Sears, D.W.G. (1986c) Thermoluminescence Dating by M.J. Aitken. *Geochim. Cosmochim. Acta*, **50**, 2120-2121. (Book review.)

BOOK REVIEWS

Thermoluminescence Dating by M. J. Aitken. Academic Press, 1985, 351 p., $59.00 (hardcover), $34.95 (paperback).

MARTIN AITKEN HAS pioneered the efforts to make thermoluminescence dating as reliable and widely used for pottery dating as the radiocarbon method. His book essentially follows the procedure through the sequence of steps involved in obtaining a date. The level of natural TL is measured, taking care to establish that nothing untoward has happened to disturb the record, the TL level is then expressed in terms of the naturally accrued geological dose by laboratory calibration and then the dose experienced by the sample is determined by conventional dosimetry methods, often TL dosimetry is involved. The accrued dose divided by the natural dose rate provides an estimate of the age since the pot was fired and its TL removed. Thus we have chapters in TL measurement, calibration and dose rate determination. The many variations on this theme, which Aitken and others have developed over the last 20 years, are discussed in another chapter. Finally there are two chapters dealing with materials other than pottery; meteorites are ingloriously clumped with slag and glass; burnt material from archaeological sites (stones and flints), bones and shells, and sediments heated by volcanic flows are discussed. In the last chapter, the dating of sediments by the sunlight-induced drainage of TL is described.

At his best, Aitken is a good writer, especially when his audience is non-specialized and multidisciplinary. He has written a great many lengthy reviews on his subject for diverse journals, both technical and semi-popular, and most of them have proved very valuable. However, the present work seems to be more the result of cutting and sticking those articles, with some "technical notes" and a good many rather technical appendices thrown in, rather than original writing; over one-third of the book consists of ill-sorted appendices. The aim of the book, its audience and purpose are therefore unclear, and the overall package rather messy; several appendices should have been assimilated into the text (*e.g., Anomalous Fading*), others would have made good footnotes (*e.g.*, that on the cosmic ray contribution to the total dose), and still others should have been omitted completely and references quoted. Certainly the declared aim of providing an updated version of Stuart Fleming's book *Scientific Techniques in Archaeology* has not been met, and I doubt that sufficient time has passed for this to be necessary anyhow. The intended audience for this book might better be referred to Fleming's book, or perhaps one of Aitken's review papers, or his earlier book *Physics and Archaeology*, which contains an excellent chapter on TL dating. If they need further details, then the next step is the primary literature.

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