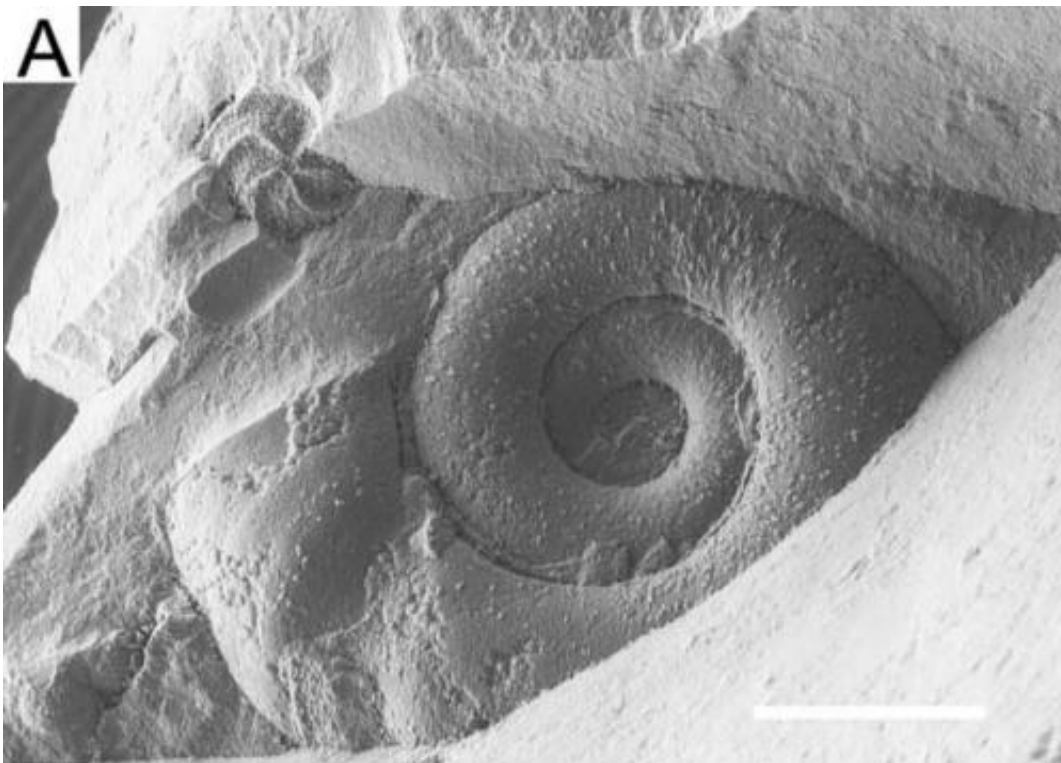


Grinding away at history using 'forensic' paleontology and archeology

June 23 2014



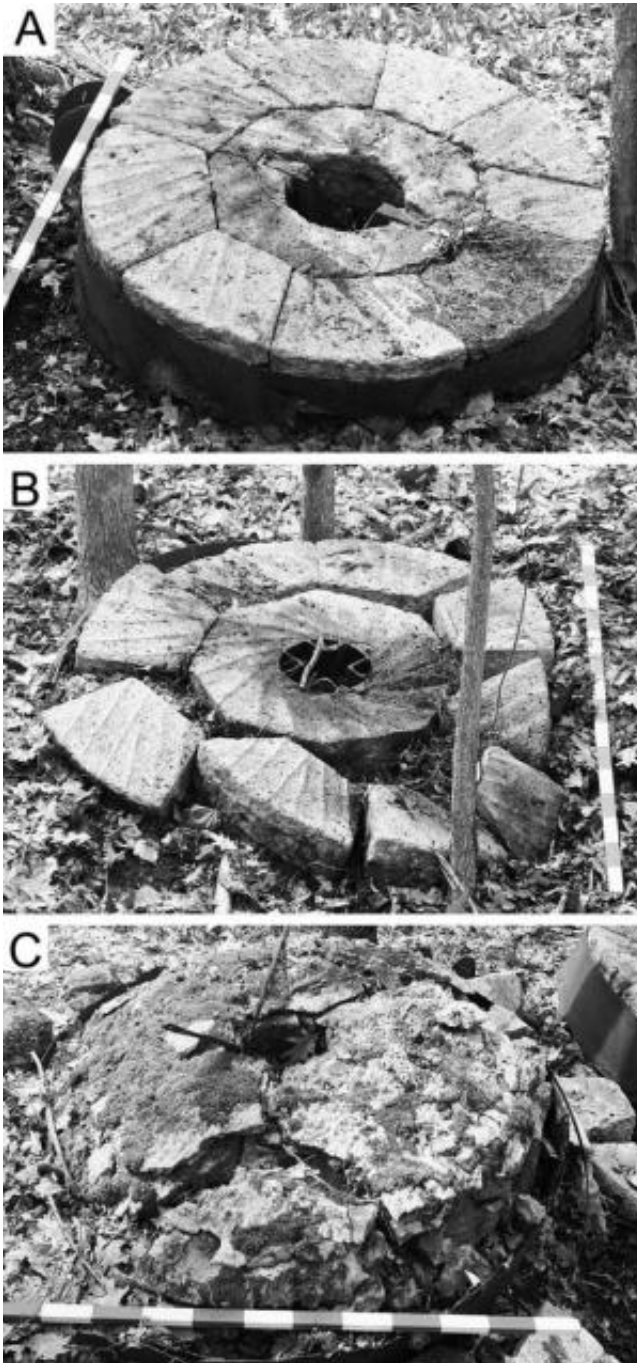
A) This is a planorbid near charophyte gyrogonite (upper left), CMNH 14695G from Duncan Grist Mill, scale bar 1 mm. Credit: J.T. Hannibal et al.; SEPM (Society for Sedimentary Geology)

The Society for Sedimentary Geology (SEPM) announces an unusual paper in their journal *PALAIOS* that combines 'forensic' paleontology and archeology to identify origins of the millstones commonly used in the 1800's. While all millstones were used similarly, millstones quarried

in France were more highly valued than similar stones quarried in Ohio, USA.

Over four years the scientific team located millstones by visiting historical localities in Ohio, then studied them and identified unique characteristics between the coveted French buhr and the locally sourced Ohio buhrstone. Both types of millstones were composed out of an extremely hard rock called chert, and superficially they can look very similar. With close examination, the scientists confirmed that the French buhr contained fossils that came from a freshwater environment, including algae and snail fossils and the Ohio buhrstone was quarried from a much older rock unit. The Ohio rock unit, likely laid down in a Paleozoic marine environment, was filled with [invertebrate fossils](#) known as fusulinids, pelmatozoans and brachiopods.

One of the key features useful to millers was the porosity of the [rock](#); where fossils left empty cavities. In 1795 famous inventor and millwright, Oliver Evans, exclaimed that pores, "larger in diameter than the length of a grain of wheat" were not desirable. Based on the fossil assemblages the authors suspect the [fossil](#) assemblages from the Ohio buhrstone may have made these millstones less effective for milling, but that this claim would require further investigation.



A) This is a composite millstone (runner stone) composed of chert segments, tightly bound with iron band. B) This is a composite millstone (bedstone) with deteriorated iron band that has allowed individual segments to separate. C) This is a millstone with deteriorated plaster top from which loose chert scraps were collected. Staff in each photograph is marked in 1 dm segments (for a total length of 1.5 m). Credit: J.T. Hannibal et al.; SEPM (Society for Sedimentary Geology)

Chert has been used for tool making throughout human history and it is the hope of the authors that these non-destructive techniques can be used to study the origins of other artifacts.



This is a close-up of millstone at Black Hand Gorge, showing fusulinids in various views, scale bar 3 mm. Credit: J.T. Hannibal et al.; SEPM (The Society for Sedimentary Geology)

More information: "Determining Provenance of Local and Important

chert millstones using fossils (especially charophyta, fusulinina and brachiopoda): examples from Ohio, U.S.A." By Joseph T. Hannibal, Nicholas A. Reser, Julia A. Yeakley, Theresa A. Kalka and Veronica Fusco. *Palaeo*, 2013, v.28, p. 739-754.
[dx.doi.org/10.2110/palo.2013.110](https://doi.org/10.2110/palo.2013.110).

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