

On the other hand, in the future, if a high-energy collider is built, it would collide electrons with positrons, polarizing the beams so that they have preferential spin orientation in the direction of motion leading to longitudinally polarized beams, or in a chosen direction in a plane perpendicular to the direction of motion, leading to transversely polarized beams. The availability of such polarized beams as the proposed International Linear Collider (ILC) would enhance the resolving power of the machine in collisions to departures from the predictions of the so-called Standard Model of electro-weak interactions, and also improve the potential to carry out precision measurements. Vauth and List review the subject and its technical aspects, including creation as well as measurement of polarization in the article entitled 'Beam polarization at the ILC: physics case and realization'. A 'Symposium Summary' by Milner also presents an enriching historical perspective.

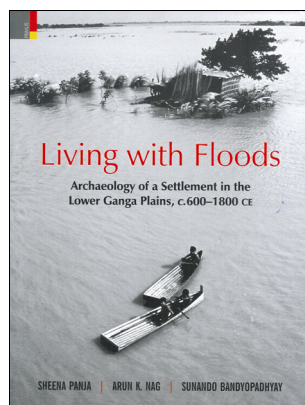
A tribute to a pioneer in the field, Michel Borghini, who passed away unexpectedly in 2012 from the *CERN Courier* is included in the collection. Akira Msaïke in the Memorial Section recalls the early years of spin physics – in memory of Michel Borghini, while Werner Meyer wishes to go forward in 'Today's polarized solid targets in Borghini's footsteps', where he points out the importance of solid diamagnetic materials, while an acolyte Wim de Boer recalls Borghini's contributions in 'Michel Borghini as a mentor and father of the theory of polarization in polarized targets'. He also points out how Borghini's spin temperature theory is now applied in cancer therapy, where polarized protons are able to help detect small tumours.

In conclusion, this collection provides a state-of-the-art companion to those who work in the theory and experimental aspects of spin physics. The editors must be congratulated on their effort and the book would be an excellent addition to any collection in high-energy physics.

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B. ANANTHANARAYAN

*Centre for High Energy Physics,
Indian Institute of Science,
Bengaluru 560 012, India
e-mail: banathanarayan@gmail.com*



Living with Floods: Archaeology of a Settlement in the Lower Ganga Plains, c. 600–1800 CE. Sheena Panja, Arun K. Nag and Sunando Bandyopadhyay. Primus Books. An Imprint of Ratna Sagar P. Ltd, Virat Bhavan, Mukherjee Nagar, Commercial Complex, Delhi 110 009, 2015. xvi + 292 pages. Price: Rs 1900.

Settlements on river banks are subject to seasonal floods that are recurrent during the peak of monsoon over the Indian subcontinent. Though the intensity of monsoon floods varies from region to region, some areas are prone to intense annual floods. The Ganga–Brahmaputra (G–B) Basin is known for such catastrophic events which are triggered by the monsoon system over the subcontinent, particularly during the southwest monsoon season. Flood science, an interdisciplinary endeavour, helps understand the causes of flood hazards and facilitates disaster management strategies. Major flood studies in India have been carried out on large peninsular rivers, lake deposits and the mighty river systems of northern India, including the Ganga and Brahmaputra. Flood studies in the deltaic region are hardly known to have taken place. History of floods is inseparable from the history of the land in general and the settlement history in particular. It has been observed that floods in the lower reaches of the Ganga and Brahmaputra have not increased over the last few decades¹. Flood studies in a dynamic delta generated by two mighty rivers are of great relevance to us, like the Bengal Fan to earth scientists. In view of the global warming threat, there is increasing concern among Quaternary scientists that the magnitude and frequency of abrupt events, for example, calamitous floods, are likely to increase and the region prone to such calamities is

likely to experience higher intensity of floods and consequent damage to the life of people and their settlements. Adequate disaster management strategies need to be in place.

During the last couple of decades, flood science in India has developed models for interpreting natural indicators of floods. Palaeoflood records have been identified in rivers, lakes and archaeological contexts. In archaeological studies, the latter occupy priority to be able to reconstruct past human response to natural calamities such as floods and the coping strategies in the past. Floods are hazardous to the stability of the settlements, but they are also harbingers of productivity and prosperity provided the inhabitants know how to live with floods. Flood records have been used to interpret the magnitude and scale of the event, the recurrence of tropical storms and intensity of monsoonal precipitation. Palaeoflood studies have generally been focused on slackwater deposits and palaeostage indicators. On the other hand, multidisciplinary studies on river-bank archaeological settlements have revealed records of human response to flood hazards and signatures of palaeofloods. Therefore, flood science needs to organize its programme for maximum societal benefit and society wants a prediction of its future. Flood scientists in India have recognized that Indian flood records provide ample scope for naturalistic/interpretive flood studies².

This prompted me to review *Living with Floods* from the perspective of palaeoflood studies as well as to understand the potential of deltaic archaeological sites to reconstruct human response to floods in the Ganga–Brahmaputra delta, the largest anywhere in the world. Current flood studies have been restricted to the northern sectors of the G–B Basin. Unfortunately, earth scientists have paid little attention to the palaeohydrology of this region. Flood hazards in this region are recurrent and catastrophic affecting the life of its inhabitants; yet the region is most populous. During the Late Holocene, population density had increased steadily, accompanied by higher density of settlements. How these settlers have adapted to the calamity-ridden landscape is of concern to us. Presumably, the book addresses this issue.

This book is authored by three scholars comprising two archaeologists and one

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earth scientist (geographer) specialized in fluvial geomorphology. In addition, specialists in distinctive sub-disciplines of environmental archaeology (archaeozoology, archaeoanthropology, phytolith science and archaeochemistry) have contributed to shaping this multidisciplinary volume based on studies at Balupur on Kalindri and related sites. These studies have contributed to understanding the nature of the site(s), site formation, subsistence, physical aspects of the people, and diverse forms of strategy adopted by the inhabitants to laterally fluctuating channel network. The latter has governed the spatial distribution of the settlements. Clusters of settlements are separated by sites with few archaeological remains. But for the buried built structures, the fluvial network has precluded mound formation. Absence of linear distribution of settlements is to be noted, as well the location of settlement clusters on the elevated interfluvies (>27 m amsl) within the overall low altitude deltaic landscape. Geomorphological, cartographic and sedimentological studies were carried out to delineate the nature of palaeofluvial terrain with human settlement in the area. Settlements were provided with tanks and ponds ensuring water supply to the inhabitants.

Excavations at Balupur have revealed the cultural history of the period between 7th and 19th centuries CE, supported by absolute dating methods such as ^{14}C and OSL of individual cultural periods. Agriculture and trade were the mainstay of



A weathered sculpture of Hara Parvati found from a 'pit' belonging to Period II. The sculpture is made of black basalt.

economy. Textile production, cotton, silk and jute were major industries; also ship-building, metal, leather and paper-making. External trade with Southeast Asia, China, and Portugal prospered. Gold, silver and Chinese porcelain were imported. The network of rivers provided for inland transport, at favourable times. The place of Balupur in the medieval urbanism of the region under different rulers of Bengal has also been emphasized. The book provides a scientific account of settlement history, site formation and an integrated picture of the culture during the course of the millennium with specific reference to Balupur and the Lower G-B Basin.

The volume lays emphasis on the importance of recent historical sites and their place in the archaeology of medieval India. This book is first of its kind in Indian medieval archaeology, though there have been purely archaeological studies at a number of medieval sites in western and northern India. The environmental context and its archaeological profile (aided by absolute dating of cultural periods) prompted the authors to initiate multidisciplinary studies. The study site is situated in a dynamic Ganga-Mahananda interfluvial and is perched on flood basin deposits in the northern part of the Bengal Delta. The region experiences periodic high- and low-magnitude floods under fluctuating monsoon regimes. The Bengal Delta is dominantly depositional landscape and erosional features are restricted to the flood basin areas. The depositional sequence reveals a huge pile of gravel, clay and sand, going to a depth of more than 100 m laid during a time-span of 30 kyr. Such fast rate of sedimentation is attributed to floods of varying magnitude. Historical records have revealed that major changes in the courses of rivers occurred under the influence of earthquakes and major floods. Studies have shown that floods in the Lower G-B Basin were locally restricted events and not governed by upstream controls and that monsoon triggered floods were not as turbulent however their threat loomed large¹. The authors' interpretation of changing palaeofluvial terrain is based on cartographic evidence, satellite data and field studies.

How did the inhabitants respond to the fluvial dynamism? What measures were unique to this largely deltaic landscapes? What were the geomorphological effects

of the floods on the river and the settlement? What geographical factors governed the location and sustenance of these settlements during the course of time? What was the role of waterways and the hinterland settlements in maintaining internal and external trade? These questions have been addressed by the authors, who have presented an integrated account of their findings.

Peasants living in this flood-prone area across Bengal, and Bangladesh, have been coping with floods because they maintain the productivity of the land and bring sustenance to their life. For them, floods are part of their lives to which their ancestors and they themselves have learned to adjust. They know the benefits that floods bring in terms of fertility of the soil. 'People do not die if there are floods, but people die if there are no floods', goes a popular saying¹. This legacy is well attested by the studies at Balupur and related sites, and hence justifies the title of the book. Modern human interventions in the form of developmental projects may have been causing increasing hazards, but as one goes back a millennium and more, obviously living with floods was the best coping method.

In recent years, Primus Books have surfaced in the publishing market with high-quality research and elegantly produced books. This book attests the fact that Primus has emerged a leading academic publisher in India. Both the authors and the publisher have come together to produce this excellent book reflecting on improved standards of research and publication. Accordingly, the authors archaeological sites in the dynamic fluvial environments are as primary as those in non-alluvial contexts. This book is a welcome addition and represents a landmark in multipronged archaeological studies.

1. Hoper, T., *Mem. Geol. Soc. India*, 1998, **41**, 119-141.
2. Baker, V., *Mem. Geol. Soc. India*, 1998, **41**, 219-228.

RAVI KORISSETAR

*Dr VS Wakankar Archaeological
Research Institute,
Sri Sarana Kripa, Sivagiri I Main,
Dharwad 580 001, India
e-mail: korisettar@gmail.com*