

A Pilot Paleointensity Study of 19th and 20th Century Bricks from the New York City Area

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Secular variation observations from historic times can be supplemented by archaeomagnetic data. This potentially rich source of information has not been tapped in North America. A pilot paleointensity study was done using six bricks fired in the New York city area between 1840 and 1926. Three samples from each brick were cut into 2-cm cubes, oriented relative to each other, and used for the Coe version of the Thellier-Thellier double heating paleointensity experiment. One yellow brick with low iron content had aberrant magnetic properties, did not yield an interpretable paleointensity, and will not be considered further below. For the other samples, NRM directions were stable upon thermal demagnetization. Median destructive temperatures ranged from 240- 330 degrees. Loss on ignition was as high as 10%. Room temperature susceptibilities increased above 350 degrees by 10-40%, and repeat pTRMs also increased above 300 degrees. Four bricks had three samples with consistent paleointensities; the fifth brick had one aberrant result. Quality factors varied from 24-81. One brick gave paleointensity results consistent with British Geological Survey secular variation models, but the other four bricks gave results 5-15% too low. Results were not corrected for fabric anisotropy (assumed to be low) or cooling rate, which was 20 minutes in the lab, and likely several days in the field. Aitken et al. (1987) suggested that self-demagnetizing effects were responsible for low archaeointensities from strongly magnetized samples from a historic kiln; we will explore that possibility further for our samples.

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