Tektites as "Date Markers" in Borneo and Elsewhere

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IN RECENT Palaeolithic/Pleistocene conferences at McGill University, Montreal (September 1973) and Groningen University, Holland (June 1974), I contributed papers on problems of dating the Early Stone Age in Southeast Asia, with special reference to extensive excavations at the Niah Caves, Sarawak, and to recent restudy of the so-called Tampanian in Perak, Malay Peninsula. I was a little surprised to find, at these conferences and elsewhere, no knowledge of important findings first reported in the *Brunei Museum Journal;* but this journal is new and as yet has a small distribution. (The Brunei Museum Curator and Editor, P. M. Shariffuddin, will be glad to receive exchange proposals or subscriptions.)

As the aforesaid conference papers, like *BMJ,* may not be available to readers of *Asian Perspectives,* and as the matter seems quite important, I shall attempt to summarize the relevant points from all sources to date.

Since Ralph von Koenigswald, encouraged by Otley Beyer's early Philippine work, correlated the big Southeast Asian Pleistocene tektite shower with the fossiliferous beds at Trinil, Java, tektites have been widely regarded as valid clues for the Middle Pleistocene, and by interpolation for the Early Palaeolithic. A Trinil tektite has been potassium-argon dated ca. 710,000 B.P. (Koenigswald 1968 and personal communication; Zahringer 1963). *Homo erectus* is there, along with a rich array of Proboscideans and other fauna which prehistorians have usually described rather loosely as "extinct." In fact, of 40 mammal species well identified in Trinil, 25 (mostly smaller and often arboreal) are still extant in the region (63%), while only 37% (*all* large and terrestrial) are extinct. The 5 non-hominid primates (including 3 apes) are all extant today, though 2 no longer occur in Java (Harrisson 1972*b*).

Tektites closely similiar to Trinil examples occur only in one Borneo locality: within about 20 miles of Brunei Town in the coastal northwest, scattered mainly through sand and gravel beds along the sea-beach and lower tidal rivers (Wilford 1961; Tate 1970 and 1971). They are common here. One tektite found in situ at

Butir quarry has been dated 730,000 B.P., very close to the Trinil date (Zahringer 1963). It has therefore been widely assumed that this so-called Jerudong formation must be Middle Pleistocene. At first accepting this view, the present writer, as Museum and Archaeological Adviser to the Brunei Government, had watch kept on Butir quarrying and other operations for several years. Nothing appeared that could remotely be called a fossil or an artifact. As recently as the second Hull-Aberdeen Symposium on Malesian Ecology, a distinguished plant ecologist, Peter Ashton (previously a Brunei forester), emphasized that the Jerudong beds could be safely dated ca. 700,000 B.P. "owing to the presence of tektites at their bases" (Ashton 1972: 41). This standard of time measurement was accepted by all present and is still current (e.g., at Groningen, 1974).

New C-14 analyses of wood from the Jerudong beds and the careful research of Brunei's State Geologist, R. B. Tate (1970, 1971), have shown, however, that this correlation is erroneous—with significant possible repercussions for other *areal* interpretations of Palaeolithic-phased events generally. The relevant Borneo figures are listed in Table 1. Those from Brunei that are marked by an asterisk are taken from or near the Jerudong (tektite-bearing) formation. Number 11 was excavated in the immediate vicinity at our prehistoric open site of Kota Batu (Harrisson 1973). Numbers 2 and 4 are with the deepest human skull at Niah (Brothwell 1959). Two related dates from Sabah, farther north, indicate major late erosion above 10,000 ft high on Mt. Kinabalu (highest peak in Southeast Asia; no. 12) and an eruption age from *below* a lowland lava flow at Tawau (no. 10)—there are no longer any active volcanos in Borneo.

TABLE 1. COMPARISON OF "TEKTITE-BED" AND OTHER DATES FROM NORTH AND WEST BORNEO, 1963–1973

NUMBERS	YEARS B.P.	PLACE	MATERIAL	REFERENCE
1(a)	ca. 730,000	Brunei	tektite	Zahringer 1963; Tate 1971
(b)	ca. 710,000	Java	tektite	Zahringer 1963
2	41,500 ± 1000	Niah	charcoal	Harrisson 1970: 40
3*	ca. 40,200	Brunei	wood	Tate 1971: 111
4	39,600 ± 1000	Niah	charcoal	Harrisson 1970: 40
5	37,500 ± 2400	Niah	shell	Harrisson 1970: 40
6	32,630 ± 700	Niah	charcoal	Harrisson 1970: 40
7*	ca. 31,600	Brunei	wood	Tate 1971: 111
8*	30,000 ± 2600 ± 1900	Brunei	wood	Tate 1971: 111
9*	29,000 ± 2300	Brunei	wood	Tate 1971: 111
10	27,000 ± 500	Sabah	charcoal	T. and B. Harrisson 1971: 8
11	14,350 ± 350	Brunei	charred wood	Harrisson 1972*a*: 10; 1973: 198
12	7,980 ± 100	Sabah	wood	T. and B. Harrisson 1971: 8
13*	6,700 ± 160	Brunei	wood	Tate 1971: 111
14*	5,850 ± 110	Brunei	coral	Tate 1971: 111

* Taken from or near Jerudong (tektite-bearing) formation.

It is becoming clear on geological and other grounds that coastal Brunei and much of lowland Borneo is of very recent origin from the point of view of human habitability. Certainly present-day tektite beds there are no earlier than the bottom strata

in the Niah Cave deposit. As date markers, tektites may thus be gravely misleading. They are light, mobile, indestructible, and easily transferred from the original deposition into other and possibly distant sites, either by being washed down (or up) or otherwise displaced.

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