**Missing Persons Lab**

NYPD CSI
214 Fake Street
Forest Hills, NY 11375

TO: Forest Hills Forensic Anthropology Division

FROM: NYPD CSI

RE: Recovered bodies & crime scene data

 As you know, we have discovered eight bodies around town. Your job is to identify these eight bodies and send a report outlining the method of death. Below, we have outlined the data we have collected from the scenes.

* **Unknown Body #1:** An unknown skeleton was discovered on the side of the road in a ditch on the outskirts of town. Ten yards from the body was a rusted bicycle bent in half. Both the ribcage and skull contained multiple fractures. The pelvis was wide and had many signs of abrasions near the hip join, along with complete ossification. The femur measured about 40 cm.
* **Unknown Body #2:** A radius, ulna, humerus, and multiple phalanges were found next to a cave in the northern forest of town. The radius appeared to have symmetrical contusions along its ventral and dorsal sides, while the phalanges were all crushed and fractured. The radius also measured about 25 cm. A skull with circular eye orbits was then found about ten meters inside the cave’s entrance. No other body parts were discovered.
* **Unknown Body #3:** Underneath the Simpson Bay Bridge, a body was discovered next to a group of rocks protruding from the river. A long piece of nylon cord was found next to the body. The skeleton displayed a narrow pelvis and rectangular eye orbits. The rest of the skull was crushed. The femur from the remains was about 39 cm long, and did not appear to be completely ossified.
* **Unknown Body #4:** In the forest south of town, a body was discovered with the entire skeleton blackened and adjacent to a ring of large stones. A rusted gasoline can was about 2 meters from the rings of stones. The ribcage of the body was narrow, and the pelvis was wide. The humerus of the skeleton also measured around 34 cm.
* **Unknown Body #5:** In the middle of Austin St., a skeleton recently dropped down from a tree. This skeleton had a branch poking through the ribcage, and was draped in some sort of nylon cloth. The femur was completely ossified, showed abrasions on the ends, and measured 49 cm. The femur was attached to a wide pelvis, and all of the other bones were too badly damaged to record any data.
* **Unknown Body #6:** The town quarry was recently drained, as the pool that used to occupy it has closed. A small skeleton was found at the bottom next to two small, circular pieces of plastic and a small rubber strap. The skull had a 4 cm fracture in it. Along with this, the bones were not completely ossified, and the eye sockets were rectangular shaped. The tibia of the skeleton was 30 cm.
* **Unknown Body #7:** A car was discovered in a ravine off the side of a winding road in town. The car’s gearshift was in neutral, and the front end was embedded in a tree. In the driver’s seat, the remains of a skeleton was found, with two small fractures in the skull. These small fractures were about the same size with one located on the dorsal side and one located on the ventral side of the skull. Aside from these two small fractures, the bones had no other major fractures. The bones were completely ossified, and the pelvis was narrow. The femur also measured 51 cm.
* **Unknown Body #8:** A body was discovered in a forest on the north side of town. The skeleton was under a rock overhang, sticking out from a 10 meter rock face. Next to the skeleton was a backpack with two full bottles of water, a can of soda that appears to have exploded, and nylon rope. The skeleton had major fractures in both femurs, and the arms of the skeleton were wrapped around the body. The pelvis was narrow, and the bones were completely ossified. The tips of the humerus also showed many abrasions. The humerus measured 32 cm.

Skeletal System Forensics

 Forensics is a science used to collect and analyze physical evidence from a crime scene to discover how crimes took place. One subset of this science is forensic anthropology. In this style of investigation, scientists use bones to analyze evidence from a crime scene. Here are some things bones can tell us about a person:

1) **Sex:** Looking at a number of different bones can predict the sex of an individual.

|  |  |  |
| --- | --- | --- |
|  | **Male** | **Female** |
| **Pelvis** | Narrow | Wide |
| **Eye Orbits** | Square | Circular |
| **Shoulders** | Wide | Narrow |

2) **Height:** By looking at different lengths of bones, the height of an individual can be estimated. To first estimate the height of the individual, it is important to predict the sex. Use the formulas below to estimate the height of the male or female.

|  |  |  |
| --- | --- | --- |
|  | **Male** | **Female** |
| **Femur** | (length x 2.23) + 69.08 cm | (length x 2.31) + 61.41 cm |
| **Tibia** | (length x 2.39) + 81.68 cm | (length x 2.53) + 72.57 cm |
| **Humerus** | (length x 2.97) + 73.57 cm | (length x 3.14) + 64.97 cm |
| **Radius** | (length x 3.65) + 80.40 cm | (length x 3.87) + 73.50 cm |

***Note: These measurements are in centimeters. To convert to inches, divide the cm measurement by 2.54 inches. This will tell you the height in inches. Then, to find the height in feet’ inches’’, divide your number by 12.***

3) **Approximate age:** Although more exact ages can be predicted using other tests, an inspection of the bones can approximate the age of an individual. Ossification is when the bones

|  |  |
| --- | --- |
|  | **Approximate Age** |
| **Bones are not completely ossified** | Age 1 – 18 |
| **Bones are completely ossified** | Age 18 – 55 |
| **Bones are starting to lose density** | Age 55 + |

4) **Level of Activity:** Bones meet at joints. Although joints contain material to soften the friction the bones go through while moving, overuse of bones can wear bones down. This can then cause the bone to enlarge and have jagged edges (abrasions). The joint that contains these types of ends is usually the joint that is overused. For example, a runner might have enlarged bones at the hip joint, while a tennis player may have enlarged bones at the shoulder or elbow joints.