

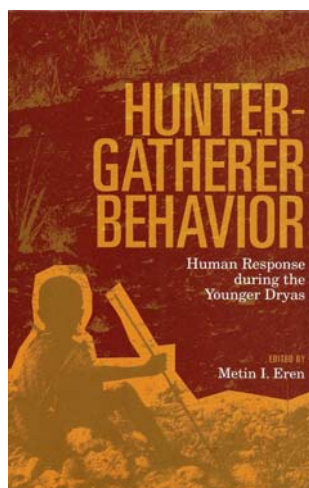
cules by gaining insight from the genome of uncultivable and symbiotic bacteria is useful (chapter 22). It gives a nice overview of metagenomics and environmental metabolome of uncultivated bacterial communities using next-generation sequencing techniques, metagenomic library construction and screening to obtain information and design novel small-molecule natural products with potential to be used as novel drugs and bioactive natural products.

There are many more exciting reviews in this volume as pointed out by Susan Gottesman, one of the editors – ‘...if every microbiologist randomly chose a half-dozen reviews to read from this volume, they would learn something new and pertinent to their own work that they may never encounter in a PubMed search’.

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Hunter-Gatherer Behavior: Human Response during the Younger Dryas. Metin I. Eren (ed.). Left Coast Press, Walnut Creek, CA 94596, USA. 2012. 281 pp. Price: US\$ 79.00. ISBN 978-1-59874-602-0.

The Last Glacial Maximum (LGM) occurred about ~18,500 BP. This was followed by a global warming period which

coincided approximately with the end of the Pleistocene (1.6 to 0.12 Ma (million years ago)). Then, a global climate event called Younger Dryas (YD) affected the world. This took place between ~12,900 cal BP and ~11,600 cal BP. This period was characterized by cooling and drying. The temperature is estimated to have fallen by 7–15°C then. The period, Younger Dryas, has been named after an indicator alpine tundra wild plant, *Dryas octopetala* (Rosaceae). Incidentally, the Older Dryas occurred before the YD. It lasted about 3000 years, between ~18,000 and ~15,000 cal BP.

YD was first reported from northern Europe in 1901 CE. It is assumed to be a global phenomenon. It has been most acutely felt in Greenland. Here, the cooling had approached that of the LGM. YD has been also reported from several other regions of the world, mostly in the northern hemisphere. Elsewhere, its severity appears to have been moderated by local or regional climatic events. There is still no unanimity about the causes and full consequences of this climate event. Incidentally, the timing of YD has been critical from anthropological and climatological angles. First, this period marks the transition from the cooling Pleistocene to the warming Holocene. Second, it approximately coincides with the transition from hunting-gathering stage of humans to the beginning of a sedentary living and hunting-farming stage, especially in the Levant (eastern Mediterranean region).

This book is the outcome of a symposium, Hunter Gatherer Transitions through the Younger Dryas, A Global Perspective, arranged by the Society for American Archaeology at their 73rd meeting held in Vancouver, Canada in 2008. It had two objectives: first, to understand how dramatic YD climate and environmental change was in different geographic locations; second, to determine the manner in which the terminal Pleistocene hunter-gatherers adapted behaviourally and technologically during the YD. Archaeologists nowadays accept that climatic and environmental changes do not wholly determine prehistoric cultural and technological changes. However, comprehending the extent of behavioural variability that humans are capable of will help us understand basic questions about the mechanisms of human adaptation and survival. The book under review is a sequel to the above symposium.

The book comprises eleven chapters. The first one by M. I. Eren, the editor of the volume (from the Department of Anthropology, University of Kent, Canterbury, United Kingdom), gives a preview and background of the subject matter of the book. This is followed by nine chapters – two dealing with South America (South America, southern South America), three chapters with USA (coastal California, southeastern USA, Rocky Mountains area), and two each with Europe (Central Europe and funerary, behaviour settlement and animal resources) and Asia (West Asia, Northeast Asia). The 11th chapter is a synthesis and overview by David Meltzer and Ofer Bar-Yosef. Both the authors are pioneers and leading scientists in the area.

There are some gaps in geographical coverage – Canada and Greenland, North and South Europe, the entire Africa and Australia, and most of Asia (South, Southeast and East Asia). The main reason appears to be that there have not been much systematic studies on this aspect in these regions. There are a few publications on some of these areas, notably Greenland, Australia and China. The second, and possibly a more plausible reason, might be that the effects of YD in these regions were minimal. If YD did produce any effects, they had been moderated by regional climate events. The monsoon for instance is known to greatly affect the climate of much of the Old World tropics and subtropics.

The regional reviews indicate that YD had produced mixed effects in different regions. As stated in chapters 2 and 3, YD was not a major event in South America. And, if it occurred in some regions, it had only marginal effect on human adaptations. The detailed studies conducted in USA (chapters 4–6) indicate that the Palaeoindians were constantly adjusting their subsistence and behaviour patterns with climatic changes, but in consonance with their hunting-gathering lifestyles. In Europe (chapters 7 and 8), while in the northern region, YD produced some significant environmental and cultural changes, in Central Europe it had only a ‘subtle’ effect. In West Asia (chapter 9) – which is one of the earliest centres of agricultural origin and crop plants domestication – the YD period was an important one. The adverse climate changes appear to have brought about a reduction in the distribution and productivity of wild cereals, then a staple

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food of the hunter-gatherers, and brought about their transition to hunting-cultivation by initiating the cultivation of wild cereals. The penultimate chapter (# 10) deals with Northeast Asia. This region has always been a harsh and arid one. Evidences of hunter-gatherer activity in the region have been only 'ephemeral'. The YD period seems to have reduced this even further. The final chapter (# 11), Looking for the Younger Dryas, provides a comprehensive and succinct account of the phenomenon

from both archaeological and anthropological perspectives. The authors indicate that the YD does not coincide everywhere with a particular or ecological signal, and that the climate and environment during the period have been 'variable across space and through time'; and, 'in the context of the last four terminations, YD appears to be integral part of global switches from glacial to interglacial climate' and YD 'should be considered innocent of causing cultural change'.

Overall, this is a comprehensive and definitive account of YD in the context of the present stage of studies in the area. Reading of the first and last chapters alone will give an authoritative and upto-date account of YD in the global context.

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