PLEISTOCENE COASTAL DUNES WITH PREHISTORIC ARTEFACTS IN SOUTHERN SRI LANKA : 74,000 - 64,000 AND 28,000 BP

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The coastal tracts of the drier parts of Sri Lanka's Dry Zone, particularly in the northern sector, are characterised by large expanses of sheet gravels of alluvial origin capped by sands which have undergone latosolic weathering resulting in a colour range of buff to crimson. These basal gravels overlain by sands have been designated the Iranamadu Formation (Deraniyagala, 1976). The sands have been conclusively identified as being representative of ancient coastal dunes (ibid.; Gardner 1981; 1982; 1981 a). The alluvial basal gravels are thalassostatic, and considering their elevations at ca. 80-8m above present sea level there has been little doubt that Middle and Upper Pleistocene sediments are represented in the basal gravels and perhaps in the overlying dune sands as well.

In 1972, the present writer set out to test the above hypothesis as to the antiquity of the Iranamadu Fm. by excavating two sets of deposits; Bundala with gravels at ca. 8m + msl capped by ca. 3m of latosolic sands (Deraniyagala 1981). At both sites the basal gravels yielded stone artefacts; but these are not datable typologically due to their non-distinctive forms. On the other hand, the overlying sands at both sites contained large numbers of (technologically) Mesolithic artefacts, distinguished by excellent specimens of microlithic lunates, triangles and trapezoidals. That these implements are not intrusive was amply demonstrated by the occurrence of well defined occupation horizons.

The question remained as to the age of the implementiferous dunes at Bundala and Patirajawela. It had long been recognised that the teri deposits of south-eastern India constitute the counter-part of Sri Lanka's Iranamadu Fm. (ibid.) and the dating of the former could (via eustatic

altimetry) be applied, at least hypothetically, to the latter. In this connection it was observed that Gardner had been able to date a lagoon deposit representing the 8m sea level in south-eastern India in teri country (1981;1983). The date obtained is $38,100 \pm \frac{1,260}{1,100}$ ^{14}C BP on aragonite of pelecypod shell (SRR-1481). The shells were checked for contamination using X-ray diffraction and thin-sections and found to be reliable as dating material, as confirmed by the $\delta^{13}C_2$ value of 0%. This horizon is succeeded by an aeolenanite representing coastal dunes as at Bundala, which has been dated to 21.000 ± 400 ^{14}C BP (BM-1670) and 25,450 ± 750 ^{14}C BP (BM-1671) (ibid.). These latter dates are on aragonite of land snails, which once again have been checked for contamination employing XRD and thin-sections and found to be reliable. It was thus hypothesised by the present writer that Gardner's dates for the 8m sea level and the aeoleanite in the teri country of south-eastern India would be applicable to similar sediments at Bundala at a similar elevation above sea level; and to test this hypothesis, two samples of fossil dune sand from Bundala, at 1.1 and 1.7m below the surface, and two others from Patirajawela, at 1.8 and 4m below the surface were submitted to A.K. Singhvi and D. Sengupta of the Physical Research Laboratory, Ahmedabad, Inida, for dating by thermo-luminescence.

The TL assays of Singhvi and Sengupta have resulted in two dates being obtained for the fossil dune at Bundala: 22,800 BP (1.1m - gl) and 28,400 BP (1.7m - gl), of which the latter is more reliable in terms of sampling in the field. The Patirajawela samples yielded dates of 28.440 BP (1.8m - gl) and two dates of 74,200 and 64,380 BP (4m - gl) with a palaeosol apparently separating the two horizons (Singhvi et al. MS).

The degree of correspondence between Gardner's radiocarbon dates for the dunes overlying the 8m shoreline in south-eastern India and those of Singhvi and Sengupta for similar deposits at Bundala is remarkable. Both sets of dunes appear to represent the commencement of a marine regression at the on-set of the Würm upper pleniglacial with the decline

of the Paudorf interstadial. At Patirajawela, the more recent date of ca. 28,400 BP suggests a dune component correlating with the Bundala sediments. The dunes dated to 74,000-64,000 BP would correlate with the end of the Last Interglacial (Late Monastirian sea level).

The artefactual associations of the Last Interglacial horizon at Patirajawela have yet to be established unequivocally. But geometric microliths do occur in the sediments dated to ca. 28,000 BP at both sites. This raised the question as to how a technologically Mesolithic industry, characterised by geometric microliths which hitherto have been considered to typify the early Holocene of Europe and Asia, came to occur during the Upper Pleistocene at ca. 28,000 - 22,000 BP. The answer was hinted at by Matupi Cave in Zaire which produced radiocarbon dates of ca. 29,999 BP on charcoal for its microlithic lunates (van Noten 1977). Then came Belilena cave at Kitulgala in Sri Lanka's rainforests with several radiocarbon dates on charcoal for the middle horizons of its Mesolithic with microlithic lunates, triangles and trapezoidals. The earliest of these averaged ca. 12,000 BP (PRL-861, FRA-91, BS-293)*; the upper levels formed a consistent series of dates down to ca. 10,500 ^{14}C BP; and the layers preceding the one dated to 12.200 BP are currently being assayed (FRA) and would probably yield dates extending back well into the Wurm upper pleniglacial. Finally, there has been the excavation at the cave of Botadomba-lena, which produced large numbers of geometric microliths (i.e., lunates, triangles and trapezoidals) from the basal layer upwards. The latter (i.e., basal layer) has been dated on charcoal to ca. 28,500 ^{14}C BP (PRL-857), with overlying strata providing a consistent series of dates down to ca. 11,500 ^{14}C BP (PRL-855, 856, 858). It thus became apparent that the tropics, as exemplified in Zaire and Sri Lanka, witnessed the advent of microlithic technology (as denoted by the presence of microlithic lunates, triangles and trapezoidals) at a much earlier date than at higher latitudes, and that there was nothing inconsistent about the dates of ca. 28,000-22,000 TL BP assigned by Singhvi and Sengupta to the fossil dunes with geometric microliths at Bundala. If one is to

accept this premise, there is a corollary : it then calls into question the dating (^{14}C on shell) of the Upper Palaeolithic blade tool complex of peninsular India at ca. 25,000-19,000 BP (TF-12455, PRL-86). Perhaps these 'Upper Palaeolithic' assemblages are very much older, or else they may constitute a mere technological facies of India's Mesolithic. Meanwhile, it is hoped that further thermoluminescence dating of the high level coastal dunes in both south-eastern India and Sri Lanka, for instance, those overlying the 60m gravels, would produce yet more significant results for world archaeology.

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