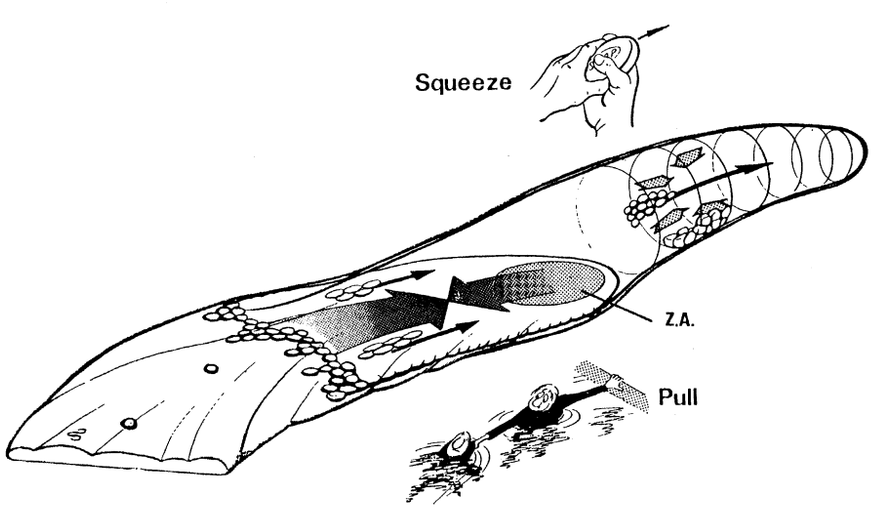
tion-induced aggregation. Topics treated include the structure and expression of the cell-surface receptor for external cAMP (the aggregation-inducing chemotactic factor), guanosine triphosphate–binding proteins that may play a role in transmembrane signaling, and the biochemistry of the cytoplasmic cAMP-dependent protein kinase. The chapter on the extracellular phosphodiesterase (PDE) and PDE inhibitor protein that, together, regulate the levels of external cAMP clearly exemplifies the potential of this system for multidisciplinary approaches to biological questions. This chapter summarizes the biochemistry of these proteins, reviews the structure and developmental regulation of the PDE gene, explores the developmental consequences of PDE overexpression, and describes the rescue of a mutant phenotype by transformation with the PDE gene on an extrachromosomal vector.

In the second section of the book, we learn about the regulation of gene expression during spore germination, the prestarvation response, early developmental events, and prestalk and prespore cell differentiation. External cAMP acting through its cell surface receptor plays a key role in triggering differentiation; both *cis*- and *trans*-acting factors are involved in signal transduction to the nucleus. Guanine-rich sequences analogous to the SP1 binding sites of higher eukaryotes are important promoter elements of many developmentally regulated genes. Other contributions review DNA repair, the properties of the multicopy *Dictyostelium* nuclear plasmids, and available integrative and extrachromosomal vectors.

The third section provides an overview of some of the cytoskeletal and cell-surface changes occurring during development. Highlights of this section include a report that conventional myosin (myosin II) can associate with cytoplasmic vesicles, evidence that actin filament cross-linking and severing proteins are conserved from *Dictyostelium* to *Homo sapiens*, and chapters on the proteins and oligosaccharides involved in cell-cell adhesion. The volume concludes with a broad-ranging section on patterning that contains discussions of cell differentiation–inducing factors other than cAMP, a comparison of high-frequency switching in yeast and *Dictyostelium*, and a model for the generation of spatial patterns in the related organism *Polysphondylium pallidum*.

This volume captures a large fraction of the excitement generated by work presented at the 1987 conference and is the most up-to-date book available on development in *Dictyostelium*—at least until the publication of the proceedings volume from the second Airlie House conference, to be held in late 1989. As such, it deserves a place in every laboratory studying *Dictyostelium*. Also, the clarity of most of the chapters, which mainly are short reviews of published and ongoing work, make the volume an appropriate adjunct for a graduate course in developmental biology.

ELIZABETH LUNA
Worcester Foundation for Experimental Biology, Shrewsbury, MA 01545



"The squeeze-pull model: forces within the [*Dictyostelium discoideum*] slug causing cell movement. This slug has been drawn in an attitude typically adopted, when the nose . . . is being protruded while the tail . . . is being drawn forward. Solid black arrows indicate cell movement; broad, shaded arrows indicate forces affecting cell movement. The squeeze-pull model asserts that nose protrusion is brought about by the circumferential contraction of a peripheral girdle of cells that squeeze interior cells forward towards the zone of adhesion (Z.A.), where the slug gains traction on the substratum (refer to illustration of the pool rescue). To simplify, only those forces leading to the propulsion of cells have been drawn." [From E. Breen and K. Williams, "Movement of the *Dictyostelium discoideum* slug" in *Molecular Biology of* Dictyostelium *Development*]

Reconnaissance in Tibet

The Geological Evolution of Tibet. Report of the 1985 Royal Society–Academia Sinica Geotraverse of the Qinghai-Xizang Plateau. The Royal Society, London, 1988. iv, 413 pp., illus., + microfiches and maps in pocket. £101.50.

Since the 1970 publication of a classic paper by John Dewey and Jack Bird exploring the relationships between plate tectonics and mountain building, the Himalayas and Tibet have been regarded as the "type" example of an orogen formed by the collision of two continents. Dozens of papers written over the last 20 years, largely based on geophysical studies, have promoted general theories of collisional orogenesis derived from the Himalayan model. The preeminence of the Himalayas and Tibet in the geophysics literature is ironic in light of the fact that the basic geology of the region is so poorly known. The physiography of the region makes fieldwork there unusually difficult—much of the Tibetan Plateau lies at elevations in excess of 5000 meters, and roads are scarce—and political instabilities have plagued the "roof of the world" since before geology emerged as a scholarly discipline. As a consequence, most geologic research in the Himalayas and Tibet has been reconnaissance. Often logistically connected with early climbing expeditions to the world's highest mountains or with exploratory travels through uncharted regions, published accounts of these studies make exciting reading. Unfortunately, the paucity of systematic studies of the Himalayas and Tibet invites rampant extrapolation of observations in a relatively few areas to the region as a whole, giving the mistaken impression that this orogen is geologically simple compared to better-studied examples like the western Alps or the Appalachians.

For these reasons, I approached *The Geological Evolution of Tibet* with some trepidation. This book evolved from a two-month field excursion, sponsored by Academia Sinica in China and the Royal Society in Great Britain, across central and northern Tibet in 1985. The traverse closely followed the new road linking the capital city of Lhasa with Golmud, some 1300 kilometers to the north, revealing a geologic cross-section through the predominant northwest-southeast structural grain of the Tibetan Plateau. Twenty-five geologists participated, representing a wide range of geologic subdisciplines. The results of their field research and follow-up laboratory studies are described in the 14 papers contained in the volume.

Although I had expected these papers to be rather sketchy, I found many to be reasonably thorough given the nature of the

research. Many papers are extremely readable, and, refreshingly, most are written so that nonspecialists in a particular subdiscipline can readily understand the general implications of the research discussed. The papers by Smith and Juntao on paleontological observations and by Kidd and eight coauthors on geologic mapping deserve special praise for their clarity, descriptions of methodology, and circumspect approach to the interpretation of data.

The participation of so many scientists in the project naturally produced some divergence of interpretation. My favorite example of this stems from the long-standing controversy about how much of the late Tertiary and Quaternary convergence between India and Eurasia is accommodated by eastward extrusion of Tibet: Kidd and Molnar, in their paper on recent faulting along the traverse, argue for a "significant fraction," whereas Dewey *et al.*, discussing the tectonic evolution of the plateau, say "little, if any." I was happy to see such disagreements apparent in the book, but I can't help wondering if they might not confuse a reader who is not well versed in the evolution of modern geologic thought about Tibet. A collection of such diverse papers begs for a summary chapter that clearly and evenhandedly discusses the strengths and weaknesses of the divergent interpretations in various papers. The tectonic evolution paper by Dewey *et al.* is the last offering in the collection, and it may have been intended as a summary. If so, it falls well short of the mark. Although I was pleasantly surprised that many of the earlier papers stressed the dangers of assuming that conclusions based on one geotraverse are applicable to the Tibetan Plateau as a whole, I found the last paper to be filled with the kind of blanket extrapolations that plague so many papers about the Himalayas and Tibet. Many interpretations in this chapter are not required by the data obtained during the geotraverse, and most of the conclusions are unsubstantiated. My greatest fear about *The Geological Evolution of Tibet* is that this general chapter will be widely cited and the preceding, better-conceived papers will be ignored.

On balance, *The Geological Evolution of Tibet* is an important contribution to the geologic literature on Tibet, even if, as a report on reconnaissance, it raises more questions than it answers. Let's hope that the present political difficulties in the region will be resolved in such a way that the geologic community can begin the kind of systematic studies required to truly understand the geological evolution of Tibet.

KIP HODGES
Massachusetts Institute of Technology, Cambridge, MA 02139

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