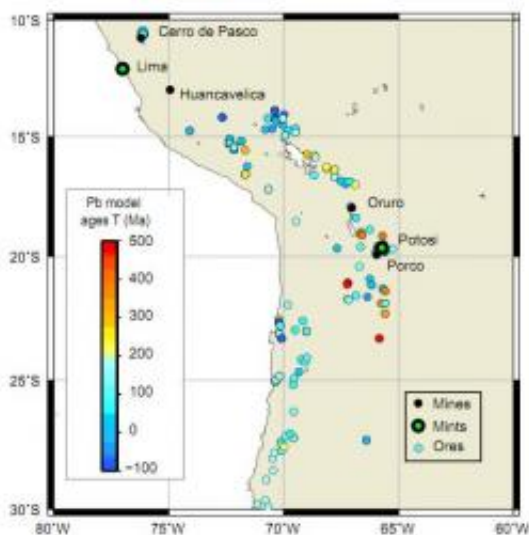


New mass spectrometry technique clouds early European inflation theories

May 27 2011, by Bob Yirka



Major silver mining centers and mints in the Viceroyalty of Peru. Also shown are the Pb geological model ages T in millions of years of various metal ores. Image (c) PNAS, doi: 10.1073/pnas.1018210108

(PhysOrg.com) -- Using a new coupled mass spectrometry technique that employs multiple collectors, researchers in France have shown that it was not an influx of silver from the America's that caused high inflation in Europe from the early 1500's to mid 1600, as some historians have long believed. Their results, published in the *Proceedings of the National Academy of Sciences (PNAS)* show that the gradual replacement of coins made from Spanish silver to imported Mexican silver, did not occur until nearly fifty years later.

The research, led by Anne-Marie Desauty, sought to answer once and for all the question of why the whole of Europe experienced a dramatic, inexplicable rise in overall prices, shortly after the discovery of the new world.

Until now, researchers have had to rely on the results of [mass spectrometry](#) analysis of lead and copper found in coins to trace its origins, because the results obtained from doing so on silver couldn't be trusted. Unfortunately, due to the difficulty of reading isotope results for lead, and the fact that copper was used at later dates to re-mint coins, no real conclusions could be drawn from the results of such tests. Now however, using the new technique, the team was able to discern that silver from Mexico didn't begin appearing in Spanish coins until the inflationary period was over; though it did become the principal source of silver in such coins thereafter.

In the past, mass spectrometry tests on silver were fraught with difficulty due to the ratio of its two stable isotopes, silver-107 and 109; making them extremely difficult to measure. New advances in mass spectrometry devices however, coupled with multiple collectors, has made the process more sensitive; sensitive enough so that the results of such tests can now be trusted; and those findings suggest that it was not the sudden importation of Mexican silver as a means of minting Spanish coins that led to the [inflation](#), because there simply wasn't enough of it present in [coins](#) during the period in question.

Unfortunately though, because the study was able to rule out the influx of Mexican [silver](#) as a cause for the inflation, a new gap in knowledge has been left behind, which will send scholars and researchers back to the drawing boards to explain why in fact, prices in Europe rose as they did, and why it happened for so long.

More information: Isotopic Ag–Cu–Pb record of silver circulation

through 16th–18th century Spain, *PNAS*, Published online before print May 23, 2011, [doi: 10.1073/pnas.1018210108](https://doi.org/10.1073/pnas.1018210108)

Abstract

Estimating global fluxes of precious metals is key to understanding early monetary systems. This work adds silver (Ag) to the metals (Pb and Cu) used so far to trace the provenance of coinage through variations in isotopic abundances. Silver, copper, and lead isotopes were measured in 91 coins from the East Mediterranean Antiquity and Roman world, medieval western Europe, 16th–18th century Spain, Mexico, and the Andes and show a great potential for provenance studies. Pre-1492 European silver can be distinguished from Mexican and Andean metal. European silver dominated Spanish coinage until Philip III, but had, 80 y later after the reign of Philip V, been flushed from the monetary mass and replaced by Mexican silver.

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