

# AN OUTLINE OF FORENSIC TAPHONOMY

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“Taphonomy” is derived from ‘tafo’ (= burial) and ‘nomos’ (= laws): the study of the laws of burial. The field originally developed in paleontology to explain how and why extinct animals became fossilized and preserved in the geological record. More specifically defined, taphonomy is the study of the processes that affect the decomposition, dispersal, erosion, burial, and re-exposure of organisms after, at, and even before death. Taphonomic processes cause sampling bias or differential preservation of some species, individuals, or body parts over others. Thus the remains under study should be viewed as “fallout” from the environment, which has filtered and altered the remains so that only a portion of the information originally available is now present.

“Forensic taphonomy” is a subfield of forensic anthropology that examines how taphonomic forces have altered evidence that is the subject of a medicolegal investigation. Two branches of forensic taphonomy include **biotaphonomy** and **geotaphonomy**.

## BIOTAPHONOMY

Biotaphonomy examines the remains themselves and asks how decomposition and destruction (or a lack thereof) of the hard and soft tissues was brought about. Biotaphonomic variables can be subdivided for convenience into three broad categories (Nawrocki 1995):

- **Environmental factors** are external variables, such as climate (**abiotic**) and animals (**biotic**).
- **Individual factors** are those that the subjects bring to the decomposition process themselves, such as body size and age at death.
- **Cultural (or Behavioral) factors** are variables that characterize human mortuary activities, such as embalming, autopsy procedures, and assailant-induced trauma.

## GEOTAPHONOMY

Geotaphonomy is the study of how someone who buries a body, and how the body itself, affects the surrounding geological and botanical environment. Phenomena of interest include:

- disturbance of the soil, including compaction, aeration, and mixing of layers;
- the production tool-marks in the walls of the burial shaft;
- production of footprints in the bottom of the grave;
- disruption (acceleration or retardation) of plant growth and natural, subsoil root patterns;
- alteration of natural water drainage and erosion patterns;
- alterations of the surrounding soil pH.

## INTERACTIONS

The sum of forces acting on human remains can be presented as a 3-way interaction between the environment, the individuals preparing the remains for burial, and the remains themselves. For example, the environment obviously affects how the remains decay, but the remains also affect the microenvironment of the grave by altering soil consistency, plant growth, and insect infestation. An assailant may significantly alter a body via dismemberment, but the decision to dismember is in part affected by the size and composition of the victim's body, which may also limit the assailant's ability to dispose of the remains and thus affect the location of the grave. Finally, the assailant will significantly alter the environment by digging a grave, but the physical characteristics of the terrain and soil may direct the assailant's behavior in one direction or another.

## UTILITY

Using data assembled during the field recovery and the laboratory analysis of the remains, the anthropologist generates a **taphonomic profile** that describes the perimortem and postmortem history of the remains. This profile revolves conceptually around information related to the "circumstances of death," a broad category including:

- perimortem injury and postmortem pseudotrauma;
- the time since death (postmortem interval);
- assailant, victim, or general mortuary behaviors;
- the location of death;
- the original position of the body and any subsequent movement of the remains;
- clarification of forces that produced scattering of the remains (human activities or natural forces);
- predictions of where additional remains may be located and where missing remains ended up.

## REFERENCES FOR FURTHER READING

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