



## Physical Anthropology Section – 2007

### H92 A Simple Technique for Imaging the Human Skeleton: An Application Using the Auricular Surface for Aging

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After attending this presentation, attendees will learn a simple technique using a photographic scanner to record images of the human skeleton without the distortion that can arise from using film and digital cameras. An example is provided using the auricular surface of the ilium from a collection of known ages at death for better aging purposes.

This presentation will impact the forensic community and/or humanity by demonstrating the impact of this presentation on the forensic community is that there are numerous applications.

A simple imaging technique utilizing a flatbed scanner is employed for the purpose of recording human skeletal remains without the distortion that can arise from using film or digital cameras. An application using this technique is provided in which images of the auricular surfaces of the pelvic ilium bones are presented in an effort to facilitate aging of the skeleton. The auricular surface of the ilium is a three-dimensional area that can be difficult to record photographically. Furthermore, some finer features such as granulations can be lost using film or digital cameras for imaging this and other skeletal structures.

Black-and-white photographic images of the auricular surfaces of ilia, traditionally shown along with descriptions of different ages at death, demonstrate photographic contrast that can make aging difficult. Several factors may contribute to photographic distortion, including such variables as the type of lighting, the angle of the lighting source, the camera type, and the image resolution, but a flatbed scanner with sufficient resolution capabilities can provide digital images with clarity that can be readily shared by researchers. Additionally, image databases can be created with this technique.

For the purpose of this study the following methodology is espoused utilizing a relatively new collection of modern human skeletal remains of known individuals from Europe. Fifty auricular surfaces with known ages-at-death were scanned with a flatbed scanner possessing sufficient resolution capabilities. The ilia used in this study are from the Modern Human Skeletal Reference Collection of the University of Athens, Greece. The University of Athens' Collection is comprised of approximately 200 known individuals from around Greece with pertinent associated data, including individual sex, age-at-death, cause of death, and occasionally specific antemortem medical information. Three different observers used the scanned images to estimate ages at death using a well-known auricular surface aging method. The results were then compared to those from observations of ages at death made both on photographic images of this subsample as well as observations of these subsamples by direct examination of the dry bone. The data were then statistically compared using an analysis of variance test with the SPSS statistical package with results indicating the utility of this technique. It is suggested that ages at death from scanned images are similar to those from observations made on dry bone.

In conclusion, this is a simple technique utilizing a flatbed scanner with sufficient resolution capabilities that allows for imaging skeletal features without the distortion that can present itself with digital or film cameras. Furthermore, this technique allows for readily sharing images and it can be used for the creation of digital databases as well. Discussion ensues regarding possible additional applications using this technique, such as the recording of pathological lesions or pubic symphyses of the pubic bones of the os coxae, again for aging purposes.

**Imaging Technique, Human Skeleton, Aging**