

When the Geological Society of America met in Reno, Nevada in early November 1984, new light was shed on ancient marbles - not of the rolling sort, but the kind that was commonly used in antiquity for sculpture and architecture. Norman Herz of the Center for Archaeological Sciences at the University of Georgia (in Athens, Georgia!) reported on a promising technique he has been testing which allows a researcher to determine not only the place of origin, but also the authenticity and integrity of an ancient marble artefact.

To illustrate the technique, let us imagine a marble bust of Nero in the possession of a major museum. It is obvious to the curator that this bust has been patched up after being damaged in antiquity. The problem is determining whether the bust has been patched up with its original fragments, or with later additions (perhaps even as late as 18th century A.D.). In the latter case, how much of the portrait is in fact ancient?

The solution lies in the isotopes of the marble. Each quarry has what Herz calls "a distinct signature" in terms of its ratio of carbon -13 to carbon -12, and of oxygen -16 to oxygen -18. If one analyzes these isotopes in the various quarries known to have been used in antiquity (and Herz did this for 39 quarries around the Mediterranean) one comes up with a data-base which can then be used to determine where a bust of unknown provenance came from, or indeed, whether it has been altered at any time in its history. Herz argues that this procedure is extremely reliable, having tested it on samples of known provenance; for example, marbles known to be from Carrara in Italy had a 91% rate of correct identification when compared to the date-base for Carrara.

To get back to our imagined bust of Nero, this technique could easily tell us whether the nose, ears and hair (all of which show signs of patching) are authentic or are later additions made by collectors of antiquities. This has actually been done for a bust of Antonia Minor (the mother of Claudius) in the Fogg Museum at Harvard, and the curators there now know that only the head section is authentic; the rest (mainly drapery) seems to have been a clever Renaissance forgery.

Since museums have countless numbers of marble artefacts whose origin and history are unknown, Herz's procedure will likely become vitally important. Forgeries have been all too common, and have picked the pockets of many a collector and museum, who will now be able to "fight back".