CONVULSIVE GEOLOGICAL EVENTS

The volume on “Sedimentologic Consequences of Convulsive Geologic Events” (Special Paper #229, Geological Society of America, 1988, edited by H. Edward Clifton) is an outgrowth of the Inaugural Symposium of the Sedimentary Geology Division of the Geological Society of America, held on 28 October 1985, in Orlando, Florida.

The volume highlights the processes and products of convulsive events, and contains the following eleven papers:

'Sedimentologic relevance of convulsive geologic events' by H. Edward Clifton

'Nearshore responses to great storms' by Robert A. Morton

'Origin, behaviour and sedimentology of prehistoric catastrophic lahar at Mount St. Helen's, Washington' by Kevin M. Scott

'The Mount Mazama climactic eruption (~6900 yr. B.P.) and resulting convulsive sedimentation on the Crater Lake caldera floor, continent and ocean basin' by C. Hans Nelson, Paul R. Carlson and Charles R. Bacon

'Sonar images of the path of recent failure events on the continental margin off Nice, France' by Alberto Malinverno, William B.F. Ryan, Gerard Auffret and Guy Pautot

'The 1929 “Grand Banks” earthquake, slump and turbidity current' by David J.W. Piper, Alexander N. Shor and John E. Hughes Clark

'Basin plains: Giant sedimentation events' by Orrin H. Pilkey

'Large-scale bedforms in Boulder gravel produced by giant waves in Hawaii' by George W. Moore and James G. Moore.

'Sedimentological consequences of two floods of extreme magnitude in the late Wisconsinan Wabash Valley' by Gordon S. Fraser and Ned K. Bleuer.

'Deposits of a middle Tertiary convulsive geologic event, San Emigdio Range, Southern California' by Peter G. DeCelles

'Cretaceous/Tertiary boundary sediment' by Kenneth J. Hisl

In recent times, geologists have shown keen interest in the study of deposits of infrequent events (see for example, Einsele and Seilacher, 1982; Einsele, Ricken and Seilacher, 1991 and numerous papers appearing in recent sedimentologic journals) of rapid deposition by processes that are sudden, unpredictable and convulsive, and defy the Principle of Uniformitarianism. Sedimentary records of such non-regular and rare convulsive episodes are known as event beds. These event beds reflect either intrabasinal (autocyclic, local mechanisms) or extra-basinal processes (more regional to global allocyclic mechanisms) (Einsele et al. 1996). The various convulsive processes are: severe flood, turbidity current, seismic shocks, giant tsunami, violent volcanic eruption, large bolide impact. Besides, purely chemical events may also generate event beds, e.g. an oxygen crisis, or a brief period of salinity crisis, reflected in the sedimentary record by a wide mass mortality of organisms (Dott, 1996). The correct identification of such event beds in the rock record helps in regional and local stratigraphic correlation, in drawing correct paleogeographic picture, in basin evolution etc.

The papers in the volume under discussion present different case histories of convulsive events, their products, and criteria to identify them in the rock record.

It appears that many of us in India are not aware of the various convulsive processes and their products in the rock record, judging from the meagre number of papers under Indian authorship(s) in various national/international journals. The present volume may be a starting point for them.
I am sure that the students of Earth Science in India will be benefited if they carefully go through the different papers in the volume.

Jadavpur University

References


(The books reviewed are available in the library of the Geological Society of India for consultation - Ed.)


The Geological Society of France has published this thematic volume on studies in intertropical carbonates in memory of Prof. Gabriel Lucas, who made landmark contributions to the study of carbonate sediments and the roles of algae in carbonate build-ups. His contributions were published mostly in French and therefore remain only known to the few who know the French language. The present volume contains gist of papers published in French as well as English includes translations of the gists of the papers. In more ways than one, the volume represents a unique collection of papers tackling diverse aspects of carbonate studies, particularly tropical carbonates and forms a comprehensive, up-to-date compilation of intertropical carbonate sedimentology.

After the introductory section devoted to the reviews of the works of Prof. Lucas, the remaining pages are divided into ten themes. The first Chapter contains five papers, all of which are in French, on the physicochemical nature of carbonate solutions and the methodology for studying carbonates. The next has three papers on the studies on the carbonate production by biotic agents in an intertropical environment. This chapter is closely linked with the third chapter on Biosedimentology, in which six papers document how nutrient supply, climate, accretion, erosion potentials and species variations influence carbonate accumulation. The following group of five papers are devoted to the global variations in sea-levels through time and their influence on the rhythms in marine carbonate deposition. The next two chapters containing six papers in all, focus on the carbonate facies associations (assemblages) and the Palaeogeographical-Palaeoenvironmental aspects of carbonates. Continental carbonates are discussed in the seventh chapter with four papers which document the microbial, environmental, hydrological and volcanic influences on such carbonate precipitation and accumulation. Although much work is available on carbonate diagenesis, for example on dolomitisation, the chapter on this theme contains only one review article and another discussing the article. The five papers on karst processes and controls cover a wide range of aspects including palaeoclimatic and palaeohydrochemical signals that can be derived from karstic limestone terrains. The last chapter devoted to “Carbonates and cultural heritage” furnishes an interesting summary on societal aspects of carbonate studies.

Although language barrier may impede a clear understanding of all the papers included in the volume, the translated gists make it a truly bilingual publication. One may be critical that several important topics on carbonate studies find poor representation in the volume, but it scores much