

www.ancienttl.org · ISSN: 2693-0935

Prescott, J., 1982. *TL Dating of calcrete ovenstones*. Ancient TL 6(1): 7-8. https://doi.org/10.26034/la.atl.1982.050

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TL DATING OF CALCRETE OVENSTONES

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Although man-made ceramics probably still provide the bread-and-butter of TL dating, there has always been a small but sustained interest in non-ceramic materials. A review of this field has recently been put together by Wintle (1980). In Australia where prehistoric man never made pottery, dates must be based on hearths (Huxtable and Aitken, 1977; Bell, 1981) or oven stones (Prescott, et al. 1981), for which the zeroing mechanism is heat, or on the sediments in which artifacts are found, for which the zeroing mechanism is sunlight.

Over a large part of the valley of the River Murray, Australia's major river, prehistoric man used calcrete (kunkar) for oven stones in his fireplaces. This material can be picked up either as nodules or lumps in exposures throughout most of the valley. The purpose of the present note is to describe the treatment we have used successfully to date the material, since it may save others some time when faced with a similar problem.

The difficulty lies in the nature of the material, which is almost pure calcium carbonate. It is well-known that the presence of this material in TL samples frequently gives rise to spurious TL, although since calcite can be successfully dated (Wintle, 1978) it does not necessarily do so.

In the present case, the sort of procedures suggested for dating of calcite were all tried. No regimen of crushing and size sorting was successful in eliminating spurious TL. Treatment with weak acids such as EDTA and acetic acid and with Calgon, which are often successful with calcareous samples, did not work. Thin sections, polished or etched did not work either. In short, it was not possible to eliminate spurious TL from any preparation of the original material. Even digestion in cold dilute hydrochloric acid did not work.

The success treatment used digestion in hot 20% HCL for two hours. This treatment reduces the oven stone material to a sludge which, after thorough washing and further treatment with Calgon to remove calcium ions, can be used with standard procedures for either fine grain or coarse grain quartz dating. Two hundred grams of oven stone yields a gram or two of fine grain material and a hundred mg or so of quartz in all sizes up to about 250 microns. Actual dates have been obtained by both techniques and their significance is discussed elsewhere (e.g., Prescott, et al. 1981).

It should be added that if the ovenstone has not been heated to a sufficiently high temperature (as established for instance by measurements of thermo-remanent magnetism) the fine grain material may not be datable even after the rather extreme measures outlined above. This is because some mechanism, which is not yet clearly understood, transfers energy back into at least some of the traps that were emptied during first glow-out so that, on reheating, light is seen at low temperatures, to give a form of spurious TL different from that described earlier. The physics of this phenomenon is currently under study and will be reported elsewhere.

It is a pleasure to acknowledge the hospitality of the Research Laboratory for Archaeology and the History of Art, Oxford, where much of the developmental work was done during study leave.

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CORRECTIONS AND ADDITIONS TO THE TL LABORATORY LISTING

Since the printing of the TL laboratory listing and map in issue number 16, several errors have been pointed out by readers and some additional information has come to light. It has been drawn to the attention of the editor that the boundary between Europe and Asia on the map was in error. Although the map was subdivided merely to make it easier for readers to go from the listing to the appropriate map location, it is desirable to follow the continental boundaries as closely as possible. The main consequence of the incorrect boundary was to place several European laboratories in Asia. The following corrections to the laboratory listing should be noted:

- 1. Laboratories <u>D1</u> (M. V. Lomonsov State University, Moscow), <u>D2</u> (Institute of Geological Sciences, Kiev) and <u>D3</u> (Institute of Geology, Tallinn) should be redesignated C27, C28 and C29, respectively.
- 2. Add <u>C30</u> Physics Laboratory II, University of Patras, Patras, Greece (Dr. Y. Liritzis) Archaeological dating and geological applications; also U-series dating.
- 3. Address correction:

<u>C13</u> Centre de Recherche Interdisciplinaire d'archeologie analytique, CR1AA (associe au CNRS 584), Maison des Sciences de l'Homme, Domaine Universitaire 33405 Talence FRANCE (Prof. Max Schvoerer) Archaeological dating, geological applications (coral, basalt, nodules, obsidian), Radiation dosimetry, Physics studies.

4. Typographical corrections: <u>C10</u> ESR; <u>C27</u> Lomonsov; <u>C28</u> Shelkoplyas; <u>D5</u> Pei Jing-Xian; <u>E3</u> <u>A. J.</u> Mortlock.

Shown in this issue is a reduced version of the revised map but the entire corrected listing is not included. The intention is to continually update the listing and to offer copies free of charge upon request. Those desiring the revised listing should send their requests to the editor at the letterhead address. With this in mind, the laboratories in the listing are encouraged to send brief descriptions of their interests to make the listing more complete. Laboratories which are not included at the present time may be added at any time.