The Vinland Map – Still a 20th Century Forgery

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Sir: In the 1 December 2003 issue of this Journal, Olin[1] purports to survey the evidence that the ink of the Vinland Map (VM) is medieval. Unfortunately her article is based on speculation, lacks logic, and lacks either new information or new insight on the ink, consisting merely of a rewriting of her earlier publications.[2] Its publication has provided the scientific and popular press with fuel with which to fire further, entirely unjustified, controversy on this subject.

The VM was convincingly shown in 1974 to be a 20th century forgery by Walter and Lucy McCrone[3,4] when they identified anatase (TiO_2) in the ink used on the map. The anatase had a particle size (~0.2 μm) and particle size distribution which is characteristic of the synthetic, that is, post-ca. 1920 material; these features, particularly the latter, distinguish it from natural mineral samples, either ground or weathered. The entire background to the problem was effectively reviewed by Towe in 1990.[5] Recent Raman microprobe studies have confirmed the presence on the map of anatase, which was shown to be confined to the outlines of the map and not to be dispersed elsewhere across the map; this identification[6] would not have been possible had the content of titanium on the VM been as low as that deduced (0.0062% by mass) from the earlier PIXE measurements. Radiocarbon dating of the parchment (not the ink) to ~1434 AD[7] admits of a single conclusion only, namely, that the VM cannot predate ~1434 AD, but does not otherwise bear upon the date of the map itself.

Olin[1] persists in referring to the VM as having been drawn in iron gall ink when she has not established that there is any of this material there at all. There is no evidence on or around the ink lines on the parchment of any degradation of the latter, as is often induced by iron gall ink over long periods of time. Baynes-Cope[8] showed 37 years ago that the ink is not based upon iron gall, and recent Raman studies indicate that it is essentially a carbon black ink.[6] Olin's entire discussion as to how anatase might get into an iron gall ink prepared from ilmenite in medieval times is thus irrelevant. Moreover, she herself has shown that such a procedure leads only to the production of extremely finely divided, nearly amorphous anatase—not the form in which the anatase is found on the map (vide supra); a subsequent and improbable calcination step at >800 °C is needed to form pigmentary anatase.[9] No amount of speculation on possible medieval methods of making an anatase-containing iron gall ink can get around this point.

Anatase is not known to have been used as a pigment in medieval Europe. Indeed, detailed Raman studies over the past 12 years of innumerable locations on >20 large Anglo-Saxon[10,11] and European[12,13] manuscripts and codices ranging in date from ~700 to 1500 AD have failed to lead to a single identification of this pigment on either the illuminations or in the inks. Yet it is known to be a very intense Raman scatterer and, if present, should be one of the easier materials to detect and identify on artwork by Raman microscopy.[14] This all provides a further context for judging Olin's claim that anatase could be a natural component of the ink on the map.

The unhealthy interest of the media in this subject seems, unfortunately, to be largely based on interest in possible controversy rather than on desire to know and recognize the facts of the situation. Moreover, such reporting is frequently confused in popular science journals. For example, that by Choi[15] perversely reverses the situation regarding the sizes of anatase particles: it is jagged particles of widely varying sizes which are characteristic of ground-up native material, whereas it is rounded particles of fairly uniform size and narrow particle size distribution (~0.2 μm across) which are characteristic of synthetic material. It is the latter, not the former, which was found on the VM by McCrone.[4]

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