The Osteological Paradox: Absence of Evidence is not Evidence of Absence
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Abstract
During the summer 2019 field season, ten human skeletons were excavated from the ongoing project (PAH-178) at the Hospital Hill Royal Navy Cemetery that was operational between the years of 1793-1822 on the island of Antigua, near English Harbour. As a student of Dr. Trena Swanston, a professor of MacEwan University, and one of the researchers invested in the project, I was hired as a research assistant and excavating archaeologist to assist with analyzing the skeletal remains excavated from a burial site associated with the Royal Navy Hospital for evidence of pathological changes.

Introduction: The Site (PAH-178)
The cemetery is associated with a colonial British Royal Navy hospital which dates between 1793-1822 (Image 1). The area in which the site is located is now a residential neighborhood situated not far from English Harbour (Image 2). The skeletal remains associated with the cemetery are at risk of destruction due to necessary residential construction in the area. The ongoing archaeological research in the area has mitigated issues representing a healthier individual than one without any evidence of skeletal changes or abnormalities, as they may have succumbed to a given disease far earlier than the individual with skeletal changes present (Wood et al., 1992).

Methodology
Over three weeks, six archaeology students worked six days a week to excavate at the site of the Hospital Hill cemetery on Hospital Hill Road, Antigua. At least ten human skeletons were excavated from the west side of the property. Careful excavation of the human remains occurred, photographs were taken of each individual and we did visual analysis of all bones and bone fragments for evidence of changes or abnormalities before packing up the skeletal elements for further analysis and cataloging and eventual reburial.

Bone Remodeling
Bone is a living tissue that undergoes continuous remodeling throughout life necessary for structural integrity, healing, and for its metabolic functions. Mature bone is removed by a process called bone resorption, and new bone tissue is formed by a process called bone ossification. Bone changes seen in paleopathology are usually representative of chronicity, meaning that an individual would have had to live with a condition for a period of time for which bone changes to occur, that the body reacted to said condition by forming and/or destroying bone.

After a few weeks, we noticed the remains appeared to be those of relatively young individuals at their time of death. Their teeth were in surprisingly good condition — although preservation of the bone was poor — along with very limited evidence of bony changes or pathologies. This is known as the osteological paradox. However, we did not find any evidence of pathological changes at site PAH-178 during the 2019 field season.

Results
No evidence of pathological skeletal changes were found on the remains excavated from PAH-178 except for evidence of healed radial fractures where thickened bone can be seen along the shaft of a right radius below the radial tuberosity on individual G35-R1 (Image 3). This fracture would not have been associated with the death of the individual as the bone had long since healed. The fracture may have occurred in adolescence, due to the complete, although improper, healing of the fracture and the likely young age of the individual. No evidence of infectious disease or other evidence of premortem trauma or damage was found on the ten individuals.

Discussion
In carrying out the excavation we noticed the remains appeared to be those of relatively young individuals at their time of death. Their teeth were in surprisingly good condition — although preservation of the bone was poor — along with very limited evidence of bony changes or pathologies. This is known as the osteological paradox. However, we did not find any evidence of pathological changes at site PAH-178 during the 2019 field season.

Conclusion
Individuals interred at the Hospital Hill Royal Navy Cemetery in Antigua who were brought to the West Indies to assist in British colonial efforts succumbed quickly to tropical diseases upon reaching the Caribbean. Large numbers of individuals perished daily, and were buried at the cemetery associated with the hospital, which is now a residential neighborhood. As no evidence was found on the ten individuals excavated from PAH-178 of bony changes associated with disease, it is clear that the individuals quickly perished upon being infected with tropical diseases. These individuals, although seemingly young, may have been weakened by long periods at sea from Britain to the West Indies, which may have played a part in their mortality.

While the team did not find any evidence of pathologies, important work was still accomplished as necessary residential development for the community can continue in the area, and skeletal remains were ethically recovered to continue our understanding of colonial life in Antigua, and for reburial at a more appropriate location in the future.

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References