Who's to Blame?
Recognizing Dismemberment Patterns from Canid Scavenging on Bone

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Research Question

Is it possible to distinguish dismemberment by a serrated blade from canid scavenging macroscopically by the evidence left on bone?

Hypothesis

Our hypothesis was that it would be possible to detect the differences between the marks of these two forms of disarticulation with some ease. We assumed that the knife would leave marks that were much straighter, and that the teeth would leave marks that were more representative of more than one point of impact, and that were rounder.

Figure 1. Partially defleshed cross-section of a *Bos taurus* long bone

Significance

It is important to study patterns of dismemberment and of canid scavenging because: (1) investigators must be able to determine whether the trauma on the bone was relevant to the death; (2) dismemberment is most likely forensically significant, and often denotes murder; (3) dismemberment is often an attempt to hide the body and the identity of the victim; (4) there may be more body dumpsites; (5) canid scavenging and dismemberment often occur at the ends of long bones, so each of their marks can often be found in the same areas; and finally (6) to determine if other body parts or evidence have been moved by scavengers.

Methods/Materials

Materials:

We purchased three femur heads from young buffalo, two for the dogs, one to be cut by a small, sharp serrated kitchen knife that would be easily obtainable for a perpetrator, and two small sections of long bones from cows.

Methods:

The bones were all purchased fleshed, so that the experiment could be as close to what would happen in a real world scenario of dismemberment or scavenging as possible. Each participant individually cut their own bone, and the knife was passed between them, and two dogs were each given a bone to gnaw on for approximately 2 hours. It took a couple hours for each participant to cut through the flesh and muscle to reach the bone, and afterwards the specimen was boiled for between approximately 5 to 7 hours, so the marks on the bone could be examined.

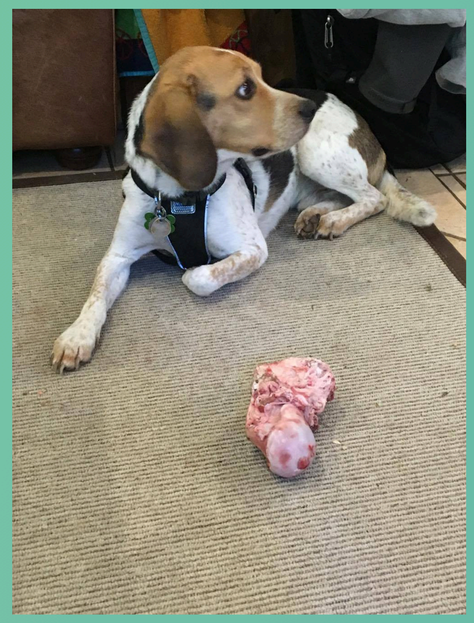

Figure 2. One of the dogs with a knucklebone of a *bison bison.*

Results

Figure 3. An close-up of the marks from the canid teeth, after chewing and defleshing.

The bones masticated by the dogs showed significant signs of trauma, including some large sections of bone that were completely broken off. The surface of the bone was also covered in shallow furrows from the dogs' teeth. Even though the dogs spent significant time around the joint area, the trauma was not limited to only one section of the bone, but rather all over.

The bones that were cut with the knives all exhibited similar patterns. The knife marks were very smooth and straight around the edges, and were notably different from those left by the dogs. There was slight wastage on the bone from the knife, mainly in the form of small shavings, and many small incision marks, although they varied slightly from bone to bone. The fourth specimen had the largest kerf mark, but even then it was still easy to distinguish it from the bones the dogs had gnawed on.

Conclusion

Throughout the course of this experiment it was determined that our hypothesis was correct: it is possible to differentiate between the markings that differentiate between animal interference and human involvement, without the aid of vision-enhancing tools, such as microscopes. It is also not necessary to have an in-depth knowledge of osteology or forensic science, as long as one knows what to look for.

Dismemberment and canid scavenging can often be found in the same contexts, as the woods or other secluded areas are common body dumpsites, and these areas are often occupied by wild animals that can disarticulate and move body parts. Therefore, it is pertinent to study them in comparison and conjunction with one another, which is why we would like to observe if it is possible to verify if a body was dismembered and then scavenged, by first cutting a bone, and then feeding it to the dogs.

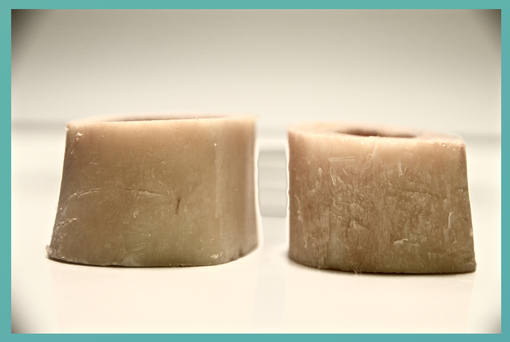

Figure 4. A close-up of the marks created by the knife.

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