Forensics Lesson 9

Forensic Anthropology

Quiz Date:



Vocabulary

**FORENSIC ANTHROPOLOGY**

* Forensic anthropology is the application of anthropology to criminal investigations.
* It incorporates concepts and methods from biological anthropology (the study of the physical aspects of humanity).
* Identifying unknown individuals is a key part of forensic anthropology.
* Anthropologists assist in identifications primarily by constructing a biological profile.
* This includes estimating age, sex, stature, and ancestry, as well as identifying specific characteristics, like diseases or injuries.
* In addition to helping identify human remains, the anthropologist analyzes injuries that happened around the time of a person's death, which can help determine how a person died.
* To do these things, an anthropologist begins by asking a series of important questions.

**Is it bone?**

* The first thing the examining anthropologist must determine is whether or not the material is bone.
* A surprising number of other materials may be mistaken for bone on first glance, especially if they are covered with dirt or other substances.
* Ceramic shards, plastic, wood fragments, rocks, small bits of concrete can all be mistaken for bones or bone fragments.
* To ensure the material is bone, the anthropologist cleans the object and examines it closely, under magnification if necessary.

**Is it human?**

* Once the anthropologist is sure that the material is bone, they must determine whether it came from a human or a non-human animal.
* All mammals share a generalized skeletal template, meaning they all have the same bones in roughly the same locations: a skull, spine (which ends in a tail), ribs (which support the internal organs), and four sets of limb bones.
* However, the shape of the bones and the way they relate to each other, differ between animals.
* By examining the size, shape, and structure of a bone, an anthropologist can determine if it is human.

**What bones are present?**

* Once a case involves human bone, the investigator must identify which bones (or "elements") are present and which are absent.
* Most anthropologists start this process by placing the elements out on a table as they would be organized in a living person, known as the "anatomical position".
* This serves several purposes.
* First, it creates an informal visual inventory that allows any missing elements to be identified quickly.
* Also, it allows the analyst to work systematically through the entire skeleton, performing a detailed inventory and examining each bone for trauma, pathology, or life history traits.
* Lastly, after examining each bone, the analyst can consider the skeleton as a whole, and look for inconsistencies among elements or patterning of trauma across multiple elements.
* At a recovery site, skeletal inventories are important because they allow searchers and scene responders to know what they might be looking for that they have not already recovered.
* This ensures they make as full a recovery as possible.
* Inventories are also important from a criminalistic perspective for establishing what elements are or are not, present.
* The absence of certain elements can provide a great deal of information regarding perimortem events, and perpetrator behavior.

**How many people are represented?**

* In addition to establishing which elements are present, anthropologists must determine the number of individuals involved.
* To do this, they look for duplicate elements - for example, two right femora (thigh bones).
* Investigators also consider the condition and size of the bones.
* If the elements do not "match", it could suggest more than one individual.
* When the remains of two or more individuals are mixed together, this is called "comingling".
* It is the anthropologist's job to address the comingling and determine which individuals are represented by which bones.
* This allows each body to be examined separately.
* Establishing the number of individuals is very important, especially if the case involves a crime.
* Multiple individuals may be killed together or separate victims may be dumped in the same place over a longer period of time.
* Sometimes perpetrators may bury many victims together in a mass grave in an attempt to conceal their behavior.
* In all cases, it is very important to the understanding and resolution of the case that the anthropologist be as accurate as possible about how many victims were involved.

**Who is the individual**

* Anthropologists contribute to the identification of unknown individuals by developing a biological profile: age, sex, stature, and ancestry.
* In addition, the biological profile includes information that may be particular to that person and no one else, such as diseases or injuries which may impact the bone.

**Sex**

* The first step in developing a biological profile is to determine sex.
* Sex is the biological aspect of an individual, determined by genes, and expressed through primary (e.g. reproductive organs and hormones) and secondary (e.g. musculature, body hair, etc) sexual characteristics.
* In contrast, gender refers to the social expression of a person's identity as it relates to their social role and behavior.
* Gender is generally self-defined.
* Societal and cultural norms may influence gender choice, but an individual may not necessarily identify themselves according to those rules.
* In general, anthropologists do not determine the gender of an individual, but personal effects and cultural materials may suggest a person's gender identification.
* The hormonal and visual differences that make living males and females distinct also create physiological differences between their skeletons.
* This "sexual dimorphism" is most obvious in the pelvic bones and the skull.
* All humans are adapted to walking on two legs, but females must also give birth to relatively large-headed babies.
* These different pressures produce structural differences between males and females that can be used to tell them apart.
* The skull also displays a degree of sexual dimorphism.
* Overall, males tend to have larger skulls than females.
* They also have, on average, greater muscle development and more rugged muscle attachments.
* These differences in size and robusticity can help determine whether an individual is male or female.
* Differences in size and robusticity may also be evident in other elements.
* If the skull and pelvis are not available, measurements of other bones may help determine if an individual is male or female.
* However, investigators must be cautious, as there is considerable overlap between males and females.

**Age**

* Estimating a person's age at the time of death depends on two fundamental life processes: growth and decline.
* Growth and developmental changes are based largely on the degree and location of bone growth and dental formation and eruption from the gums in immature individuals.
* At birth, our "bones" are mostly soft cartilage.
* As we grow, this cartilage is replaced by hard bone at different centers of growth.
* There are over 300 centers of bone growth in infants which eventually fuse to form the 206 bones in the adult body.
* Since the centers grow and fuse at known rates, anthropologists can use the pattern to estimate age in children and sub adults.
* Similarly, teeth develop and erupt in a specific sequence at specific times during childhood and this timing can also be used to provide an accurate estimate of age in juveniles.