

BOOK REVIEWS

technology remains an intriguing vehicle that is designed to transmit powerful images and messages about economy, polity and society. Prasad's analysis offers not only an innovative contribution to current debates within S&T studies, but also an original post-colonial perspective on the history of cutting-edge medical technology.

Studying S&T realm is Prasad's vocation. In setting out this thesis, he provides a nuanced reading of alternative science in order to explore possibilities of a dialogue between the analyses of alternative sciences (by drawing insights from some of the proponents of alternative sciences like Ashish Nandy, J. P. S. Uberoi and Shiv Viswanathan) and the empirical studies of sciences. Prasad is concerned with putting into broad relief the role of location or transnational geography in machineries of knowledge production. He addresses how both the internal world of science and the external world of science and the interface between the two, influence (and have influenced) the development of MRI technology (an interdisciplinary technoscience specialty) in India. He has empirically investigated technoscientific practices with respect to MRI-related research by following particular trajectories; for instance, in India MRI-related research and development is critically affected by networks of power, bureaucracy and '...hierarchical organization', sometimes including policies of the government, laboratory practices and so on. The book has looked at the question of construction and legitimization of knowledge, and the relation between expert and other forms of knowledge. A way of life depends on the way knowledge and the relation between other forms of knowledge determines not only the hierarchies of power, but the fate of pluralism. It also raises issues about the nature of invention, innovation and regulation.

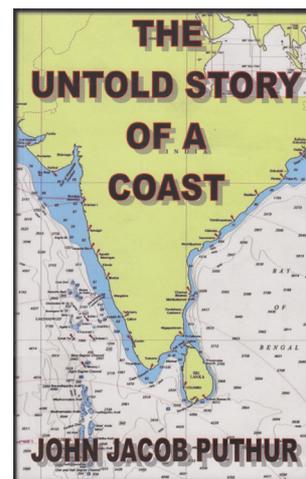
Invention of the method transforms the fate of knowledge. The scientization of knowledge, and of technology in particular, is crucial for understanding the nature of innovation in society. Innovation does not follow a linear path, but tends to follow complex feedback loops between research, processes development, design, engineering and production. Scientific (or innovative) work itself is a bricolage. The key to innovation is problem-solving, identifying ways of improving

the method to find answers to big problems. If one looks at the historical record, one finds that a source of inequality in the modern world (at least since the 1980s) has come from technological change. It can be threatening if it is mishandled, misused or misunderstood, because it can deskill people. This book provides a platform to study the roles of various actors and the form of influences/interactions they have on each other.

The book consists of five chapters in addition to introductory essay, concluding remarks and the postscript notes. A fascinating account is provided of how technological innovation happens in many different loci, but much of it goes unrecognized. Also, there are interesting accounts of how research agendas require a whole world of material things that are unequally accessible globally. One issue that Prasad did not delve in-depth is that the culture of technology transfer to the industry from academia is not a dominant trend in India as yet (although he spends more than reasonable amount of space towards the end of the book in the notes). The scientists, rather very much want the government to intervene in terms of policies of translational research within Indian academia. This book is a significant contribution in the field of history of technology, post-colonial science studies and current debates within S&T policy studies. A must for anyone who wants to think about innovation globally and as an accessible language, because of the histories it unloads as evidence.

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The Untold Story of a Coast. John Jacob Puthur. Star of Sea Publications, 95, Defence Layout, Vidyanarayapura, Bangalore 560 097. 2013. xviii + 294 pp. Price: Rs 400.

Since 1990, natural disasters in our country such as floods have claimed 35,035 lives, earthquakes have claimed 32,822 lives, storms have claimed 19,655 lives, 16,389 people lost their lives due to the December 2004 Indian ocean tsunami, and 10,373 people lost their lives due to extreme temperatures. Table 1 lists five natural events which have taken a high toll¹.

Can human beings in general be held responsible (to a certain extent) for a few of the aforementioned disasters? It may not be possible to give a correct answer (accompanied with a meaningful and scientific explanation) to this perturbing question without first gaining a deep understanding of nature, its ways and at least a few related natural phenomena.

Does wind pressure really act on the surface of the sea? Can wind make water

Table 1. Natural events (floods, earthquakes, storms, tsunami, extreme temperatures)

Month and year	Natural event	Casualties
September 1993	Latur earthquake	9,748
October 1999	Odisha cyclone	9,843
January 2001	Bhuj earthquake	20,005
December 2004	Indian Ocean tsunami	16,389
June 2013	North India floods	6,054

flow along the direction it blows? Does water move horizontally with the wave at sea? Or does it move vertically with the wave at sea? Is the Indian coast different from most of the other coasts in the world? What is the relationship between wind speed and wave height? Can we actually measure the wavelength of a wave at sea? Why do we find sand on all the beaches in the world? Are there any differences between the land dynamics at a beach and at a sheltered coast? What proof do we have that the city of Dwaraka is now submerged? Why do we find most of the deserts along the tropics? The answers to the questions above are not as simple as they appear, and they have to be understood in a larger context. John Jacob Puthur has conducted a seminal study of ocean waves, sea waves and related phenomena and compiled the information in the form of the book under review. The book is a scientific exploration of natural phenomena. Each of the 47 chapters presents novel information and facts which provide deep insights into how man through his activities is influencing the coasts in several undesired ways. The book contains several scientific mysteries connected through a common thread which are solved through a logical process and unfolded layer by layer.

Like most other books, this one has a foreword, acknowledgements section, contents, prologue, regular chapters, epilogue, references and an index, but it also incorporates a warning section at the beginning. The book challenges several long-held dogmas and dispels several myths related to the oceans and the seas.

The first chapter sets the tone of the book. It dwells on dredging – capital dredging as well as maintenance dredging; siltation – a phenomenon which costs the Indian Navy more than ~120 million by the present standards and the lowest astronomical tide (LAT), which occurs once in 19½ years. Chapter 2 explains the use of various colours such as blue, white, olive green; and yellow, magenta and brown or black symbols in a navigational chart. The chapter also explains how known or suspected offshore dangers and other conspicuous features are depicted on a navigational chart. Chapter 3 is devoted to beach gradient survey. Chapter 4 provides information about hydraulic models: wave-hydraulic model, tidal-hydraulic model, the wave-cum-tidal hydraulic model,

mobile-hydraulic model, and rigid-bed hydraulic model. Chapter 5 unravels a mystery – do waves really move sediments? The chapter also explains the finer differences between erosion, accretion and siltation and formations such as sandbar, spit, sandridge and berm. Chapter 6 provides a bird's-eye view of the Chennai port and the gradual changes in beach (which stretched from the mouth of Adayar River in the south to the Ennore Creek in the north) due to erosion and construction activities. It also provides an introduction to the concept of littoral currents, which becomes important later in the book. Chapter 7 is devoted to the expansion of the Naval Dockyard in Mumbai. Chapter 8 dwells on a bizarre process of building a dockyard at Mumbai, which ultimately collapsed. Chapter 9 gives a detailed description regarding an incident which took place in the Mumbai dockyard in which several vessels were set adrift and suffered major damages resulting in great chaos. Chapter 10 is a treatise on the properties of water and the waves that are formed on oceans and seas.

Chapter 11 explains why the equations: wave speed = wavelength ÷ wave-period, and Orbital speed = π * wave-height ÷ wave-period, are only a mathematical fiction for waves at sea. Chapter 12 dissects the concept of breaking of waves. Chapter 13 delves into the movement of sediments along the coast. Chapter 14 dwells on the formation processes of sandbars and spits. Chapter 15 explains how the Marina Beach in Chennai has been fashioned. Chapter 16 opens a Pandora's box – it dwells on the Sethusamudram ship canal project. [Starting from 1861, 13 massive reports have been prepared on the Sethusamudram project and as of now, work on the canal has been suspended.] Chapter 17 is devoted to Karanja Breakwaters construction, which took almost four years and cost the nation ~1.6 billion. Chapter 18 throws light on the seismic survey process. Chapters 19 and 20 expose the flaws in the experiments conducted and the thought processes that went into designing the Karanja Breakwaters.

Chapter 21 offers explanation for silting at New Mangalore Port. Chapter 22 examines the factors due to which erosion of beaches takes place. The chapter also dwells on the formation of islands and islets. Chapter 23 delves into the rea-

sons due to which a seawall might collapse (no matter how securely it has been built). Interestingly, the waves which break on a seawall, no matter how furious they are, cannot even shake the boulders which make the seawall and yet it might collapse. Chapter 24 discusses the reasons which led to severe erosion at the Kakinada Deepwater Port. Chapter 25 is devoted to the disappearance of a few prominent features on the 300 km long West Kathiawar coast. Chapter 26 discusses the effect of road construction (near a coast) on coastal areas. Chapter 27 discusses the effects of dams (near a coast) on coastal areas. Chapters 28–32 explain how floods altered the geography from Port Muziris to Kochi Port (ancient ports in Kerala).

Chapter 33 dwells on the geography of Karwar, now known as the Third Naval Base of the Indian Navy. Chapter 34 contains descriptions of pontoon and whaler. The chapter dwells on the sinking of a pontoon, the reasons for which have been dissected in chapters 35–38. Chapter 39 explains how accretion has been affecting the coastal line of Gujarat. Chapter 40 dwells on an epochal decision – that of building a dam across the Gulf of Khambhat. Chapter 41 is a treatise on tidal resonance. Chapter 42 rings alarm bells. It examines the effects of inter-linking of rivers. Chapter 43 dwells on terms 'coastal plain', and 'continental shelf'. Chapter 44 unravels the mystery of the 'chakara', which literally implies 'dead coast'. Chapter 45 is a treatise on atmospheric pressure, effect of uneven heating of the earth on the path of wind, and effect of earth's rotation on the path of the wind. Chapter 46 is devoted to monsoon in India. Chapter 47 discusses a theory which connects Africa, Antarctica, Australia, India and Madagascar with Gondwanaland.

The author has described terms related to hydrography and hydrographic equipment in great detail and coupled them with real-life incidents which make the book come alive. A careful reading of the book will provide deep insights into practical applications of Bernoulli's law, Beaufort's scale, wave celerity, wave flume, groynes, swatches, longshore drift, funnelling effect and precession. The book will be of use to scientists, geologists and environmentalists.

The author has also passed judgments at certain places. For instance, on p. 34 he states: 'Theories are invariably based

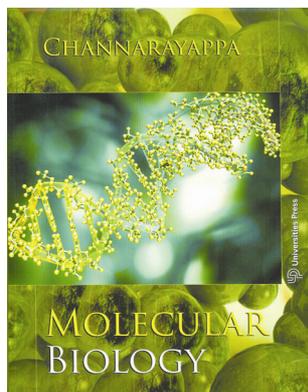
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on reasonableness rather than actual empirical evidence'. Experiences and experiments might not always agree with such judgments. Nonetheless, this book is an outcome of painstaking research carried out over a period of nearly 2–3 decades (if not more), and contains useful information.

1. EM-DAT: The OFDA/CRED International Disaster Database, Universite catholique de Louvain, Brussels, Belgium; www.emdat.be

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Molecular Biology. Channarayappa. Universities Press (India) Private Limited, 3-6-747/1/A & 3-6-754/1, Himayatnagar, Hyderabad 500 029, India. 2015. viii + 500 pp. Price: Rs 650.

This book is a lucid account of the vast subject of molecular biology. It starts

with the chapter 'Introduction to molecular biology' targeting new entrants to the subject, and introduces them to the most common and recent tools utilized in the field. Some advanced topics like DNA and protein microarray technologies are covered, and it is hoped that the omission of next-generation sequencing technology will be rectified in a future edition. Each chapter in the book ends with key points, self-assessment questions, further reading and references, giving the readers helpful tools to judge and further expand their knowledge about the subject.

The rest of the chapters provide in-depth understanding of basic molecular biology and cover major areas like transcription, RNA processing, translation, and protein processing and transportation. The relevance of the basic biological processes to disease is brought out through helpful sub-topics such as 'Cell division cycle and cancer', within the chapter on 'Cell division'. This is much needed for translation-oriented curricula and allows readers to better appreciate a subsequent chapter on 'Molecular biology of cancer'. The chapter on 'Protein processing and transportation' is notable, due to detailed and illustrative presentation of this important cellular process. How proteins are processed and targeted to different organelles is the key to understand the functioning of a specific cell type. A detailed section on 'Cell signaling' is, however, missed.

The book has separate well laid out chapters on the regulation of gene expression in prokaryotes and eukaryotes, which provide a detailed description of these vital regulatory mechanisms. The section of 'RNA interference' misses out on microRNAs (miRNA), which are currently in the limelight, because of their

crucial post-transcriptional regulatory role in numerous cellular processes and their implication in several diseases, including cancer. Although miRNA is introduced elsewhere, it warrants a more elaborate explanation. The book provides the reader with exhaustive and up-to-date information on epigenetic regulation, genetic recombination, transposons and mutagenesis, and DNA repair. The book includes 'applications' of most of these processes, or discusses about their relation to disease, which is an added advantage to the reader. Readers are also introduced to some recent findings like 'RNA repair'. It is commendable that most of the chapters also include a description about similar mechanisms in 'plant systems', thus making the book useful for both animal and plant biotechnologists. The book concludes with a dedicated chapter on 'Molecular biology of cancer' that is meticulously written and introduces the molecular basis of cancer, types of cancers, cytomorphological characteristics of cancer cells, oncogenes, causes and risk factors leading to cancer, and finally the treatment of cancer.

Overall, the book is written in an eloquent style, and is aimed to help students assimilate complex mechanisms and concepts with reasonable ease. It will definitely prove to be a useful addition to the repertoire of books available for graduate/postgraduate students of basic sciences and medicine.

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