Buried Coins Key to Roman Population Mystery?

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Researchers applied a unique blend of quantitative modeling and empirical testing normally found in the natural sciences to determine the population size of ancient Rome nearly 2,000 years ago. Just as tree rings help climatologists determine past evironmental conditions, University of Connecticut theoretical biologist Peter Turchin and Stanford University ancient historian Walter Scheidel used coin hoards to determine the size of the Roman Republic's population after 100 B.C. Coin hoards are bundles of buried Roman coins that citizens hid to protect their savings during times of violence and political strife and the researchers say they are as an excellent indicator of intense internal warfare, which has direct impacts on population size. Credit: Credit: © 2009 Jupiter Images Corporation

(PhysOrg.com) -- The first century BC in Italy was culturally a brilliant age, unequaled by any other period in Roman history. It was a time of Cicero, Caesar, Vergil, Horace and many other major literary figures of the Antiquity.

Using a mathematical model to predict population trends based on ancient coin hoards, a UConn biologist and a Stanford University historian have concluded that the population of ancient Rome was smaller than sometimes suggested.

Although the first century BC in Italy has been extensively studied, and much is known about the great figures of the era, including Cicero, Caesar, Virgil, and Horace, some basic facts - such as the approximate population size of the late Roman Republic - remain the subject of intense debate.

Depending on who historians believe was counted in the early Imperial censuses (adult males or the entire citizenry including women and children), the Italian population either declined or more than doubled during the first century BC.

The ultimate answer is important. If the high count is correct, much of Roman history as it currently stands would have to be re-written and it would have enormous implications for the popular view of the economic scope and social structure of ancient Rome.

In an article published online on Oct. 5 in the Proceedings of the National Academy of Sciences, University of Connecticut theoretical biologist Peter Turchin and Stanford University ancient historian Walter Scheidel attempt to answer the population question by focusing on the region's prevalence of coin hoards, the bundles of treasure that people buried to protect their savings during times of great violence and political strife.

According to Turchin and Scheidel, the temporal distribution of unrecovered coin hoards is an excellent proxy for the intensity of internal warfare and unrest, and therefore a key indicator of population demographics.

"Hoards are an excellent indicator of internal turmoil," says Turchin. "This is a general phenomenon, not just in Rome. So little catastrophes happening to small people, in accumulation, can give us a very good idea of what happened at the macro-level to the whole society."

Applying a blend of quantitative and empirical testing normally found in the natural sciences rather than relying on traditional historiographical methods of reading and interpreting ancient sources, Turchin and Scheidel developed a simple mathematical model that used coin hoards to project population dynamics before and after 100 BC.

Their conclusion? The model predicts declining population after 100 BC and suggests the vigorous population growth scenario of the "high count" is highly implausible.

"This may seem like an arcane dispute, but it isn't really, because the difference is so large - 200 percent," says Scheidel, a professor of humanities and expert on Roman history. "This model is much more consistent with the low count. I'm not sure that by itself it has absolutely proven it, but it certainly provides additional evidence for the low-count hypothesis."

Turchin's and Scheidel's model was developed using census data of the period before 100 BC, when Roman population history is relatively uncontroversial. The model's trajectory successfully captured major demographic trends during that period, including the short-lived population increase before the Second Punic War, demographic contraction during the war, and sustained population growth in the second century BC. They then tested the model using coin hoard data after 100 BC, and found that the trajectory mirrored the numbers postulated by adherents of the low-count theory.

"Judging by the number of hoards found during the first century BC, this

period was as calamitous as the war with Hannibal," Turchin says. "Actually it was even worse, because there was not just one, but two large clumps of hoards. It is very difficult to imagine how a population could grow during a period of such violence, and the model provides a precise quantitative statement of this."

Turchin and Scheidel are both strong advocates for greater collaboration between scholars of the humanities and scientists.

"The results in this article indicate that a formal approach combining modeling with data analysis can compensate for the scarcity of reliable statistics from pre-modern societies," says Turchin, a professor of ecology and evolutionary biology in the College of Liberal Arts and Sciences. He has coined a term for such collaborations - "Cliodynamics" - and has [devoted a website](link) to the new science.

"I'm very much in favor of such collaborations," Scheidel says. "Most humanists don't do that, but they should be doing it. I don't expect humanists to be scientists, they can't be. But that doesn't mean scientists can't be more involved."

Provided by University of Connecticut ([news](link) : [web](link))