

when they were still alive and active. Based on all these clues, the authors have been able to reconstruct the whole tropical ecosystem, including the dynamic processes (for example, a bee with pollen attached to its legs), as it had been in the past on one of the Caribbean Islands.

Chapter two, the longest section of the book, takes the readers through this reconstructed prehistoric ecosystem. Chapter three highlights the structure of the prehistoric tropical forests on the Island of Hispaniola and in chapter four the readers are oriented to the amber world, how to handle amber-containing fossils and more than all, how to tell imitations from the real ones. In two appendices, the authors provide details of the diversity of organisms in the Dominican amber.

It is amazing to learn that most genera of plants and animals preserved in amber collected from the Dominican Republic have living representatives either in the Caribbean or elsewhere in the tropical world today. Ants belonging to the genera *Aphaenogaster*, *Camponotus*, *Crematogaster*, *Dolichoderus*, *Leptothorax*, *Pheidole*, *Prenolepis*, *Solenopsis* and *Tapinoma* are amongst those identified in the amber fossils. Interestingly, these genera include species of ants which are some of the commonest and widespread amongst extant insects.

On the whole, the book is excellent in its presentation. The fossils have been beautifully illustrated with both coloured and black and white photographs. Additionally, the authors have enriched the book with their painstaking sketches, reconstructing prehistoric scenes. The overall style of writing is one of 'story-telling', taking the readers through a biodiversity-rich prehistoric world. For instance, the book starts with a prologue that reads as follows: "I lifted to the window, a nugget of golden Dominican amber entombing a small stingless bee. The sunlight infused it and illuminated the bee caught forever in flight – gossamer wings outstretched and perfectly preserved down to the last hair. Stark eyes appeared to be gazing at me... . Would the vistas of just one day be sufficient to reveal the wonders of life millions of years ago? What was the last fateful day like? And what events had taken place in the eras before this specimen arrived in my hand?"

This book should be of great interest to all students of biodiversity and palaeobiology as much as it would be to general readers. It is available as a paperback edition. Those who wish to get more details regarding this fine book may look up [www.pup.princeton.edu](http://www.pup.princeton.edu).

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This volume begins with an introductory chapter giving a wonderful summary of the advances and turning points in the scientific career of Charles Yanofsky. Throughout the text Yanofsky treats us to many interesting metaphors. For example, we learn about how he was turned down by the undergraduate admissions committee both at Johns Hopkins and University of Illinois, graduate admissions committee at Caltech, and how one prominent biochemist wrote a personal letter advising him to seek a career in some area other than science! Much against his advice, Yanofsky pursued graduate work at Yale, became a faculty member at Case Western Reserve, and since 1958 has been at Stanford as a distinguished Professor. The low-key approach that Yanofsky uses to describe his work over five decades is a rare treat in our overhyped, oversold and overly solicitous world of science. Looking at the scientific contributions from his lab, among many, two are eminently noteworthy: establishing gene–protein colinearity, and elucidating the features of operon regulation by transcription attenuation.

The Editorial Committee responsible for organizing this volume takes a Noah's ark approach, presenting a parade of articles that cover areas,

including DNA metabolism, signal transduction, mechanisms of enzyme catalysis, gene regulation, protein synthesis, protein engineering, cytoskeleton, protein processing and degradation, that extend across species, except plants.

The chapter by D. Frick and C. Richardson is outstanding in conveying the idea of the complexity of initiation of DNA replication mediated by a class of enzymes called primases. There is intense current interest in learning about this novel class of RNA-synthesizing enzymes, which are distinct from the classical RNA polymerases. It offers an excellent review of the topic from the discovery of gene 4 protein in phage T7 as a priming protein, later designated as primase, and brings many studies into a coherent perspective. It also has the courage to be speculative, especially regarding the design of drugs to block bacterial or viral diseases. It goes on to present in detail a collection of primases, interacting partners and insights into mechanistic aspects. In addition, it has extensive summary charts and figures, which are useful for the person working in this area to grasp the text without having to read the remainder of the text!

The ability of proteins to recognize each other in a specific manner to form stable complexes is a hallmark of most cellular processes. The replication of duplex DNA by an assembly of enzymes and proteins that collectively constitute the replisome is an instructive example of finely-crafted biological machine. Through the case studies of *Escherichia coli*, phage T4 and T7 replisomes, S. Benkovic and colleagues review decades of research and show that our knowledge and understanding of this complex process has dramatically expanded. Whereas the chapter regarding work on *E. coli* which has been the centerpiece of the DNA replication field, and often reviewed in this series, is exceptional as an introduction to anyone interested in getting initiated into the area of DNA replication.

The chapter by J. Champoux discusses the structure, function and mechanism of DNA topoisomerases. Progress has also been made toward defining the regulation of topoisomerases *in vivo*. There has been a remarkably longstanding controversy over whether topoisomerase II contributes to scaffolding architecture of the eu-

## BOOK REVIEWS

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karyotic cell or not. Both find no mention here. Since reviewed in this series by J. Wang few years ago, apparently not much conceptually new information has been added. I would have liked to see emphasis on regulation of topoisomerases *in vivo*. This would have been useful for a variety of readers in cell biology and related fields.

Two chapters address transcriptional coactivator complexes and their regulation by chromatin modelling activities, including coactivator complexes and their effects on gene regulation. Transcription factors and their regulation are key in controlling all aspects of cellular development. These two chapters succeed in the daunting task of reviewing a plethora of papers into a cohesive review of the field. However, I find some aspects in these two chapters repetitive, with significant overlap which should have been avoided.

Four chapters explore genetic, biochemical and structural aspects of signal transduction and signalling molecules, thus reflecting the focus of current research in these areas and the vast increase in our understanding of these processes. Of these, I find that the chapter on G-protein-initiated signal transduction by Dohlman and Thorner is most distinct and classic. Much of what we understand on signal transduction is tied to the genetic analysis of the pathway in yeast, where, most if not all, of the core components of the signal transduction pathway have been identified. The great strength of this chapter is that it covers all of the important work on genetics, biochemistry, cell biology and regulation. While the role of phosphorylated inositol lipid molecules in signal

transduction has been firmly established, the interest has now turned to enzymes involved in their metabolism. For this purpose, the enzymatic activities have been separated into three categories. These include phospholipases, kinases and phosphatases. Although many of the isoforms of phospholipases had been previously described, the chapter by Soo Goo strengthens the link between the interacting partners and distinct modes of activation. These complexes contain a large number of motifs, suggesting a web of functional interactions that might be viewed as either elegantly integrated or just incidental. A chapter by Waterfield and colleagues illustrates different pathways and enzymes involved in synthesis of inositol lipid molecules. This chapter leads very nicely to the next by Dixon and colleagues, linking the protein tyrosine phosphatases to a wide variety of cellular processes, including growth, metabolism, differentiation, motility, apoptotic cell death and disease processes.

As we enter into the post-genomic era, our attention has naturally shifted to the products of the genomes that have been unravelled – the enzymes and proteins. The conventional wisdom is that an enzyme is only as good as the speed with which it carries out its function. Three chapters deal with the mechanisms of enzyme catalysis, tunnelling of substrates and intermediates, and divergent evolution of enzymatic function. The chapters on channelling of intermediates and substrates and evolution of enzymatic function are exceptional as an introduction to anyone interested in intermediary metabolism. The chapter

by Perry deals with the radical mechanisms of enzymatic catalysis. Here, the kinetics and thermodynamics are presented from a truly biological viewpoint.

One chapter systematically details the background and functional and structural approaches taken to decipher the role of the signal recognition particle in targeting of proteins. Scrutiny of the structure of some of and numerous *in vitro* studies allow a clear and concise picture of the functional properties of the SRP particle in both prokaryotes and eukaryotes. Two chapters deal with recent developments in analysis of proteins and proteomes by mass spectrometry and protein engineering of zinc-finger proteins. In addition, this volume has excellent chapters on intracellular trafficking of copper, regulation of actin filament network, protein ubiquitination, and protein synthesis and folding in the cell. The last chapter is on viral membrane fusion proteins, which addresses a variety of model systems and development of vaccine strategies for viral therapies. Each of these chapters appears to be comprehensive and informative. The accompanying illustrations in each of these chapters are of excellent quality. For students, teachers and researchers, this volume contains a compendium of useful articles covering a wide variety of diverse topics.

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