**The Romans' Concrete Secret**

**Seawalls and piers built by the Romans 2,000 years ago are sturdier than modern versions, and haven't been eroded by seawater. Scientists have finally figured out why. To unlock the secret, an international team of researchers analyzed the chemical makeup of Roman-era marine structures off the Italian coast. Advanced imaging techniques and spectroscopic tests revealed that the Roman recipe for concrete included volcanic ash, rock, lime (calcium oxide), and seawater. This mixture produces a rare chemical reaction that creates two minerals -- aluminous tobermorite and phillipsite -- that essentially reinforce the concrete when it's exposed to the sea. "Contrary to the principles of modern cement-based concrete, the Romans created a rock-like concrete that thrives in open chemical exchange with seawater," lead author Marie Jackson tells BBC.com. "It's a very rare occurrence in the Earth." Jackson and her team are now working to reverse-engineer the Roman-era concrete, in order to construct more-durable seawalls. *(The Week magazine, July 21, 2017)***