Ancient TL

www.ancienttl.org · ISSN: 2693-0935

Ancient TL, 1994. *Thesis Abstract.* Ancient TL 12(2): 54. https://doi.org/10.26034/la.atl.1994.231

This article is published under a *Creative Commons Attribution 4.0 International* (CC BY): https://creativecommons.org/licenses/by/4.0

© Ancient TL, 1994

Thesis Abstracts

On the suggestion of Dave Huntley, Simon Fraser University, abstracts for two recent theses are included below and it is hoped that other laboratories will wish to keep the field informed of new and recent theses by sending further details to the Editor.

• Thesis title: Luminescence Dating of Quartzite from Diring Yuriakh
Awarded by: Simon Fraser University
Author: M. P. Richards
Date: 1994 Degree: MSc

Abstract
The lower cultural stratum (stratum 5) at the Diring Yuriakh archaeological site, in Siberia, Russia, contains crude stone tools, which, it has been suggested, were made before the currently accepted earliest occupation of Siberia in the Upper Palaeolithic (ca. 35,000 years ago). The stratum 5 artifacts are mostly quartzites, which contain a great deal of quartz. The artifacts lie on a deflation surface, and show evidence of wind abrasion, so it is likely that they were exposed to sunlight for a period of time before being buried by the overlying sediments. Experiments were undertaken to see if these quartzites could be dated using luminescence dating techniques similar to those that have been used to date the last time quartz grains extracted from sediments were exposed to sunlight. A method was developed to extract quartz grains from the quartzites, layer by layer, using successive 30 minute treatments of 50% hydrofluoric (HF) acid. By comparing the luminescence signal of quartz grains from each layer of quartzite recently exposed to sunlight, it was found possible to determine how deep into the quartzite the sunlight penetrated sufficiently to reduce the luminescence to zero. This allows selection of quartz grains for luminescence dating that should have been exposed to sufficient sunlight in the past. Dating attempts were made on quartzite samples from stratum 5 and stratum 2 (a deeper noncultural stratum), and it was found that the traps in the quartz grains were in saturation. After determining the radiation dose required to saturate the traps the dose-rate was calculated for each sample and then minimum age limits were determined. A stratum 2 quartzite was found, using thermoluminescence, to be last exposed to sunlight more than 150 ka ago. A stratum 2 control sample, which was expected to be in saturation on the basis of its supposed age, was found not to be in saturation, and yielded an equivalent dose of 440±90 Gy, using 1.4 eV excitation. The evidence presented for a stratum 5 quartzite suggests it was last exposed to sunlight over 74 ka ago.

• Thesis title: Infrared Optical Dating of Organic-rich Sediments
Awarded by: Simon Fraser University
Author: Jinsheng Hu
Date: 1994 Degree: MSc

Abstract
The dating of sediments using infrared stimulated luminescence has drawn very much attention in recent years, especially because of the simplicity of the apparatus by which such luminescence can be measured. On the other hand, the applicability of the technique for age determination has not yet been demonstrated satisfactorily so far. This work is an attempt to investigate whether or not the infrared optical dating technique could produce correct ages for organic-rich sediments. Five of the seven samples studied yield satisfactory ages ranging from 0 up to about 100 ka. Two of the samples are of well-established ages while another three yield ages which are consistent with other evidence. It was also found that inhomogeneities in this type of sediment can be large enough to destroy the validity of the optical age. For the oldest sample studied (the age of which is between 0.78 and 1.06 Ma), the optical age was found to be 706±98 ka.

Additionally, a possible lower limit of 290±30 ka was obtained for the age of a sand sample collected from the Diring Yuriakh stone tool site.