

A30 Robbed Burial Sites: A Comparative Investigative Approach Using Geographic Information Software (GIS) to Locate Secondary Burial Sites

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After attending this presentation, attendees will: (1) better understand the phenomenon of “robbed” mass graves in armed conflict contexts; (2) become familiar with examples from Spain, Bosnia, and Cyprus; and, (3) more thoroughly understand the motives behind the clandestine removal of bodies from graves, which can be studied to help determine the location of the secondary depositions. Attendees will also appreciate the negative consequences of this grave robbing for forensic professionals, who are called on to exhume residual remains from primary sites and reconstruct the sequence of events concerning the victims, and for the families of the missing, who are offered partial skeletal remains (possibly at different time intervals) for reburial.

This presentation will impact the forensic science community by demonstrating a new investigative approach which uses GIS to assist in the discovery of secondary deposition sites. This study builds on previous research, analyzing patterns of primary grave distribution, and examines whether a more specific analysis of similar patterns may assist in identifying secondary grave locations.

This study reviews a set of 130 graves in Cyprus, of which five were subject to the clandestine removal of bodies, and 403 graves in Bosnia, of which ten sites were robbed. Robbed bodies from sites in Bosnia were redeposited in 39 secondary graves, whereas secondary burial locations in Cyprus are unknown. Several examples of robbed graves from the Spanish Civil War, which relate to different motives and actors (i.e., by families of the victims or by the postwar government), are also used to assist in the analysis, albeit in a qualitative rather than quantitative way due to the limited number of confirmed sites and positive identifications from secondary sites.

This study examines the possible elements that set the robbed graves apart from others that were left intact. Observations from all three contexts indicate that bodies from robbed graves were of both civilians and military personnel; however, factors such as victim demographics (sex, age) and whether the victims were battle casualties, executed prisoners of war, or mass killings of civilians, have been identified as important factors influencing the decisions of those responsible for the robbing.

In order to assist in the search for secondary graves in Cyprus, GIS was used to analyze primary and secondary grave locations in Bosnia for spatial clustering and distances relative to settlements and territorial borders. The analyses indicate a 24% increase in distance from settlements between primary (mean of 1,049 meters) and secondary (mean of 1,303 meters) graves. The mean distance of secondary graves from their robbed primary graves is 14.85km with a standard deviation of 9.21km. Of particular interest is that the bodies robbed from primary graves closest to international borders and territory controlled by the military associated with the victim group were relocated farther than other robbed bodies. Consistent with previous studies, there is significant clustering of secondary graves. These results all indicate a coordinated effort to hide victim bodies in response to the threat of international investigations in Bosnia, which subsequently firmly established military responsibility for grave robbing.

This study hypothesized that, similar to Bosnia, high-level political developments — at an international scale —



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combined with considerations regarding the victim count and demographics, spurred the large-scale, organized, and costly operations of the clandestine removal of human remains from mass graves in Cyprus. Qualitative evidence and observations from Spain indicate that *internal* (rather than international) high- and low-level decisions also motivated grave robbing, but the spatial patterns between primary and secondary graves in Spain contrast with the case of Bosnia.

Through the analysis of data collected from all three contexts, this study is able to construct site location models to assist in the search for identifying secondary deposition sites, particularly in Cyprus, but with implications for other contexts as well. Such mechanisms offer the forensic community useful guidelines and insights to help manage expectations of the families of the missing. This will also help to work toward a more complete return of victim remains to families, honoring their fundamental right to know the fate of their loved ones.

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