place at the Penn Museum, utilizing both the laboratory facilities in the Center for the Analysis of Archaeological Materials (CAAM) and the resources in the Museum Library and Museum Archives.

## **4. RESULTS**

### **4.1 Procedure and Considerations: Analysis of Human Skeletal Remains at Gibeon**

In this chapter, I present the analysis and description of the human skeletal remains excavated from Gibeon that are currently housed in the Penn Museum. The description of the remains is formed from the basic osteological analysis of the remains that was not previously completed either during or following excavation. The process of my analysis began with recording an initial inventory of the collection, identifying the number of more complete and more fragmented remains, reconstructing fractured remains which clearly belonged together, and establishing the collection's minimum number of individuals per tomb if possible. I began this first component of the analysis in Spring 2018. The largest part of this process was reconstructing as much of the fragmented remains as possible, in order to both more securely assess the number of individuals present, and to be able to complete standard analyses with data such as cranial measurements.

The reconstruction of fragments was done using Duco Cement, a cellulose nitrate resin ("glue") often used for bone consolidation because it maintains solubility over time, and is thus not permanent (Warren, Walsh-Haney, & Freas, et al., 2008). One cranium, T15 101, required the addition of a small wooden rod at its base to support the consolidated fragments. In a few other cases, noted in the description, there are fragments associated with a cranium, but it was not possible to consolidate them due to missing portions of the cranium. In other cases, evidence of previous reconstruction was evident from the presence of resin but had deteriorated and needed to be redone. Overall, most of the small fragments were able to be consolidated, and almost all of the larger fragments were. Some fragments (T1580 C, T1580 D) constituted their own individuals, and were not associated to any more complete elements. Only one cluster of

fragments, all labeled T15 65, was not able to be entirely identified as a specific number of individuals. This cluster is discussed below as T15 65B and T1565C.

Following the reconstruction process, all of the more complete crania were photographed in the six conventional orientations of the Frankfurt Horizontal plane, “defined by three points: the right and left porion points (located at the top of each external acoustic meatus) and the left orbital (located at the bottom of the left orbit)” (White, Black, & Folkens, 2012, p. 54). These six orientations are normal verticalis (view from above), normal lateralis left and right (view from either side), norma occipitalis (posterior view), normal frontalis (view from the front), and norma basilaris (view from the base) (p. 54). The mandibles were photographed in the same orientations; any less complete and non-cranial material was photographed anteriorly and posteriorly at a minimum (i.e. any cranial fragment was photographed to show the ectocranial and endocranial surfaces). Any features of interest, such as evidence of traumas and paleopathology, were also photographed close-up. I took all of the photos using a Nikon D300s with an 18-135mm lens in the Human Skeletal Laboratory of the Center for the Analysis of Archaeological Materials at the Penn Museum.

At the same time as I was reconstructing and documenting the skeletal material, I visited the Penn Museum archives to read through the notes from the Gibeon excavation (Figures 4-7). This information, along with Pritchard’s official publications on the site, allowed me to describe the background and context of the site, as well as determined how the human remains were being recorded across the unofficial notes and the official records. I combined this textual, archival information with the physical information of the skulls to build a “historical” catalogue, documenting how many individuals were said to have been excavated, and how many are currently present in the Museum. The most important finding from this comparison was that

what is currently at the Museum does not represent all of the human remains excavated at Gibeon, many of which may be spread across other institutions or missing. The discussion of these historical and archival findings and their implications for the collection are discussed in section 4.6 below.

Once the remains were reconstructed and documented, I began the standard procedures of osteological analysis for bioarchaeological collections. First, for any individuals with an ID number that was not clear, such that two obviously separate individuals were labeled with the same ID number, I added an uppercase letter (A, B, C) to indicate separate individuals. For remains only labeled with the tomb number (only the case for Tomb 15), I have similarly added a lowercase letter (a, b, c) to the tomb number. Because this is a fragmentary, incomplete collection, in some cases bones recorded as separated individuals may very likely be one individual, but it was impossible to securely identify them as the same through this basic analytical procedure. The individuals for which this may be the case are T15c and T15d, the three vertebrae and sacrum, respectively, and the two isolated mandibles, T15a and T15b, which could not be firmly associated with any crania. Where probable, associations of separate elements were made, but the considerations of this are discussed as well (T15 80C and T1580D). I have estimated the MNI at 24 individuals present in the collection, and the analysis each of these individuals is detailed in the catalogues, section 4.2.

The largest portion of the standard osteological analysis included taking standard measurements and scores to build an idea of the paleodemographics of the collection. The more complete crania were measured using the standard cranial measurements outlined in Buikstra & Ubelaker (1994), which also correspond to the measurements standardly taken by the Israel Antiquities Authority (Nagar, 2011) if the remains were excavated after 1994. The cranial

measurements, many of which were only possible due to reconstruction of the fragmented crania, are a valuable record and can be used for future craniometric analyses. Each of the more complete adult crania was also scored in terms of suture closure, to indicate the level of closure cranial suture closure at standard points. The method of suture scoring followed that outlined in Buikstra & Ubelaker (1994, p. 32) and Meindl & Lovejoy (1985), which is used to estimate general age-at-death of adult individuals--young adult (20-34 years), middle adult (35-49 years), and old adult (50+ years). In order to make this age estimation, the individual suture scores were first consolidated into composite scores for the vault cranial region (suture scores 1-5) and the lateral-anterior cranial region (suture scores 5-10) (Buikstra & Ubelaker, 1994). Composite scores could only be determined for crania that had all five of the necessary scores for the vault and lateral-anterior systems, respectively. For the vault system, T15 65, T38 3474/M314, and T57 3621/M332 did not have enough suture scores to create a composite score. For the lateral-anterior system, T15 7, T15 65, T15 103A, T38 3474/M314, and T57 3621/M332 did not have enough suture scores to create a composite score. T15 80A and T15 80B, though more complete, were excluded from suture scoring because they are both juvenile crania (evident by overall size, thinness, lack of robusticity).

Each vault and lateral-anterior composite score corresponds with an “S” score (S1-S6 for the vault and S1-S7 for the lateral-anterior), which in turn fall into an age range category of young adult, middle adult, or old adult (Meindl & Lovejoy, 1985). For the Gibeon sample, the cranial vault age and the lateral-anterior region age did not directly equate, but the relationship of the ages of the individuals was largely distributed the same; e.g. many of the vault “middle adults” were designated as lateral-anterior “old adults,” while several vault “young adults” were

designated as lateral-anterior “middle adults.” Meindl & Lovejoy (1985) note that they found the lateral-anterior region to be a better predictor of chronological age than the vault suture sites.

Relative age at death within the collection was also estimated using dental crown height measurements (in millimeters) and scoring of attritional wear for all teeth where possible. Each tooth’s crown height was measured in four locations: mesial-lingual, distal-lingual, mesial-buccal, and distal buccal; each was also scored for level of attritional wear (with the molars being scored in all four quadrants) following the procedures in Selinsky (2009), derived from Miles (1963), Scott (1979), and Mays et al. (1995). and Buikstra & Ubelaker (1994). The dental measurements of the crania with at least some of the first and second molars were used to estimate the relative age at death among these individuals; i.e. not their overall chronological age, but the age relationship among them, oldest to youngest. The first and second molars were chosen for relative age estimation because they are most clearly indicative of age both in terms of attritional wear and average crown height (Mays et al., 1995; Scott, 1979). Overall, my collection of dental data was constrained both by the fragmentary nature of the Gibeon sample and by sediment adhering strongly to several maxillary and mandibular teeth of the adult individuals. Of the nine adult individual remains with teeth, five were crania with maxillary teeth only, two were crania with most maxillary and mandibular teeth, and two were isolated mandibles. For analysis, each of these individuals was required to have at least one molar tooth fully present for dental wear scoring and full dental crown measurement. Of the nine adult individuals with teeth, two (T15 83 and T38 3474/M314) did not have sufficient molar teeth present (or they were adhered with sediment) for attrition or crown-based analysis and so were excluded from age estimation. Seven adult individuals were assessed for relative dental age; descriptive statistical analysis is not applicable for such a small sample size.

To form the crown height ordinal rankings (oldest-youngest, 1-7), simple averages of the measurements (in millimeters) on the lingual and buccal sides of each molar were taken and differentiated, with maxillary calculated as buccal (less worn) - lingual (more worn) average crown height, and mandibular calculated as lingual (less worn) - buccal (more worn) average crown height (adapted from Miles 1963, Mays et al. 1995). To form the attritional wear ordinal rankings (oldest-youngest, 1-6), the average was taken of all the wear scores for the four quadrants across the each first and second molar present (adapted from Scott 1979, Buikstra and Ubelaker 1994). Simple averages were taken across both sums of the wear scores and crown height differentials of each individual because of the small sample size and minimal overlap of teeth in common among the different individuals in the sample. An analysis with more complete material would be able to differentiate between first and second molar scores and measures, rather than averaging them together, and investigate the anterior dentition (the crown-height measurements and wear scores of which were recorded).

The crown height measurements (adapted from Miles 1963, Mays et al. 1995) and dental wear (adapted from Scott 1979, Buikstra and Ubelaker 1994) produced consists ordinal rankings (oldest-youngest) of relative dental age, so the two methods did not need be combined to produce a single, composite ranking of age. The analysis presented has used all available molar data for this best estimation of relative dental age. One individual (T15 106) included in the rankings based on crown height measurements is not in the rankings based on attritional wear, because its singular present molar (URM1) could not be fully scored. The results of the ordinal rankings of dental age, along with a discussion of their relation to suture age (including inconsistencies) is given in the catalogue for each individual and are summarized in Tables 7, 8 and 9. Overall,

while there are a few inconsistencies, the suture age estimation and dental age estimations are mostly concordant in their ordinal rankings of the adult individuals' relative ages.

There are also two juvenile dental remains in the collection; a mandible (T15 80C), and an associated mandible and left maxilla fragment (T15 80D). The age of these remains was estimated using x-rays taken at the Center for the Analysis of Archaeological Materials at the Penn Museum, which were then compared to dental growth standards from Buikstra & Ubelaker (1994). The specific ages for these juveniles are given in the catalogue for each individual. Figures 1 and 2 show an example comparison between the x-ray image and the growth standard graphics depicted in Buikstra & Ubelaker (1994). Overall, all more complete remains, including adult crania, juveniles, post-crania, isolated mandible, and fragments were assessed for a general age based on morphology, broadly falling into juvenile, sub-adult, adult, or old adult if markers of age were especially visibly apparent. This description of morphological age was recorded primarily for the purpose of giving a very general age estimation for the remains lacking sufficient suture scores, teeth, or other age-related data points. For example, two crania, T15 65 and T 38 3474/M314, were not able to be aged using either suture scores or dental ages, because they were too fragmentary and covered in sediment, respectively. Both are aged more generally as adults according to their overall size and features.

There is one post-cranial remain in the collection that could be measured; T57 3620/M331, which is the proximal head of a femur. Although this femur is partial, having only the proximal portion present, three standard measurements could be taken—the maximum femoral head diameter (breadth), the sagittal subtrochanteric diameter, and the transverse subtrochanteric diameter (Buikstra & Ubelaker, 1994). The femoral head breadth (FHB) measurement can be used to estimate body mass. The estimation is based on regressions between

individuals of known mass and specific skeletal measures. The estimate of body mass from this measurement is uncertain because it tracks body mass in late puberty and early adulthood rather than at time of death, but it still provides an understanding of this person's approximate lean body mass in early adulthood (Ruff et. al, 2012). The FHB of T57 3620/M331 is 46.6mm; there are three formulas that can be used to determine lean body mass; one for males, females, or a combined sex regression. While this FHB is closer to the female mean (45.5mm, SD 2.3) of a large (n=128 of each sex) recent study, rather than the male mean (50.9mm, SD 2.8), it is in the range of both sexes (Elliot et al. 2015), so sex cannot be determined from the FHB alone. All three formulas were used to produce a body mass estimate between 63.78 and 65.79 kilograms (140.6 and 145 pounds), which is within average modern lean body mass estimates. The relevance of this estimated without data on body height (which would be provided by a whole femur) is difficult but provides insight that this particular individual was of average body mass (Ruff et al., 2012). See Table 10 for the three formulas and body mass estimates.

Biological sex is best determined osteologically using the crania and/or the pelvis. There are no pelvic remains in this collection, so all sex determinations were done using the more complete cranial elements. Each adult cranium was assessed for sex estimation, according to the procedure in Buikstra & Ubelaker (1994). Based on the scoring of five standard points (nuchal crest, mastoid process, supraorbital margin, supraorbital ridge, and mental eminence), each adult cranium was given an estimated sex of female (1), probable female (2), ambiguous (3), probable male (4), and probable female (5). The estimation was calculated by summing the traits scored and dividing by the number of traits scored (as not all crania had all five points present) and designating the average according to the sex estimation it was numerically closest to. Any remains which are juvenile, postcranial, isolated mandibles, or extremely fragmentary are

recorded as undetermined sex. All remains in the present collection were assessed for evidence of paleopathology and trauma; any evidences of the two are described for each individual below. Recurring types of paleopathology are defined the first time they are listed for an individual. The references for paleopathology were primarily sourced from Ortner (2003), and the descriptions of trauma from Galloway (1999).

The description of each identified individual is in the following format and order:

(Individual No. X) **ID No.:** Unique individual ID number

- A. **Tomb No.:** Gives the number of the tomb the remains were found in
  - B. **Other No.:** Any other number associated with the remains, either from the Museum Catalogue, or one of many potential numbers labeled on the remains
  - C. **Skeletal Elements Present**
    - a. **Cranial:** The specific cranial bones present for the individual
    - b. **Teeth:** Record of teeth present, if any
    - c. **Post-Cranial:** The post cranial bones present for the individual
  - D. **Preservation:** Preservation state prior to reconstruction-whole, partial, or fragmentary
  - E. **Reconstructed:** Record of whether or not the skull was reconstructed as part of this analysis, using Duco Cement
  - F. **Estimated Chronological Age (ectocranial suture closure)**
    - a. **Age based on vault composite score:** The composite “S” score and age based on ectocranial vault scores of suture closure
    - b. **Age based on lateral-anterior composite score:** The composite “S” score and age based on lateral-anterior scores of suture closure
  - G. **Relative Age within Collection (dental crown height measurement and wear score)**  
**OR Age based on dental development (juvenile dentition)**
    - a. **Age based on crown height:** age estimate based on molar crown height measurements; gives relative age among the individuals measured only, not chronological age; number signifies placement in a scale of oldest to youngest (1-7) of the 7 individuals with crown height-based ages
    - b. **Age based on dental attrition:** age estimate based on wear scores of occlusal molar surfaces; number signifies placement in a scale of oldest to youngest (1-5) of the 5 individuals with attrition-based ages
- OR**
- a. **Juvenile tooth development:** for the juvenile remains with teeth, age was assessed by comparing x-rays showing the teeth to dental growth standards

(Buikstra & Ubelaker, 1994)

**H. Estimated Chronological Age (morphology)**

- a. **Age based on morphology:** Age based on overall morphology (general size, appearance of sutures. etc.). Much more broadly scored.
- I. **Estimated Sex:** Estimated sex based on cranial features
- J. **Evidence of Paleopathology:** Evidence of paleopathology (disease)
- K. **Evidence of Trauma:** Evidence of trauma (pre or perimortem fractures, depressions, etc.)
- L. **Notes:** Any general notes not covered by items above

## 4.2 Catalogue of Human Remains

**List: ID Nos. of Identified Individuals:**

1. T15 7
2. T15 65A
3. T15 65B
4. T15 65C
5. T15 80A
6. T15 80B
7. T15 80C
8. T15 80D
9. T15 83
10. T15 101
11. T15 103A
12. T15 103B
13. T15 106
14. T15 124
15. T15a
16. T15b
17. T15c
18. T15d
19. T15e
20. T38 3474/M314
21. T53 3475/M315
22. T53 3476/M316
23. T57 3620/M331
24. T57 3621/M332

## Catalogue of Human Remains

1. **ID No.:** T15 7
  - A. **Tomb No.:** 15
  - B. **Other No.:** “T15 I7” (The “I” presumably indicates Phase I)

- C. **Skeletal Elements Present**
  - a. **Cranial:** frontal bone, left parietal, partial right parietal, occipital bone
  - b. **Teeth:** none
  - c. **Post-Cranial:** none
- D. **Preservation:** fragmentary
- E. **Reconstructed:** yes
- F. **Estimated Chronological Age (ectocranial suture closure)**
  - a. **Age based on vault composite score:** S2: young adult
  - b. **Age based on lateral-anterior composite score:** not enough scores
- G. **Relative Age within Collection (dental crown height measurement and wear score)**
  - a. **Age based on crown height:** no teeth
  - b. **Age based on dental attrition:** no teeth
- H. **Estimated Chronological Age (morphology)**
  - a. **Age based on morphology:** adult, due to size and completeness of features
- I. **Estimated Sex:** female
- J. **Evidence of Paleopathology:** none visible
- K. **Evidence of Trauma:** none visible
- L. **Notes:** The cranial remains for this individual consisted of four fragments that were reconstructed; there is evidence of plant remains on the endocranial surface.

2. **ID No.:** T15 65A

- A. **Tomb No.:** 15
- B. **Other No.:** none
- C. **Skeletal Elements Present**
  - a. **Cranial:** partially complete crania, consisting of the frontal, right and left parietals, occipital, and the inferior portion of the right temporal bone. There is a large fracture on the medial portions of the parietals, surrounding the sagittal suture
  - b. **Teeth:** none
  - c. **Post-Cranial:** none
- D. **Preservation:** partial
- E. **Reconstructed:** yes, at the right and left parietals
- F. **Estimated Chronological Age (ectocranial suture closure)**
  - a. **Age based on vault composite score:** not enough scores
  - b. **Age based on lateral-anterior composite score:** not enough scores
- G. **Relative Age within Collection (dental crown height measurement and wear score)**
  - a. **Age based on crown height:** no teeth
  - b. **Age based on dental attrition:** no teeth
- H. **Estimated Chronological Age (morphology)**
  - a. **Age based on morphology:** adult, based on the size of cranial features, particularly the supraorbital ridge, and closure status of visible sutures

- I. **Estimated Sex:** ambiguous sex
- J. **Evidence of Paleopathology:** none visible
- K. **Evidence of Trauma:** none visible
- L. **Notes:** Cranium was initially tagged in 7/5/1960; it had been reconstructed before, due to evidence of old residue along the fractures. The left temporal, face bones, maxilla, and mandible are not present. One of the written labels on the skull says, "Skull 65," confirming that 65 is the specific object number.

### 3. ID No.: T15 65B

- A. **Tomb No.:** 15
- B. **Other No.:** none
- C. **Skeletal Elements Present:** assorted skeletal fragments, all labeled as T15 65
  - a. **Cranial:** right frontal bone fragment with a supraorbital notch on the supraorbital ridge (T15 65B); also two temporal bone fragments and numerous other unidentifiable cranial vault fragments
  - b. **Teeth:** none
  - c. **Post-Cranial:** fragment of a cervical vertebrae; two rib fragments (likely from the same rib)
- D. **Preservation:** fragmentary
- E. **Reconstructed:** no
- F. **Estimated Chronological Age (ectocranial suture closure)**
  - a. **Age based on vault composite score:** not enough scores
  - b. **Age based on lateral-anterior composite score:** not enough scores
- G. **Relative Age within Collection (dental crown height measurement and wear score)**
  - a. **Age based on crown height:** no teeth
  - b. **Age based on dental attrition:** no teeth
- H. **Estimated Chronological Age (morphology)**
  - a. **Age based on morphology:** the frontal bone is that of a sub-adult, based on its small size and relative thinness; the vertebra, ribs, and other cranial fragments are indeterminate but potentially belong to the same individual as the frontal bone
- I. **Estimated Sex:** undetermined sex
- J. **Evidence of Paleopathology:** none visible
- K. **Evidence of Trauma:** none visible
- L. **Notes:**
  - a. The collection assorted fragments are all labeled as T15 65; T15 65C listed below is also in this assortment, as were fragments reconstructed with T15 65A. Of the remaining fragments, only the frontal fragment (T15 65B) and ramus fragment (T15 65C, below) are clearly from individuals of different ages, giving a minimum number of two individuals for this assortment. I was not able to securely determinable whether the remainder of these cranial and postcranial

fragments can be identified with either of these individuals or other cranial remains. There is one cranial fragment of notable thickness, indicating a possible third individual, although it may belong with the cranium T15 65A.

4. **ID No.:** T15 65C

- A. **Tomb No.:** 15
- B. **Other Number:** none
- C. **Skeletal Elements Present**
  - a. **Cranial:** fragment of the left ramus of a mandible (T15 65C)
  - b. **Teeth:** none
  - c. **Post-Cranial:**
- D. **Preservation:** fragmentary
- E. **Reconstructed:** no
- F. **Estimated Chronological Age (ectocranial suture closure)**
  - a. **Age based on vault composite score:** not enough scores
  - b. **Age based on lateral-anterior composite score:** not enough scores
- G. **Age based on dental development (juvenile dentition)**
  - a. **Juvenile tooth development:** no teeth
- H. **Estimated Chronological Age (morphology)**
  - a. **Age based on morphology:** the ramus is that of a child around 2 years old;
- I. **Estimated Sex:** undetermined sex
- J. **Evidence of Paleopathology:** none visible
- K. **Evidence of Trauma:** none visible
- L. **Notes:**
  - a. See T15 65B above for notes on the T15 65 fragment assemblage

5. **ID No.:** T15 80A

- A. **Tomb No.:** 15
- B. **Other No.:** none
- C. **Skeletal Elements Present**
  - a. **Cranial:** right frontal bone, partial right parietal bone, occipital bone (all associated and reconstructed together)
  - b. **Teeth:** none
  - c. **Post-Cranial:** none
- D. **Preservation:** fragmentary
- E. **Reconstructed:** yes
- F. **Estimated Chronological Age (ectocranial suture closure)**
  - a. **Age based on vault composite score:** not enough scores
  - b. **Age based on lateral-anterior composite score:** not enough scores
- G. **Age based on dental development (juvenile dentition)**

- a. **Juvenile tooth development:** no teeth
- H. **Estimated Chronological Age (morphology)**
  - a. **Age based on morphology:** child based on overall size; older than T15 80B; difficult to assess beyond this because of the lack of skeletal elements
- I. **Estimated Sex:** undetermined sex
- J. **Evidence of Paleopathology:** Possible evidence of *cribra orbitalia* on the right orbital plate. *Cribra orbitalia* is evidenced by porotic changes on the roof of the eye socket, often concurrent with porotic changes on the ectocranial surface of the skull vault (*cribra cranii externa*). Both changes are forms of *porotic hyperostosis*. These changes are usually assumed to be caused by chronic anemia but may also be due to other diseases that cause inflammation of the bones of the skull (Ortner, 2003, p. 102).
- K. **Evidence of Trauma:** There is a cranial depression on the right temporal near the sagittal suture, moving from the internal to the external table of the cranial vault. It does not appear to be a depression fracture, but rather may be from a *leptomeningeal cyst* (“growing skull fracture”), a fluid-filled spaces between the pia mater and the arachnoid membrane resulting from crania trauma. These cysts usually occur in children under 3 years of age (Lende & Erickson, 1961).
- L. **Notes:**
  - a. One of the labels written on the cranium says, “Fig. 80,” indicating that both “Fig.” and “Skull” were being used to refer to the specific object number. Older than T15 80B based on the relative larger size and greater thickness (4.36, measured at occipital) of the cranial vault.

6. **ID No.:** T15 80B

- A. **Tomb No.:** 15
- B. **Other No.:** none
- C. **Skeletal Elements Present**
  - a. **Cranial:** frontal, left and right parietals, occipital
  - b. **Teeth:**
  - c. **Post-Cranial:**
- D. **Preservation:** partial
- E. **Reconstructed:** yes
- F. **Estimated Chronological Age (ectocranial suture closure)**
  - a. **Age based on vault composite score:** not enough scores
  - b. **Age based on lateral-anterior composite score:** not enough scores
- G. **Age based on dental development (juvenile dentition)**
  - a. **Juvenile tooth development:** no teeth
- H. **Estimated Chronological Age (morphology)**
  - a. **Age based on morphology:** juvenile based on overall size of the cranium
- I. **Estimated Sex:** undetermined sex
- J. **Evidence of Paleopathology:** *Cribra orbitalia* on both right and left orbital plates
- K. **Evidence of Trauma:** none

L. **Notes:**

- a. Skull fragmented along suture lines, so reconstructed easily. Younger than T15 80A based on the relative smaller size and greater thinness (3.64 mm, measured at occipital) of the cranial vault.

7. **ID No.:** T15 80C

A. **Tomb No.:** 15

B. **Other No.:** I5 (cranium labeled as "I5 80? T15")

C. **Skeletal Elements Present**

- a. **Cranial:** left frontal fragment, left parietal fragment, mandible
- b. **Teeth:** mixed dentition of permanent and deciduous teeth
- c. **Post-Cranial:**

D. **Preservation:** fragmentary

E. **Reconstructed:** yes (repairs on all fragments)

F. **Estimated Chronological Age (ectocranial suture closure)**

- a. **Age based on vault composite score:** no scores
- b. **Age based on lateral-anterior composite score:** no scores

G. **Age based on dental development (juvenile dentition):**

- a. **Juvenile tooth development::** Based on dental growth standards (Buikstra & Ubelaker, 1994), the mandible is estimated between 6 and 7 years old, +/- 24 mos. on upper and lowers ends (4-9 years). X-rays were used to assess tooth development, matching the images to estimates based on known age standards. See Figures 1 and 2.

H. **Estimated Chronological Age (morphology)**

- a. **Age based on morphology:** juvenile based on size of frontal and thickness (3.61 mm) of the cranial vault bone

I. **Estimated Sex:** undetermined sex

J. **Evidence of Paleopathology:** none

K. **Evidence of Trauma:** none

L. **Notes:**

- a. Frontal and parietal associated due to similar thickness; these two fragments are not associated with the T15 80D fragments because the thickness of the former two fragments is too different; T15 80C is also covered in much more sediment than T15 80D. There is the possibility that the respective frontal and parietal fragments among T15 80 C and T15 80D are not associated in pairs, and that the respective maxilla and mandible fragments are not associated to T15 80C and T15 80D, for a maximum of six juveniles. However, these are the remains of at least two juveniles, and I have associated and recorded them as such. Based on the dental ages and the cranial vault thicknesses, T15 80C is around 2-3 years older than T1580D.

8. **ID No.:** T15 80D

A. **Tomb No.:** 15

B. **Other No.:** “T15 80? I5” (cranial vault fragments), “T15” (maxilla and mandible fragments)

C. **Skeletal Elements Present**

a. **Cranial:** right frontal fragment, right parietal fragment, left maxilla, mandible

b. **Teeth:** mixed dentition of permanent and deciduous teeth

c. **Post-Cranial:** none

D. **Preservation:** fragmentary

E. **Reconstructed:** yes (right parietal fragment only)

F. **Estimated Chronological Age (ectocranial suture closure)**

a. **Age based on vault composite score:** no scores

b. **Age based on lateral-anterior composite score:** no scores

G. **Age based on dental development (juvenile dentition):**

a. **Juvenile tooth development:** based on dental growth standards (Buikstra & Ubelaker, 1994), the maxilla and mandible are estimate at 4 years old, +/- 12 mos. (3-5 years). X-rays were used to assess tooth development, matching the images to estimates based on known age standards. See Figures 1 and 2.

H. **Estimated Chronological Age (morphology)**

a. **Age based on morphology:** juvenile, based on size of frontal and thickness (2.95mm) of the cranial vault bone

I. **Estimated Sex:** undetermined sex

J. **Evidence of Paleopathology:** none

K. **Evidence of Trauma:** none

L. **Notes:**

a. Frontal and parietal bones associated due to similar thickness and rough alignment along the coronal suture; as a juvenile skull, the sutures would not have been fused yet. See T15 80C for further notes on the relative ages between the T15 80C and T15 80D.

9. **ID No.:** T15 83

A. **Tomb No.:** 15

B. **Other No.:** none

C. **Skeletal Elements Present**

a. **Cranial:** mostly complete cranium

b. **Teeth:** ULPM3

c. **Post-Cranial:** none

D. **Preservation:** (almost) whole

E. **Reconstructed:** no

- F. **Estimated Chronological Age (ectocranial suture closure)**
  - a. **Age based on vault composite score:** S1: young adult
  - b. **Age based on lateral-anterior composite score:** S4: middle adult
- G. **Relative Age within Collection (dental crown height measurement and wear score)**
  - a. **Age based on crown height:** no molars
  - b. **Age based on dental attrition:** no molars
- H. **Estimated Chronological Age (morphology)**
  - a. **Age based on morphology:** adult
- I. **Estimated Sex:** probable female
- J. **Evidence of Paleopathology:** There is a midsagittal (pachionian) depression, evidenced by the concave contour of the sagittal suture; this depression is likely pathological, happening antemortem, but closer to death. Extensive *porotic hyperostosis* on the ectocranial surface, primarily the left and right parietals. The eroded mastoid process shows evidence of *mastoiditis*, a bacterial ear infection that causes mastoid air cell expansion (Flohr & Schultz, 2009)
- K. **Evidence of Trauma:** Evidence for a possible ring fracture of the cranial base, a trauma usually caused by falling from a height, where the skull base separates from the rim of the foramen magnum and detaches from the cranial vault (Galloway, 1999, p. 71). The fracture site is covered in sediment, indicating the fracture existed when the cranium was deposited.
- L. **Notes:**
  - a. Cranium tagged on 7/6/1960; the cranial surface is very clean, indicating it had perhaps been cleaned before. There is dark green coloring on the right temporal, which is possibly either writing or discoloration from a metal. Cranium has an open metopic suture (non-metric trait), and is mostly complete except for the facial bones, sphenoid, and mandible.

10. **ID No.:** T15 101

- A. **Tomb No.:** 15
- B. **Other No.:** none
- C. **Skeletal Elements Present**
  - a. **Cranial:** nearly all cranial bones except for some smaller facial bones; right temporal and sphenoid are partial
  - b. **Teeth:** ULC, ULPM4, ULM2, ULM3, URI2, URC, URPM3, URPM4, URM1
    - i. **Note:** ULM1 was lost and the alveolus was resorbed antemortem; ULPM3 was also lost antemortem but later, as the alveolus is partially resorbed
  - c. **Post-Cranial:** none
- D. **Preservation:** (almost) whole
- E. **Reconstructed:** yes
- F. **Estimated Chronological Age (ectocranial suture closure)**

- a. **Age based on vault composite score:** S3: middle adult
- b. **Age based on lateral-anterior composite score:** S6: old adult
- G. **Relative Age within Collection (dental crown height measurement and wear score)**
  - a. **Age based on crown height:** 1 (oldest)
  - b. **Age based on dental attrition:** 2 (second oldest)
- H. **Estimated Chronological Age (morphology)**
  - a. **Age based on morphology:** older adult based on partially visible tooth wear
- I. **Estimated Sex:** probable male
- J. **Evidence of Paleopathology:** Evidence of *mastoiditis* on both mastoid processes, though more severe on the right mastoid process. Evidence of infection on ULC, ULI2, and ULPM3, causing resorption of the alveoli in the area. ULM1 was also likely lost due to infection.
- K. **Evidence of Trauma:** none
- L. **Notes:**
  - a. Cranium covered in thin layer of sediment, preventing the scoring of the tooth wear, although it is visible that they are severely worn, with extensive dentin exposure. On additional associated cranial fragment (part of occipital) that could not be attached using Duco Cement.

11. **ID No.:** T15 103A

- A. **Tomb No.:** 15
- B. **Other No.:** none
- C. **Skeletal Elements Present**
  - a. **Cranial:** frontal, right parietal, partial left parietal, partial right temporal, occipital
  - b. **Teeth:** none
  - c. **Post-Cranial:** single thoracic vertebra
- D. **Preservation:** partial
- E. **Reconstructed:** yes
- F. **Estimated Chronological Age (ectocranial suture closure)**
  - a. **Age based on vault composite score:** S3: middle adult
  - b. **Age based on lateral-anterior composite score:** not enough scores
- G. **Relative Age within Collection (dental crown height measurement and wear score)**
  - a. **Age based on crown height:** no teeth
  - b. **Age based on dental attrition:** no teeth
- H. **Estimated Chronological Age (morphology)**
  - a. **Age based on morphology:** adult
- I. **Estimated Sex:** probable female
- J. **Evidence of Paleopathology:** Evidence of minimal *cribra orbitalia* on both left and right orbital plates; evidence of a midsagittal (pachionian) depression, likely caused by intercranial pressure from cerebrospinal fluid (Ortner, 2003)
- K. **Evidence of Trauma:** none

L. **Notes:**

- a. The cranium has massive amounts of erosion that is not pathological, as it is present on the internal table; has associated zygomatic and sphenoid fragments that could not be attached using Duco Cement; the associated vertebra is very worn down.

12. **ID No.:** T15 103B

A. **Tomb No.:** 103

B. **Other No.:** none

C. **Skeletal Elements Present**

- a. **Cranial:** fragments of a parietal and occipital bone
- b. **Teeth:** none
- c. **Post-Cranial:** none

D. **Preservation:** fragmentary

E. **Reconstructed:** yes (occipital fragment)

F. **Estimated Chronological Age (ectocranial suture closure)**

- a. **Age based on vault composite score:** not enough scores
- b. **Age based on lateral-anterior composite score:** not enough scores

G. **Relative Age within Collection (dental crown height measurement and wear score)**

- a. **Age based on crown height:** no teeth
- b. **Age based on dental attrition:** no teeth

H. **Estimated Chronological Age (morphology)**

- a. **Age based on morphology:** juvenile, based on thinness (parietal—2.83 mm, occipital—3.17 mm) of the fragments

I. **Estimated Sex:** undetermined sex

J. **Evidence of Paleopathology:** none

K. **Evidence of Trauma:** none

L. **Notes:**

- a. evidence of two cut or scrape marks on the ectocranial surface of the occipital fragment, which likely occurred during excavation as the surface sediment is not in the groove of the marks

13. **ID No.:** T15 106

A. **Tomb No.:** 15

B. **Other No.:**

C. **Skeletal Elements Present**

- a. **Cranial:** most of the cranial bones are present except for the left zygomatic, maxilla, parts of the left sphenoid, and some smaller facial bones
- b. **Teeth:** URM1
- c. **Post-Cranial:** none

D. **Preservation:** (mostly) whole

- E. **Reconstructed:** no
- F. **Estimated Chronological Age (ectocranial suture closure)**
  - a. **Age based on vault composite score:** S2: young adult
  - b. **Age based on lateral-anterior composite score:** S3: middle adult
- G. **Relative Age within Collection (dental crown height measurement and wear score)**
  - a. **Age based on crown height:** 4 (median of age range)
  - b. **Age based on dental attrition:** not possible
- H. **Estimated Chronological Age (morphology)**
  - a. **Age based on morphology:** adult
- I. **Estimated Sex:** probable female
- J. **Evidence of Paleopathology:** none visible
- K. **Evidence of Trauma:** none visible
- L. **Notes:**
  - a. The cranium was tagged on 7/7/1960; there is a lot of plant material on the interior surface of the cranium; the entire left eye socket and face bones are missing, fractures which occurred postmortem. Presence of taphonomic erosion on the bone surface; the cranium is also covered in a thin layer of sediment

14. **ID No.:** T15 124

- A. **Tomb No.:** 15
- B. **Other No.:** none
- C. **Skeletal Elements Present**
  - a. **Cranial:** frontal, left and right parietals, partial left and right temporals, occipital, partial sphenoid
  - b. **Teeth:** none
  - c. **Post-Cranial:** none
- D. **Preservation:** partial
- E. **Reconstructed:** none
- F. **Estimated Chronological Age (ectocranial suture closure)**
  - a. **Age based on vault composite score:** S4: middle adult
  - b. **Age based on lateral-anterior composite score:** S7: old adult
- G. **Relative Age within Collection (dental crown height measurement and wear score)**
  - a. **Age based on crown height:** no teeth
  - b. **Age based on dental attrition:** no teeth
- H. **Estimated Chronological Age (morphology)**
  - a. **Age based on morphology:** adult
- I. **Estimated Sex:** ambiguous sex
- J. **Evidence of Paleopathology:** none visible
- K. **Evidence of Trauma:** there are six circumcranial depressed fractures that look like points of perimortem blunt force trauma; each fracture mostly localized at the area of impact, although some have one or two radiating linear fractures The traumatic nature of

the fractures is evidenced by the beveling of the ectocranial and endocranial surfaces, indicating depression of the cranial vault at the point of impact (Galloway, 1999, p. 66-69). In general, the traumas indicate an object with a relatively small surface area (such as a rod or staff) coming from the outside. This trauma was not an accident and would have been the cause of death for this individual. Unrelated—the midsagittal portion of the cranium is quite distorted, indicating a probable older trauma.

L. **Notes:**

- a. Surface of the skull is covered in too much sediment to say much about its characteristics other than the evident trauma; there is plant material on the endocranial surface. The skull was tagged at some point; the date is not indicated, but the tags look similar to those on T15 65, T15 83, and T15 106.

15. **ID No.:** T15a

A. **Tomb No.:** 15

B. **Other No.:** “T15 124 80?” (written on mandible), “T15 101?” (written on tag)

C. **Skeletal Elements Present**

- a. **Cranial:** mandible
- b. **Teeth:** LLC, LLPM3, LLPM4, LLM1, LLM2, LLM3, LRI1, LRI2, LRPM3, LRPM4 (broken perimortem), LRM1 (broke perimortem), LRM2, LRM3
- c. **Post-Cranial:** none

D. **Preservation:** whole

E. **Reconstructed:** no

F. **Estimated Chronological Age (ectocranial suture closure)**

- a. **Age based on vault composite score:** not possible
- b. **Age based on lateral-anterior composite score:** not possible

G. **Relative Age within Collection (dental crown height measurement and wear score)**

- a. **Age based on crown height:** 7 (youngest)
- b. **Age based on dental attrition:** 5 (second youngest)

H. **Estimated Chronological Age (morphology)**

- a. **Age based on morphology:** adult

I. **Estimated Sex:** undetermined sex

J. **Evidence of Paleopathology:** none

K. **Evidence of Trauma:** none

L. **Notes:**

- a. The LRPM4 and LRM1 broke near before death, as the surfaces of the fractured crown have been rounded and smoothed, and the sediment covering the mandible fills the exposed pits in the roots. LLI1 and LLI2 broke/fell out more recently, likely while the mandible was buried (LLI1) and after excavation (LLI2).

16. **ID No.:** T15b

A. **Tomb No.:** 15

M. **Other No.:** “T15 124 80?”

- B. **Skeletal Elements Present**
  - a. **Cranial:** mandible
  - b. **Teeth:** LRC, LLC, LLM2
  - c. **Post-Cranial:** none
- C. **Preservation:** whole
- D. **Reconstructed:** yes
- E. **Estimated Chronological Age (ectocranial suture closure)**
  - a. **Age based on vault composite score:** not possible
  - b. **Age based on lateral-anterior composite score:** not possible
- F. **Relative Age within Collection (dental crown height measurement and wear score)**
  - a. **Age based on crown height:** 3 (third oldest)
  - b. **Age based on dental attrition:** 1 (oldest)
- G. **Estimated Chronological Age (morphology)**
  - a. **Age based on morphology:** adult
- H. **Estimated Sex:** undetermined sex
- I. **Evidence of Paleopathology:** none
- J. **Evidence of Trauma:** none
- K. **Notes:**
  - a. Mandible surface is extremely chalky; it had been broken down the midline and repaired before, evidenced by old glue residue; mandible is very large and robust, so the sex is probable male.

17. **ID No.:** T15c

- A. **Tomb No.:** 15
- B. **Other No.:** "T15"
- C. **Skeletal Elements Present**
  - a. **Cranial:** none
  - b. **Teeth:** none
  - c. **Post-Cranial:** singular thoracic vertebra (T11), two lumbar vertebrae fused together (L3 and L4)
- D. **Preservation:** whole
- E. **Reconstructed:** no
- F. **Estimated Chronological Age (ectocranial suture closure)**
  - a. **Age based on vault composite score:** not possible
  - b. **Age based on lateral-anterior composite score:** not possible
- G. **Relative Age within Collection (dental crown height measurement and wear score)**
  - a. **Age based on crown height:** no teeth
  - b. **Age based on dental attrition:** not teeth
- H. **Estimated Chronological Age (morphology)**
  - a. **Age based on morphology:** adult
- I. **Estimated Sex:** undetermined sex

J. **Evidence of Paleopathology:** The two fused lumbar vertebrae indicates the early stages of *diffuse idiopathic skeletal hyperostosis* (DISH). See T15d below for a discussion on DISH (Ortner, 2003).

K. **Evidence of Trauma:** none

L. **Notes:**

- a. The singular thoracic and two fused lumbar are likely from same individual due to coloring, but don't fit exactly together, as they are not sequential. These vertebrae also likely go with the sacrum, T15d below, but L5 between L4 and the sacrum is missing. Because this vertebra is missing, the association cannot be made for certain, so they are recorded as separate individuals. The fused vertebra are labeled with "T9" in green, which cannot refer to a tomb number as there is no Tomb 9 (Pritchard, 1963). The label possibly refers to an identification of the vertebrae as thoracic, but this identification would have been incorrect, as they are lumbar vertebrae (L3 and L4). Because they were among other T15 material, the vertebrae were associated generally with Tomb 15.

18. **ID No.:** T15d

A. **Tomb No.:** 15

B. **Other No.:** "T15"

C. **Skeletal Elements Present**

- a. **Cranial:** none
- b. **Teeth:** none
- c. **Post-Cranial:** whole sacrum

D. **Preservation:** whole

E. **Reconstructed:** no

F. **Estimated Chronological Age (ectocranial suture closure)**

- a. **Age based on vault composite score:** not possible
- b. **Age based on lateral-anterior composite score:** not possible

G. **Relative Age within Collection (dental crown height measurement and wear score)**

- a. **Age based on crown height:** no teeth
- b. **Age based on dental attrition:** no teeth

H. **Estimated Chronological Age (morphology)**

- a. **Age based on morphology:** adult

I. **Estimated Sex:** undetermined sex

J. **Evidence of Paleopathology:** none

K. **Evidence of Trauma:** none

L. **Notes:**

- a. This sacrum does not go with the fused vertebral column (T15e below) because of the extreme difference in wear and coloring, but more likely is associated with the three thoracic and lumbar vertebrae (T15c above).

19. **ID No.:** T15e

- A. **Tomb No.:** 15
- B. **Other No.:** “T15”
- C. **Skeletal Elements Present**
  - a. **Cranial:** none
  - b. **Teeth:** none
  - c. **Post-Cranial:** fused vertebral column, T8-L5
- D. **Preservation:** (almost) whole
- E. **Reconstructed:** no
- F. **Estimated Chronological Age (ectocranial suture closure)**
  - a. **Age based on vault composite score:** not possible
  - b. **Age based on lateral-anterior composite score:** not possible
- G. **Relative Age within Collection (dental crown height measurement and wear score)**
  - a. **Age based on crown height:** no teeth
  - b. **Age based on dental attrition:** no teeth
- H. **Estimated Chronological Age (morphology)**
  - a. **Age based on morphology:** older adult based on advanced stage of spine pathology
- I. **Estimated Sex:** undetermined sex
- J. **Evidence of Paleopathology:** This vertebral column is entirely fused together, a pathological condition known as *diffuse idiopathic skeletal hyperostosis* (DISH) that often occurs together with arthritis. This disease produces excessive amounts of bone at joint margins and the entheses, which presents most obviously in the spine, where the abnormal bone growth occurs under the anterior longitudinal ligament. DISH is twice as common in males as females and increases in occurrence with age, being common in individuals over 65. DISH (spinal fusion) is present in human archaeological remains going back to at least 3000 BC in Egypt (Ortner, 2003, p. 558-559).
- K. **Evidence of Trauma:** none
- L. **Notes:**
  - a. This is the most visibly extreme paleopathology of the present collection; since the collection is primarily crania, the presence of this vertebral column suggests that it may have been collected and brought back because of its visible pathology. The column is very worn and covered in a sediment; its morphology contrasts from the sacrum, indicating they are two different individuals.

21. **ID No.:** T38 3474/M314

- A. **Tomb No.:** 38
- B. **Other No.:** none
- C. **Skeletal Elements Present**
  - a. **Cranial:** mostly complete cranium, missing the right maxilla and portions of the right temporal and zygomatic

- b. **Teeth:** ULC, ULPM3, ULPM4, ULM1, ULM2, ULM3
- c. **Post-Cranial:** atlas vertebra (C1)
- D. **Preservation:** (almost) whole
- E. **Reconstructed:** no
- F. **Estimated Chronological Age (ectocranial suture closure)**
  - a. **Age based on vault composite score:** not possible to score (too much surface sediment)
  - b. **Age based on lateral-anterior composite score:** not possible to score (too much surface sediment)
- G. **Relative Age within Collection (dental crown height measurement and wear score)**
  - a. **Age based on crown height:** not possible (too much sediment on tooth surfaces)
  - b. **Age based on dental attrition:** not possible (too much sediment on tooth surfaces)
- H. **Estimated Chronological Age (morphology)**
  - a. **Age based on morphology:** older adult; unilateral thinning on the left parietal, an occurrence with advances with age
- I. **Estimated Sex:** male
- J. **Evidence of Paleopathology:** none visible
- K. **Evidence of Trauma:** none visible
- L. **Notes:**
  - a. Cannot determine much about this cranium beyond the elements present and the estimated sex, as it is the most thickly covered in sediment, and has actually been mineralized, evidenced by the hard, rock-like fill on the entire right half of the cranium. The amount of surface sediment prevented accurate cranial measurements, suture closure scoring, dental crown measurements, and dental wear scoring.

22. **ID No.:** T53 3475/M315

- A. **Tomb No.:** T53
- B. **Other No.:** “62-30-759”, “CG850605-3687” (Museum Catalogue numbers)
- C. **Skeletal Elements Present**
  - a. **Cranial:** whole cranium and mandible
  - b. **Teeth:** ULC, ULPM3, ULPM4, ULM1, ULM2, ULM3, URC, URPM3, URPM4, URM1, URM2, URM3
  - c. **Post-Cranial:** none
- D. **Preservation:** whole
- E. **Reconstructed:** no
- F. **Estimated Chronological Age (ectocranial suture closure)**
  - a. **Age based on vault composite score:** S3: middle adult
  - b. **Age based on lateral-anterior composite score:** S6: old adult
- G. **Relative Age within Collection (dental crown height measurement and wear score)**

- a. **Age based on crown height:** 2 (second oldest)
  - b. **Age based on dental attrition:** 3 (third oldest)
- H. **Estimated Chronological Age (morphology)**
- a. **Age based on morphology:** adult
- I. **Estimated Sex:** probable male
- J. **Evidence of Paleopathology:** There are two depressed fractures, or *osteomyelitis*, on the frontal bone, that are both partially healed. The osteomyelitis likely occurred as a result of a scalp infection introducing pyogenic bacteria to the cranial bone (Ortner, 2003, p. 181). Significant *mastoiditis* from an ear infection is present on the left mastoid process.
- K. **Evidence of Trauma:** none
- L. **Notes:**
- a. This individual favored chewing on their right side, perhaps due to the ear infection on the left ear. This asymmetry is visible in the molars (the right side is more worn) and the digastric groove (larger on the right side). This cranium is the most complete in the present collection, having a largely complete skull as well as a mandible.
23. **ID No.:** T53 3476/M316
- A. **Tomb No.:** 53
  - B. **Other No.:** none
  - C. **Skeletal Elements Present**
    - a. **Cranial:** frontal, left parietal, partial right parietal, occipital, maxilla, facial bones
    - b. **Teeth:** ULI2, ULC, ULPM3, ULPM4, ULM1, ULM2, URI2, URC, URPM3, URPM4, URM1, URM2
    - c. **Post-Cranial:** none
  - D. **Preservation:** partial
  - E. **Reconstructed:** yes
  - F. **Estimated Chronological Age (ectocranial suture closure)**
    - a. **Age based on vault composite score:** S1: young adult
    - b. **Age based on lateral-anterior composite score:** not enough scores
  - G. **Relative Age within Collection (dental crown height measurement and wear score)**
    - a. **Age based on crown height:** 6 (second youngest)
    - b. **Age based on dental attrition:** 6 (youngest)
  - H. **Estimated Chronological Age (morphology)**
    - a. **Age based on morphology:** young adult; the third molars, while not present, had not erupted fully, evidenced by the placement of their crypts; the skull was also fragmented along the sutures and easily reconstructed, indicating the sutures had not fully fused. Additionally, the sphenoccipital suture still open
  - I. **Estimated Sex:** probably female
  - J. **Evidence of Paleopathology:** There is bilateral *cribra orbitalia* on the orbital plates; the teeth have a lot of concretions, and the ULI2 has noticeably advanced wear, much more

than any other teeth. The ULC is also oddly worn on the mesial slope of incisive surface. This idiosyncratic wear pattern in the teeth may indicate non masticatory dental use, such as pipe, etc.

- K. **Evidence of Trauma:** There is *plastic distortion* (deformation or strain in the bone caused by increasing stress) on the squama of left parietal, which may be due to a trauma (Galloway, 2003, p. 39); it appears as though a bit of the bone was fractured perimortem. The most notable evidence that some sort of trauma occurred is that the coronal suture does not mesh together on the left side; this trauma may have been the cause of death.

L. **Notes:**

- a. This individual has several notable non-metric traits present, including a double hypoglossal canal under left occipital condyle, which is extremely unusual, as well as a large inca bone between the parietals and occipital. Before reconstruction, this cranium was in three fragments, but as the fragmentation was along the sutures, it was easily reconstructed.

24. **ID No.:** T57 3620/M331

A. **Tomb No.:** 57

B. **Other No.:** “62-30-760,” “CG850105-1960” (Museum catalogue numbers)

C. **Skeletal Elements Present**

- a. **Cranial:** none  
b. **Teeth:** none  
c. **Post-Cranial:** proximal right femur (fractured near the midpoint of the shaft)

D. **Preservation:** partial

E. **Reconstructed:** no

F. **Estimated Chronological Age (ectocranial suture closure)**

- a. **Age based on vault composite score:** not possible  
b. **Age based on lateral-anterior composite score:** not possible

G. **Relative Age within Collection (dental crown height measurement and wear score)**

- a. **Age based on crown height:** no teeth  
b. **Age based on dental attrition:** no teeth

H. **Estimated Chronological Age (morphology)**

- a. **Age based on morphology:** adult based on overall size; see notes for a discussion of the femoral head measurement.

I. **Estimated Sex:** undetermined sex

**Evidence of Paleopathology:** While not disease related, the femur has possible presence of enthesopathy (and area of muscle pucker), a marker of occupational stress resulting from inflammation at the points where tendons and/or ligaments attach to the bone—in this case, gluteal tendons (Ortner, 2003, p. 158).

J. **Evidence of Trauma:** none

K. **Notes:**

- a. Although this femur is partial, having only the proximal portion present, three standard measurements could be taken—the maximum femoral head diameter (breadth), the sagittal subtrochanteric diameter, and the transverse subtrochanteric diameter (Buikstra & Ubelaker, 1994). The femoral head breadth, which can be used to estimate body mass, is 46.6mm. Three formulas can be used to determine lean body mass (one for males, females, and a combined sex regression), and produced an estimate between 63.78 and 65.79 kilograms (140.6 and 145 pounds), which is within average modern lean body mass estimates (Ruff et al., 2012). See Table 10 for the three formulas and body mass estimates.
25. **ID No.:** T57 3621/M332
- A. **Tomb No.:** 57
  - B. **Other No.:** “62-30-758, CG850105-9802
  - C. **Skeletal Elements Present**
    - a. **Cranial:** right half of a cranium, partially complete mandible (missing condyles)
    - b. **Teeth:**
    - c. **Post-Cranial:** none
  - D. **Preservation:**
  - E. **Reconstructed:** no
  - F. **Estimated Chronological Age (ectocranial suture closure)**
    - a. **Age based on vault composite score:** not possible (no measurements)
    - b. **Age based on lateral-anterior composite score:** S5: middle adult
  - G. **Relative Age within Collection (dental crown height measurement and wear score)**
    - a. **Age based on crown height:** 5 (third youngest)
    - b. **Age based on dental attrition:** 4 (third youngest)
  - H. **Estimated Chronological Age (morphology)**
    - a. **Age based on morphology:**
  - I. **Estimated Sex:** probable female
  - J. **Evidence of Paleopathology:** ULM1, ULM3, URM1, and URM3 were lost antemortem, and there is presence of reactive bone associated with resorption of the alveoli. The loss of the former three teeth was probably due to an infection that was resolving at a normal rate at the time of death, while URM3 was lost much earlier, as the alveoli has completely resorbed. On the mandible, LRM2, LLM2, and LLM3 were all lost and the alveoli completely resorbed antemortem, prior to the maxillary tooth loss. LRM1 was also lost, more recently than the other mandibular teeth, evidenced by an earlier stage of alveolae resorption. Overall, the tooth loss and resorption indicates very poor dental health of this individual.
  - K. **Evidence of Trauma:** none
  - L. **Notes:**
    - a. no notes beyond the notable antemortem tooth loss, and that the majority of the cranium is missing (left side).

### 4.3 Human Remains at Gibeon: Burial Context of Individuals

Pritchard's descriptions (1963) of the skeletal remains for four tombs with remains currently present are quoted in the table below:

**Table 1. Pritchard's descriptions of T15, T38, T53, T57**

T15	“When the stone was removed the tomb goods were immediately apparent, since no dirt had filtered into the chamber from the shaft (Fig. 78). In the process of removing the bones and burial offerings it was possible to distinguish three phases of use, although there had been considerable disturbance within the tomb. Bones were piled up in heaps along the walls (Fig. 82) and no skeleton of the upper layer, Phase I was found in an articulated position. The second layer, Phase II, was of hard, gray fill in which there were embedded bones and vessels. Phase III consisted of earth mixed with pottery and bones. [...] Although the skeleton which was found on the bed of Phase III was partly disturbed in its position, enough of the skeletal remains were in position to suggest that the burial had taken place with the skeleton articulated. A dagger (Fig. 24:92) was found neatly poised across the spine of the skeleton. Fourteen human skulls and 4 sheep skulls were recorded from the tomb” (p. 22-23).
T38	The tomb is unique in that it contained a complete skeleton, but no grave goods with it. It is likely that the tomb had been entered previously and robbed of its contents. [...] Overlying the floor of the chamber was 10 cm. of hardpacked <i>huwwar</i> , in which the skeleton was embedded. The body had been placed along the north-south axis of the tomb with the head at the south wall and facing east. The bones were in a flexed position with the knees pulled up to the chest, the right leg pulled up higher than the left. The arms were bent, the lower parts being drawn up against the chest. The lower leg bones measured 40 cm. in length and the femurs 46 cm” (p. 47)
T53	“The upper 70 cm. of the shaft was filled with soil and rocks; below this layer was <i>huwwar</i> . A stone, 80 by 60 by 12 cm., filled all but about 15 cm. of the doorway into the tomb chamber, which was only partly filled by roof fall and silt. It contained only three disarticulated burials which had been pushed back against the walls. There were no grave goods” (p. 56)
T57	“The shaft of this tomb is 4 m. deep and was filled with stones and loose soil containing a few bones and sherds. [...] With the exception of this silt and some roof fall, the chamber was relatively clear of intrusive material (Fig. 85). The latest burials seem to have been represented by two poorly preserved skeletons lying side by side near the entrance. Both were found partly articulated with feet toward the southwest. Two storage jars, Nos. 4 and 13, had fallen across the skeleton lying to the northwest, of which there were remains of a skull (A), vertebrae, pelvis, leg and arm bones. The skeleton to the southeast is represented by two fragments of skull (D), found under storage jar No. 14, vertebrae, a pelvis, and leg bones. Between the two skeletons were found a bronze dagger, No. 35, and a toggle pin, No. 34. [...] Between the platform to the west and the skeleton to which skull A belonged, was an infant's skull (B), but no other bones were found which could be identified with it. To the north of the platform at the west were a pile of human bones and a skull (C), probably an earlier burial which had been pushed aside to make room for the later ones. A sheep's skull and mandible were found along with other animal bones to the east of this group of human bones. Fragments of a third stone platform appeared at the south of the chamber, and around it two lamps, a carinated bowl, and some small bones” (p. 58)

**Table Note:**

Descriptions from *The Bronze Age cemetery at Gibeon* (Pritchard, 1963).

As Pritchard describes in his catalogue of the cemetery (1963), the mortuary context of the Bronze Age tombs at Gibeon is communal tombs ranging in use from Middle Bronze Age I to Late Bronze Age. The in-situ position of all of the individuals was never fully recorded, as

Pritchard gives general descriptions of the remains in context but does not list the remains in his catalogue along with the grave goods (Table 1). Additionally, two of the tombs, T38 and T53, only had human remains present when excavated, and no grave goods (Pritchard, 1963). T15 and T57 are the two tombs with skeletal material currently present that do have grave goods, and a prolific amount. Pritchard describes the number of human individuals and catalogued from the two tombs in conjunction with the evidence for tomb reuse in the MBII:

“Although the skeletal remains were frequently in a poor state of preservation and difficult to record, it seems that the practice of multiple burials within the same tomb was common in MB II. T15, which contained only MBII tomb goods, had remains of 14 skulls; and in T57, where the funerary goods were predominantly MBII, there were evidences of 4 skeletons. In general the goods placed in the tomb in MBII were more numerous as well as more varied than the rather limited repertoire of equipment found in the MBI tombs. T15 contained a total of 128 catalogued objects [...] T57 produced a total of 61 objects” (Pritchard, 1963, p. 71).

Pritchard mentions T15 as having 14 skulls (i.e. individuals); I have identified 19, though due to the fragmentary nature of the collection, identifying bones as belonging to the same individual was extremely difficult. The mandibles T15a and T15b could not be associated with any crania present but may have been found with them initially. Similarly, the vertebrae T15c and sacrum T15d may be associated, but because they do not directly articulate, I have catalogued them separately. The cranial fragments and mandibles across T15 80C and T1580D are at a minimum 2 juvenile individuals (and are associated and catalogued thus) but may be a maximum of 6 juvenile individuals. Thus, Pritchard’s “14 skulls” are not directly identifiable within the current collection, but it is a number close in approximation. If T15a through T15e do ultimately associate with other individuals present, and T15 80C and T15 80D is securely two individuals, then the number of individuals for T15 would be 14. However, I am not able to make this secure assessment because of the condition of the remains present.

For T57, only two skeletal elements are present, T57 3620/M331 and T57 3621/M332. Pritchard lists evidence for four skeletons from T57, indicating that some skeletal material either wasn't recovered or is currently missing from this tomb. These two remains present are a cranium (T57 3620/M331) and a partial femur (T57 3621/M332); because these are given two different numbers from each other, they can be assumed to be two different individuals. However, which of the remains Pritchard describes from T57 are these ones present isn't immediately clear; he reports two skeletons side by side, but even if the two remains currently present are assumed to be from these two individuals, there is no recording of which is which, especially as both remains are described to have partial skulls and leg bones. These two remains do have Museum catalogue numbers (the cranium is 62-30-760 and the femur is 62-30-758), so it is possible that the location can be reconstructed by associating them with the other objects catalogued from the tombs. This would mean trying to determine the Museum's catalogue numbers for what Pritchard labels storage jars No. 3, 13, 14, and the bronze dagger and toggle pin described between the two skeletons (Table 1). The Museum's object catalogue, available online, does list a bronze dagger, 62-30-272, with the field no. B342 in its description. In Pritchard's catalogue (1963), B342 corresponds to the dagger described as no. 35, found between the skeletons (Penn Museum). Similarly, object no. 62-30-277 in the Museum's catalogue is listed with field no. B347, which corresponds to toggle pin no. 34 found with the skeletons (Penn Museum).

Thus, from these associations, it is clear that the Penn Museum's catalogue numbers for the skeletons do not immediately associate with them the catalogue number for the dagger, given the difference 200-series label for the objects and the 700-series for the human remains. The association only becomes clear from the field numbers listed in Pritchard's publication, and

relies the assumption that these remains are the ones that were next to the dagger and toggle pin, and not the older remains pushed aside—which they likely aren't, given that the radiocarbon date for the femur falls within a MBII range (Table 1, Table 2). This discordance and insecure association reemphasizes that any actual association was never properly recorded beyond Pritchard's unspecific description of locations of remains in the tombs, and that there is an absence of the human remains from his catalogue which lists the field numbers of each grave good. The difference in series number likely is due to the order the objects were catalogued in, with the bones being catalogued at a different time than the dagger and pin (Boulis, 2018). The history of these remains within the Penn Museum after excavation, including cataloguing, is further discussed in section 4.6. Figure 3 is an image of the tomb drawing for T57 from Pritchard's publication (1963).

Along with the remains from T38 and T53, the numbers for the T57 remains record both the plan number (3620, 3621) and the field number (M331, M332). From the information in Pritchard's catalogue, the field number seems to indicate the category of material, such as pottery (P), bronze (B), or bone (M). The labels present for the T57 remains differs from all of the T15 labels, which only list a plan number (65, 83, 101, etc.). This difference in recording is not explained, but it may be because the tombs were excavated in different seasons, with T15 one of the first tombs excavated in 1960, and the remaining three all excavated in 1962 (Pritchard, 1963). As the numbers are primarily indicated by writing on the skeletal elements, it seems likely that the process or even the individual(s) writing these numbers on the bones shifted between seasons, leading to the discrepancies in types of numbers written.

Pritchard further writes on the condition of human remains tombs used exclusively in the MBI period. While no remains from these tombs are physically present, his description is useful

in providing more context about the recording of human remains during excavation. Pritchard writes:

“Unfortunately many of the tombs used exclusively in the MBI period had suffered badly from decay and from further damage during the subsequent use of the area as a quarry for stone. These two types of disturbances, along with further dislocation of tomb 68 contents by surface water and roots of trees and vines, made it difficult to determine the condition of the skeletal remains at the time of the burials. Only T50 contained what could be called an articulated crouched burial; but this same tomb also contained scattered skeletal remains. T59 contained portions of two skeletons which were partially articulated; and 10 other tombs (Tombs 32, 46, 47, 48, 49, 51, 52, 54, 56, and 62) contained scattered human bones. It would thus seem that the prevailing practice was that of disarticulated burials, as in the Pottery type tombs at Jericho. But it should be kept in mind that it is entirely possible that this condition of disarticulated and scattered bones within the tomb chamber may have been due to disturbances after the burial” (Pritchard, 1963, p. 67-68).

Overall, Pritchard’s discussion of the human remains at the Bronze Age Cemetery, for both MBI and MBII tombs, outline a picture of difficulty. Lacking a staff member trained in the bioarchaeological techniques and osteological analysis, Pritchard’s teams records of the human remains were hindered both by this lack of experience and by the conditions of the site, with many of the remains disturbed. Perhaps the lack of surety on the team’s part is why no bones are listed in Pritchard’s catalogue beyond a general observation and count of skulls, and the burial context of the human remains at Gibeon is incomplete.

#### **4.4 Radiocarbon Dating**

As detailed in the background, Pritchard’s publication on the Bronze Age tombs at Gibeon (1963), dates the tombs according to an established ceramic chronology based on other tombs in the Near East. By matching the pottery to well-known technical forms and designs, the layer the pottery is found in can be dated, assuming that all the pottery in a particular stratigraphic layer dates to the same time period. In disturbed sites, individual pieces of pottery

may be associated with a time period, but the layer cannot, and other associated objects cannot be associated securely by date. Pritchard's dating of the periods of occupation at the site is essential to his identification of al-Jib with Gibeon (Pritchard, 1962). In particular, the Bronze Age cemetery held particular significance for him; dating the tombs to the Bronze Age legitimized occupation of the site in the time believed to be before the Israelites, congruent with the "grand city" of Gibeon mentioned in the Book of Joshua. However, there are multiple problems with Pritchard's dating methods. Some critics (Galling, 1965, de Vaux, 1966, Lapp, 1968) stressed that in areas of the excavation, he was rushed in ascribing objects to periods of antiquity. These critiques primarily deal with the supposed wine cellar at Gibeon (Lapp, 1968), but the idea that some of Pritchard's date determination may be inaccurate or too strongly made is important in questioning the dating across the site, including the cemetery.

In Pritchard's publication on the Bronze Age cemetery (1963), the human remains were associated with the dates of the material in their tomb. However, for tombs with multiple periods of use and multiple individual remains, Pritchard's summary catalogue does not differentiate the individuals by date. Some descriptions of the tombs list layers as different phase numbers (I, II, III), and describe bones or individual skeletons within these layers, but no overarching number or date is given to the bones. For example, part of tomb 15's (T15) description says, "The second layer, Phase II, was of hard, gray fill in which there were embedded bones and vessels. Phase III consisted of earth mixed with pottery and bones" (Pritchard, 1963, p. 23). Without details of what types of bones, what specific objects they were associated with, or catalogue numbers, the date of the bones becomes unconfirmed, especially in a case like T15, which was reused many times and thus contains artifacts and supposedly remains from throughout Bronze Age periods (Pritchard, 1963). The overall uncertainty of Pritchard's dating prowess and the lack of

specificity of the dating of human bones led me to the prospect of radio carbon dating. Sampling bone fragments and having them analyzed for their ratio of C-14 to C-12 isotopes would provide an actual chronological date for the samples and confirm at least some portion of the periods of tomb use.

Currently present in the skeletal collection from the Gibeon site is material from four tombs—T15, T38, T53, T57. With funding for two radiocarbon tests, I wanted to sample material from two different tombs, on the chance that they would produce different radiocarbon dates. I would also then be able to provide calibrated dates for two of the four tombs with material physically present. T38 and T53 would have been ideal to date; T38 was the only tomb containing a single, complete skeleton but no grave goods, while T53 contained three disarticulated skeletons and no grave goods. Because of the lack of goods, Pritchard had no means to date the skeletal material through association with ceramics dated by chronology. All tombs which weren't assigned a date either only contained human remains or had no remains or artifacts at all (Pritchard, 1963). However, I did not sample the skeletal from T38 and T53 for dating, as what is currently present from the two tombs is fairly complete crania. As radiocarbon dating is a destructive process, I wanted to choose samples that were already fractured heavily and/or were not associated with more intact remains. I chose to date fragments from T15 and T57. T15 was the most intact and proliferative tomb the excavators found at the site. Most of the present skeletal material is from T15, including small fragments I was not able to associate with any of the more complete individuals. These fragments were labeled as "T15 65," part of the assemblage of fragments with that number labeled on them. The fragment I sent to be dated was of a long bone. T57 3620/M331 is the proximal portion of a fragmented femur bone, so sampling

would be easier and would not prevent valuable future analysis of the bone. The two samples were sent for analysis to the laboratories at Beta Analytic Radiocarbon Dating.

Pritchard's publication lists the material for T15 as being from the Middle Bronze Age II, and the material from T57 from both the Middle Bronze Age I and II. As Pritchard defines, the Middle Bronze I (MBI) is 2100-1900 BCE, and the Middle Bronze II (MBII) is 1900-1550 BCE. The calibrated radiocarbon date for T15 65, with 95.4% probability, is 1746 - 1616 cal BCE, or 3380 +/- 30 radiocarbon years before present (BP, "present" is 1950). The calibrated radiocarbon date for T57 3620/M331, with 95.4% probability, is 1767-1623 cal BC, or 3400 +/- 30 BP. These dates indicate that both samples fall within Pritchard's MBII date range, and the tombs were thus in use tombs contemporaneously. Pritchard remarks about T57, " here is no clear indication that the tomb is other than roughly contemporary with T15, which has been placed in Group III of the Jericho classification" (1963, p. 60). The radiocarbon dates indicate that the tombs were, in fact contemporaneous, with only a little over a decade difference in the upper and lower limits of the two radiocarbon date ranges. The full results of the radiocarbon analysis sent to me by Beta Analytic is provided in Table 2 below, and the images of the samples are provided in Figures 8-11.

The calibrated radiocarbon date for the two tombs confirms Pritchard's MBII date assignment based on ceramic chronology dating, at for these tombs, was accurate. He does associate T57 with MBI as well; this could also very well be true and confirmed by radiocarbon dating material from a different skeletal sample from the tomb. However, further sampling was not possible to try and confirm an MBI date, primarily because the other T57 skeletal material is a more complete cranium, which I did not want to disturb through the destructive sampling process. Overall, the radiocarbon dates do not prove the veracity of any pottery dates or of the

identity of site of Gibeon, but they demonstrate that these two tombs were definitely in use at the time Pritchard believed them to be. Additionally, these are the first radiocarbon dates of the archaeological site of Gibeon.

**Table 2. Beta Analytic export results**

<b>Lab No.</b>	<b>502779</b>	<b>502778</b>
<b>Submitter No.</b>	T15 65	T57 3620/M331
<b>Conventional Age</b>	3380 +/- 30 BP	3400 +/- 30 BP
<b>Calendar Calibration (95.4% Probability)</b>	1746 - 1616 cal BC (3695 - 3565 cal BP)	1767 - 1623 cal BC (3716 - 3572 cal BP)
<b>IRMS d13C</b>	-19.1	-18.9
<b>IRMS d15N</b>	7.81	7.94
<b>CN</b>	3.3	3.3
<b>Wt %C</b>	40.17	41.16
<b>Wt %N</b>	14.23	14.61
<b>Wt %Col</b>		
<b>IRMS d18O</b>		
<b>(Material): Pretreatment</b>	(bone collagen): collagen extraction: with alkali	(bone collagen): collagen extraction: with alkali
<b>Service</b>	AMS-Standard delivery	AMS-Standard delivery
<b>Received</b>	8/28/2018	8/28/2018
<b>Due</b>	9/6/2018	9/6/2018
<b>Report Completed</b>	9/10/2018 4:16:00 PM	9/10/2018 4:16:00 PM
<b>Percent Modern Carbon (pMC)</b>	65.65 +/- 0.25 pMC	65.49 +/- 0.24 pMC
<b>Fraction Modern</b>	0.6565 +/- 0.0025	0.6549 +/- 0.0024
<b>D14C</b>	-343.46 +/- 2.45 o/oo	-345.09 +/- 2.45 o/oo

#### 4.5 Description of Faunal Remains

Among the human remains present were fragments of faunal remains. Pritchard's publication (1963) also mentions the presence of animal remains; these were examined and identified by Milton Hildebrand, Associate Professor of Zoology at UC Davis. Pritchard's catalogue only identifies sheep bones; other faunal remains are described as "animal bones" (p.

54). Pritchard quotes Hildebrand’s identification of sheep skulls from T15: “The bones are of sheep, not goats. Most are adult or sub-adult rams, though at least one skull base is of an ewe” (letter of October 3, 1961)” (1963, p. 23). All of the faunal remains currently present are labeled as being from T15, though this was not the only tomb with animal remains, so it is unclear whether all animal remains were collected and brought with the rest of the tomb contents, or if these fragments were presumed to be human. Table 3 below details the approximate species identification of the faunal fragments from T15; because sheep and goat bones are similar, the fragments that were clearly either sheep or goat could not be identified as one or the other. One fragment was identifiable as a pig, and another as some type of rodent (species indeterminate). All of the faunal remains aside from the rodent indicate these animals were being raised and consumed by the inhabitants at Gibeon during the Bronze Age.

**Table 3. Faunal remains present from T15**

<b>Tomb</b>	<b>Skeletal element</b>	<b>Species</b>	<b>Approximate Age</b>	<b>Notes</b>
15	left zygomatic	sheep/goat	young	
15	basis sphenoid	sheep/goat	young	
15	occipital fragment	sheep/goat	young	
15	braincase	probable sheep/goat	young	very thin bone
15	left scapula, two frags.	sheep/goat	young	
15	rib	sheep/goat	young	
15	cranial - pterygoid plate	pig	indeterminate	
15	two teeth	indt.; some type of rodent	indt.	one tooth is the upper premolar of some kind of rodent - similar to Asia minor ground squirrel, Cape hair, desert hair; other tooth unidentifiable

#### **4.6 History of Collection Since Excavation and Publication**

While Pritchard does not make much clear about the human remains at Gibeon, their subsequent history within the Penn Museum further erases context for the remains. When I first

began this project, I knew I wanted to investigate what happened to the remains after they were brought to the Museum, to excavate the history of these excavated bones. In doing so, I hope to recover possible reasons for the lack of an archive of this skeletal collection, if not build and add to that archive. In addition to Pritchard's publications, I searched through the archival notes from the Gibeon expeditions for mentions of human remains and spoke with Penn Museum registrar Chrisso Boulis. Here I present what I have reconstructed of the history of these remains as objects in the Penn Museum's collections.

All of the skeletal remains were brought back by 1962, when excavations concluded, alongside the artifacts and grave goods recovered (Pritchard, 1963). In this same year, Pritchard became inaugural curator of the Biblical Archaeology section at the museum (then the University Museum), as well as Professor of Religious Studies (Penn Almanac, 1997). At this time, all of the material from his excavations, including those done at Gibeon, resided in the Biblical Archaeology section, also called the Syro-Palestinian section. In 1963, 469 of the objects from Gibeon, excluding human remains, were catalogued and officially entered into the Penn Museum's records, receiving systematic catalogue numbers. In 1967, another 1500 objects were catalogued (Boulis, 2018). Also in 1967, Pritchard became the Associate Director of the Museum, assuming the position of Director from 1976-1977. In 1978, Pritchard retired, becoming Emeritus Professor of Religious Studies and Emeritus Curator of the Syro-Palestinian Section (Penn Almanac, 1997). At the time of his retirement, the Syro-Palestinian section, containing over 15,000 objects from Gibeon and other sites in Palestine, was merged with the Near East section. The human remains, still stored with the other materials and not yet catalogued, were likely transferred to the relatively new Physical Anthropology section (formed in the late 1960s) at the time of this section merger (Boulis, 2018). Between 1962 and 1978

remains may have also been transferred to other institutions, although no record exists of any such process. Such transfers have long occurred, so the possibility cannot be ruled out (Watson and Muller, 2015).

In 1995, another 1000 objects from Gibeon began to be catalogued, nearly 30 years after the second round of cataloguing. If the human remains were transferred either during the merger or at any point in this 30-year period before the 1995 cataloguing, then there would be no record of them in the Museum's catalogue. Three catalogue entries for human remains at Gibeon were made in 1996, for T53 3475/M315 (a cranium and mandible), T57 3620/M331 (the partial femur), and T57 3621/M332 (a partial cranium). These three remains were initially assigned Computer Generated (CG) numbers by the Museum's cataloguing system, which were then translated into catalogue numbers to fit them within the larger Gibeon collection. The respective catalogue and CG numbers for these three remains are: 62-30-759 & CG850605-3687 (53 3475/M315), 62-30-760 & CG850105-1960 (T57 3620/M331), and 62-30-758 & CG850105-9802 (T57 3621/M332). A catalogue card listing all three remains contains this note: "Skulls, mandibles, and femur given to Janet Monge, Keeper of Collections (Physical Anthropology Section)" (Boulis, 2018). These three remains were catalogued likely because they were found still in the Near-East section with non-skeletal material during 1995 cataloguing. The remainder and majority of the remains from Gibeon, including all of the T15 material, T38 3474/M314, and T53 3476/M316, made their way to the Physical Anthropology section at some point during the late 20<sup>th</sup> century, either when the sections merged in 1978, or at some point between then and 1995 (Boulis, 2018). After inquiry with Katherine Blanchard, the current Keeper of Collections for the Near East Section, we determined that the section does not have any record or physical evidence of any Gibeon human remains still in their collection storage. This instability of the

record of the remains, particularly in the lack of any cataloguing alongside other Gibeon material, erased much contextual information for the remains. At the moment the remains were handed over to Physical Anthropology, they could no longer be placed in a specific catalogue context.

Having built a shaky history from my conversations with Registrar Chrisso Boulis and the records of the Penn Museum's shifts in sections, I returned to the Penn Museum Archives, to the material from the excavation at Gibeon. Now familiar with what was currently present in the human remains from Gibeon and how they were considered by Pritchard in his publications, I wanted to know whether any information on human remains from the field notes and reports had been lost as it was filtered from the recorder of the notes through Pritchard. After looking at the Archive's Guide to Gibeon Expedition Records, a finding aid prepared in 2015, I determined that two sections of field notes would be most pertinent to me; "Field Notes, Asia Halaby (Tomb Notes), 1960," and "Field Notes, Tombs." I did look through the rest of the archival materials for mention of human remains, finding only very general information about the presence of skeletons and tomb reuse in correspondence to the Museum from Pritchard, much of which was later repeated in his publications.

Asia G. Halaby supervised excavation of the tombs in 1960, and recorded notes about the contents of the tombs in her notebooks. She also worked as a cataloguer in the 1957 and 1959 seasons (Pritchard, 1962). The season she worked was when Tomb 15 was found, and so I approached her records looking for records of the tomb. She lists in her index tombs 10-22A and the number of finds per tomb; for T15, she reports 109 pieces of pottery and 29 "other" objects. Following her index and overview on the condition of the tombs, Halaby's notes begin to detail each tomb, listing pottery, bronze, jewelry, other, and skulls. She begins with T10, moving

chronologically. Unfortunately, her notes end after the detailed description of T10; it is clear that her notebook fell apart, and the subsequent pages, including the details from T15, are missing. However, the T10 entry indicates how she was recording human remains. Under “skulls,” Halaby records the remains as such: “Skulls: 5, plus scattered pieces and jaws and teeth” (Figure 4). The body texts provides general information about fragmented bones being found in certain layers of the tomb, much how Pritchard’s final publication describes the remains. Already it is clear to me that the lack of context began right at the point of recording during excavation, immediately losing specific in-situ information for the bones.

The “Field Notes, Tombs” detail the tombs excavated in the 1962 season, from tomb 30 to tomb 62. Multiple cataloguers worked on these, as some are in English (by multiple authors based on handwriting), and some are written in German by Willy Schottroff, who also worked on drawings of tomb plans and sections. These field notes are syntheses of smaller field notebooks, summarizing the tomb contents in a regular format. Similar to Halaby’s notebook, each tomb entry lists a number for the types of objects found, and then describes the layout of the tomb in a fairly general manner. Human remains are recorded as number of “human skulls,” usually with a note for skulls in fragmentary condition (Figures 5, 6, 7). I read through the entry for each tomb, and it becomes apparent that the general manner of describing the placement of human remains in the tomb used by Pritchard was directly drawn from these notes, and there is no additional recorded contextual information that he left out.

Having explored the archival, published, and catalogued history of the remains, I began integrating the information with what is currently present in the collection of human remains at Gibeon, to point out what had been physically lost along the way. What I determined was that the archival records and Pritchard’s published catalogue (1963) are discordant with what is

present in the Museum. Specifically, the collection is more incomplete than it should be, as many skeletal elements which were published as being brought to the Museum in 1962 are not present in the collection. As described in the background, the material from the tombs is marked as having gone to three places: the Penn Museum, the National Museum in Amman, and the American School in Oriental Research (Pritchard, 1963). Pritchard notes the material sent to ASOR was entirely ceramic, and the Jordanian government claimed the material from Tombs 10, 10A, 13, 14, 18, 19, 30, 31, 32, 36, 37, 43, 45, 46, 50, 52, and 58 (Pritchard, 1963, p. 5). Presumably, any human remains in these tombs also went to the Jordan government. This leaves the material from Tombs 10B, 15, 38, 39, 42, 47, 48, 49, 53, 56, 57, 59, 62, and 64A as what was brought to the Penn Museum; all of these tombs are recorded as having at least one human skull or fragments (Pritchard, 1963). However, as stated, only skeletal material from tombs 15, 38, 53, and 57 is present, indicating the absence of human remains for the rest of these tombs. Additionally, there is potentially more individuals that recorded for T15, and T53 and T57 have less individuals present than recorded. These discrepancies between what is recorded at brought to the Penn Museum and what is here (specifically in terms of missing skeletal material) is detailed in Table 4, with the second column listing first the number of skulls Pritchard recorded, and second, the number of individuals present. Table 5 lists the tombs which contents were claimed by the Jordanian government, as well as number of skulls recorded for each of these tombs.

**Table 4. Human remains that should be in Penn Museum but aren't (by tomb no.)**

Tomb No.	No. of individuals (total given, total present)	What individuals Pritchard describes in the tomb (1963)
T10B	4, none present	4 skulls
T39	1, none present	A jaw and 2 skull fragments
T42	1, none present	Fragment of a skull and other bones (likely only skull frag. was taken)
T47	1, none present	Broken skull and a few bones (only skull may have been collected)

T48	2, none present	2 fragmentary skulls
T49	1, none present	1 fragmentary skull
T53	3 total, 2 present	3 disarticulated burials 1 skull
T54	1(?), none present	Question mark appears in Pritchard's publication for the number of skulls/fragments; he writes the tomb has "a few bones"
T56	1, none present	1 skull; other bones described, but likely were not collected
T57	4 total, 2 present	4 skulls, only one present here (adult) along with a partial femur; of the other three that should, one is an infant skull
T59	1, none present	Skull fragments and portion of mandible; other fragments plus leg bones
T62	1, none present	1 skull and scattered fragments of bone
T64A	1, none present	2 skull fragments found with other bones (one skull frag. may be an animal)

**Table 5. Human remains that may be in Jordan (by tomb no.)**

Tomb No.	No. of individuals (listed as "skulls")
T10A	7
T10	6
T13	2
T14	1
T18	1
T30	2
T31-T31A	2
T32	1
T46	2
T50	2
T52	1
T58	5

**Table Note:**

The material claimed by the Jordanian government is listed as being sent to the "National Museum" in Amman. It is not clear what museum the "National Museum" refers to since no museum has existed solely under this specific name today. It could refer to the Jordan Archaeological Museum (established 1951) in Amman, but this is a small museum with little storage. The material may have been sent to storage buildings which are not explicitly named or clarified in Pritchard's publication; over fifty years later, discovering where this material ended up would be a momentous task.

In piecing together the history of these skeletal remains in the Penn Museum, I also looked to published resources in order to more comprehensively understand how skeletal material is integrated with written records. Rachel Watkins is an anthropological scholar whose

has done work on this subject, as exemplified in her article, “Repositioning the Cobb Human Archive: The Merger of a Skeletal Collection and its Texts” (2015). This article outlines her team’s process for “constructed an improved study sample for biocultural analysis by merging skeletal remains from the collection with their associated texts. The merging allows for the inclusion of individuals from the original series for whom we no longer have skeletons” (Watkins, 2015, p. 41). While it seems that Watkins’ sample has more text information immediately available, it still stresses the importance of amassing all the available information in order to reflect the depth of information a skeletal collection can offer. Interestingly, she notes that her collection lost several skeletons during storage and disuses, which correlates to the history of this collection.

#### **4.7 Summary and Interpretation of Human Remains at Gibeon**

Like Pritchard, my analysis is hindered by the fragmentary nature of the collection, perhaps even more so because the excavation context and numerous human remains are largely unavailable to me. My process of osteological analysis attempts to fill some of these gaps made by the lack of initial description. One attempt at filling these gaps is examining whether the patterning of distribution of age, sex, and pathology within the tombs suggests any patterning to the burial contexts. Overall, the tomb layouts, contents, and patterns of use are typical of the Bronze Age; reusing old tombs was a common practice during the MBII (Pritchard, 1962, Gerstenblith, 1980). Table 6 below details the age (vault and lateral anterior S-scores, vault and lateral anterior ages, dental crown ages, dental wear ages), sex, and pathology for each individual among the four tombs. Estimations or observations that were not possible are indicated by N/A.

**Table 6. Summary of age, sex, paleopathology, trauma**

ID No.	Vault S Score	Vault Age	Lat-Ant S Score	Lat-Ant Age	Crown	Wear	Est. Sex	Paleo-pathology	Trauma
					oldest-youngest (1=oldest)				
T15 7	S2	Young Adult	N/A	N/A	N/A	N/A	female	none	none
T15 65A	N/A	N/A	N/A	N/A	N/A	N/A	ambiguous sex	none	none
T15 65B	N/A	N/A	N/A	N/A	N/A	N/A	undetermined	none	none
T15 65C	N/A	N/A	N/A	N/A	N/A	N/A	undetermined	none	none
T15 80A	N/A	N/A	N/A	N/A	N/A	N/A	undetermined	possible cribra orbitalia	cranial depression from trauma
T15 80B	N/A	N/A	N/A	N/A	N/A	N/A	undetermined	cribra orbitalia	none
T15 80C	N/A	N/A	N/A	N/A	N/A	N/A	undetermined	none	none
T15 80D	N/A	N/A	N/A	N/A	N/A	N/A	undetermined	none	none
T15 83	S1	Young Adult	S4	Middle Adult	N/A	N/A	probable female	midsagittal depression, porotic hyperostosis, mastoiditis	possible ring fracture
T15 101	S3	Middle Adult	S6	Old Adult	1	2	probable male	mastoiditis, tooth infections	none
T15 103A	S3	Middle Adult	N/A	N/A	N/A	N/A	probable female	cribra orbitalia (minimum), midsagittal depression	none
T15 103B	N/A	N/A	N/A	N/A	N/A	N/A	undetermined	none	none
T15 106	S2	Young Adult	S3	Middle Adult	4	N/A	probable female	none	none
T15 124	S4	Middle Adult	S7	Old Adult	N/A	N/A	ambiguous sex	none	six depression fractures from blunt force trauma
T15a	N/A	N/A	N/A	N/A	7	5	undetermined	none	none
T15b	N/A	N/A	N/A	N/A	3	1	undetermined	none	none
T15c	N/A	N/A	N/A	N/A	N/A	N/A	undetermined	early stage DISH	none
T15d	N/A	N/A	N/A	N/A	N/A	N/A	undetermined	none	none
T15e	N/A	N/A	N/A	N/A	N/A	N/A	undetermined	extensive DISH	none
T38 3474/ M314	N/A	N/A	N/A	N/A	N/A	N/A	male	none	none
T53 3475/ M315	S3	Middle Adult	S6	Old Adult	2	3	probable male	osteomyelitis (depressed fractures), mastoiditis	none

T53 3476/ M316	S1	Young Adult	N/A	N/A	6	6	female	cribra orbitalia	possible trauma causing plastic distortion
T57 3620/ M331	N/A	N/A	N/A	N/A	N/A	N/A	undetermined	none	none
T57 3621/ M332	N/A	N/A	S5	Middle Adult	5	4	probable female	multiple infected teeth	none

Most of the material present is from T15, with the other three tombs (T38, T53, T57) having 1-2 individuals each, so there is not enough data overall to establish general conclusions about the distribution of sex, age, paleopathology, and trauma across all four tombs. The data demonstrates that this is a mixed assemblage, with males, females, young, middle, and old adults, and juveniles. Notable among this assemblage is the large proportion of juveniles and subadult remains, including T15 65B, T15 65C, T1580A, T15 80B, T15 80C, T1580D, and T15 103B. When I first inventoried the collection, I found numerous fragments labeled T15 65. Many of these did not turn out to be associated with the T15 65A cranium, though pieces I did reconstruct with T15 65A were also among this group. Of the remaining fragments, the only one that could be separated was a fragment of a juvenile ramus estimated at about 2 years old (T15 65C). Otherwise, the rest of the fragments include bits of parietals, temporals, a rib, and a cervical vertebra. The overall size indicates young adult or subadult, but the lack of available information beyond this limits any secure determinations.

T15 80 A and T15 80 B are both crania of juveniles, with T15 80B being more complete and also younger, based on the overall size of the cranium. However, both are lacking teeth, so a more specific age estimation beyond young children is not possible. T15 80C and T15 80D both consist of juvenile frontal and parietal fragments, each associated due to similar thickness; these two fragments of T15 80C are not associated with the T15 80D fragments because the thickness of the former two fragments is too different; T15 80C is also covered in much more sediment

than T15 80C. T15 80C and T15 80D were also associated with a mandible and a maxilla and mandible pair, respectively, the age of which is discussed in the intro of this section. Figures 1 and 2 show the comparison between one of the x-rays and the dental age standard, used in making the dental age estimation. There is the possibility that the respective frontal and parietal fragments among T15 80C and T15 80D are not associated in pairs, and that the respective maxilla and mandible fragments are not associated to T15 80C and T15 80D, for a maximum of six juveniles. However, this assemblage is the remains of at least two juveniles, and I have associated and recorded them as such. Based on the dental ages and the cranial vault thicknesses, T15 80C is around 2-3 years older than T1580D. T15 103B also is a juvenile, consisting of parietal and occipital fragments; not much can be stated beyond the type of bone and the approximate age based on size and thinness. Overall, I have estimated 7 juvenile/subadult remains, which may be more depending how T15 80C and T15 80D are associated, and on the assorted fragments of T15 65B. Pritchard’s catalogue also describes several instances of young remains; overall, these remains indicate many children were not surviving.

In addition to the presence of young remains, the age estimations based on suture closure, dental crown measurements, and dental wear was able to demonstrate relative ages within the collection of a few individuals. These estimations were limited, either because of fragmentation, age, sediment, or lack of teeth. However, they do align many of the more complete crania, and produce a range of adult ages from young to old adults. The relative age rankings based on dental metrics are detailed in Tables 7 and 8, and a comparison between the dental metrics and the suture ages is detailed in Table 9.

**Table 7. Ordinal age rankings based on dental crown height measurements**

ID No.	ULM1	ULM2	URM1	URM2	LLM1	LLM2	LRM1	LRM2	Average	Ordinal Ranking
T15 101		2.6	1.9						2.25	1

T53 3475/ M315	2.85	2.45			3.25	3	0.3	0.6	2.08	2
T15b		2							2	3
T15 106			1.1						1.1	4
T57 3621/ M332				1.8	0.1				0.95	5
T53 3476/ M316	0.7	0.85	0.4	0.1					0.51	6
T15a					0.5	-0.35		0.05	0.07	7

**Table Note:**

These ordinal rankings (listed oldest-youngest, 1=oldest) based on a differential of average crown height. The maxillary average crown height (mm) was calculated as buccal (less worn) - lingual (more worn). The mandibular average crown height (mm) was calculated as lingual (less worn) - buccal (more worn) (adapted from Miles 1963, Mays et al. 1995). Only those first and second molars with all quadrants present for measurement are listed; some molars are not listed because strongly adhering sediment prevented complete analysis.

**Table 8. Ordinal age rankings based on dental attrition (wear) scores**

ID No.	ULM1	ULM2	URM1	URM2	LLM1	LLM2	LRM1	LRM2	Average	Ordinal Ranking
T15b		35							35	1
T15 101		28							28	2
T53 3475/M315	28	28			25	17	20	18	22.67	3
T57 3621/M332				17	16				16.5	4
T15a					18	16		15	16.33	5
T53 3476/M316	10	5	8	5					7	6
T15 106										N/A

**Table Note:**

These ordinal rankings (listed oldest-youngest, 1=oldest) are based on the average of first and second molar wear scores (adapted from Scott 1979, Buikstra and Ubelaker 1994). Only those first and second molars with all quadrants visible for scoring are listed; some molars are not listed because strongly adhering sediment prevented complete analysis. T15 106 could not be scored on age but is included here because this individual's age was estimated based on crown measurement.

**Table 9. Age estimates for crania with suture and dental data**

ID No.	Crown Age	Wear Age	Vault S Score	Lat-Ant S Score	Vault Age	Lat-Ant Age
T15 101	1	1	S3	S6	Middle Adult	Old Adult
T53 3475/M315	2	2	S3	S6	Middle Adult	Old Adult
T15 106	4	N/A	S2	S3	Young Adult	Middle Adult
T57 3621/M332	5	3	N/A	S5	N/A	Middle Adult
T53 3476/M316	6	6	S1	N/A	Young Adult	N/A

**Table Note:**

The individuals are listed in order overall from oldest to youngest, with the oldest individual in the top row, and youngest in the bottom row.

Tables 7 and 8 indicate relative age rankings are concordant between the crown height measurement and wear methods, though T15 106 could not be placed in the ranking for dental wear, as not all four quadrants of the singular first molar present could be scored. Table 9 indicates the two dental ages correlate to the order of the two suture ages. The vault ages and lateral-anterior ages for each individual are different from each other (but the individuals are in the same age relationship within each). The only outliers of this table are T15 106 and T57 3621/M332, which demonstrate opposite relationships in the crown age ranking and the lateral-anterior age estimate. For the former age estimate, T15 106 is older, but for the lateral, T57 3621/M332 is estimated older. However, the ages these two lateral-anterior S scores give (both middle adult) fall into the overall age pattern. The T15 101a mandible was aged using dental metrics (both crown height and wear) but not suture closure since it is an isolated mandible. T15 101a falls out of the dental age pattern (Tables 8 & 9); according to the relative dental age it is the youngest, but according to dental wear scoring is second youngest. However, T53 3475/M316, the youngest in relative age based on crown height, overall appears much younger than T15 101a. The third molars (while not present) had not erupted fully, but their crypts are fully formed; the skull was also fragmented along the sutures and easily reconstructed, indicating that the sutures were not fully fused. The suture ages indicate T53 3475/M316 as a young adult, possibly sub-adult, as the suture closure estimation metric is meant to be for adult crania. However, these few anomalies in the age estimations are to be expected, as they are not objectively accurate, and the sample is highly incomplete.

As the catalogue and Table 6 detail, there is a significant presence of paleopathologies. Many of the remains exhibiting evidence of disease, infection, and/or nutritional deficiency.

Cribra orbitalia and porotic hyperostosis are the most common deficiencies; there are several instances of tooth infections causing tooth loss and ear infections causing mastoiditis (Table 9). The tooth infections and porotic crania suggests that many of these individuals were sick as a result of a poor diet (Ortner, 2003). The discussed presence of numerous children further indicates poor quality of life in some aspect, especially early in age. This does not fit with the image of Gibeon as a fertile land with numerous agricultural resources, as detailed by both biblical narratives and Pritchard (Pritchard, 1957). However, these remains are localized to a particular period in the MBII, so this lack of nutrition cannot be extrapolated for ancient populations at Gibeon as a whole. Further analysis of isotopic ratios (carbon, oxygen, nitrogen, lead, and strontium) from samples of the teeth could reveal detailed information about diet, status, and place of origin for the individuals (Price et al., 2012). Completing isotopic analysis for this purpose is beyond the scope of my project but may be a fruitful area of further research with this material.

The most visually significant example of a paleopathology is T15e, the vertebral column with DISH, diffuse idiopathic skeletal hyperostosis, a disease producing excessive amounts of bone at joint margins and the entheses, which presents most obviously in the spine, where the abnormal bone growth occurs under the anterior longitudinal ligament (Ortner, 2003). Two of the vertebrae of T15c also appear to be exhibiting an early stage of DISH. Given that the majority of the skeletal material present is cranial remains, the presence of a few postcranial remains, including these vertebrae, is anomalous in the context of the collection. Pritchard records many instances of postcrania and entire skeletons in the tombs, but nearly none of those postcranial elements are here (Pritchard, 1963). Why there are postcranial elements present among the current collection Gibeon remains is unclear. In the case of T15e and perhaps T15c,

the remarkable evidence of paleopathology may have been why they were collected and brought back to the Penn Museum. However, this does not explain the presence of the partial femur T57 3620/M331. The femur is very obviously broken (after excavation), so there is the possibility that the entire femur included an interesting pathology or trauma. Otherwise, the remainder of the postcranial material is highly fragmented (T15 65b, T15 65d), and may have thought to be cranial material.

The lack of postcrania, in addition to Pritchard listing human remains by number of “skulls,” may also indicate that perhaps only or primarily crania were being recovered. Indeed, collecting only crania was a fairly common practice until the emergence in the 1970s of bioarchaeology and a standard procedure for documenting archaeological human remains (Buikstra & Beck, 2006). T38 offers evidence that primarily crania were being collected; this is the only tomb where only one skeleton was found, and no grave goods. What is present is the crania and atlas, T38 3474/M314. The lack of presence of the rest of the skeleton seems unlikely to be due to it being lost; more likely it was never brought here. Another possibility is that the postcrania were kept at an institution in Israel or Jordan. Whether the majority of the postcrania were reburied or brought to a local institution, the lack of their presence in the current collection marks an ignorance and absence of much valuable data that could have been assessed through bioarchaeological analyses (Buikstra & Beck, 2006).

One of the postcrania present, the partial femur (T57 3620/M331), was able to be minimally analyzed, as discussed at the beginning of this section. Specifically, three measurements could be taken: the maximum femoral head diameter (breadth), the sagittal subtrochanteric diameter, and the transverse subtrochanteric diameter (Buikstra & Ubelaker, 1994). The femoral head breadth, which can be used to estimate body mass, is 46.6mm. Three

formulas can be used to determine lean body mass (one for males, females, and a combined sex regression), and produced an estimate between 63.78 and 65.79 kilograms (140.6 and 145 pounds), which is within average modern lean body mass estimates (Ruff et al., 2012). Table 10 details the three formulas and body mass estimates. While a more specific age and an estimated sex cannot be established for this individual using the femur, and body mass without data on body height does not provide much information, the body mass estimate does determine that this individual from Gibeon was within average modern lean body mass estimates (Elliott et al., 2012). Interestingly, Pritchard’s team also took a few postcranial measurements in the field. In T38 (discussed above), the "lower leg bones" (likely tibia and fibula together) and femur of the skeleton were measured at 40 cm and 46 cm, respectively (Pritchard, 1963, p. 47). However, in the publication, Pritchard doesn’t explain why the measurements were taken, and not all of the leg bones excavated were measured (1963).

**Table 10. Body mass estimate for T57 3620/M331 using femoral head measurement**

Formula	Group	Kgs	Lbs	Reference
2.18*FHB-35.8	Females	65.788	145.0375	Ruff et al. 2012
2.80*FHB-66.7	Males	63.78	140.6107	Ruff et al. 2012
2.30*FHB-41.7	Combined Sex	65.48	144.3585	Ruff et al. 2012

**Table Note:**

The maximum femoral head diameter measured 46.6 mm. While not used in this calculation, the sagittal subtrochanteric diameter measured 24.4 mm, and the transverse subtrochanteric diameter 33.9 mm.

While incomplete due to the nature of the collection, the observations and estimations I have made for the human remains at Gibeon provide a partial picture, where there was none before. The radiocarbon dating results confirm MBII dates for T15 and T57. Paleopathology indicates many sick individuals died, including children, and at least one person died from severe blunt force trauma. The age estimations follow a logical pattern in relation to each other and the morphological appearances of the crania. The sex estimations fall more into the “probable” and

“indeterminate” categories rather than heavily to a binary of male and female remains. One individual was of average body mass, and another very old individual had severely fused vertebrae. All possible cranial measurements are recorded and can be used in further analysis. In the case of T57, the remains present can be tentatively associated with specific objects catalogued at the Penn Museum. This association confirms the MBII date based on ceramic chronology, alongside the radiocarbon date for the tomb. Otherwise, Pritchard’s failure to assign specific field numbers for the majority of the remains, as well as the lack of cataloguing, indicates a massive loss of information, which cannot be ignored in the context of this collection. Overall, through my multimodal research process, I have able to see the large gaps in the record of the human remains at Gibeon and have attempted to fill these as I can through my analyses and have noted where it is impossible to do so.

## **5. DISCUSSION**

### **5.1 On the Politics of Archaeology in Palestine/Israel**

Whether archaeology should try to be separated from political frameworks is a matter that archaeological theory has confronted head on. Lynn Meskell speaks generally on intersections of identity and politics in archaeology, and the disjunctions between archaeological theory and classic anthropological theory. Meskell (2002) describes a phenomenon at the end of the 20<sup>th</sup> century wherein two changes in archaeological interpretation occurred. The first shift was in the way social identity in past society was theorized; previously, social identity was

largely based on ethnicity; its definition expanded to include experiences such as gender and sexuality. The second shift was a rise of a politicized and ethical archaeology, whereby the field recognizes its “active role in contemporary culture and is enunciated through the discourses of nationalism, sociopolitics, postcolonialism, diaspora, and globalism” (2002, p. 279). Meskell explains both of these trends as having been shaped by changing anthropological and social theory, but also driven by the “voices of once marginalized groups and their new places in the circles of academic legitimacy” (p. 279). The space for academic thought in archaeology was widened and new voices were added, thereby enlarging the discourse in an archaeological context.

Archaeologically investigating aspects of identity such as ethnicity, gender, and sexuality necessarily relates the past to the present, weighing these multitudes of identity not as discrete entities but continuous and each informative of the interpretations of the other. As Meskell argues, archaeological research on identity formation forms a space for contemporary questions about origins, legitimacy, ownership, and rights, and allows for input from new scholars and fields (2002, p. 287). Meskell’s arguments are highly relevant in considering the relationship between archaeology of ancient sites in Palestine, like Gibeon, the determinations of the past identities of these sites, and the contemporary geopolitical context of the area. One can hardly conceive of or consider ancient sites in Palestine without considering the many narrative histories of the area, relating to the various populations which have called the land home over thousands of years. The interpretations of these identities of past peoples can create deeply held tensions, particularly given the current geopolitical instability of the area. These tensions indicate that any archaeology in Israel/ancient Palestine is inherently political, a status that cannot be avoided, nor should be.

In the area of ancient Palestine that is now the state of Israel, archaeology became intimately tied to the state and its goals during the period of the state's formation in the early 20<sup>th</sup> century (El-Haj, 2001). Understanding the history of archaeological practice in Israel is essential for understanding the place of human archaeological remains in Palestine. This includes understanding how archaeology has been undertaken historically, what it contributes to the state's ideology, and how its practice is now continuing in various, and sometimes contrasting, narratives (Finkelstein, 2002). As the excavation of Gibeon occurred during a politically tumultuous period (1956-1962), this historical understanding is essential to placing the excavation of the site within its geopolitical context.

Israel today contains long-standing sites considered integral to all three monotheistic faiths, and the land these sites sit on and within has been politically, socially, and culturally contested, "changing hands" so many times over the past few thousand years as one type of state was succeeded by another. Many of Israel's sites are recorded in religious texts, and Israeli archaeology has been inextricably tied with these biblical sources (Finkelstein 2002). Israeli archaeology is considered a subset of the wider transnational field of Biblical archaeology (Moore & Kelle, 2011). Thus, the majority of early archaeology done was solely to confirm religious narratives. Both Israeli and non-Israeli scholars have largely concurred that archaeology became an essential project of Zionism, in order to confirm and legitimize the historical right of the Jewish people to the land of Israel as its indigenous people (Finkelstein & Silberman, 2002, Meskell, 2002, Zerubavel, 2005, El-Haj, 2003, Susser, 2012). Archaeology also served, and continues to serve, an important role in creating and maintaining collective cultural memory (Ben-Yehuda, 1996, Meskell, 2002). Scholars who have been critical of Zionism emphasize that archaeology was intensely used by the state early on, being funded and undertaken with very

specific goals in mind—establishing and confirming a legitimate Jewish claim to the land (El-Haj, 2001). Such anti-Zionist scholars point out the biases and flaws of biblical archaeology in Israeli altogether, due to the archaeology’s codependence on the narratives put forth in religious texts and focus on placing these narrative within specific geographies (Zevit, 2002).

Israel Finkelstein, a preeminent scholar of ancient Israeli archaeology, views that archaeology has helped reconstruct the history behind the Hebrew Bible, and while the text should not be considered fact, it should not be discredited entirely either, especially where narratives do align with systematic archaeological analysis (Finkelstein, 2002). Nadia Abu El-Haj, an American-Palestinian scholar, is deeply critical of Biblical archaeology and the dependence on religious texts in archaeology. She considers archaeology in Israel to be closely connected with the dispossession of Palestinian people from what they also consider their historical homeland, and that the specific way in which archaeology has been undertaken continues to legitimize the “colonial” rule of Israel (El-Haj, 2001).

The history of historical narratives and of archaeological analysis in Israel is incredibly complex, and the two have not always acted in favor of one another. The validity of one over the other, or the degree of validity when combined, continues to be hotly debated today. In relation to the ongoing Arab Israeli conflict, knowing the historical uses of archaeology in Israel matters. As a result of the heavy emphasis Biblical archaeologists place on biblical narratives, the stories and histories of the Arabs—specifically the Palestinian Arabs—have been deemphasized, nearly erased. In her book, El-Haj includes a quote on this from the Israeli news site, *Ha’aretz*:

“The Palestinian search for national historical depth pushed Palestinian researchers and politicians to fashion a direct connection, virtually impossible, with peoples and politicians who lived in the land before its conquest by the Hebrews; on the one hand,

and to deny or ignore the prominent Jewish presence in the history of the country, on the other. From this perspective the Canaanites, the Jebusite, [...] the Adomites and the Nabateans were Arab tribes” (250).

Israel’s historical depth, in the narratives of important written documents and validated by early archaeological ventures, proved crucial to the Zionist cause. The lack of a similar background for the Palestinians—and the absence of their histories from Biblical archaeology—certainly contributed to the justification for a Jewish nation-state having a right over the “holy land” (Alter, 1973). In Israel, archaeology took a political stance early on, and archaeology here can never be completely separated from politics, from historical narratives, or from identity.

The excavations at Gibeon, though under an American director (Pritchard), are still tied into the political framework of the area, in terms such as who held authority over the site, who was able to claim material from it, where the scholars working on it came from, how permission was obtained from the local people in al-Jib to do the excavation on their land, etc. The site of Gibeon was part of Jordan when it was excavated between 1956 and 1962, and part of Palestine prior to 1948, when the British Mandate of Palestine was ended, and Israel given statehood (Applied Research Institute – Jerusalem, 2012). In 1967, a six-day war broke out, during which Israel controlled the West Bank, and resulting in reconfiguration of Israel’s boundaries. From 1967 until 1995, the site (as congruent with the city of al-Jib) was entirely seized by Israeli authority. Today, the site of Gibeon still sits in what is termed the West Bank, and the nearby village of el-Jib is considered Palestinian, even as it sits under Israeli control. Israel built a “separation wall” in 2005 around el-Jib and other villages, forming an enclave that prevents Palestinian inhabitants without Israeli citizenship or permanent residency from having direct access to Jerusalem and other Israeli settlements. (Applied Research Institute – Jerusalem, 2005).

Today, Ministry of Planning and International Cooperation (MOCIP) of the Palestinian National Authority (PNA) lists Al Jib as an "Endangered Cultural Heritage Sites in the West Bank Governorates" due to the excavations of ancient Gibeon (Jerusalem Media & Communication Centre 1999).

The material from Gibeon cannot be separated from this historical context; due to the politically fraught situation and enclosure within an Israeli state enclave, this area has extremely limited access by archaeologists today. Further, how the past of Gibeon is interpreted is inherently political, as these interpretations will determine what any excavated material means in the narrative of Israeli history and Jewish claims of residence. Gibeon's identification as a biblical site that was folded into the history of the Israelites remains pertinent for both its modern identity as an Arab village (al-Jib) and its inaccessibility. Pritchard's excavation at Gibeon skirts around the politics, mentioning gunfire and the nearby border, but never directly confronting it (Pritchard, 1962). The geopolitical context of the site may have ultimately been what rushed the archaeological work, which in turn was criticized for failing to build an accurate history for the site (Galling, 1965). Any attempt to build this history, such as merging the site with its modern context and restoring data never gathered during excavation, as my project is doing, is a political act, and is valuable especially given the restricted enclave the site and the village of al-Jib are now enclosed in.

Some Israeli scholars have called for a detachment of politics from scientific work such as archaeology, with the goal of more objective, truly scientific work. Of course, this itself can be critiqued, for it is highly questionable that any work is truly objective. Leaving these critiques aside, striving for a perfect scientific process is neither a useful nor realistic goal. Israeli archaeology can never be truly separated from politics while there are ongoing arguments about

national ideology, identity, and claims to land. In general, archaeology is likely to be political almost anywhere it is done (El-Haj, 2001, Meskell, 2002). The isolation of archaeological work, from either politics or from written history, makes it less accessible to both analysis and critiques of it. Arguably, the integration of archaeology with other cultural and scholarly issues is precisely what makes archaeology both valuable and open to critique. Furthermore, the continued political element of Israeli archaeology as well as the interpretation of biblical texts means that these histories remain dynamic and relevant in their various (mis)uses. After all, “history is not the past. The past is always a created ideology with a purpose, designed to control individuals, or motivate societies, or inspire classes. Nothing has been so corruptly used, as concepts of the past” (Alter, 1973).

In this section, I do wish to emphasize that I do not have a personal or family history with Israel (I am not Jewish) and I speak neither Hebrew nor Arabic. Consequently, I view these limitations as a specific lens through which my interpretations about Gibeon are filtered. In order to hopefully somewhat lessen this limitation, I took a course in the spring 2018 semester about Middle Eastern conflict spanning the past one-hundred years, with the Israeli-Palestinian conflict as one of the three conflicts focused on in the course. As part of this class, I was able to travel to Israel and Jordan over a week’s time, visiting cultural sites that have been impacted by the conflict, such as Jerusalem. While I was not able to visit the site of Gibeon due to both time and the inaccessibility of the site, this trip gave me a more direct framework for how political conflict has broadly affected the lives of the people in these countries. Visiting Israel and Jordan allowed me to deeply consider how national identity and geopolitics involve tangible cultural heritage sites in the area, an entanglement which my research on Gibeon is directly part of.

## **6. CONCLUSION: THE VALUE OF REVISITING OLD SKELETAL COLLECTIONS**

Here I have presented my project on revisiting Gibeon through an integrated bioarchaeological approach, engaging in cross-disciplinary research methods in order to expand and integrate knowledge about the collection. This assemblage of human remains from Gibeon is fundamentally fragmentary; what is lost can never be fully recovered or restored. However, this does not mean there is no potential held in the remains; quite the opposite. The very act of investigating them, of building a post-excavation history for them, holds value. I see my project as building biographies for these human remains (Daston, 2000), enriching their status as objects within a museum collection. I have built these biographies primarily through my osteological analysis and catalogue, my recovery of the available history of the bones within the Penn Museum, and by placing these remains in the wider context of the political nature of archaeology in Palestine, especially as the site is now within the West Bank. This latter discussion could very well constitute a whole project itself, and may be a productive direction for further research, broadening and encompassing beyond what I have through my analyses. I envision my project as the foundation for these human remains, a layer that can be added to, complicated, expanded in every direction.

The very idea of how human remains are considered within Museum collections makes valuable revisiting collections of human remains, particularly ones with fragmented or empty archives such as this one. While I cannot recover everything that was lost from the excavation to the museum, the noticing of this loss is important, and provides a picture for how these remains were prioritized at the time of their excavation. Revisiting an old collection always has the potential to unearth, revise, and build its biographies. The specific intersection of Gibeon's human remains with bioarchaeology, archival records, museum collections, and political

contexts allowed me to build and execute an integrated approach in studying them. I am not seeking to definitively answer every question about the people living in Bronze Age Gibeon, for many of these questions are unanswerable. I am not seeking to overturn the identification of the site itself. Rather, my questions about the remains and the context of their excavation guided my research such that I was able to visibly uncover gaps in Gibeon's archive and create a mechanism by which to fill those gaps, synthesizing osteological analysis with the remains' historical and contextual framework. Now distinctly aware that these human remains were not relevant to the goals of Pritchard and his team at the time the Gibeon was excavated, I hope that my project has made clear ways in which the human remains can continue to be relevant, over fifty years after they were pulled from the ground.

## ACKNOWLEDGEMENTS

My utmost thanks are due to Janet Monge and Paul Mitchell, without whom this project would not have been possible. Janet, thank you for your constant kind words, support, and guidance. Paul, thank you for going above and beyond in mentoring me and answering every single one of my questions throughout this process. In particular, I am grateful for your significant help with the dental age estimations, and advice on throughout the process of osteological analysis. I also would like to thank Katherine Moore, who assisted graciously with identification of the faunal fragments, as well as Marie-Claude Boileau, who assisted with x-raying of the juvenile mandibles and maxilla fragment. To Sarah Linn and the Penn Museum Fellows program, thank you for the support, feedback, and space. This project was also supported by the Wolf Humanities Center and the Center for Undergraduate Research and Fellowships, without either of whom much of the analysis would not have been able to be done. My gratitude is also extended to all those in the Penn Museum who I spoke to and who assisted me in gathering together the pieces of Gibeon, including Chrisso Boulis, Alex Pezzati, and Katherine Blanchard. Finally, thank you to my mother, Kari Jensen, for the constant words of encouragement.

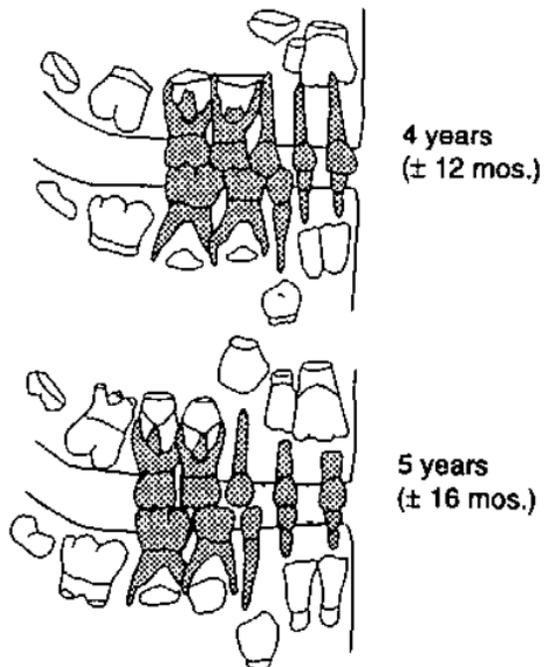
## FIGURES

**Figure 1. X-ray of T15 80D, the left side of a juvenile maxilla**



*x-ray image taken by Dr. Marie-Claude Boileau in the Center for the Analysis of Archaeological Materials at the Penn Museum.*

**Figure 2. Sequence of formation and eruption of teeth**



*image from Buikstra & Ubelaker, 1994, p. 51*

**Figure 3. T57 tomb plan drawing**



image from Pritchard, 1963, p. 59

**Figure 4. Asia Halaby's field notes detailing number of objects from T10-T22A**

<u>Tomb No</u>	<u>Pottery</u>	<u>Other</u>	<u>Total</u>
T.10	7	-	7
T.10A	52	6	58
T.10B	108	38	146
T.10AB	8	1	9
T.11	7	3	10
T.12	6	2	8
T.13	8	4	12
T.14	15	1	16
T.15	109	29	138
T.16	21	15	36
T.19	4	-	4
T.20	14	3	17
T.22	30	7	37
T.22A	6	-	6
T.21	1	-	1
	<u>396</u>	<u>109</u>	<u>505</u>

image from the Gibeon excavation records in the Penn Museum archives, Box 2

Figure 5. T38 first page of field notes

Tomb 38

6/27/62 Book 4: 61, 63, 64, 65, 67-75, 78, 79

SHAFT DIAMETER - 90 cm.  
SHAFT DEPTH - 120 cm. (west) - 160 cm. (east)  
SHAFT CHAMBER DOORWAY  
HEIGHT - 65 cm.  
WIDTH - 60 cm.

CHAMBER  
MAXIMUM HEIGHT - 100 cm.  
AREA - 1.766 sq. m.

HUMAN SKULLS - 1  
SCARABS - none  
OTHER CATALOGUED OBJECTS - none  
PERIODS OF USE - uncertain

Tomb 38 proved to be something of an enigma in that it failed to produce a single object apart from a human skeleton. Beyond doubt the tomb had previously been entered and robbed, but such a complete removal of grave goods is rather unusual.

The entrance to the tomb was first discovered when only a few cm. beneath the surface an opening in the bedrock was observed into which the loose dirt was falling. This opening was on the west side of the tomb shaft & was through the upper part of the doorway from the ~~the~~ shaft into the tomb chamber. The area above the tomb & the western part of the shaft had been quarried away, but to the east what may have been the full extent of the shaft remains in place.

As further evidence that the tomb had

image from the Gibeon excavation records in the Penn Museum archives, Box 2

Figure 6. T53 first page of field notes

TOMB 53

7/18/62

Book 4A: 8, 9, 40, 41, 47, 54, 55,  
63, 75  
(see also Book 7)

SHAFT DIAMETER - 125 cm. (max.)  
SHAFT DEPTH - 200 cm.  
SHAFT CHAMBER DOORWAY  
HEIGHT - 90 cm.  
WIDTH - 55 cm.  
CHAMBER  
MAXIMUM HEIGHT - 100-125 cm. (roof fall)  
AREA  
HUMAN SKULLS - 3  
SCARABS - 0  
OTHER CATALOGUED OBJECTS - 0  
PERIOD OF USE - MBI ?

Tomb 53 has one of the deepest shafts and largest chambers so far encountered this season. At the same time, however, it contained nothing whatsoever in the way of grave goods. Only three disarticulated burials were found in the chamber.

The upper part of the shaft was packed with soil and rocks. At a depth of ca. 70 cm. humus fill began appearing which gradually changed to mostly humus. At a depth of ca. 110 cm. the top of a doorway appeared to the E. The upper ca. 15 cm. of the doorway was not blocked, but beneath this a doorstone was in place. This stone was 80 cm. wide, 60 cm high & 12 cm. thick. In the center of the shaft another stone was wedged against this door stone.

image from the Gibeon excavation records in the Penn Museum archives, Box 2

Figure 7. T57 first page of field notes

TOMB 57

8/1/62

BOOK 4A: 82, 83, 88, 89, 92, 93, 95-97,  
100, 101, 108, 109, 118, 119,  
122, 123, 126, 127.

SHAFT DIAMETER - 125 cm.  
SHAFT DEPTH - 400 cm.  
SHAFT CHAMBER DOORWAY  
HEIGHT - 75 cm.  
WIDTH - 60 cm.  
CHAMBER  
MAXIMUM HEIGHT - 145 cm.  
AREA -  
HUMAN SKULLS - 4 (3 broken, 1 fragmentary)  
SCARABS - 1  
OTHER CATALOGUED OBJECTS - 61  
PERIODS OF USE - MBI, MBII

Tomb 57 is the largest tomb ~~in area~~ found this season & is also one of the most well preserved. In the S. there was heavy roof & wall fall, but to the N. where the bodies & the majority of grave goods were placed, only moisture, ~~and~~ decay, & the inevitable vine roots had served to disturb the remains. An excellent selection of MBII objects were found on the surface, or only slightly buried. Buried in the fill to the rear of the chamber several MBI jars were found, many still intact.

The shaft of <sup>the tomb</sup> T57 is the deepest (4.0m.) found ~~so far~~ at el-jih. For its entire depth, apart from the usual surface fill at the very top, it was filled with medium sized stones surrounded by loose soil.

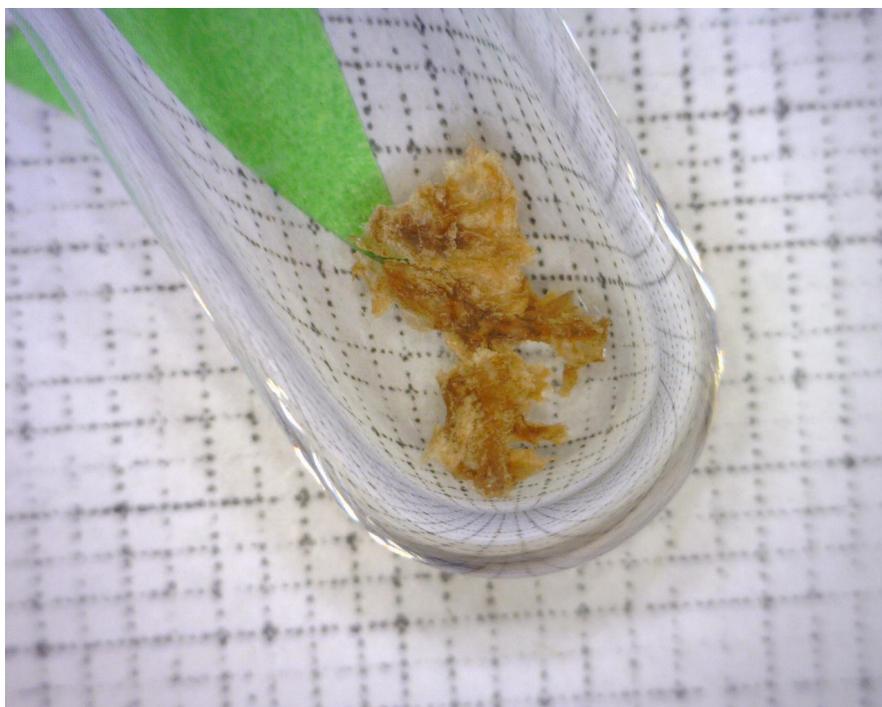
image from the Gibeon excavation records in the Penn Museum archives, Box 2

**Figure 8. Whole sample of T15 65 fragment used for radiocarbon dating**



*Picture provided by Beta Analytic Laboratories*

**Figure 9. Analyzed sample of T15 65 fragment used for radiocarbon dating**



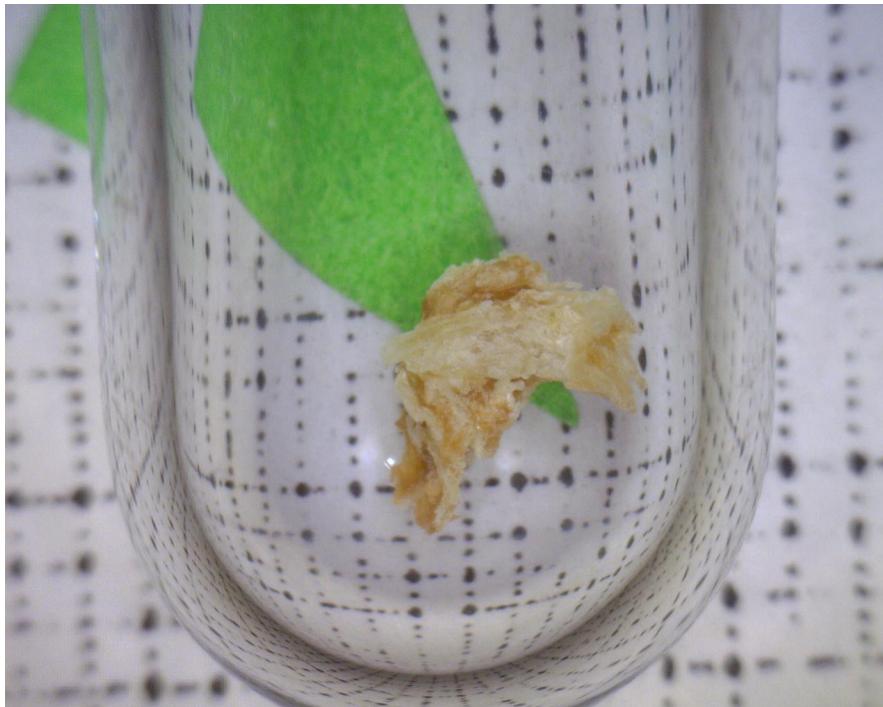
*Picture provided by Beta Analytic Laboratories*

**Figure 10. Whole sample of T57 3620/M331 fragment used for radiocarbon dating**



*Picture provided by Beta Analytic Laboratories*

**Figure 11. Analyzed sample of T57 3620/M331 fragment used for radiocarbon dating**



*Picture provided by Beta Analytic Laboratories*

## APPENDIX A: PHOTO CATALOGUE

Photos of the more complete cranial elements (crania, maxilla, mandibles) and postcranial fragments are attached below; the photos of especially fragmented crania and postcrania are not included (4.2). All crania are photographed in the six *norma* planes of Frankfurt Horizontal: *frontalis*, *occipitalis*, *lateralis* (left and right), *verticalis*, and *basilaris*. Features are also shown, including pathologies and traumas. Noncranial remains are photographed on at least two sides; mandibles are photographed from above to show the dental arch.

### 1.T15 7

Photo 1. *Norma frontalis*



Photo 2. *Norma occipitalis*



Photo 3. *Norma lateralis* (left)



Photo 4. *Norma lateralis* (right)



Photo 5. *Norma verticalis*



Photo 6. *Norma basilaris*



**2. T15 65A**

Photo 1. *Norma frontalis*



Photo 2. *Norma occipitalis*



Photo 3. *Norma lateralis* (left)



Photo 4. *Norma lateralis* (right)



Photo 5. *Norma verticalis*



Photo 6. *Norma basilaris*



Photo 7. Feature: postmortem fracture (taphonomic feature)



**5. T15 80A**

Photo 1. *Norma frontalis*

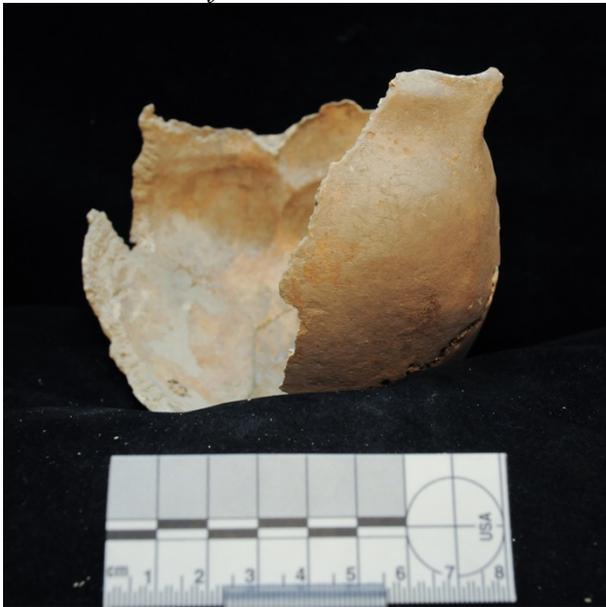


Photo 2. *Norma occipitalis*



Photo 3. *Norma lateralis* (left)



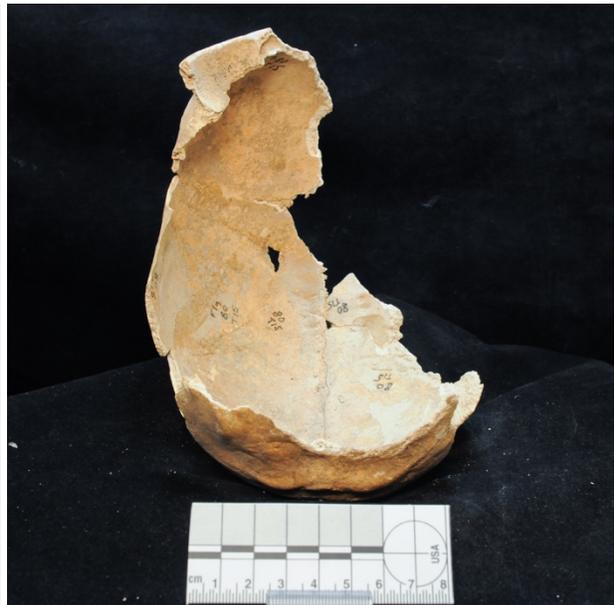
Photo 4. *Norma lateralis* (right)



Photo 5. *Norma verticalis*



Photo 6. *Norma basilaris*



**6. T15 80B**

Photo 1. *Norma frontalis*



Photo 2. *Norma occipitalis*



Photo 3. *Norma lateralis* (left)



Photo 4. *Norma lateralis* (right)



Photo 5. *Norma verticalis*



Photo 6. *Norma basilaris*



Photo 7. Cribra orbitalia, left orbit

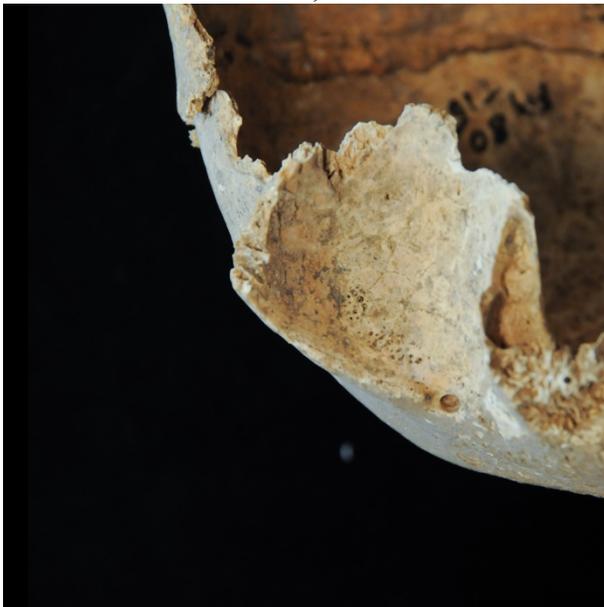


Photo 8. Cribra orbitalia, right orbit



**7. T15 80C (mandible only)**

Photo 1. Superior view of mandible



**8. T15 80D (mandible and maxilla only)**

Photo 1. Superior view of mandible



Photo 2. Inferior view of maxilla



9. T15 83

Photo 1. *Norma frontalis*



Photo 2. *Norma occipitalis*

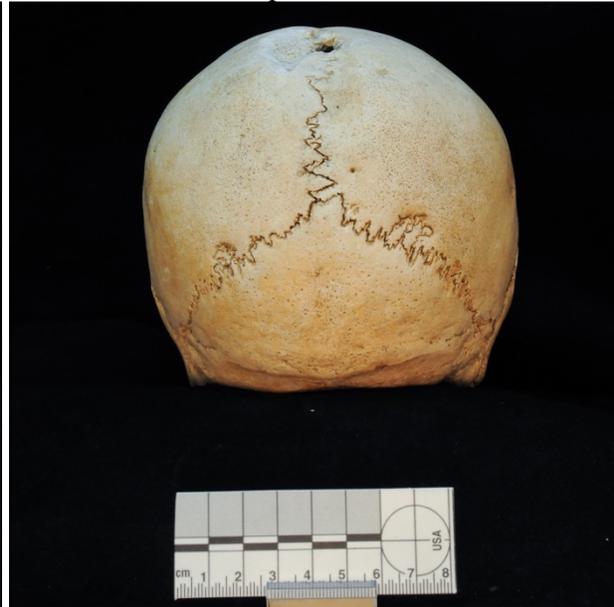


Photo 3. *Norma lateralis (left)*



Photo 4. *Norma lateralis (right)*



Photo 5. *Norma verticalis*



Photo 6. *Norma basilaris*



Photo 7. Porotic hyperostosis view 1

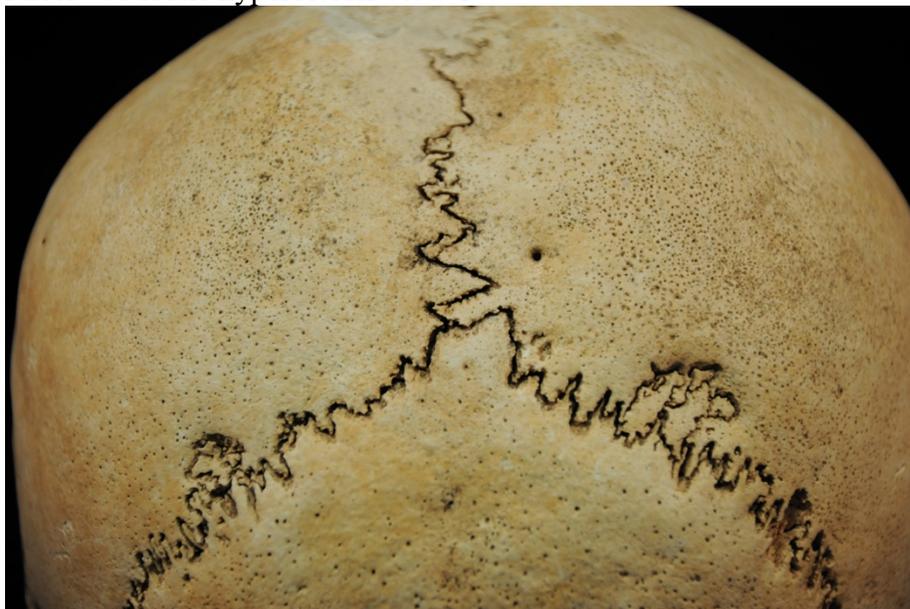


Photo 8. Porotic hyperostosis view 2



Photo 9. Midsagittal depression



Photo 10. Possible ring fracture



Photo 11. Mastoiditis



Photo 12. Maxillary arch



**10. T15 101**

Photo 1. *Norma frontalis*



Photo 2. *Norma occipitalis*



Photo 3. *Norma lateralis* (left)



Photo 4. *Norma lateralis* (right)



Photo 5. *Norma verticalis*



Photo 6. *Norma basilaris*



Photo 7. Mastoiditis



**11. T15 103A**

Photo 1. *Norma frontalis*



Photo 2. *Norma occipitalis*



Photo 3. *Norma lateralis* (left)



Photo 4. *Norma lateralis* (right)



Photo 5. *Norma verticalis*



Photo 6. *Norma basilaris*



Photo 7. Cribra orbitalia, left orbit

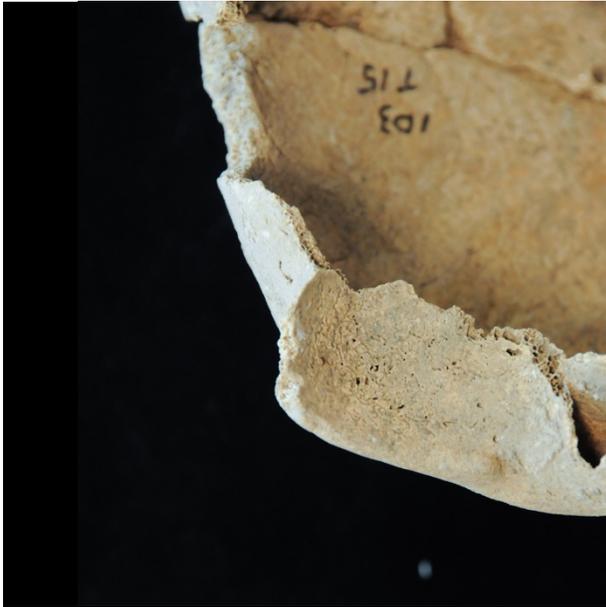


Photo 8. Cribra orbitalia, right orbit



Photo 9. Midsagittal depression



Photo 8. Taphonomic surface wear



**13. T15 106**

Photo 1. *Norma frontalis*

Photo 2. *Norma occipitalis*



Photo 3. *Norma lateralis* (left)



Photo 4. *Norma lateralis* (right)



Photo 5. *Norma verticalis*



Photo 6. *Norma basilaris*



14. T15 124

Photo 1. *Norma frontalis*



Photo 2. *Norma occipitalis*



Photo 3. *Norma lateralis (left)*



Photo 4. *Norma lateralis (right)*



Photo 5. *Norma verticalis*



Photo 6. *Norma basilaris*



Photo 7. Fracture from blunt force trauma



Photo 8. Fracture from blunt force trauma



Photo 9. Fracture from blunt force trauma



**15. T15a (mandible)**

Photo 1. Superior view of mandible



**16. T15b (mandible)**

Photo 1. Superior view of mandible



**17. T15c (3 vertebrae: T11, L3 & L4)**

Photo 1. Superior of L3 & L4, posterior up



Photo 2. Inferior of L3 & L4, posterior up



Photo 2. Left lateral of L3 & L4, superior up



Photo 1. Posterior view of L3 & L4, superior up



Photo 4. Superior view of T11, posterior up



Photo 5. Inferior view of T11 posterior up



**18. T15d (sacrum)**

Photo 1. Anterior view of sacrum



Photo 10. Posterior view of sacrum



**19. T15e (fused vertebral column)**

Photo 1. Right side of vertebral column



Photo 2. Left side of vertebral column



20. T38 3474/M314

Photo 1. *Norma frontalis*



Photo 2. *Norma occipitalis*



Photo 3. *Norma lateralis* (left)



Photo 4. *Norma lateralis* (right)



Photo 5. *Norma verticalis*

Photo 6. *Norma basilaris*



Photo 7. Closeup of postmortem cranial fracture



21. T53 3475/M315

Photo 1. *Norma frontalis*



Photo 2. *Norma occipitalis*



Photo 3. *Norma lateralis* (left)



Photo 4. *Norma lateralis* (right)



Photo 5. *Norma verticalis*



Photo 6. *Norma basilaris*

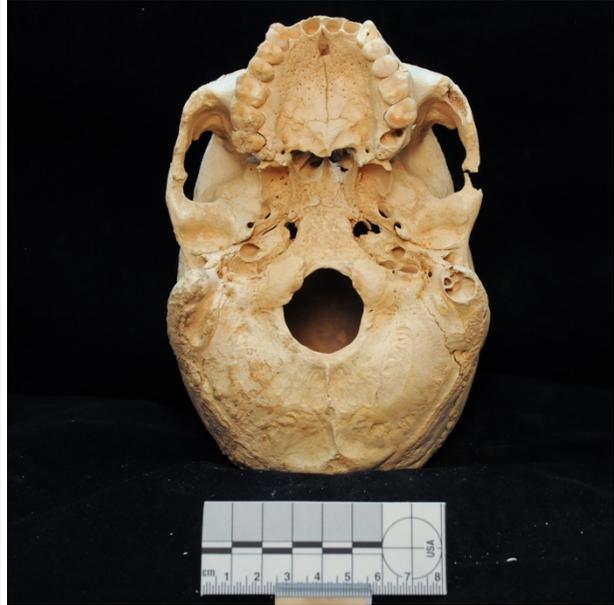


Photo 7. Ectocranial depression 1



Photo 8. Ectocranial depression 2



Photo 9. Mastoiditis



Photo 10. Superior view of mandible



22. T53 3476/M316

Photo 1. *Norma frontalis*



Photo 2. *Norma occipitalis*



Photo 3. *Norma lateralis* (left)



Photo 4. *Norma lateralis* (right)



Photo 5. *Norma verticalis*



Photo 6. *Norma basilaris*



Photo 7. Cribra orbitalia, left orbit

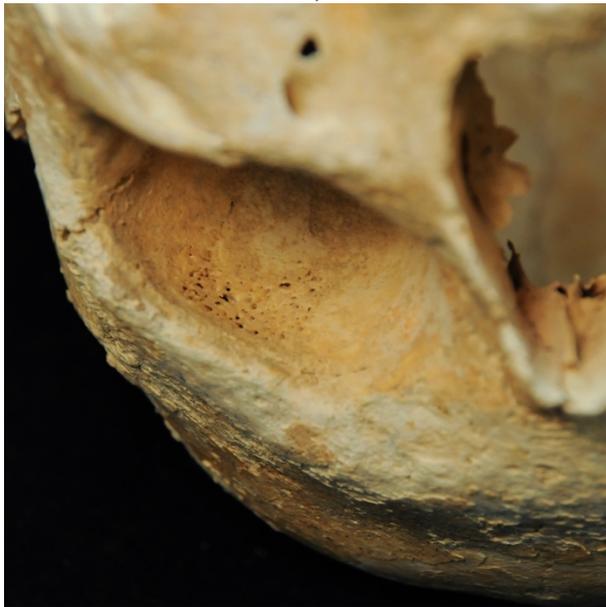


Photo 8. Cribra orbitalia, right orbit



Photo 9. Left maxillary dental arch



Photo 10. Right maxillary dental arch



**23. T57 3620/M331 (femur)**

Photo 1. Anterior view of femur

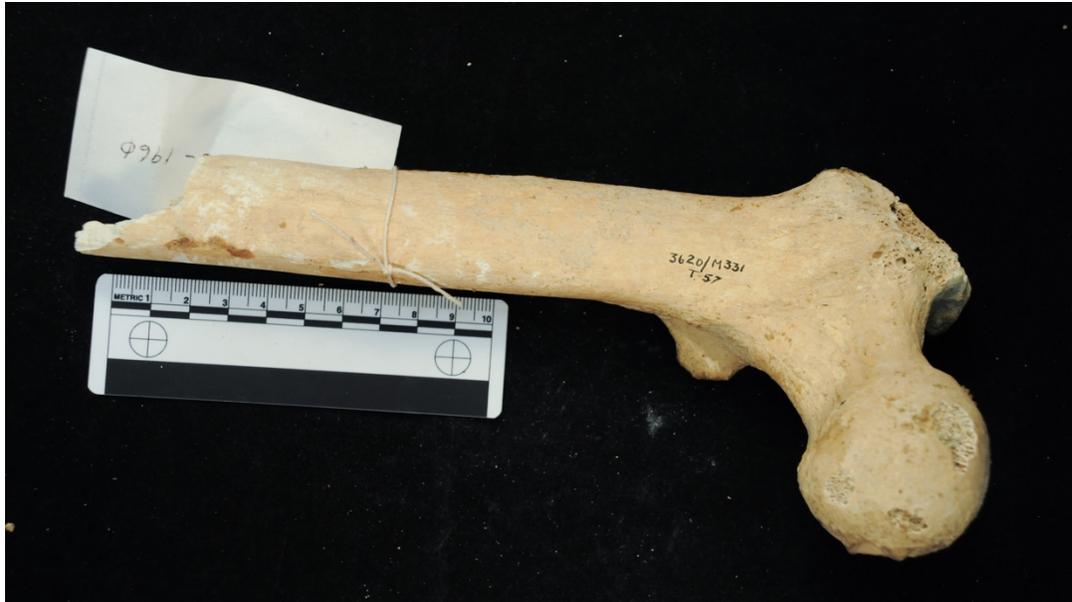


Photo 2. Posterior view of femur



**24. T57 3621/M332**

Photo 1. *Norma frontalis*



Photo 2. *Norma occipitalis*



Photo 3. *Norma lateralis* (left)



Photo 4. *Norma lateralis* (right)



Photo 5. *Norma basilaris*



Photo 6. Superior view of mandible



\**Norma verticalis* not able to be photographed

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