

Prudence J. JONES
The Cleopatra Cocktail

According to Pliny the Elder, Cleopatra once drank a pearl dissolved in vinegar (*NH* 9.120-1). While this tale may seem fantastic, the true wonder lies in its very possibility. Indeed, Horace also attests to Roman belief in this property of vinegar (*Sat.* 2.3.240-1). This paper investigates the ability of modern science to shed light on seemingly fantastic elements of classical texts. In addition to examining the classical background and modern chemical explanation, I will give a demonstration of the reaction between a (cultured) pearl and vinegar.

I argue that the skepticism with which commentators have reacted to accounts of pearls dissolved in vinegar is unfounded. Rackham footnotes Pliny's tale with, "no such vinegar exists" (H. Rackham trans. *Pliny: Natural History Books 8-11* [Cambridge 1940] 244). Horace receives a similar judgement: Morris comments, "pearls do not dissolve in wine or vinegar" (E.P. Morris ed. *Horati: Sermones* [Norman 1967] *ad* 2.3.240).

Experimental trials demonstrate that an acid-base reaction occurs between pearls and vinegar, resulting in the disintegration of the pearl. The ancient terminology reflects this process: Horace describes the process with *diluit* (*Sat.* 2.3.241), Pausanias with *apollusthai* (8.18.6), and Pliny with *in tabem...resolvit* (*NH* 9.120) and *liquefactum* (*NH* 9.121). All these terms denote the observable disintegration that occurs when calcium carbonate, which is the primary component of pearls, neutralizes the acetic acid in vinegar.

I also contend that ordinary vinegar is the ideal concentration for this reaction, despite Rackham's implication that only a special type of vinegar could dissolve a pearl. Experiments confirm that acetic acid solutions of concentrations similar to vinegar (5-7%) reacted more rapidly with pearls than did more concentrated solutions, with pure acetic acid reacting hardly at all.

Ancient belief in the power of vinegar influenced non-scientific works as well. Livy describes Roman soldiers clearing a path through the Alps by pouring vinegar over heated rocks (21.37). In this case the temperature differential between rocks and liquid causes the rocks to crack. Thus, any liquid would work, but beliefs about the powers of vinegar to cause disintegration may account for its use in this instance.

In addition to giving credence to accounts that might seem fictional, this experiment provides a model grounded in reality for truly fantastic claims. Strange but true stories like vinegar dissolving pearls bridge the gap between reality and fantasy. For instance, Pausanias claims, on the analogy of pearls and vinegar, that goat's blood can dissolve a diamond (8.18.6). Pliny, however, proves a more careful researcher. Although he mentions goat's blood and its power to dissolve diamonds, he evidences some discomfort with the notion (M. Beagon, *Roman nature: the thought of Pliny the Elder* [Oxford 1992] 231). He has no such reservations about Cleopatra's cocktail.