Archaeochemistry: A Transdisciplinary Approach to Organic Residue Analysis

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Two decades ago, the ARCHEM project was founded to advance archaeological research through the comprehensive, non-destructive, and field-integrated extraction of ancient organic residues for both preservation and ongoing analysis. The resulting “big data” library of thousands of organic samples has allowed for tailored analyses that answer complex archaeological questions elusive to more isolated approaches. Archaeological chemistry, the application of chemistry towards material culture, has existed for generations but in a multidisciplinary fashion where the chemistry does not fundamentally alter the practice of archaeology and vice versa. Disciplinary silos have been steadfastly maintained to the point that provenance, provenience, context, conservation, and object biography are impermeable non-factors throughout this established multidisciplinary approach. Indeed, entrenched traditions operating in relative isolation privilege their own disciplinary outlook irregardless of cross-disciplinary ramifications or overarching research goals. Archaeochemistry, as has been defined by ARCHEM, is fundamentally a transdisciplinary endeavor that constantly accounts for a broad range of traditions and data sets that continually inform each other, from ethnobotany to ancient texts, thereby strengthening the overall process and producing new results. This approach allows the investigative process to evolve according to the latest information and adapt the most effective research design to provide a higher level of interpretive resolution and agility than afforded by a siloed multidisciplinary approach. This edge-finding transdisciplinary approach is the distinctive characteristic that separates archaeochemistry from the simple characterization of organics using chemistry with little regard for broader archaeological questions, the more traditional archaeological chemistry that still dominates the field today. This presentation summarizes the past two decades of archaeochemistry research and the invaluable lessons gleaned from a transdisciplinary approach that prizes field work as much as lab work, and what the next two decades might hold for the organic residue analysis of ancient artifacts, especially in the context of field work that mainly takes place within Eurasian academic spheres, but has been instigated at North American institutions that have retreated behind well-defined disciplinary walls despite best attempts to foster interdisciplinarity.