Taphonomy Assignment
Course: ANTH-3405H
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The specimen used for the taphonomy assignment is a humerus from a chicken (Figure 1). The chicken humerus was collected from the leftovers of a chicken wing meal at a local restaurant, Portly Piper Oshawa. The specimen had been cooked before the assignment. The wings were unbreaded, fried, and seasoned with a dry garlic parmesan rub. After the meal, the humerus was wiped off, wrapped in a restaurant napkin, and transported home. After photographing the specimen from various angles (Figure 2), the chicken humerus was ready for the taphonomy assignment. The specimen appeared to have discolouration throughout the diaphysis and the proximal and distal ends. The discolouration appeared to have been from the cooking of the bone. The periosteum is seen to have been peeling off the bone on the proximal end (Figure 2). Portions of the diaphysis felt dry, particularly where there was no periosteum present, but the overall texture of the bone was greasy and sticky. The specimen was as firm as far as cooked bones go.

On January 15th, 2024 the specimen was placed in a small canning jar. The placement of the chicken humerus took place immediately following the photographs (Figure 2) mentioned above. The size of the canning jar used was a half-pint jelly jar (Figure 3), which holds 8oz or 250ml. The canning jar was filled with standard white vinegar containing 5% acetic acid per volume, after the placement of the chicken humerus. Note that there had been no water exposure to the specimen; it was not washed before placement in the canning jar. The jar was closed firmly and placed in an upper cupboard above the kitchen sink. The specimen was not observed during this first week, as the observations were to begin on January 22nd.

Through the weeks of January 22nd, 29th, February 5th, and 12th, the specimen remained in the cupboard. The chosen cupboard for placement contains dishes used daily. Considering the frequency of the cupboard use, the specimen was exposed to both natural and artificial sources of light, for short intervals, throughout its time in the cupboard. It is undeterminable if the exposure to light had any impact on the results of the taphonomic changes to the specimen, as there is no second specimen to compare with. The specimen was taken out of the cupboard and photographed on February 5th, 2024. After the photographs were taken, the specimen was promptly placed back into the cupboard.

Due to a previous experiment using the femur of a chicken, there were preconceived notions as to what changes would occur to the humerus submerged in a vinegar solution. Once a bone is submerged in a vinegar solution, the acid, although mild, begins to eat away at the calcium minerals within the bone. Consequently, the disintegration of the calcium minerals causes the bone to lose its density and firmness. This process usually takes three to five days, which is a much shorter period than the five weeks the specimen was submerged in a vinegar solution. Considering the length of time the specimen was submerged, it was expected to be flaccid and perhaps gelatinous by February 5th, 2024.

During the weeks of January 22nd and 29th, The chicken femur was observed, but not removed from the cupboard. The specimen was not photographed during these weeks. In hindsight, the lack of photography for these weeks was an oversight. All changes, despite how minor, should have been documented with photography. During those weeks, the specimen began to undergo colour changes. As visible in the photographs from January 15th, 2024 (Figure 2), the chicken humerus was discoloured on the proximal and distal ends. The discolouration appeared to be earthy colours ranging from dark brown to dark orange. During the weeks of

January 22nd and 29th, it was observed that the discolouration began to fade and change to a grey colour. The periosteum along the diaphysis, stemming from the proximal end, began to take on a more grey colour as well. The vinegar solution was still clear, and there appeared to be small fragments of organic material at the bottom of the canning jar. It is theorized the organic fragments may have been parts of the periosteum due to the visibility of its partial removal at the beginning of the experiment.

During the weeks of February 5th and 12th, the specimen was removed from the cupboard once for photographs. On February 5th, 2024, the specimen was removed from the cupboard to observe changes and to record those changes with photography (Figure 4). The periosteum seemed thicker in appearance. Although the specimen was not removed from the vinegar solution at that time, it was theorized that when touched the periosteum would feel gelatinous. Overall, the specimen appeared to have been waterlogged, despite sitting in a vinegar solution. It was indeterminable at that point whether this was an optical illusion from an object submerged in a liquid, or if the vinegar solution was causing a waterlogging effect on the bone.

During the week of February 19th, the specimen was removed from the cupboard, photographed, then placed in a piece of foil. Surprisingly, the entire diaphysis was not flexible and flaccid. The centre of the diaphysis was still fairly solid. It is undeterminable as to why all of the calcium minerals were not disintegrated after complete submersion of the specimen in a vinegar solution for 35 days. It is important to note that the presence of calcium minerals is the theorized explanation for the firmness of the femur, but the true reason is not known. The foil was carefully folded around the specimen. The ends of the foil were folded inwards as well to keep it as airtight as possible without further destruction of the integrity of the bone. The

specimen was placed on the lower rack in a gas-powered oven. The specimen remained in the oven until March 17th, 2024.

During the week of February 19th, the oven was used a total of three times. Preheating of the oven takes 30-40 minutes per use. Therefore, each time the oven was turned on, it is important to add the preheating time for a more accurate recording of element exposure to the specimen. The first time the oven was heated to 350◦F for three hours. On the second use, the following day, the oven was once again heated to 350◦F, but only for 30 minutes. The third time, the oven was heated to 400◦F for 20 minutes. During this week, the specimen was monitored without its removal from the oven or its removal from the packet of foil it was folded into. The chicken femur was not removed from the foil packet so as to not disturb the taphonomic processes and possibly change the outcome. During the three oven uses, there were no obvious smells relating to the presence of the specimen. The lack of smell was indicative of the proper sealing of the foil packet.

During the week of February 19th, 2024, the household tested positive for COVID-19 for the second time. The specimen was left untouched and unobserved in the oven. The oven was not turned on again until the week of March 4th. During the week of March 4th, the oven was turned on twice at 400◦F for ninety minutes and sixty minutes, respectively. The use of the oven was four days apart. The foil packet containing the specimen was left untouched during this week. During the use of the oven, there were no smells indicative of the presence of the specimen. During the week of March 11th, the oven was turned on once at 350◦F for three hours. Once again, there were no smells indicative of the presence of the specimen.

On March 17th, 2024, the foil packet containing the specimen was removed from the oven. A carefully as possible, the packet was gently and slowly unfolded on a hard surface. The

hard surface was a kitchen table. Unexpectedly, upon opening the foil packet, there was a putrid smell. The smell was not like a typical burnt smell from remnants stuck to a barbeque grill, but more akin to something foul. Shockingly, the specimen was obliterated (Figure 6). The chicken femur displayed obvious signs of heat changes. All visible surfaces were blackened, as well as the centre of the bone typically housing the marrow. Despite the destruction of the specimen, it was still possible to tell which were the distal and proximal ends. The foil was stained black and brown, suggesting the specimen leaked some type of fluid which then changed colour as heat was administered multiple times throughout its time in the oven. Part of the distal end, stuck to the foil (Figure 6), appeared to be sticky in texture. Nothing within the foil was touched to confirm textures and to prevent further degradation of the specimen.

Throughout the semester, the specimen was exposed to two types of environments that are known to damage its integrity. From the photographs provided (Figure 2; Figure 4; Figure 5; Figure 6), the changes to the specimen over the semester are drastic. The two biggest unexpected results were the rigid part of the diaphysis after being submerged in a vinegar solution for weeks, and the near-total destruction of the specimen after repeated heat exposure. It is theorized that the removal of the calcium minerals from the bone, through submersion in a vinegar solution, played a role in its fragility when exposed to multiple instances of heat. The sealing of the foil packet likely played a role in the preservation of some of the sticky substances observed upon the removal from the oven. Unfortunately, the specimen cannot be adequately put on display due to its condition at the end of the experiment.

Figures

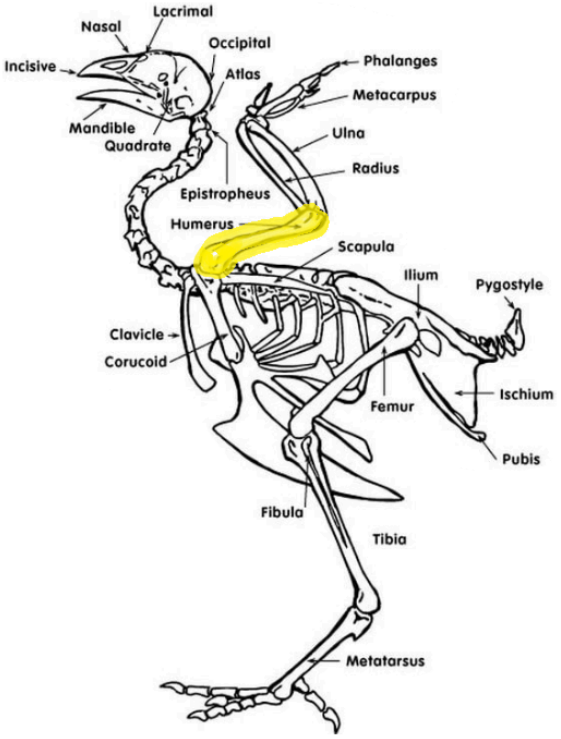

Figure 1: Chicken Skeletal Anatomy
(Pinterest, n.d.)

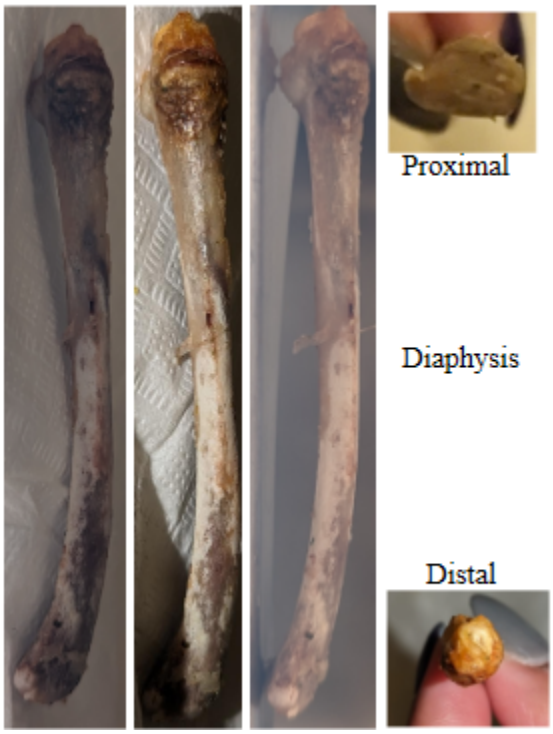

Figure 2: Chicken Humerus at Varying Angles
(Aya Yagnaya, 2024)

Figure 3: Canning Jar Measurement
(Pinterest, n.d.)

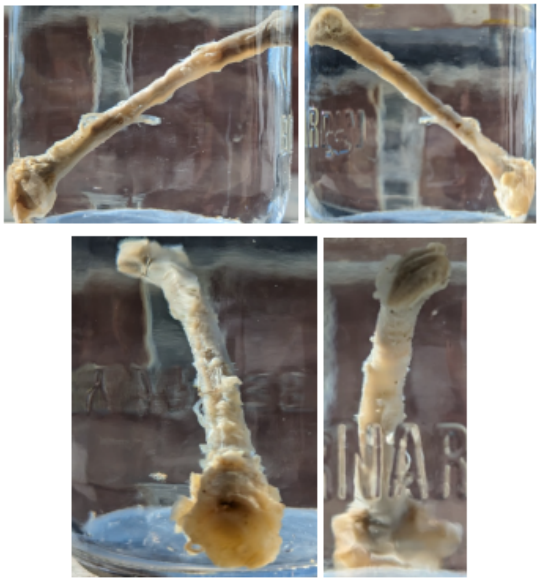

Figure 4: Specimen on February 5th, 2024
(Aya Yagnaya, 2024)

Figure 5: Specimen on February 19th, 2024
(Aya Yagnaya, 2024)

Figure 6: Specimen on March 17th, 2024
(Aya Yagnaya, 2024)