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Chemical detective work proves that the Vinland map is a forgery

The Scripps Howard article that deals with Yale University's "resurrection" of the ill-famed Vinland map, while accurate, is very misleading ("Yale says no fake, unfolds medieval map again," *Nation*, March 27).

The article states that in the early 1970s, Walter McCrone found tiny particles of ink that contained "a type of titanium that, rare in nature, wasn't sold as a pigment until the 1920s." The "type of titanium" that Mr. McCrone found was the mineral *anatase*. It was the presence on the Vinland map of rounded, well-crystallized anatase crystals free of natural clay contaminants and not the simple presence of the element of titanium that led Mr. McCrone to declare the map a fake. Nothing has changed to alter that conclusion.

Physicist Thomas Cahill and his multidisciplinary team at the Crocker Nuclear Laboratory at the University of California at Davis were able to find the element titanium on the Vinland map, as well as "scores of known medieval documents," but their cyclotron technique was

unable to tell if the titanium on any of these documents was present as the mineral anatase. In fact, except for the Vinland map itself, none of these other documents has ever been found to contain anatase. This is because Mr. Cahill's technique is able neither to image the ink particles nor analyze the crystallography and mineralogy of the particles.

The cyclotron team also claims to have detected only trace amounts of titanium on the map. But the analysis took place over a much larger area (up to 30,000 times larger) than that used by Mr. McCrone, or even by others in the Mr. Cahill's laboratory who found significant titanium by analytical electron microscopy in particles carefully taken from the crease in the map. The very small values reported for titanium must therefore represent analytical error because they are in direct conflict with results from these other high-resolution approaches from two independent sources.

Moreover, the report that Mr. Cahill submitted to the Yale University Library in 1985 states clear-

ly that titanium was "the most frequently found element in the ink [of the map] . . . found 65% of the time." It also reveals that the titanium on the map is closely associated with the ink and not with the parchment, and notes that no titanium at all was detected on either of the two companion documents. Instead of contributing to authenticity, all of this adds to Mr. McCrone's conclusion that the Vinland map is a fake.

The team of scholars at Yale University Press argues that the Vinland map has been "vindicated." Until they can present clear evidence showing the presence of well-crystallized anatase (free of natural sediment contaminants) in the ink on some of the scores of other indisputably genuine medieval documents they have analyzed, the forgery conclusion drawn by Mr. McCrone in 1974 remains valid.

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