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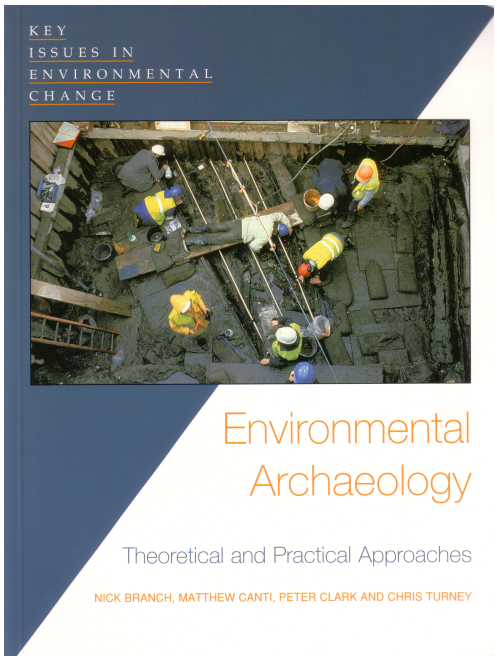
BOOK REVIEW



Nick Branch, Matthew Canti, Peter Clark, and Chris Turney. *Environmental Archaeology: Theoretical and Practical Approaches* (Book in series: Key Issues in Environmental Change. John A Matthews, Coordinating Editor). 2005. London: Hodder Arnold. ISBN: 0-340-80871-3. 240 pages with 95 figures and 11 tables. List price $35 US (paperback).

Reviewed by: Yaroslav V Kuzmin, Senior Research Scientist, Pacific Institute of Geography, Far Eastern Branch of the Russian Academy of Sciences, Radio St. 7, Vladivostok 690041, Russia. Email: ykuzmin@tig.dvo.ru.

This volume is assembled as a comprehensive introduction to the growing field of environmental archaeology. It is well compiled and well structured and contains a compressed description of basic methods, approaches, and techniques, supplemented by an extensive list of references including some of the latest articles and books. The volume consists of 5 chapters: 1) Introduction, 2) Defining the Context, 3) Bioarchaeology, 4) Dating and Numerical Analysis, and 5) Integrated Studies in Environmental Archaeology. The main emphasis is given to chapter 3 (83 pages), while chapter 4 has 47 pages, similar to chapters 2 (42 pages) and 5 (32 pages).

The authors define environmental archaeology as "the study of the environment and its relationship with people through time" (p. 8); it incorporates geoarchaeology, archaeobotany, and zooarchaeology. Major developments in environmental archaeology in the last few decades belong to 3 lines of research: a) geochronology; b) human origins, evolution, colonization, and adaptation; and c) plant and animal domestication and exploitation.

In chapter 3, bioarchaeology is defined as the "… analysis of fossil (and sub-fossil) plant and animal remains from both archaeological … and geological archives," and the goal of bioarchaeology is to "improve our knowledge and understanding of the links between the environment and humans (the

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palaeoenvironment), as well as providing details of their diet, economy and daily life (the palaeoeconomy)" (p. 67). Chapter 3 contains abundant examples of the study of microfossils, including pollen and spores, diatoms, ostracods, foraminifera, and other organic remains, with a strong focus on pollen analysis and its interpretation. Data on macrofossils, seeds, and other plant remains, mollusca, insects, and vertebrate organisms (fish, birds, and mammals) comprise the second part of chapter. References to Internet sites where plentiful data on different types of organisms are stored are quite helpful. Special attention is given to the methods of recovery of both microfossils and macrofossils from archaeological contexts and their laboratory treatment. This is perhaps the best chapter in whole volume.

Chapter 4, although not very long, is the most important for the radiocarbon community because it gives scholars "… a feel for the issues to be considered when selecting a particular dating technique and the sampling option(s)" (p. 155). The importance of the 3 most widely used dating methods, radiocarbon (^{14}C), luminescence, and electron spin resonance, is highlighted (p. 156, Figure 4.3). A few notes should be made about the ^{14}C dating section (p. 174–9). When explaining the correction for stable carbon isotope ratio ($\delta^{13}C$), it is mixed up with a very different procedure, the reservoir age correction in water environments. This leads the authors to the inaccurate conclusion that a "… difference of 1‰ in $\delta^{13}C$ is therefore equivalent to 16 ^{14}C years" (p. 176). In fact, this value is half of what is said, 8 years, because the age correction of a sample with $\delta^{13}C = 0.0$‰ to the conventional $\delta^{13}C = -25.0$‰ gives a difference of only 200 yr (e.g. Stuiver and Polach 1977).

Another weak point is the uncritical use of data by Y Yasuda on the age of the earliest rice agriculture in Asia (p. 179, box 4.2). By citing Yasuda's (2002) age determination of the rice cultivation at 14.0 kyr BP (calibrated), corresponding to ~12,000 BP, the authors to some extent confuse readers. Yasuda (2002:134) is using phytoliths and seed data on 3 sites in southern China (Xianrendong, Yuchanyan, and Diaotonghuan) in order to establish timing of the earliest rice cultivation. The authenticity of Yasuda's concept is open to question. First, dating of these sites to ~12,000 ^{14}C BP is highly debatable (Kuzmin 2006). Second, it has never been properly proven that rice phytoliths from these sites belong to a domesticated type (e.g. Crawford 2005). The presence of domesticated rice phytoliths in a marine core, located ~500 km offshore the Yangtze River Delta in a layer estimated to be 13.9 kyr BP old (Lu et al. 2002), does not look convincing. Thus, this is not the best case for illustrating the use of ^{14}C method to determine the age of agriculture beginnings.

Chapter 5 has several examples of complex studies in environmental archaeology: the Dover Bronze Age boat; prehistoric environment of the London Thames; development of irrigation in Mesopotamia; and megafaunal extinction and human settlement. A few words can be said about the last subject. Progress in this field is happening so fast that some information already needs to be updated! For example, the youngest ages of the Cuban ground sloth are now 4960 ± 280 BP (Jull et al. 2004) and 4490 ± 40 BP (Martin 2005:97) compared with ~6250 BP (p. 226). Taking into account human presence in Cuba at least at ~5300 BP (Jull et al. 2004) and possibly up to the Early Holocene, ~8000 BP (Vasilievsky 1986), the conclusion about the Caribbean megafaunal extinction due to human impact could now be challenged.

The example of rapid data accumulation in the extinction studies is the discovery of a second (after the Wrangel Island, p. 223) Holocene woolly mammoth refugium on the remote St. Paul Island in the Bering Sea, formerly part of Beringia. The ^{14}C dates of "normal" size mammoths from 2 localities are ~7900–5700 BP (Guthrie 2004; Yesner et al. 2005). Another case is the finding of giant deer remains around the Ural Mountains dated to ~7000 BP (Stuart et al. 2004), compared to the previous latest date of ~9400 BP from British Isles (p. 223).

It is obvious that archaeologists and geoscientists will welcome this volume, and it will serve as good starting point for both undergraduate and graduate students, as well as for professionals. The affordable price should facilitate a wide distribution of this book.

REFERENCES

Crawford GW. 2005. East Asian plant domestication. In: Stark MT, editor. *Archaeology of Asia*. Oxford: Blackwell Publisher. p 77–95.

Guthrie RD. 2004. Radiocarbon evidence of mid-Holocene mammoths stranded on an Alaskan Bering Sea island. *Nature* 429:746–9.

Jull AJT, Iturralde-Vinent M, O'Malley JM, MacPhee RDE, McDonald HG, Martin PS, Moody J, Rincón A. 2004. Radiocarbon dating of extinct fauna in the Americas recovered from tar pits. *Nuclear Instruments and Methods in Physics Research B* 223–4: 668–71.

Kuzmin YV. 2006. Chronology of the earliest pottery in East Asia: progress and pitfalls. *Antiquity* 80(308): 362–71.

Lu HY, Liu ZX, Wu NQ, Berné S, Saito Y, Liu BZ, Wang L. 2002. Rice domestication and climatic change: phytolith evidence from East China. *Boreas* 31:378–85.

Martin PS. 2005. *Twilight of the Mammoths: Ice Age Extinctions and the Rewilding of America*. Berkeley and Los Angeles: University of California Press. 269 p.

Stuart AJ, Kosintsev PA, Higham TFG, Lister AM. 2004. Pleistocene to Holocene extinction dynamics in giant deer and woolly mammoth. *Nature* 431:684–9.

Stuiver M, Polach H. 1977. Discussion: reporting of ^{14}C data. *Radiocarbon* 19(3):355–63.

Vasilievsky RS, editor. 1986. *Arkheologiya Kuby* [Archaeology of Cuba]. Novosibirsk: Nauka Publishers. 173 p.

Yasuda Y. 2002. Origins of pottery and agriculture in East Asia. In: Yasuda Y, editor. *The Origins of Pottery and Agriculture*. New Delhi: Roli Books/Lustre Press. p 119–42.

Yesner DR, Veltre DW, Crossen KJ, Graham RW. 2005. 5,700-year-old mammoth remains from Quagnax Cave, Pribilof Islands, Alaska. In: Agenbroad LD and Symington RL, editors. *The World of Elephants. Short Papers and Abstracts of the 2nd International Congress (Mammoth Site Scientific Papers, Volume 4)*. Hot Springs, SD: Mammoth Site of Hot Springs. p 200–4.