

The Global Origins and Development of Seafaring. Atholl Anderson, James H. Barrett and Katherine V. Boyle (eds). 2010. McDonald Institute of Archaeology, University of Cambridge, Cambridge CB2 3ER, UK. xiv + 330 pp. Price: £ 44/US\$ 88.

Seafaring is defined in this book as 'travelling upon and making a living from the sea, through the use of watercraft'. When humans were still hunter-gatherers, from at least the Middle Palaeolithic (300,000–30,000 years ago), they sought the resources of the sea and attempted to move on its surface or beneath. The earliest watercraft consisted of securing together one or more wooden logs, or sheafs of reeds or grasses. This facilitated coastal foraging, fishing, hunting, and travel, and the much later development of sailing allowed long offshore passages and larger cargoes, to put it simply.

This book is the outcome of a conference on 'The Global Origins and Development of Seafaring', held at the McDonald Institute Archaeology, University of Cambridge, during 19–21 September 2007. Its 'purposes were to explore key themes in maritime prehistory from the perspective of seafaring, and in doing so, to bring an understanding of its origins, development, qualities, and influence into the centre of discourse about maritime archaeology'. Seafaring is reckoned here as the principal dynamic force of maritime prehistory.

The conference was meant to seek answers to four questions: the time and circumstances in which seafaring began; the meaning of seafaring from the perspective of maritime technology; the circumstances and incentives of seafaring developments, especially during the Holo-

cene; and the nature of relationships between sailing and society. The papers in the volume have been also arranged accordingly.

Three gaps in coverage, pointed out by the editors, are the origins of East Asian seafaring (except of Japan), seafaring traditions of Africa and Americas, and all aspects of Indian Ocean seafaring. The editors have also assessed that the most finished works of synthesis are on 'The development of boats and seafaring' (Part III of the volume) and the most contentious of current research relates to 'inferences of early seafaring' (Part II of the volume).

The earth's surface area is covered by 71% sea and 29% land. All the continents of the world are surrounded by water, but they are not reckoned as islands, as also New Zealand. The total number of islands in the world is estimated at 0.75–2.0 million, depending on their definition and size. The number keeps changing with tides, storms, earthquakes, and so on. The four largest islands in the world are Greenland, New Guinea, Borneo and Madagascar. About 100,000 islands are estimated to have human population. The total length of the coastline is about 1.6 million km.

Seafaring is usually studied under maritime archaeology. Traditionally, it focused on boats and their technology, but now it embraces 'all human activities on the seas, also those related to interconnected waterways, adjacent locales and associated communities' (Adams 2006). There have been attempts to enlarge the scope of seafaring even further, but they appear to be premature as even basic issues of the core areas remain unresolved.

The study of seafaring has been heavily handicapped because of the disappearance of archaeological evidences from the coastal areas due to sea-level changes. The most important of this has been the rise in sea level by 120–140 m to approximately the present levels during the Last Glacial Maximum (18,000–26,000 yrs BP). This has had the greatest impact in Island Southeast Asia. Prior to this sea-level rise, the present-day Indonesian islands of Sumatra, Java and Borneo and much of their neighbouring islands were contiguous with the present-day Malayan Peninsula, constituting the Sunda land. It was also nearly connected to the present day Philippines. Likewise, Australia was connected to New Guinea in the north and Tasmania in the south, and was

known as Sahul. The existence of Sunda and Sahul has had major consequences on biogeography and human dispersals in the region. This sea-level rise has produced disastrous consequences in maritime archaeology, since it has almost completely removed or hidden from view all the coastal archeological evidences and artefacts. Various facets of these developments have been discussed by several authors in this volume. We do not have, for instance, any direct evidences for the earliest seafaring, which is thought to have been initiated during the middle Paleolithic (300,000–30,000 yrs BP) in Island Southeast Asia. Presently, the available archaeological records of boats barely span the Holocene (10,000–11,000 yrs BP).

In his introductory chapter, Anderson (pp. 3–16) has given a comprehensive analysis and synthesis of various aspects of seafaring. The earliest evidence of sea travel in the world is from the western Pacific at 800,000 BP, and humans were reaching 120 km distance in the sea about 40,000 years ago. However, whether the long passages of that period beyond eyesight were intentional or accidental is conjectural. We do not also know the impetus, motivation or challenges that would have spurred the early humans to venture out into the sea in the first instance, 'the extraordinary regional precocity of sea travel in the western Pacific'. Anderson has attributed it to 'environmental contingency'.

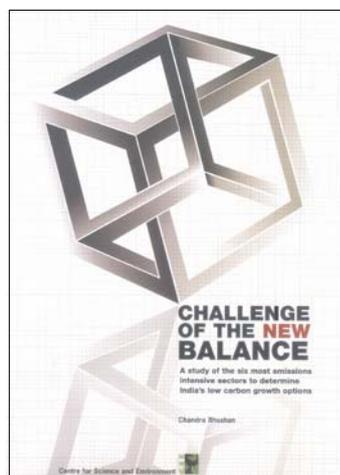
Sailing was a novel experience for the humans when it was first initiated, according to the book. It appears to have originated in the Middle East (Egypt, eastern Mediterranean, Persian Gulf) during the mid-Holocene, and then in India by the third millennium BC. However, evidences for their origin are still uncertain. It has been suggested that this technology spread by diffusion.

The last chapter (by Barrett and Anderson), though entitled 'Discussion', is a summary of all the presented papers. It is discussed under five themes: time, the crew, the land, the sea, and the vessel. What the chapter brings out more than anything are the gaps in our understanding. There is no clear understanding even on the initial peopling of Sahul, about its time and the causes; the former fluctuating between ca. 65,000 and 40,000 yrs BP. As for the latter, the question of cultural versus environmental causes has not been resolved.

To sum up, this is possibly the first book on the subject of seafaring. The volume has helped to clarify both the areas of agreement and dissent, and identify the gaps in our understanding of the subject. The glaring gaps in the global coverage in the volume relating to eastern Asia (except Japan), Arabian Sea, and the Americas have been already pointed out by the editors. We hope that the present organizers will arrange another conference, sooner rather than later, to fill the missing gaps in our information, and possibly also identify the use of newer tools and techniques to unravel the mysteries of seafaring.

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Challenge of the New Balance: A Study of the Six Most Emissions Intensive Sectors to Determine India's Low Carbon Growth Options. Chandra Bhushan. Centre for Science and Environment, 41 Tughlakabad Institutional Area, New Delhi 110 062. 2010. v + 149 pp. Price: US\$ 39.

Greenhouse gases (GHGs) make up only about 1% of the atmosphere, but they act like a blanket around the earth, or like the glass roof of a greenhouse – they trap heat and keep the planet some 30°C warmer than it would be otherwise. Human activities are making the blanket ‘thicker’ – the natural levels of these gases are being supplemented by emissions of carbon dioxide (CO₂) from the burning of coal, oil and natural gas; by additional methane and nitrous oxide produced by farming activities and changes in land use; and by several long-

lived industrial gases that do not occur naturally. These changes are happening at an unprecedented rate. If emissions continue to grow at the current rates, it is almost certain that the atmospheric levels of CO₂ will double from the pre-industrial levels during the 21st century resulting in the rise of average global temperature by 1.8°C to 4.0°C by the year 2100. Over a decade ago, most countries joined an international treaty – the United Nations Framework Convention on Climate Change (UNFCCC) – to begin to consider what can be done to reduce global warming and to cope with whatever temperature increases are inevitable. More recently, a number of nations approved an addition to the treaty, the Kyoto Protocol, which has more powerful (and legally binding) measures, especially for high carbon-emitting nations in the developed world. The recent Copenhagen summit was a further step in this direction, but failed to produce the desired results owing to various reasons.

The book under review provides a succinct description of the above-mentioned issues on carbon emissions and climate change, and what low carbon growth options are available for key industrial sectors with high carbon emission rates. The book is a compilation of the statistics and research done by the Centre for Science and Environment (CSE), New Delhi as part of the recent Green Rating Project, which looks carefully at the lifecycle of different industrial sectors to benchmark performance and gather information on energy and water usage in various industries. The author has put in tremendous effort in compiling and analysing the statistics and in gradually developing this book, giving clear strategies for selected industrial sectors (power, steel, aluminium, cement, fertilizer, paper and pulp) to achieve low carbon growth.

It is a short book running into about 150 pages, but is extremely focused and crisply written. It is rich in data, and most of the analysis and interpretation is objective rather than subjective. As also highlighted, the book assumes importance owing to the recent voluntary declaration (on 30 January 2010) by the Ministry of Environment and Forests, Government of India, to the UNFCCC regarding reduction in emission intensity of its GDP (excluding the agriculture sector) by 20–25% by 2020 in comparison to the 2005 level. The industrial sectors covered in the book account for

61.5% of India's CO₂ emissions in 2008–2009. The style of writing and presentation in this book is different but impressive, and makes reading much more interesting and enjoyable for the general reader. Each chapter starts with a short abstract and few important punch lines from them. Further, separate boxes are used within the chapters to highlight the important contents. The complete book is divided into six chapters, with each chapter devoted to one industrial sector. Additionally, there is one summary section called ‘the study’ before the first chapter and two other additional sections on ‘low carbon growth’ and ‘overview’ after the sixth chapter. All the six chapters are evenly structured, which makes it easy for the general reader to comprehend the contents. Each chapter starts with a short summary followed by an overview of that particular industrial sector. Further, it presents the details of the study, including the present energy consumption and GHG emissions for that sector. Next, the chapter presents various options available and the production projections for that sector. Finally, it presents the future emissions scenario, both for business as usual (BAU) and low carbon (LC) scenarios.

The first chapter is devoted to the industrial sector of ‘power’. It is highlighted that the average specific CO₂ emissions from coal-based thermal power plants in India (1.1 kg/kWh) is equal to the global average. However, there is potential to reduce emissions using advanced steam parameters, and better grid and load management practices. But, high temperature and humidity along with poor coal quality will be an impediment to achieve the level of efficiencies currently being touted for super-critical plants. The chapter concludes that the emission intensity of the power sector in the BAU scenario would reduce by 18% between 2008–2009 and 2030–2031, whereas in LC scenario the reduction will be by 35%, largely because of massive deployment of renewable energy technologies.

The second chapter focuses on the industrial sector of ‘steel’. The author points out that the per capita steel consumption in India is one-fourth that of the global average, and massive growth in infrastructure and the housing sector, as projected by the Government agencies, will lead to high growth in the demand of steel products in the future.