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Letters

Letter to the Editor of Ancient TL

Terminology in Optical Dating

I am in process of writing a book on Optical Dating, albeit against advice from some members of the community who rightly or wrongly say the time is not yet ripe. One question concerns terminology and I would appreciate the opportunity to seek opinion from your readers.

The present situation as I see it is that the overall title Optical Dating, established by the first paper on the technique (Huntley *et al.* 1985), is so firmly embedded that it would be confusing to discard it even if one wanted to (see below). Although 'optical' tends to signify 'visible' to most people, the Oxford English Dictionary unambiguously indicates inclusion of the infrared (as well as the ultraviolet); hence there is no fundamental objection to dating by IRSL (infrared-stimulated luminescence) being included under Optical Dating.

OSL (optically-stimulated luminescence) is also well embedded but now with some ambiguity as to whether or not it includes IRSL; it was introduced by the Oxford group to keep in line with what, in 1986 at any rate, was the practice in Luminescence Dosimetry (see Mathur *et al.* 1986) --- OSL referring to the use of luminescence in which detrapping is involved, with PL (photostimulated luminescence) being used for emission from phosphate glasses in which there is no detrapping. On the other hand certain dating groups prefer PL in place of OSL on the basis that it is more meaningful to physicists. Time-dependent recombination luminescence and light-induced emission have also been used, as well as GLSL (green-light-stimulated luminescence).

The principal need is to decide whether OSL is an umbrella term for GLSL and IRSL or whether it refers only to GLSL. An umbrella term is convenient when discussing common characteristics of the two.

Possibility A (suggested to me in discussion with John Prescott & Alan Franklin): Retain Optical Dating as the overall title and use it also for the umbrella term, with more specific indication of wavelength being given when appropriate, e.g., OD(514 nm), OD(880 nm), the terms OSL and IRSL being allowed to atrophy

Disadvantage (to my mind): When discussing characteristics of the luminescence it is more appropriate to talk of OSL rather than OD, though in such contexts JP & AF suggest use of 'luminescence' in full.

Possibility B: Retain Optical Dating as the overall title and use OSL as the umbrella term for GLSL and IRSL, but replacing these by OSL(G) and OSL(IR) with stimulation wavelength being put in the parenthesis when more precise specification is appropriate, e.g., OSL(514), OSL(880).

Disadvantage: By usage OSL is now tending to signify GLSL.

Possibility C: Retain Optical Dating as the overall title and use PL for the umbrella term, reserving OSL for green-light stimulation, GLSL not being used.

Disadvantage: Many earth scientists would be mystified by PL, nor would they appreciate the subtle implication attributed to OSL, having become accustomed to regarding 'OSL Dating' as synonymous with 'Optical Dating' and inclusive of IRSL.

Whichever of these I use for the book readers should not think that I am suggesting any that this should be the editorial dictat in respect of other publications. I hope to complete the text during the coming winter/spring and publication, by Oxford University Press, is likely to be late 1996/early 1997; for various reasons it is not possible, regrettably, to delay long enough for reference to be made to papers in the Canberra proceedings but I would appreciate receiving any pre-prints, in respect of those proceedings or in respect of other journals, that anyone cares to send. Appropriate acknowledgement would of course be made together with opportunity to vet the relevant passage.

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References

- Huntley D.J., Godfrey-Smith D.I. & Thewalt M.L.W. (1985) Optical dating of sediments. *Nature* 313, 105-107.
- Mathur V.K., Gasot J., Abbundi R.J. & Brown M.D. (1986) Optically stimulated luminescence in MgS:Ce,Sm. *Radiation Protection Dosimetry* 17, 333-336.

Addendum

Addendum to :

D.J. Huntley, O.B. Lian, HU Jinsheng and J.R. Prescott (1994) "Tests of luminescence dating making use of paleomagnetic reversals" appeared in *Ancient TL* (12, pp. 28-30).

I wish to draw interested readers to two matters related to the article mentioned above. The first is that D.J. Easterbrook, who made the paleomagnetic measurements on the Salmon Springs section, considers the whole sequence to be of reversed polarity, and that the observed normal polarity is a magnetic overprint. This conclusion was based on measurements at several sections (D.J. Easterbrook, J.R. Roland, R.J. Carson and N.D. Naeser, Geological Society of America Special paper 227, pp. 139-165, 1988). The age of the peat should therefore be considered to be between 0.78 and 1.06 ± 0.11 Ma. The details are in O.B. Lian, J. Hu, D.J. Huntley and S.R. Hicock, *Can. J. Earth Sci.* in press (1995).

The second point is that optimism raised by the 680 ± 130 ka age for the West Naracoorte dune, using optical dating on inclusions within quartz grains, has been tempered by the results of measurements on several other dune samples from the same area which have yielded ages which are much younger than their known ages. A resolution is being sought.

D.J. Huntley