

farmers, anti-globalization campaigners and various kinds of academic philosopher and sociologist, one wonders whether the epithet “unreason” has lost its critical edge. What do all these different groups really have in common? Are they on the same side, intellectually or practically speaking? And if so, what side is it?

The problem is at its most severe where Taverne deals with intellectual criticism of various types of scientific and science-policy practice. Noting the call for “more democratic science”, he concedes that the public and its representatives have an important role to play in the development of science. But (in an argumentative style that is repeated throughout the book), having conceded this important point, he immediately undermines it by blaming those who are working to make science more responsive to public interests and concerns for having “driven scientists onto the defensive”. This charge immediately reduces what is an important area of constructive debate, about the way that science policy should be conducted in advanced democracies, to an

‘us versus them’ or (even worse) a ‘reason versus unreason’ stand-off.

Those of us who seriously advocate closer public engagement in science and science policy-making are not motivated by anti-scientific or antirational sentiments. Rather, we recognize that making decisions about how to conduct and apply science and technology in advanced industrial societies is a complex and difficult business. Experts of various sorts have essential roles to play, and so too do democratic representatives. But it is increasingly becoming clear that the establishment of sustainable policies in socially sensitive areas of science and technology is facilitated by the engagement of others in the process — such as special-interest groups, stakeholder groups and citizens’ groups.

Frankly, tarring efforts to achieve wider engagement in science and technology policy-making with the broad brush of ‘antiscience’ or ‘unreason’ is simply not helpful. ■

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tions of Çatalhöyük and its remarkable finds, but does not answer them. He explains the significance of Çatalhöyük as the earliest known site with domesticated cattle (a conclusion contradicted by recent zooarchaeological analyses). Although Çatalhöyük was an unusually dense settlement with bull’s horns embedded in some walls, and some female figurines, no credible hypothesis is ever offered for the meaning of these odd features. In fact, the reader never learns much about the life of those who lived there, despite the astonishing number of human skeletons buried under the floors of houses. All this extraordinary evidence begs for an explanation.

There are also myriad questions about Mellaart. In the bizarre ‘Dorak affair’, Mellaart was purportedly shown a treasure trove of looted artefacts from northern Turkey by a mysterious woman who subsequently disappeared. Only Mellaart’s drawings and descriptions of the artefacts remained. An inquiry conducted by the British Institute at Ankara exonerated Mellaart from any involvement in looting, but even so, Mellaart’s excavation was shut down in 1965.

In 1989, Mellaart, together with carpet specialists Belkis Balpinar and Udo Hirsch, published *The Goddess from Anatolia* (Eskenazi), which included stunning reconstructions of 44 wall paintings from Çatalhöyük. Why had there been no word of such glorious art before? Blatant discrepancies between the book’s claims and Mellaart’s earlier pronouncements cast doubt on the paintings’ very existence. Early reports described only red and black paint, not the striking blue in the new reconstructions. Rooms identified in the book as having magnificent wall paintings had been earlier declared by Mellaart to have no paintings. No excavator remembered seeing the fragments upon which Mellaart’s reconstructions were based. All corroborative evidence had been destroyed by fire in 1967, Mellaart told Balter. As Carl Lamberg-Karlovsky remarked: “Bluntly put, there is no objective reason to believe that these ‘new’ wall paintings exist.” Further, Mellaart proposed that

## At the trowel’s edge

**The Goddess and the Bull: Çatalhöyük: An Archaeological Journey to the Dawn of Civilization**

by Michael Balter

Free Press: 2005. 416 pp. \$27, £18.99

### Pat Shipman

This book is about neither a goddess nor a bull, unless Michael Balter is using a metaphor too subtle for me to appreciate. Indeed, *The Goddess and the Bull* is not really about the archaeological site of Çatalhöyük either. After much thought, I believe this is actually a post-processual book about archaeology.

Post-processualism is a concept developed by Ian Hodder, a Cambridge-trained archaeologist who now works at Çatalhöyük in Turkey. In its early formulation, Hodder suggested that the best way to approach archaeology is “characterized by debate and uncertainty about fundamental issues that may have been rarely questioned before”. He added that archaeologists “move backwards and forwards between theory and data, trying to fit or accommodate one to the other in a clear and rigorous fashion, on the one hand being sensitive to the particularity of the data and on the other hand being critical about assumptions and theories.” Post-processual archaeology is a dialogue, not a diatribe.

So too is this book, which provides a great deal of information: about archaeological theory, methodology and traditional interpretations of Çatalhöyük, one of the famous (or infamous) sites that inspired the concept of the Neolithic revolution. There have been decades of excavation by the original site director,

James Mellaart, and by more than 100 specialists under Hodder’s modern (or post-modern) direction. The most recent excavation, which began in 1993, is Hodder’s brave attempt to integrate his theoretical stance with field practice. The new methodology includes ongoing and constantly changing “interpretation at the trowel’s edge”, with computer diaries written by the excavators, video recording of discussions about interpretation and methodology carried out in the trenches, and constant interactions among scientists, locals, politicians, goddess-worshippers, carpet scholars and other groups who claim some ‘ownership’ of Çatalhöyük’s past. It is fair to say that Hodder’s task has been difficult and complex.

Balter raises many compelling questions about the differing and changing interpreta-



**The horns of a dilemma: what is the meaning of this painting of a red bull found at Çatalhöyük?**

J. & A. MELLAART

the paintings were linked to patterns found on Turkish kilims today, but the Çatalhöyük patterns cannot be made into rugs using the weaving technology preserved at the site.

The book details much debate but few conclusions. The result is a good read that bespeaks the importance of this enigmatic and iconic site and highlights Balter's considerable journalistic skills. The book is both accessible and fascinating. Balter tries, with moderate success, to show us how personality, nationality and the training of the scientists involved influences their scientific ideas.

Yet the book left me distinctly dissatisfied: I learned more about the childhoods of the excavation team members than about ancient Çatalhöyük. This is an intelligent, provocative book by a distinguished science writer who visited the site every field season for six years, interviewed the excavators, and read their publications, which are referenced in extensive notes and a lengthy bibliography. The scholars who have worked at Çatalhöyük are impressive, the duration of excavations far in excess of normal expectations. Why then is so much about Çatalhöyük so unclear?

Perhaps the reason is Balter's adherence to a Hodder-like reluctance to settle on a single interpretation for a site that means so much to so many. What are we to think, then, of Çatalhöyük and its evidence, excavators, myths? That remains the post-processual question. ■ Pat Shipman is in the Department of Anthropology, Pennsylvania State University, 315 Carpenter Building, University Park, Pennsylvania 16802, USA.

## Hidden depths

### **Fathoming the Ocean: The Discovery and Exploration of the Deep Sea**

by Helen M. Rozwadowski

Belknap: 2005. 304 pp. \$25.95, £16.95, €24

### **The Remarkable Life of William Beebe: Explorer and Naturalist**

by Carol Grant Gould

Shearwater: 2004. 416 pp. \$30

### **Descent: The Heroic Discovery of the Abyss**

by Brad Matsen

Pantheon: 2005. 286 pp. \$25

### **Jon Copley**

Deep-sea science is big science. Ocean covers 365 million square kilometres, and most of it is more than two kilometres deep. To understand what goes on down there, you need a ship to brave the high seas and equipment that can reach into the abyss. As today's researchers agonize over grant proposals and publication records, some may yearn for the time when they could chart the depths without worrying about tenure or research assessment exercises.



**The descent of man: William Beebe (left) and Otis Barton used their bathysphere to explore the ocean depths.**

But as these three books charting the history of deep-sea science reveal, that golden age never existed.

*Fathoming the Ocean* by Helen Rozwadowski chronicles the birth of deep-sea oceanography, from early observations by Benjamin Franklin to the voyage of HMS *Challenger* in the 1870s. She weaves a rich narrative from the work of renowned as well as lesser-known oceanographers. While unearthing the foundations of the subject, she reveals some striking parallels with modern research careers.

Like today, there was plenty of job-hopping, with worries about money and research output. When Edward Forbes accepted a chair in botany at King's College, London, in 1843, he also became curator of the museum at the Geological Society of London to boost his income. But he was concerned that he no longer had any time for research, and jumped ship just a year later for a job with the Geological Survey. This strategic jockeying paid off, and he was later appointed regius chair in natural history at the University of Edinburgh.

Then there is the tale of George Wallich, who sailed as a naturalist on the cable-surveying voyage of HMS *Bulldog*. Wallich hoped the expedition would make his name in scientific circles, as other voyages of discovery had done for T. H. Huxley and Darwin. But it was not to be. Despite initial enthusiasm about his results, Wallich failed to secure election to the Royal Society. Under the financial pressures of supporting his wife and children, he became a photographer instead. He described the prospects of his new career as "more than I could venture to hope for in that muddy sea of science". His story may sound familiar to today's postdocs-turned-plumbers.

Worrying about funding also occupied the mind of deep-sea pioneer William Beebe. To write *The Remarkable Life of William Beebe*, Carol Gould was granted unprecedented access to Beebe's personal papers that he had bequeathed to his colleague Jocelyn Crane.

Grant's detailed and well-organized biography is a treasure. From the waters of Bermuda to the jungles of Venezuela, Beebe was tireless in his enthusiasm for understanding the living world, and he provided the inspiration for many scientific careers.

Brad Matsen's *Descent* focuses on Beebe's collaboration with Otis Barton and their bathysphere dives. In the 1930s, they plunged six times deeper than anyone before and became the first people to see deep-sea life *in situ*. "No human eye had glimpsed this part of the planet before us," wrote Barton, often considered the more prosaic of the pair, "this pitch-black country lighted only by the pale gleam of an occasional spiralling shrimp." Matsen offers a wor-

thy tribute to their remarkable achievement, and explores the tensions between them. His account is captivating, although not as lavishly referenced as Gould's biography.

In the days before research councils and national science foundations, Beebe was using publicity and popular accounts of his work to charm funds from philanthropists. Like some who popularize their research today, he sometimes encountered snobbery from his academic peers. But deep-sea research has always been newsworthy and captured the public imagination. On 26 April 1857, the front page of *The New York Herald* hailed the laying of the first transatlantic cable as the "great work of the age", and illustrated the story with microscope drawings of seafloor sediments. Seventy-eight years later, radio listeners right across the United States and Western Europe tuned in to hear Beebe's voice live from the bathysphere at a depth of

### **NATURE EDITOR WINS AVENTIS BOOK PRIZE**

Philip Ball, a science writer and consultant editor of *Nature*, has won this year's Aventis Prizes for Science Books General Prize. *Critical Mass: How One Thing Leads to Another* (William Heinemann) takes a look at the application of physics to the collective behaviour of society. Bill Bryson, who chaired this year's judging panel and won the prize in 2004, says: "This is a wide-ranging and dazzlingly informed book about the science of interactions. I can promise you'll be amazed." (For a review of this book see *Nature* **428**, 367-368; 2004.)

Robert Winston takes the junior Aventis Prize for his children's book *What Makes Me, Me?* (Dorling Kindersley). The judging panel for this prize included schoolchildren as well as adult writers and scientists.

The winners received their awards at a ceremony on 12 May 2005 at the Royal Society in London.