

Authors' Response

Sir:

We are encouraged by the letter sent to the editor regarding our article. When we began this research over 3 years ago, not many people were discussing the analysis of contaminated cremains. We hoped that our article would generate more discussion and hence, more research in this area.

Table 1, in the letter, does provide a beginning for another method of analysis. We encourage Bush et al. to increase the sample size of their analysis. The data do not have any methodological information or standard deviations. We began our study with five samples. Initially, it seemed as if a cursory glance at the data would provide confirmation of contamination. Upon expansion of the study, however, we found that the concentration ranges of many elements within cremains and cement samples were extremely wide and sometimes overlapping. Table 1 does not report concentration values for Al and Fe in the pure cremains sample although these elements are essential to human physiology and should be present. We also found Al and Fe abundant in cement; therefore, the presence/absence of these elements cannot alone be used to differentiate between mixtures and unadulterated cremains. We encourage further study of Ti and Si. Ti has no known biological function in humans, and Si functions very poorly in human biochemistry but may be present in trace amounts due to exposure. We are also surprised at the zero values for Na in the 50/50 mixtures. Na is a common element in nature and therefore a contaminant in many analytical analyses.

We realize that other techniques exist that might have worked for this analysis. XRD, XRF, and SEM/EDS should certainly be explored as tools for cremains research. Depending

on the options, XRD and SEM/EDS can be costly instrumentation. Both also require extensive training in use and data interpretation. As ICP-OES is frequently used in environmental analysis, it is readily available in certified labs. It is also an instrument found in many chemistry departments with varying budgets. The sample preparation is indeed lengthy, but it is also very straightforward. With minimal training, a technician can operate the ICP-OES instrumentation and interpret the data. We developed a method that could be easily applied by labs across the country.

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