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PLEISTOCENE ART OF THE WORLD

Short articles



## DATING ROCK ART:

### Two New Methods for Pictographs and Petroglyphs

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Two new methods for dating rock art with underlying soil have been tested under ten pictographs and five petroglyphs in seven regions of Canada, Mexico and the United States. Both assume pigment particles or paint droplets or hammerstone chips and the dust they created fell to the feet of the artist. This is like chalk dust at a blackboard, droplets while painting, or marble chips and dust in sculpting. Both require finding the soil level with this material and AMS dating its organic matter. Dating precision varies with the thickness of each level analyzed, especially for palimpsests with art of different periods in several levels. We have scraped and collected levels varying from 5-12 mm.

Pictograph pigment seen in photographic or microscopic enlargements is verified with scattered electron microscopy. A coating of water-soluble glue on common copy paper applied to each level removes its surface sediment. The rest is sifted and photographed in stages over a wide cardboard.



Scraping and sieving levels for hammerstone chips and their pulverized rock flour, plus AMS samples, at the Thunderbird petroglyph (Brickyard site, Gabriola Island, Canada).

It becomes backfill, as its pigment is invisible until enlarged, but adds to glue sheet counts. Pigment taken from a glue sheet with a damp cotton tip under a microscope or hand lens is dropped in a gelatine capsule for shipping and SEM analysis.

Hammerstone chips and pulverized rock flour occur in petroglyphs with underlying soil (figure). Big chips and pebbles remain in a 4 mm mesh deep fry basket; small ones and fine gravel pass to a nested 1 mm mesh kitchen sieve. Hammerstone chips differ from stone flakes and other contents in being chunky, sharp and of different material. Chips are bagged separately from datable shell, wood, charcoal, plant or bone fragments, which are removed with tweezers. Pebbles, rootlets and unwanted debris are discarded. If clay clogs the sieve, water immersion lets it, silt, sand and flour pass. Suspended clay and silt are decanted and the sand-flour mix separated by fine wet sieving.

I assume soil pigments or sharp chips linked to rock flour denote either pictographs or petroglyphs. Pigment may be residue from a burial or other ritual, but we have never found human bone or painted artifacts. Both dating methods assume soil strata are parallel to the ground surface, an assumption minimized by scraping thin layers within a footprint-sized test made possible by refining our initial larger tests. I assume soil under a motif made in a single application has most pigment and hammerstone fragments in one level, minimizing SEM analysis and AMS dating. I assume several applications to one motif or a series of palimpsests result in several levels with pigment or chips. Their dating may show sequential visits, some spanning centuries. Separate motifs are best tested individually. I assume a pigment particle or some rock flour in one level, especially at the rock/soil interface, were rain-washed down the rock face, perhaps long after the art was made. We avoid soil altered by wind or water, as in desert “washes” and shorelines.

Both methods are artistically non-destructive, quantifiable, repeatable, falsifiable and applicable to cave, boulder and cliff walls and ceilings, and possibly open-air flat bedrock with nearby soil-filled cavities. They do not touch the art and are quantifiable, as fallen hammerstone chips, pigment and rock flour are distinct and datable based on proximity to organic material, as in traditional archaeological dating. Both methods are repeatable if new tests are placed alongside. Both are falsifiable if pigment or sharp-edged flakes without rock flour are absent. Dating will change our interpretation of rock art by providing a time-line. This is especially true if a corpus of similarly dated art in one region forms a pattern. Petroglyphs are 90% of all rock art, yet dated ones are based mainly on style. Each test needs a few hours and works in damp soil with petroglyphs. Pigment and some rock flour washed down the rock face by rain may appear above the artist’s floor in a line at the rock/soil interface.





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