H83   Taphonomy Reader Beta-Version: A Software to Help in Taphonomic Syndromes Diagnosis

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After attending this presentation, attendees will value the benefits of using a free software that assists reading the alterations on human bones to reconstruct the taphonomic process.

This presentation will impact the forensic science community and students in this discipline by offering a Beta version of a free software

that presents the possibility of recognizing taphonomic imprints on bones, a combination of which can indicate one or more taphonomic syndromes and is useful to redevelop the postmortem life of skeletal remains.

As demonstrated by numerous articles and the AAFS Workshop in 2010, taphonomy has an important role in the study of skeletal human remains from historical and forensic settings. The natural and artificial alterations readable on osseous remains can make understandable the changes and the events that a body suffered in its death onwards; to individuate taphonomic imprints on bones and their classification in taphonomic syndromes, it is necessary in forensic anthropological investigation to estimate the postmortem interval and forensic pertinence, to contextualize the remains, and to recognize the natural and human agents that acted upon the remains.

Taphonomy is a very complex discipline and in its application on archaeological and forensic study, it is possible to recognize two different lines: depositional and contextual taphonomy. The depositional taphonomy analyzes the position of the remains and the preservation of articulations that helps to recognize the type of the burial (i.e. primary, secondary, a dressed or nude body, in an empty space). The contextual taphonomy analyzes the specific imprints left on the bones by the interaction between the remains and the environment such as soil, water, atmosphere, fire, and human activity as well. The software presented is called *Taphonomy Reader* and has been developed to help the anthropologist (students or professionals), the archaeologist, and the forensic investigatory in the contextual taphonomy analysis by creating the base for a common language in this discipline.

Taphonomy Reader has been written in HyperText Markup Language (HTML), the predominant markup language for web pages; this language allows the software to be used on every kind of computer and platform (Windows, Linux, Macintosh) using a simple browser. The HTML has embedded scripts using JavaScript, a different language that affects the behavior of HTML pages, which creates an elaborate "results page." JavaScript has been used to avoid developing a database that requires use online; in this way, users can download the software on their computer and use it either on- or off-line.

When run, *Taphonomy Reader* shows the "main window" with the most common taphonomic imprints: marrow or soft tissue presence; complete degreasing; fossilization and sub-fossilization; soil adherence; soil staining; mineral incrustation; warping; melted elements adherence; roots invasion; roots erosion; soil infiltration on fractures; mineral staining; unilateral soil adherence; unilateral soil staining; bleaching; algal growth; punctures; parallel striations (rodent gnawing marks); longitudinal splitting; weathering; blackening with smoke; ash accumulation, calcination; carbonization; crisscross cracking; shrinkage fractures or bull-eye fractures; sand adhesion; water staining; circumferential staining; surface erosion; rounded margins; marine taxa incrustation. If the user is uncertain about the meaning of each pattern, it's possible to click on the pattern's name to open a new page with a synthetic description and a picture of the typical appearance of each taphonomic modification. The pictures are from several Italian historical or forensic cases and from the sample collection of the MercyHurst College.

Examining a case, the user can tick off the patterns that are singled- out on the analyzed remains and then push the verification button. The script recognizes the choices of the user and creates a new virtual "result page." The taphonomic changes present in the software can correspond to eight different taphonomic syndromes: forensic interest; possible forensic interest; historical remains; burial; surface exposure; animal activity; cremation or fire alteration; and, aquatic taphonomy.

The "result page" presents the selected taphonomic changes tabulated in a schedule where it can be visualized and each taphonomic syndrome imprint is presented. The syndromes are clickable to open a page with a short explanation and references. As some imprints are common to more than one syndrome, the user can choose the most

appropriate syndrome or if two or more possible syndromes are present, they can be listed sequentially.

A preliminary version of the software will be presented that is able to analyze 32 different taphonomic imprints tracing them back to eight different taphonomic syndromes. The software is free and downloadable at the web site www.restiumani.it. As it is an open source, the software can and will be improved by the scientific

community over time.

Taphonomy, Software, Forensic Anthropology