

astounding considering that they are printed on art paper. Typographical errors abound the text; there are references to 'implements like seed grills' (instead of drills), 'granuries' (instead of granaries) and the Devil's tree has been described as *Alstonia seholaris* (instead of *scholaris*), to cite a few examples. Page 17 has been reprinted and it occurs twice.

A serious shortcoming of this book is that it is not connected up to the present-day India in any way, even though there is plenty to suggest that the tradition of sciences and technologies referred to have a large presence in India even today. The chapter on medicine makes no reference to the fact that even today most Indian babies are delivered by traditional birth attendants, and a majority of the broken bones are definitely set by traditional bone-setters. The All India Coordinated Research Project on Ethnobiology has recorded in 1994 that the tribals of India (who constitute only 6% of our population) have a knowledge of about 9000 species of plants among which 7500 species were being used for medicinal purposes – a truly staggering figure that is perhaps unmatched by any other civilization. The chapter on metallurgy talks of the rust-proof iron pillar of Delhi made 1600 years ago. However it does not tell us that even in 1960s Orissa tribals were making iron that was highly resistant to corrosion, or that even now iron is being made using the traditional process in tribal areas of Madhya Pradesh and Uttar Pradesh. The chapter on navigation and shipbuilding discusses about the ancient achievements from Mohenjodaro to the nineteenth century. However, it does NOT show an awareness of All India Coordinated Research Project on Navigation and Shipbuilding. This project has documented the great depth and knowledge in this area that has survived with our fishing community and boat builders even in the 1980s. As a result, the chapters in the book read more like indological essays ('The Wonder that was India!') rather than the description of a living tradition that has possibilities for today and tomorrow.

Today, in the study of sciences of various cultures, there is a growing understanding of how the science and technology of various civilizations are rooted in specific geographical or social contexts. Following this, there are also signs of a growing appreciation of the distinct difference in world views of

civilizations that gave rise to varying traditions of science and technology. One would expect that a publication of this kind would address some aspects of science and technology in India that make it distinct from Western science and technology, and the how and why of it. However, rather strangely, the book really reinforces the old dominant view that sees science and technology of various civilizations in a 'linear hierarchical' order! The only point the authors are keen to score are '... we got there earlier!'. In their overwhelming desire to hike up the score on all that Indians did – particularly before the West, this compilation has also slipped in material that is highly speculative or suspect (to put it mildly!). Descriptions regarding Sage Bhardwaj's spectrometer and electrolysis of water (Agasthya Samhitha – *Shilpasashtra*) do not pass the test of critical examination and editing. Better editorial guidance and greater attention to production would have vastly enhanced the value of this compilation on a fascinating subject.

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Migraine: A Neuroinflammatory Disease. E. L. H. Spierings and M. Sanchez del Rio (eds). Birkhauser Verlag AG, P.O. Box 133, CH-4010, Basel, Switzerland. 169 pp. Price not mentioned.

Migraine is a recurrent clinical syndrome characterized by a combination of neurological, gastrointestinal and autonomic manifestations. It causes substantial suffering and disability, and gives rise to great economic and personal burden by affecting a large number of people across their lifespan. It is a heterogeneous condition and the symptoms vary both among individuals and within individuals from attack to attack. The exact pathophysio-

logical disturbances that occur with migraine have yet to be completely elucidated; however, it is currently regarded as a neurovascular disorder of trigeminal sensory processing system. Despite the recent advances in the understanding of the pathophysiology of migraine and new treatment options, it remains an under-diagnosed and poorly treated health condition.

The three mechanisms thought to be involved in the pathogenesis of migraines are arterial vasodilation, decreased inhibition of central pain transmission and inflammation. The classical drugs used for treatment of migraines are vasoconstrictors, including ergotamine and dihydroergotamine that were introduced for the treatment of migraines in 1926 and 1945 respectively, and are in use even today. More recently, the triptans (selective serotonin agonists) are becoming the first-line alternatives in the acute pharmacological treatment of migraine along with non-steroidal, anti-inflammatory agents. Often, preventative medication is also indicated for patients experiencing frequent and/or refractory attacks.

The book under review focuses on the involvement of neurogenic inflammation in the pathogenesis of migraine and explores the possibility of developing anti-migraine medications that act by inhibiting inflammation. The current and potential future therapeutic approaches for preventive and acute treatment have been reviewed in a series of articles by clinicians and research scientists and the need for drugs that would be multi-pronged in their mode of action has been emphasized by several authors throughout the book.

In the first article in the book, Spierings reviews the three major pathogenic mechanisms involved in migraines, namely extracranial vasodilation, inhibition of central pain transmission and inflammation, and presents evidence that the lowering of pain thresholds is secondary to inflammation. Drugs like ergots and triptans have two modes of action, vasoconstriction and reduction of neurogenic inflammation. This article also introduces the reader to the calcitonin gene-related peptide as a mediator of neurogenic inflammation. The important role of calcitonin gene-related peptide in neurogenic vasodilation and in the pathogenesis of migraine is discussed in great detail in subsequent chapters. The animal models currently used to study the pathogenesis of migraines have been des-

cribed in detail and this will be useful for investigators involved in migraine research. The possible therapeutic targets for anti-migraine medication are discussed extensively. The clinical presentation and treatment strategies for migraine have also been presented cohesively. If the disorganized arrangement of the chapters can be overlooked, this book gives an overview of the current understanding of the pathogenesis of migraine and would be useful for scientists actively engaged in this area of research. This is an area that needs attention considering the enormous human suffering associated with it. It is often trivialized but this disorder has considerable social and economic impact and there is an unquestioned need for better drugs for treatment and prevention of migraine.

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The Dynamic Neuron. John Smythies. The MIT Press, Cambridge, Massachusetts 02142, USA. 2002. 150 pp. Price not stated.

There are living things that make do without neurons; not just plants but even slime moulds and other such organisms. They even move about and coordinate affairs of the various parts, albeit somewhat slowly. In fact a good fraction of the world of living things, has no need for the 'memory' stuff. But a moving animal as we know it, has a nervous system and needs to learn, remember and forget. It can occur in small timescales when changes in chemistry and hysteresis in reactivity lead to memories that can form, remain and fade at a purely cellular level and these then reflect onto cell-cell interactions. For longer time

scales, the short-term changes in chemistry should shift over to longer-term changes in cellular properties, possibly turning on and off genes or relocating molecules in cells. Even longer-term changes will feed these cellular changes, including changes in expression patterns of neural molecules to changes in circuitry, either physical or chemical. In one sense then, the neuron and the nervous system must be plastic enough to change as needed. Smythies' monograph is perhaps more like a good review in this area but written with a wider audience in mind. At times, Smythies' writing seems to be addressed to the lay reader. Phrases like 'arrival at the receptor' and 'departure from the receptor' reflect this style.

There is not much to say about the contents; it strings together a lot of studies and is descriptive. Evidence for synaptic plasticity is followed by mechanisms biased towards redox systems. Exocytosis and endocytosis are put in a central scheme of neuronal plasticity. They are suggested as plausible mechanisms of redistribution of membranes while retracting spines and re-growing. A chapter follows on cell biological mechanisms mostly to do with cell adhesion molecules, neurotrophins, scaffolding proteins and other molecules. While they are important and possibly the route to neuronal plasticity, in the discussion of details of the biochemical events, their real ability to modify and their consequence is almost ignored. The author finally makes a case for cellular changes leading to synaptic changes in the concluding short piece.

The book did not make exciting reading. Seasonally changing nervous systems, phantom limbs and such phenomena that reflect plasticity in connectivity never even get mentioned. This book could be treated only as part of a big story and the reader is best advised not to start with any great expectations. But in the areas Smythies has dealt with, this monograph is a complete review.

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Kaveri Riverine System: An Environmental Study. T. S. Sadasivan *et al.* (eds). The Madras Science Foundation, Chennai. 2000. 257 pp. Price not mentioned.

The book under review is the outcome of an Integrated Environmental Programme of Research on the river Kaveri, South India. It is entirely coordinated by the Madras Science Foundation under the sponsorship of the Ministry of Environment and Forests, Government of India.

The data were collected by 11 post-graduate colleges, six universities situated on the banks of the Kaveri and two universities elsewhere. A team of 29 investigators and their research workers studied the river and its physico-chemical and biological characteristics for a two-year period from 1990 to 1992 and 144 sampling stations were covered every month during this 24-month period.

It has been found that Kaveri waters are mildly polluted. The tributaries and distributaries are more polluted than the main river. Anthropogenic pressures and non-point sources seem to be also responsible for a great deal of damage in certain specific regions. Increased discharge of water due to monsoon rains does not seem to have had much of an impact. Pesticide residues have been found persisting in the top level of the food chain. Bacterial and heavy metal pollution are negligible.

The investigation is an attempt of a multidisciplinary, multifaceted approach to study the entire Kaveri system.

The book contains nine chapters dealing with different aspects of both physical and biological characteristics of the river. This is a sort of final technical report and does not look like a book. The dimensions of the book (29.5 cm × 21 cm) make it difficult to handle. The book however contains valuable information on Kaveri riverine system which is the lifeline of the people of Karnataka and Tamil Nadu. This will remain a model for investigation on other riverine systems of India.

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