D.RICHTER

Ancient TL

Editor: S. R. Sutton
Box 1105, Washington University
St. Louis, Mo. 63130

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" We have three principal means: observation of nature, reflection, and experiment. Observation gathers the facts, reflection combines them, experiment verifies the result of the combination. It is essential that the observation of nature be assiduous, that reflection be profound, and that experimentation be exact. Rarely does one see these abilities in combination. And so, creative geniuses are not common."

Denis Diderot, 1753

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TL DATING IN CHINA

M.J. Aitken

Research Laboratory for Archaeology
6 Keble Road, Oxford OX1 3QJ

During a visit to China in October 1980 at the invitation of the Institute of Geophysics of Academia Sinica, I saw several TL laboratories. This note provides brief details of the TL studies being carried out.

In Peking there are two laboratories, one at the Institute of Archaeology and one at the Institute of Geology of Academia Sinica. The one at the Institute of Archaeology is run by Mr. Li Hu Hou, who has recently taken delivery of a computerised set from Littlemore Scientific. This has been set up without problems and Mr. Li was engaged on dating baked clay from a metallurgical furnace of Neolithic age; in addition to thick source alpha counting he was using the fluorescence method for determination of uranium and thorium.

At the Institute of Geology Ms. Pei Jing-xian had the use of a Harshaw 400 plus a locally built set derived from it, with the upper temperature limit extended to 600°C. Her past and present programme included work on the Jilin meteorite, dating of loess, sediment baked by lava, and calcite as well as quartz extracted from burnt soil from the level at Zchoukoudian in which the Peking Man had been found. The TL age obtained for this soil was 610 Ka, and the fission track age 462 $\pm$ 45 Ka. Amino acid dating of levels above and below had given ages of 390 Ka and 460 Ka respectively. Uranium series dating of the level above had indicated an age in excess of 320 Ka.

Also in Peking I met Ms. Ji Fung-ju and Mr. Sun Jian-zhong of the Institute of Geology of the State Bureau of Seismology who were starting TL work on lava using the equipment at the Institute of Archaeology; anomalous fading tests of their samples (age in the range 100-200 Ka) had indicated not more than 10% loss in 6 weeks.

At the Shanghai Museum TL dating is being undertaken by Mr. Wang Wei-ta (of the Museum) in collaboration with Mr. Zhou Zhi-xing from an Institute concerned with medical and industrial dosimetry, assisted by Mr. Xia Ning. The TL oven and photo-multiplier housing arrangement was of novel design; the oven was small (50-100 ml) and covered by a large lid on which two alterna-tive photomultipliers were mounted so that by rotation

of the lid either could be positioned over the oven. Also in the lid was an access hole. One of the photomultipliers (an EMI 9635 QB) was used in photon counting mode (for archaeological TL) and the other in DC mode (for TL dosimetry). Both fine grain and quartz inclusion techniques were being used, the fine grains being deposited from water onto 0.1 mm thick silver discs of diameter 16 mm; the time required to make a set of discs was quoted as an hour, the water being drained off drop by drop after completion of deposition. Alpha activity was measured by means of a 50-mm diameter surface barrier detector. No trouble had been experienced due to contamination from the powdered sample which was presented to the detector in air at a distance of a few millimetres without any window intervening; the background was quoted as 10 counts in 24 hours. Beta irradiation was by means of a large Sr-90 plaque source, 30 mm x 40 mm, at a distance of 2 or 3 mm from the sample. Alpha irradiation was by means of a 30 mm diameter Po-210 source, without window. For TL dosimetry $CaSO_4$:Tm was used, made at the laboratory.

I was not able to visit the TL laboratory at Qei-Yiang, where loess dating has been carried out at the Institute of Geochemistry of Academia Sinica. There are also plans for loess dating at the Institute of Oceanography of Academia Sinica at Tsingdao (Mr. Guang C.Z.).

I also visited four radiocarbon laboratories in Peking (at the University, at the Institute of Archaeology, at the Institute of Anthropology, and at the Institute of Geology of the State Bureau of Seismology); altogether there are about a dozen in China, with more planned.

The main business of my visit was to give lectures at the Institute of Geophysics and to have discussions with the archaeomagnetic group there (Dr. Wei Quin-yun, Mr. Chang Wei-si, Mr. Chao Quan-yu, Ms Li Tung-chien and Ms Wang Shuang-pin). I was most appreciative of the Institute's hospitality and I am grateful to Academia Sinica and the Royal Society for making my visit possible. It was a great pleasure to be welcomed by all these formerly unknown colleagues in the dating business, and I hope we shall all have more contact with them in the future.

THE 1981 ARCHAEOMETRY SYMPOSIUM -- BROOKHAVEN, NEW YORK

The twenty-first International Archaeometry Symposium will be held at Brookhaven National Laboratory, Upton, New York, USA, May 17-22, 1981. The following sessions (and Convenors) are currently scheduled.

Provenance studies (all materials including coins)
A. Aspinall and S. Warren, University of Bradford, U.K.
Ancient metals and metallurgy
R. Maddin, University of Pennsylvania, USA
Ancient technology: non-metals
M. S. Tite, British Museum, U.K.
Prospection
R. Linington, Fondazione Lerici, Rome, Italy
Dating of organic materials (e.g. radiocarbon and other cosmogenic nuclides, dendrochronology, amino acid dating)
E. T. Hall, Research Laboratory for Archaeology and the History of Art, Oxford, U. K.
Dating of inorganic materials (e.g. thermoluminescence, ESR, fission tracks, uranium-series, archaeomagnetism)
M. J. Aitken, Research Laboratory for Archaeology and the History of Art, Oxford, U. K.
Mathematical methods and data management
I. Scollar, Rheinisches Landesmuseum, Bonn, West Germany

Abstracts should reach the appropriate Convenor not later than February 1, 1981. In addition to the above sessions, the Smithsonian Institution is organizing panel discussions on "Future Directions in Archaeometry" to be held following the Thursday sessions and continuing Friday morning.

For further information regarding the symposium, contact G. Harbottle at Brookhaven.

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READERS' CLUES AND QUERIES

Fellowship Information

The Thermoluminescence Laboratory of the University of Missouri provides one research assistantship earmarked for a graduate student of Archaeometry. The holder must be enrolled in degree program in Anthropology, Physics or logically related discipline. The total salary depends upon just how much research the student has time to do, but is nominally $ 4,000 for a half time. Address enquiries to:

Professor Ralph M. Rowlett
Department of Anthropology
University of Missouri-Columbia
Columbia, MO. 65211

Sample Request

A current research project at Washington University is aimed at developing thermoluminescence techniques for accurately dating heated rocks from archaeologic sites. Current efforts are concentrated on locating and collecting suitable samples for this study. Ideal samples are heated granite and sandstone/quartzite found close together in fired structures containing charcoal for radiocarbon intercomparison. Anyone having information on possible samples and/or sites is invited to contact me at the letterhead address.

Stephen Sutton

ANCIENT TL AT A GLANCE

a handy index of the first 12 issues