Ancient TL

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PUBLICATION OF THERMOLUMINESCENCE DATE LISTS

In this issue, Ancient TL will begin the publication of thermoluminescence date lists. The purpose of including date listings is to provide for the publication of the details of dating procedures and results which may then be referred to in journal articles. The adopted format is essentially that proposed by David Zimmerman at the 1978 TL Specialist Seminar at Oxford and is similar to the format used by Radiocarbon for the publication of radiocarbon dates. Immediately following this note is a listing from the Physical Research Laboratory (Ahmedabad, India) which can also serve as a format reference for future contributors.

The TL date report consists of an introductory paragraph giving information on technique, apparatus and pertinent references followed by a listing of the dates. In the first date list from each laboratory, the introductory paragraph should be reasonably detailed. Subsequent reports from that laboratory may then simply refer to this first report for details of technique. The date listing itself is divided according to site. Each TL date is given a three entry identification code which consists of a laboratory identification acronym, 'TL' to distinguish the date from a radiocarbon date and a laboratory sample/context number. The actual dates and error assessment values are listed following the format suggested by Aitken and Alldred (1972) and Aitken (1976). It is suggested that a base year of 1980 be adopted when quoting ages in years before present. Directly under this information is given the type of material dated and context information. Finally, a comments section appears containing detailed information on the measurements and calculations. This section is subdivided into three subsections- the natural dose, the annual dose and general comments. The actual information given in these subsections will depend on the material and dating technique used.

The format suggested here should not be considered rigid. Readers are encouraged to suggest modifications and/or additions to this format as well as alternative methods of listing. It is also hoped that some discussion of TL date reporting will take place at the upcoming specialists' seminar.

S. R. Sutton, Editor

PHYSICAL RESEARCH LABORATORY TL DATES - 1981 (II)

Y. P. Sharma*, A. K. Singhvi and D. P. Agrawal

Physical Research Laboratory, Ahmedabad 380009, India

The following TL dates on pottery from a protohistoric site, Sanghol (District Ludhiana) in Punjab and one date from Bagor (Rajasthan) were assayed. Fine grain technique (Zimmerman, 1971) was used. The alpha activity of the sample was measured using thick source ZnS(Ag) counting method and NaI(TL) gamma spectrometry was used for potassium determination. For dose-rate calculations, equal alpha activity of uranium and thorium series was assumed and the decay series were taken to be in equilibrium. Both

* Permanent address: Dept. of Physics, Kurukshetra University, Kurukshetra 132 119 India

unsealed (α_0) and sealed (α_1) counts were measured. In cases where α_1/α_0 was greater than 1.05, an average of α_1 and α_0 was used for the dose-rate estimation. For other cases, α_0 was considered appropriate. Saturation water content was used both for soil and the sherd. Beta irradiations were performed using a 40 mCi, $^{90}Sr/^{90}Y$ beta plaque. Alpha irradiations were carried out under vacuum using six-seater alpha irradiation facility (Singhvi and Aitken, 1978). The details of the experimental procedures and the apparatus have been described elsewhere (Agrawal et al., 1981). In view of the fact that in general a glow curve is a composite of many glow peaks, the natural dose (AD) and the alpha efficiency (a) were estimated at intervals of 10°C on the glow curve. These values were then used to compute the age at various points on the glow curve. The quoted ages are the mean of these ages, averaged over the age plateau. The natural dose and alpha efficiency and thus the dose-rate reported are only typical values corresponding to a particular glow curve temperature. In all the cases anomalous fading was estimated as the loss in the TL signal integrated over the plateau region. The error estimates were made using procedures suggested earlier (Aitken, 1976). No allowance was, however, made for σ_8 as saturation water content was assumed. The samples were collected by A. K. Singhvi (PRL) and G. B. Sharma (Department of Archaeology, Punjab). All the dates are in years B. P. and use 1980 as the base year. Errors are given within parenthesis.

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A. SANGHOL (Dist. Ludhiana, 30°20'N, 75°15'E), India

PRL-TL-1 Late Harappan Bara Ware 3120 (±---;±270) 1140 B.C.

Pottery: Loc. SGL-II, Tr. EX-1, kiln sealed by Layer 40.

COMMENTS- Natural dose: 2440 rads (I=360), δQ = 5%, plateau ≃ 60°C, anomalous fading < 5% (14 days). Annual dose: 0.79 rads/yr., α_1/α_0 = 1.05, sherd wt. sat/dry = 1.13, a = 0.12, δa = 5%.
^{14}C date on associated charcoal is 3640 ± 150 (PRL-513).

PRL-TL-6 Grey Ware 2100 (±---;±180) 120 B.C.

Pottery: Loc. SGL-II, Tr. EX-1, Layer 31.

COMMENTS- Natural dose: 1640 rads (I=270), δQ = 5%, plateau ≃ 70°C, anomalous fading < 5% (18 days). Annual dose: 0.80 rads/yr., α_1/α_0 = 1.0, sherd wt. sat/dry = 1.13, a = 0.13, δa = 5%.

PRL-TL-7 Late Harappan Bara Ware 3220 (±---;±450) 1240 B.C.

Pottery: Loc. SGL-II, Tr. EX-1, Layer 45.

COMMENTS- Natural dose: 2350 rads (I=170), δQ = 10%, plateau ≃ 70°C, anomalous fading < 5% (25 days). Annual dose: 0.72 rads/yr., α_1/α_0 = 1.03, sherd wt. sat/dry = 1.12, a = 0.11, δa = 10%.

PRL-TL-9 Upper level of Late Harappan Bara Ware 3110 (±---;±270) 1130 B.C.

Pottery: Loc. SGL-II, Tr. EX-1, Layer 35.

COMMENTS- Natural dose: 2360 rads (I=420), δQ = 5%, plateau ≃ 70°C, anomalous fading < 5% (40 days). Annual dose: 0.76 rads/yr., α_1/α_0 = 1.0, sherd wt. sat/dry = 1.14, a = 0.11, δa = 5%.

PRL-TL-10 Lower levels of Late Harappan period 4030 (±---;±330) 2050 B.C.

Pottery: Loc. SGL-II, Tr. EX-1, Layer 46.

COMMENTS- Natural dose: 3190 rads (I=380), δQ = 5%, plateau ≃ 70°C, anomalous fading < 5% (20 days). Annual dose: 0.80 rads/yr. (using $(\alpha_1+\alpha_0)/2$), α_1/α_0 = 1.11, sherd wt. sat/dry = 1.13, a = 0.12, δa = 5%.

PRL-TL-14 Painted Grey Ware (?) 1760 (±---;±210) A.D. 220

Pottery: Loc. SGL-II, Tr. EX-1, Later 33.

COMMENTS- Natural dose: 1350 rads (I=390), δQ = 8%, plateau ≃ 70°C, anomalous fading < 5% (30 days). Annual dose: 0.76 rads/yr., α_1/α_0 = 1.0, sherd wt. sat/dry = 1.14, a = 0.11, δa = 8%.
The date is anomalously younger than expected.

B. BAGOR (25 21'N, 74 23'E), India

PRL-TL-42 Bagor Ware 2060 (±---;±210) 80 B.C.

Pottery: Loc. sample from depth 0.41-0.55m from a sand dune which also yielded microliths.

COMMENTS- Natural dose: 2220 rads (I=60), δQ = 7%, plateau ≃ 80°C, anomalous fading < 5% (90 days). Annual dose: 1.09 rads/yr. (using $(\alpha_1/\alpha_0)/2$), α_1/α_0 = 1.07, sherd wt. sat/dry = 1.13, a = 0.18, δa = 5%.

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