

PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE TL DATES, 1983(II)

A. Román, A. Deza and O. Brito

Facultad de Física
Pontificia Universidad Católica de Chile
Casilla 114-D
Santiago, Chile

The TL dates on pottery from two sites: "Chiu-Chiu 200" (Second Region) and "Parque La Quintrala" (Santiago, Metropolitan Region), were measured in 1982. The pottery was crushed and washed 3 hours with HCl at 50°C. The quartz was sieved to obtain grains with 80-120 microns diameter. The details of the experimental apparatus have been reported in an earlier paper (Concha et al., 1980). Beta irradiation was carried out with Sr-90 source, 10mCi (nominal) calibrated in 1981 with LiF powder samples, irradiated and non-irradiated, supplied by Dr. Gilmartin (Brookhaven National Laboratory, Upton, New York). The annual dose was determined using the revised data of Bell (1979). The Th, U and K₂O concentration values, both sherd and soil (stone-free), were measured by the Neutrónic Activation Department of the "Comisión Chilena de Energía Nuclear". Santiago. Saturation water content was calculated for sherd and soil of the Parque La Quintrala and no moisture content was considered for the Chiu-Chiu's sherds (desertic zone). 15 mrad/yr was used as the cosmic radiation dose-rate. The alpha dose-rate was assumed zero. The equivalent dose is the average of the values obtained by extrapolating first and second glow growth curves. Anomalous fading was not studied in any case. The error estimates were made using the method proposed by Aitken (1976), but the uncertainties σ_3 (due to the stone content of the soil) and σ_7 (radon emanation) were assumed zero. All the dates are in B. P. and 1980 was used as the base year. Errors are given within parenthesis.

Acknowledgements

This work was supported by the Pontificia Universidad Católica de Chile Research Direction (DIUC) grant 49/81. The authors would like to thank Dr. Rafael Vicuna and his Department (DIUC) for the financial support and his kind encouragement.

References

- Aitken, M. J. (1976) Thermoluminescent age evaluation and assessment of error limits: revised system. Archaeometry, 18, 233-238.
- Bell, W. T. (1979) Thermoluminescent dating: Radiation dose-rate data. Archaeometry, 21, 243-245.
- Concha, G., Román, A., Brito, O., and Deza, A., (1980) Thermoluminescent dating of ancient Toconce potteries. Ancient TL, 10, 9-11.
- Thomas, C., Benavente, M. A. and Durán, A. (1980) Análisis crítico comparativo del cementerio Parque La Quintrala. Revista Chilena de Antropología, 3, 41-56.
Análisis crítico comparativo del cementerio Parque La Quintrala. Revista Chilena de Antropología, 3, 41-56.

ARCHAEOLOGIC SAMPLES

A. CHIU-CHIU (Province El Loa, Second Region, 22°20'S, 68°39' W), Chile.

This site corresponds to the so called "alfareria temprana" period (Chilean Northern region). The context date is about 2800 years B.P. (Department of Anthropology, University of Chile, Santiago)

UC-TL-6: 2950(---, \pm 240) 970 B.C.

Pottery: Ch-200-I, pulido negro, depth: 0.30-0.50 m.

Comment- Natural dose: 1150 rads (I=10), δ Q=5%, plateau \cong 70°C.
Annual dose: 0.39 rads/yr, sherd water = 0.

UC-TL-7: 2850(---, \pm 230) 870 B.C.

Pottery: Ch-200-III, pulido café, depth: 0.30-0.50 m

Comment- Natural dose: 940 rads (I=150), δ Q=5%, plateau \cong 70°C.
Annual dose: 0.33 rads/yr, sherd water = 0.

UC-TL-8: 2950(---, \pm 260) 970 B.C.

Pottery: Ch-200-IV, alisado negro, depth: 0.30-0.50 m.

Comment- Natural dose: 945 rads (I=85), δ Q=4%, plateau \cong 70°C.
Annual dose: 0.32 rads/yr, sherd water = 0.

B. PARQUE LA QUINTRALA, LA REINA (Province Santiago, Metropolitan Region, 33°25'S, 70°35' W) Chile.

This site corresponds to the so called "agro-alfarero temprano" period (Chilean central region). ¹⁴C dates on associated charcoal from the similar sites are between 180 B.C. - 430 A.C. (Thomas et al., 1980).

UC-TL-9: 1760(---, \pm 200) A.D.220.

Pottery: PLQ-VIII, alisado café, layer 13, depth: 2.00-2.16 m

Comment- Natural dose: 335 rads (I=55), δ Q=9%, plateau \cong 80°C.
Annual dose: 0.19 rads/yr, sherd wt.sat./dry=1.14.

UC-TL-10: 2000(---, \pm 150) 20 B.C.

Pottery: PLQ-I, pulido negro, layer 7, depth: 1.10-1.15 m.

Comment- Natural dose: 360 rads (I=60), δ Q=3%, plateau \cong 80°C.
Annual dose: 0.18 rads/yr, sherd wt.sat./dry = 1.14.

UC-TL-11: 1780(---, ± 160) A.D.200.

Pottery: PLQ-III, alisado café, layer 6, depth: 0.95-1.10 m.

Comment- Natural dose: 160 rads (I=30), $6Q=6\%$, plateau $\approx 70^\circ\text{C}$.
Annual dose: 0.09 rads/yr, sherd wt.sat./dry = 1.14.

UC-TL-12: 1600(---, ± 130) A.D.280

Pottery: PLQ-II, pulido café, layer 13, depth: 0.80-0.95 m.

Comment- Natural dose: 160 rads (I=40), $6Q=5\%$. plateau $\approx 80^\circ\text{C}$.
Annual dose: 0.10 rads/yr, sherd wt.sat./dry = 1.14.

All the sherds were collected by Maria A. Benavente and Carlos Thomas from the University of Chile, Santiago.

* * * * *

7th INTERNATIONAL CONFERENCE ON SOLID STATE DOSIMETRY
Ottawa, Canada - September 27-30, 1983

The seventh in the series of International Conferences on Solid State Dosimetry will be convened in Ottawa, Canada at the Federal Government Conference Centre from September 27 to 30, 1983.

The scientific sessions will cover advances in a variety of fundamental and applied topics concerning solid state dosimeters and dosimetry including: basic physical mechanisms; ionizing and UV radiation dosimetry; exoelectron and track etch techniques; new materials; instrumentation; personnel, environmental and medical dosimetry; and standardization.

PROCEEDINGS

The proceedings will be published as a distinctive issue of Radiation Protection Dosimetry, Volume 6. Each participant will receive a copy of the proceedings.

TECHNICAL EXHIBITS

Provision is being made for a limited number of technical exhibits. For details contact Morgan Cox, Harshaw Chemical Company, Crystal and Electronic Products Department, 6801 Cochran Road, Solon, Ohio, 44139 U.S.A.

PROGRAM (ABSTRACTS)

T. Stoebe
University of Washington
Seattle, WA 98195
U.S.A.

LOCAL ARRANGEMENTS

Radiation Protection Bureau
Health and Welfare Canada
Brookfield Road
Ottawa, Ontario, Canada K1A 1C1

PRE-DOSE DISCUSSION

Ian Bailiff has proposed an informal discussion during the conference for those involved with pre-dose measurements. Those interested should contact him at the address given on page 7 of this issue.