LETTER

Irreconcilable differences between stratigraphy and direct dating cast doubts upon the status of Tam Pa Ling fossil

The specific evolutionary history of anatomically modern humans (AMHs) and their regional variation throughout the course of the Pleistocene form two major areas of paleoanthropological research, particularly in poorly documented regions (1). Unfortunately, uncertainties still surround the chronology of the emergence of AMHs and their initial occupation of Southeast Asia. In this context, although the recently published modern human cranium from Tam Pa Ling, Laos (2) (i.e., TPL1), provides new anatomical data concerning AMHs in Southeast Asia, the authors' interpretation of TPL1 as "the earliest skeletal evidence for fully modern humans in mainland Southeast Asia" is not supported by their stratigraphic data. In the absence of additional information, TPL1, although directly dated to 63.6 ka, appears to have been found in an intrusive position within sediment dated to between 46 ka (optically stimulated luminescence) and 2.77 ka [accelerator mass spectrometry (AMS) ^{14}C; Fig. 1]. If the base of the stratigraphic sequence dates to between 48 ka (optically stimulated luminescence) and 49.2 ka (AMS ^{14}C), how could sediment ~2 m above be as old as 51.4 ka (AMS ^{14}C) if the main sedimentary process at work is claimed to be "relatively slow, low-energy slopewash transport"? Similarly, what is the rationale for stating that "the fossils were buried no later than 46 ka and no earlier than 47 to 51 ka"? In the absence of any supporting explanation for this "reverse stratigraphy," the older dates produced for the top of the 2- to 3-m layer should be regarded with suspicion. Hence, contrary to the authors' assertion that TPL1 has a "minimum secured age of 46 ka and a maximum age of ~63 ka", the published stratigraphy, if correct, indicates that the TPL1 specimen is no older than 46 ka. TPL1's status as "the earliest well-dated modern human fossil east of the Jordan Valley" also appears weak compared with the Liujiang specimen dated to ~153 ka (3), the Callao Cave fossil in the Philippines dated to 67 ka (4), and, above all, the ~100 ka modern fossil from Zhirendong (5), discovered only 484 km northeast of Tam Pa Ling in Southern China. Direct dating

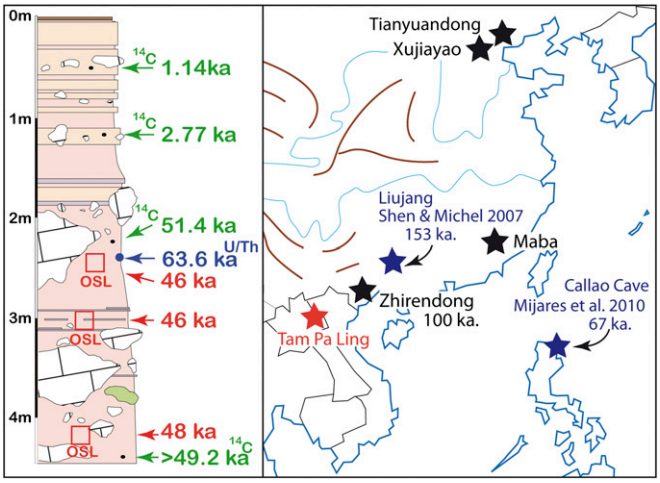

Fig. 1. Intrusive position of TPL1 and dated AMH fossil locations.

methods are increasingly applied to human fossils because stratigraphic associations between human fossils and archaeological remains and/or deposits do not always exist. However, the dating of the fossils themselves should by no means be considered independently of contextual multidisciplinary data that form the basis of modern archaeology. In summary, given the irreconcilable differences between the stratigraphy and direct dating, the TPL1 specimen is not demonstrably the earliest modern human in Southeast Asia.

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